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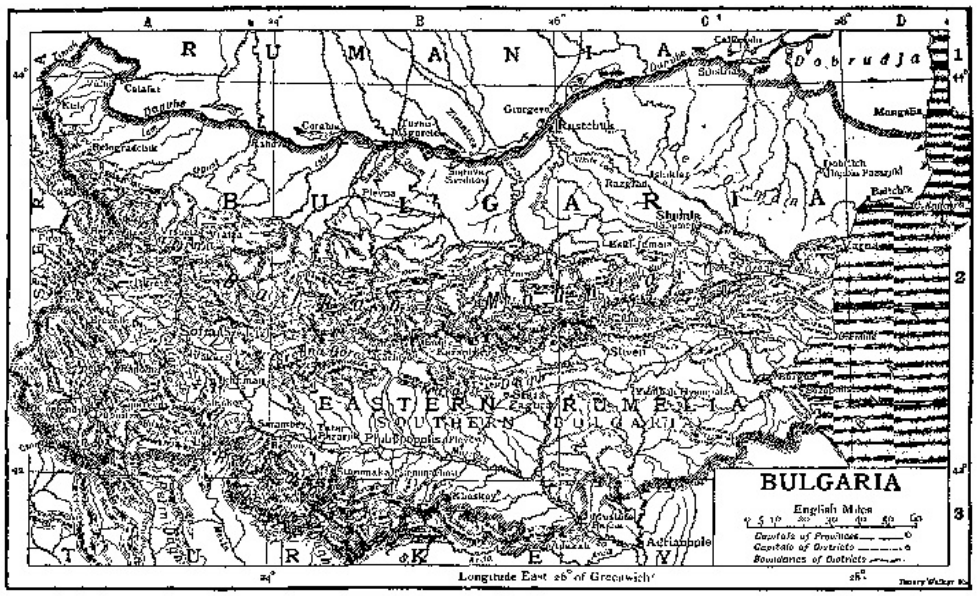
[v.04 p.0773]

BULGARIA (*continued from part 3*)

... the mean interval being 60 m.; the summits are, as a rule, rounded, and the slopes gentle. The culminating points are in the centre of the range: Yumrukchál (7835 ft.), Maragudúk (7808 ft.), and Kadimlía (7464 ft.). The Balkans are known to the people of the country as the *Stara Planina* or "Old Mountain," the adjective denoting their greater size as compared with that of the adjacent ranges: "Balkán" is not a distinctive term, being applied by the Bulgarians, as well as the Turks, to all mountains. Closely parallel, on the south, are the minor ranges of the Sredna Gora or "Middle Mountains" (highest summit 5167 ft.) and the Karaja Dagh, enclosing respectively the sheltered valleys of Karlovo and Kazanlyk. At its eastern extremity the Balkan chain divides into three ridges, the central terminating in the Black Sea at Cape Eminé ("Haemus"), the northern forming the watershed between the tributaries of the Danube and the rivers falling directly into the Black Sea. The Rhodope, or southern group, is altogether distinct from the Balkans, with which, however, it is connected by the Malka Planina and the Ikhtiman hills, respectively west and east of Sofia; it may be regarded as a continuation of the great Alpine system which traverses the Peninsula from the Dinaric Alps and the Shar Planina on the west to the Shabkhana Dagh near the Aegean coast; its sharper outlines and pine-clad steeps reproduce the scenery of the Alps rather than that of the Balkans. The imposing summit of Musallá (9631 ft.), next to Olympus, the highest in the Peninsula, forms the centre-point of the group; it stands within the Bulgarian frontier at the head of the Mesta valley, on either side of which the Perin Dagh and the Despoto Dagh descend south and south-east respectively towards the Aegean. The chain of Rhodope proper radiates to the east; owing to the retrocession of territory already mentioned, its central ridge no longer completely coincides with the Bulgarian boundary, but two of its principal summits, Sytké (7179 ft.) and Karlyk (6828 ft.), are within the frontier. From Musallá in a westerly direction extends the majestic range of the Rilska Planina, enclosing in a picturesque valley the celebrated monastery of Rila; many summits of this chain attain 7000 ft. Farther west, beyond the Struma valley, is the Osogovska Planina, culminating in Ruyen (7392 ft.). To the north of the Rilska Planina the almost isolated mass of Vitosha (7517 ft.) overhangs Sofia. Snow and ice remain in the sheltered crevices of Rhodope and the Balkans throughout the summer. The fertile slope trending northwards from the Balkans to the Danube is for the most part gradual and broken by hills; the eastern portion known as the *Delí Orman*, or "Wild Wood," is covered by forest, and thinly inhabited. The abrupt and sometimes precipitous character of the Bulgarian bank of the Danube contrasts with the swampy lowlands and lagoons of the Rumanian side. Northern Bulgaria is watered by the Lom, Ogust, Iskr, Vid, Osem, Yantra and Eastern Lom, all, except the Iskr, rising in the Balkans, and all flowing into the Danube. The channels of these rivers are deeply furrowed and the fall is rapid; irrigation is consequently difficult and navigation impossible. The course of the Iskr is remarkable: rising in the Rilska Planina, the river descends into the basin of Samakov, passing thence through a serpentine defile into the plateau of Sofia, where in ancient times it formed a lake; it now forces its way through the Balkans by the picturesque gorge of Iskretz. Somewhat similarly the Deli, or "Wild," Kamchik breaks the central chain of the Balkans near their eastern extremity and, uniting with the Great Kamchik, falls into the Black Sea. The Maritza, the ancient *Hebrus*, springs from the slopes of Musallá, and, with its tributaries, the Tunja and Arda, waters the wide plain of Eastern Rumelia. The Struma (ancient and modern Greek *Strymon*) drains the valley of Kiustendil, and, like the Maritza, flows into the Aegean. The elevated basins of Samakov (lowest altitude 3050 ft.), Trn (2525 ft.), Breznik (2460 ft.), Radomir (2065 ft.), Sofia (1640 ft.), and Kiustendil (1540 ft.), are a peculiar feature of the western highlands.



Geology.—The stratified formation presents a remarkable variety, almost all the systems being exemplified. The Archean, composed of gneiss and crystalline schists, and traversed by eruptive veins, extends over the greater part of the Eastern Rumelian plain, the Rilska Planina, Rhodope, and the adjacent ranges. North of the Balkans it appears only in the neighbourhood of Berkovitza. The other earlier Palaeozoic systems are wanting, but the Carboniferous appears in the western Balkans with a continental *facies* (Kulm). Here anthracitiferous coal is found in beds of argillite and sandstone. Red sandstone and conglomerate, representing the Permian system, appear especially around the basin of Sofia. Above these, in the western Balkans, are Mesozoic deposits, from the Trias to the upper Jurassic, also occurring in the central part of the range. The Cretaceous system, from the infra-Cretaceous Hauterivien to the Senonian, appears throughout the whole extent of Northern Bulgaria, from the summits of the Balkans to the Danube. Gosau beds are found on the southern declivity of the chain. Flysch, representing both the Cretaceous and Eocene systems, is widely distributed. The Eocene, or older Tertiary, further appears with nummulitic formations on both sides of the eastern Balkans; the Oligocene only near the Black Sea coast at Burgas. Of the Neogene, or younger Tertiary, the Mediterranean, or earlier, stage appears near Pleven (Plevna) in the Leithakalk and Tegel forms, and between Varna and Burgas with beds of spaniodons, as in the Crimea; the Sarmatian stage in the plain of the Danube and in the districts of Silistria and Varna. A rich mammaliferous deposit (*Hipparion*, *Rhinoceros*, *Dinotherium*, *Mastodon*, &c.) of this period has been found near Mesemvria. Other Neogene strata occupy a more limited space. The Quaternary era is represented by the typical loess, which covers most of the Danubian plain; to its later epochs belong the alluvial deposits of the riparian districts with remains of the *Ursus*, *Equus*, &c., found in bone-caverns. Eruptive masses intrude in the Balkans and Sredna Gora, as well as in the Archean formation of the southern ranges, presenting granite, syenite, diorite, diabase, quartz-porphyry, melaphyre, liparite, trachyte, andesite, basalt, &c.

[v.04 p.0774]

Minerals.—The mineral wealth of Bulgaria is considerable, although, with the exception of coal, it remains largely unexploited. The minerals which are commercially valuable include gold (found in small quantities), silver, graphite, galena, pyrite, marcasite, chalcosine, sphalerite, chalcopyrite, bornite, cuprite, hematite, limonite, ochre, chromite, magnetite, azurite, manganese, malachite, gypsum, &c. The combustibles are anthracitiferous coal, coal, "brown coal" and lignite. The lignite mines opened by the government at Pernik in 1891 yielded in 1904 142,000 tons. Coal beds have been discovered at Trevna and elsewhere. Thermal springs, mostly sulphureous, exist in forty-three localities along the southern slope of the Balkans, in Rhodope, and in the districts of Sofia and Kiustendil; maximum temperature at Zaparevo, near Dupnitza, 180.5° (Fahrenheit), at Sofia 118.4°. Many of these are frequented now, as in Roman times, owing to their valuable therapeutic qualities. The mineral springs on the north of the Balkans are, with one exception (Vrshetz, near Berkovitza), cold.

Climate.—The severity of the climate of Bulgaria in comparison with that of other European regions of the same latitude is attributable in part to the number and extent of its mountain ranges, in part to the general configuration of the Balkan Peninsula. Extreme heat in summer and cold in winter, great local contrasts, and rapid transitions of temperature occur here as in the adjoining countries. The local contrasts are remarkable. In the districts extending from the Balkans to the Danube, which are exposed to the bitter north wind, the winter cold is intense, and the river, notwithstanding the volume and rapidity of its current, is frequently frozen over; the temperature has been known to fall to 24° below zero. Owing to the shelter afforded by the Balkans against hot southerly winds, the summer heat in this region is not unbearable; its maximum is 99°. The high tableland of Sofia is generally covered with snow in the winter months; it enjoys, however, a somewhat more equable climate than the northern district, the maximum temperature being 86°, the minimum 2°; the air is bracing, and the summer nights are cool and fresh. In the eastern districts the proximity of the sea moderates the extremes of heat and cold; the sea is occasionally frozen at Varna. The coast-line is exposed to violent north-east winds, and the Black Sea, the πόντος ἄξεινος or "inhospitable sea" of the Greeks, maintains its evil reputation for storms. The sheltered plain of Eastern Rumelia possesses a comparatively warm climate; spring begins six weeks earlier than elsewhere in Bulgaria, and the vegetation is that of southern Europe. In general the Bulgarian winter is short and severe; the spring short, changeable and rainy; the summer hot, but tempered by thunderstorms; the autumn (*yasen*, "the clear time") magnificently fine and sometimes prolonged into the month of December. The mean temperature is 52°. The climate is healthy, especially in the mountainous districts. Malarial fever prevails in the valley of the Maritza, in the low-lying regions of the Black Sea coast, and even in the upland plain of Sofia, owing to neglect of drainage. The mean annual rainfall is 25-

59 in. (Gabrovo, 41-73; Sofia, 27-68; Varna, 18-50).

Fauna.—Few special features are noticeable in the Bulgarian fauna. Bears are still abundant in the higher mountain districts, especially in the Rilska Planina and Rhodope; the Bulgarian bear is small and of brown colour, like that of the Carpathians. Wolves are very numerous, and in winter commit great depredations even in the larger country towns and villages; in hard weather they have been known to approach the outskirts of Sofia. The government offers a reward for the destruction of both these animals. The roe deer is found in all the forests, the red deer is less common; the chamois haunts the higher regions of the Rilska Planina, Rhodope and the Balkans. The jackal (*Canis aureus*) appears in the district of Burgas; the lynx is said to exist in the Sredna Gora; the wild boar, otter, fox, badger, hare, wild cat, marten, polecat (*Foetorius putorius*; the rare tiger polecat, *Foetorius sarmaticus*, is also found), weasel and shrewmouse (*Spermophilus citillus*) are common. The beaver (Bulg. *bebr*) appears to have been abundant in certain localities, *e.g.* Bebrovo, Bebresh, &c., but it is now apparently extinct. Snakes (*Coluber natrix* and other species), vipers (*Vipera berus* and *V. ammodytes*), and land and water tortoises are numerous. The domestic animals are the same as in the other countries of southeastern Europe; the fierce shaggy grey sheep-dog leaves a lasting impression on most travellers in the interior. Fowls, especially turkeys, are everywhere abundant, and great numbers of geese may be seen in the Moslem villages. The ornithology of Bulgaria is especially interesting. Eagles (*Aquila imperialis* and the rarer *Aquila fulva*), vultures (*Vultur monachus*, *Gyps fulvus*, *Neophron percnopterus*), owls, kites, and the smaller birds of prey are extraordinarily abundant; singing birds are consequently rare. The lammergeier (*Gypaëtus barbatus*) is not uncommon. Immense flocks of wild swans, geese, pelicans, herons and other waterfowl haunt the Danube and the lagoons of the Black Sea coast. The cock of the woods (*Tetrao urogallus*) is found in the Balkan and Rhodope forests, the wild pheasant in the Tunja valley, the bustard (*Otis tarda*) in the Eastern Rumelian plain. Among the migratory birds are the crane, which hibernates in the Maritza valley, woodcock, snipe and quail; the great spotted cuckoo (*Coccystes glandarius*) is an occasional visitant. The red starling (*Pastor roseus*) sometimes appears in large flights. The stork, which is never molested, adds a picturesque feature to the Bulgarian village. Of fresh-water fish, the sturgeon (*Acipenser sturio* and *A. huso*), sterlet, salmon (*Salmo hucho*), and carp are found in the Danube; the mountain streams abound in trout. The Black Sea supplies turbot, mackerel, &c.; dolphins and flying fish may sometimes be seen.

Flora.—In regard to its flora the country may be divided into (1) the northern plain sloping from the Balkans to the Danube, (2) the southern plain between the Balkans and Rhodope, (3) the districts adjoining the Black Sea, (4) the elevated basins of Sofia, Samakov and Kiustendil, (5) the Alpine and sub-Alpine regions of the Balkans and the southern mountain group. In the first-mentioned region the vegetation resembles that of the Russian and Rumanian steppes; in the spring the country is adorned with the flowers of the crocus, orchis, iris, tulip and other bulbous plants, which in summer give way to tall grasses, umbelliferous growths, *dianthi*, *astragali*, &c. In the more sheltered district south of the Balkans the richer vegetation recalls that of the neighbourhood of Constantinople and the adjacent parts of Asia Minor. On the Black Sea coast many types of the Crimean, Transcaucasian and even the Mediterranean flora present themselves. The plateaus of Sofia and Samakov furnish specimens of sub-alpine plants, while the vine disappears; the hollow of Kiustendil, owing to its southerly aspect, affords the vegetation of the Macedonian valleys. The flora of the Balkans corresponds with that of the Carpathians; the Rila and Rhodope group is rich in purely indigenous types combined with those of the central European Alps and the mountains of Asia Minor. The Alpine types are often represented by variants: *e.g.* the *Campanula alpina* by the *Campanula orbelica*, the *Primula farinosa* by the *Primula frondosa* and *P. exigua*, the *Gentiana germanica* by the *Gentiana bulgarica*, &c. The southern mountain group, in common, perhaps, with the unexplored highlands of Macedonia, presents many isolated types, unknown elsewhere in Europe, and in some cases corresponding with those of the Caucasus. Among the more characteristic genera of the Bulgarian flora are the following:—*Centaurea*, *Cirsium*, *Linaria*, *Scrophularia*, *Verbascum*, *Dianthus*, *Silene*, *Trifolium*, *Euphorbia*, *Cytisus*, *Astragalus*, *Ornithogalum*, *Allium*, *Crocus*, *Iris*, *Thymus*, *Umbellifera*, *Sedum*, *Hypericum*, *Scabiosa*, *Ranunculus*, *Orchis*, *Ophrys*.

Forests.—The principal forest trees are the oak, beech, ash, elm, walnut, cornel, poplar, pine and juniper. The oak is universal in the thickets, but large specimens are now rarely found. Magnificent forests of beech clothe the valleys of the higher Balkans and the Rilska Planina; the northern declivity of the Balkans is, in general, well wooded, but the southern slope is bare. The walnut and chestnut are mainly confined to eastern Rumelia. Conifers (*Pinus silvestris*, *Picea excelsa*, *Pinus laricis*, *Pinus mughus*) are rare in the Balkans, but abundant in the higher regions of the southern mountain group, where the *Pinus peuce*, otherwise peculiar to the Himalayas, also flourishes. The wild lilac forms a beautiful feature in the spring landscape. Wild fruit trees, such as the apple, pear and plum, are common. The vast forests of the middle ages disappeared under the supine Turkish administration, which took no measures for their protection, and even destroyed the woods in the neighbourhood of towns and highways in order to deprive brigands of shelter. A law passed in 1889 prohibits disforesting, limits the right of cutting timber, and places the state forests under the control of inspectors. According to official statistics, 11,640 sq. m. or about 30% of the whole superficies of the kingdom, are under forest, but the greater portion of this area is covered only by brushwood and scrub. The beautiful forests of the Rila district are rapidly disappearing under exploitation.

Agriculture.—Agriculture, the main source of wealth to the country, is still in an extremely primitive condition. The ignorance and conservatism of the peasantry, the habits engendered by widespread insecurity and the fear of official rapacity under Turkish rule, insufficiency of communications, want of capital, and in some districts sparsity of population, have all tended to retard the development of this most important industry. The peasants cling to traditional usage, and look with suspicion on modern implements and new-fangled modes of production. The plough is of a primeval type, rotation of crops is only partially practised, and the use of manure is almost unknown. The government has sedulously endeavoured to introduce more enlightened methods and ideas by the establishment of agricultural schools, the appointment of itinerant professors and inspectors, the distribution of better kinds of seeds, improved implements, &c. Efforts have been made to improve the breeds of native cattle and horses, and stallions have been introduced from Hungary and distributed throughout the country. Oxen and buffaloes are the principal animals of draught; the buffalo, which was apparently introduced from Asia in remote times, is much prized by the peasants for its patience and strength; it is, however, somewhat delicate and requires much care. In the eastern districts camels are also employed. The Bulgarian horses are small, but remarkably hardy, wiry and intelligent; they are as a rule unfitted for draught and cavalry purposes. The best sheep are found in the district of Karnobat in Eastern Rumelia. The number of goats in the country

tends to decline, a relatively high tax being imposed on these animals owing to the injury they inflict on young trees. The average price of oxen is £5 each, draught oxen £12 the pair, buffaloes £14 the pair, cows £2, horses £6, sheep, 7s., goats 5s., each. The principal cereals are wheat, maize, rye, barley, oats and millet. The cultivation of maize is increasing in the Danubian and eastern districts. Rice-fields are found in the neighbourhood of Philippopolis. Cereals represent about 80% of the total exports. Besides grain, Bulgaria produces wine, tobacco, attar of roses, silk and cotton. The quality of the grape is excellent, and could the peasants be induced to abandon their highly primitive mode of wine-making the Bulgarian vintages would rank among the best European growths. The tobacco, which is not of the highest quality, is grown in considerable quantities for home consumption and only an insignificant amount is exported. The best tobacco-fields in Bulgaria are on the northern slopes of Rhodope, but the southern declivity, which produces the famous Kavala growth, is more adapted to the cultivation of the plant. The rose-fields of Kazanlyk and Karlovo lie in the sheltered valleys between the Balkans and the parallel chains of the Sredna Gora and Karaja Dagh. About 6000 lb of the rose-essence is annually exported, being valued from £12 to £14 per lb. Beetroot is cultivated in the neighbourhood of Sofia. Sericulture, formerly an important industry, has declined owing to disease among the silkworms, but efforts are being made to revive it with promise of success. Cotton is grown in the southern districts of Eastern Rumelia.

Peasant proprietorship is universal, the small freeholds averaging about 18 acres each. There are scarcely any large estates owned by individuals, but some of the monasteries possess considerable domains. The large *tchifliks*, or farms, formerly belonging to Turkish landowners, have been divided among the peasants. The rural proprietors enjoy the right of pasturing their cattle on the common lands belonging to each village, and of cutting wood in the state forests. They live in a condition of rude comfort, and poverty is practically unknown, except in the towns. A peculiarly interesting feature in Bulgarian agricultural life is the *zadruga*, or house-community, a patriarchal institution apparently dating from prehistoric times. Family groups, sometimes numbering several dozen persons, dwell together on a farm in the observance of strictly communistic principles. The association is ruled by a house-father (*domakin*, *stareïshina*), and a house-mother (*domakinia*), who assign to the members their respective tasks. In addition to the farm work the members often practise various trades, the proceeds of which are paid into the general treasury. The community sometimes includes a priest, whose fees for baptisms, &c., augment the common fund. The national aptitude for combination is also displayed in the associations of market gardeners (*gradinarski druzhini*, *taifi*), who in the spring leave their native districts for the purpose of cultivating gardens in the neighbourhood of some town, either in Bulgaria or abroad, returning in the autumn, when they divide the profits of the enterprise; the number of persons annually thus engaged probably exceeds 10,000. Associations for various agricultural, mining and industrial undertakings and provident societies are numerous: the handicraftsmen in the towns are organized in *esnafs* or gilds.

Manufactures.—The development of manufacturing enterprise on a large scale has been retarded by want of capital. The principal establishments for the native manufactures of *aba* and *shayak* (rough and fine homespuns), and of *gaitan* (braided embroidery) are at Sliven and Gabrovo respectively. The Bulgarian homespuns, which are made of pure wool, are of admirable quality. The exportation of textiles is almost exclusively to Turkey: value in 1806, £104,046; in 1898, £144,726; in 1904, £108,685. Unfortunately the home demand for native fabrics is diminishing owing to foreign competition; the smaller textile industries are declining, and the picturesque, durable, and comfortable costume of the country is giving way to cheap ready-made clothing imported from Austria. The government has endeavoured to stimulate the home industry by ordering all persons in its employment to wear the native cloth, and the army is supplied almost exclusively by the factories at Sliven. A great number of small distilleries exist throughout the country; there are breweries in all the principal towns, tanneries at Sevlievo, Varna, &c., numerous corn-mills worked by water and steam, and sawmills, turned by the mountain torrents, in the Balkans and Rhodope. A certain amount of foreign capital has been invested in industrial enterprises; the most notable are sugar-refineries in the neighbourhood of Sofia and Philippopolis, and a cotton-spinning mill at Varna, on which an English company has expended about £60,000.

Commerce.—The usages of internal commerce have been considerably modified by the development of communications. The primitive system of barter in kind still exists in the rural districts, but is gradually disappearing. The great fairs (*panaïri*, πανηγύρεις) held at Eski-Jumaia, Dobritch and other towns, which formerly attracted multitudes of foreigners as well as natives, have lost much of their importance; a considerable amount of business, however, is still transacted at these gatherings, of which ninety-seven were held in 1898. The principal seats of the export trade are Varna, Burgas and Baltchik on the Black Sea, and Svishtov, Rustchuk, Nikopolis, Silistria, Rakhovo, and Vidin on the Danube. The chief centres of distribution for imports are Varna, Sofia, Rustchuk, Philippopolis and Burgas. About 10% of the exports passes over the Turkish frontier, but the government is making great efforts to divert the trade to Varna and Burgas, and important harbour works have been carried out at both these ports. The new port of Burgas was formally opened in 1904, that of Varna in 1906.

In 1887 the total value of Bulgarian foreign commerce was £4,419,589. The following table gives the values for the six years ending 1904. The great fluctuations in the exports are due to the variations of the harvest, on which the prosperity of the country practically depends:—

Year.	Exports.	Imports.	Total.
	£	£	£
1899	2,138,684	2,407,123	4,545,807
1900	2,159,305	1,853,684	4,012,989
1901	3,310,790	2,801,762	6,112,552
1902	4,147,381	2,849,059	7,996,440
1903	4,322,945	3,272,103	7,595,048
1904	6,304,756	5,187,583	11,492,339

The principal exports are cereals, live stock, homespuns, hides, cheese, eggs, attar of roses. Exports to the United Kingdom in 1900 were valued at £239,665; in 1904 at £989,127. The principal imports are textiles, metal goods, colonial goods, implements, furniture, leather, petroleum. Imports from the United Kingdom in 1900, £301,150; in 1904, £793,972.

The National Bank, a state institution with a capital of £400,000, has its central establishment at Sofia,

and branches at Philippopolis, Rustchuk, Varna, Trnovo and Burgas. Besides conducting the ordinary banking operations, it issues loans on mortgage. Four other banks have been founded at Sofia by groups of foreign and native capitalists. There are several private banks in the country. The Imperial Ottoman Bank and the Industrial Bank of Kiev have branches at Philippopolis and Sofia respectively. The agricultural chests, founded by Midhat Pasha in 1863, and reorganized in 1894, have done much to rescue the peasantry from the hands of usurers. They serve as treasuries for the local administration, accept deposits at interest, and make loans to the peasants on mortgage or the security of two solvent landowners at 8%. Their capital in 1887 was £569,260; in 1904, £1,440,000. Since 1893 they have been constituted as the "Bulgarian Agricultural Bank"; the central direction is at Sofia. The post-office savings bank, established 1896, had in 1905 a capital of £1,360,560.

There are over 200 registered provident societies in the country. The legal rate of interest is 10%, but much higher rates are not uncommon.

Bulgaria, like the neighbouring states of the Peninsula, has adopted the metric system. Turkish weights and measures, however, are still largely employed in local commerce. The monetary unit is the *lev*, or "lion" (pl. *leva*), nominally equal to the franc, with its submultiple the *stotinka* (pl. *-ki*), or centime. The
[v.04 p.0776] coinage consists of nickel and bronze coins (2½, 5, 10 and 20 *stotinki*) and silver coins (50 *stotinki*; 1, 2 and 5 *leva*). A gold coinage was struck in 1893 with pieces corresponding to those of the Latin Union. The Turkish pound and foreign gold coins are also in general circulation. The National Bank issues notes for 5, 10, 20, 50 and 100 *leva*, payable in gold. Notes payable in silver are also issued.

Finance.—It is only possible here to deal with Bulgarian finance prior to the declaration of independence in 1908. At the outset of its career the principality was practically unencumbered with any debt, external or internal. The stipulations of the Berlin Treaty (Art. ix.) with regard to the payment of a tribute to the sultan and the assumption of an "equitable proportion" of the Ottoman Debt were never carried into effect. In 1883 the claim of Russia for the expenses of the occupation (under Art. xx. of the treaty) was fixed at 26,545,625 fr. (£1,061,820) payable in annual instalments of 2,100,000 fr. (£84,000). The union with Eastern Rumelia in 1885 entailed liability for the obligations of that province consisting of an annual tribute to Turkey of 2,951,000 fr. (£118,040) and a loan of 3,375,000 fr. (£135,000) contracted with the Imperial Ottoman Bank. In 1888 the purchase of the Varna-Rustchuk railway was effected by the issue of treasury bonds at 6% to the vendors. In 1889 a loan of 30,000,000 fr. (£1,200,000) bearing 6% interest was contracted with the Vienna Länderbank and Bankverein at 85½. In 1892 a further 6% loan of 142,780,000 fr. (£5,711,200) was contracted with the Länderbank at 83, 86 and 89. In 1902 a 5% loan of 106,000,000 fr. (£4,240,000), secured on the tobacco dues and the stamp-tax, was contracted with the Banque de l'État de Russie and the Banque de Paris et des Pays Bas at 81½, for the purpose of consolidating the floating debt, and in 1904 a 5% loan of 99,980,000 fr. (£3,999,200) at 82, with the same guarantees, was contracted with the last-named bank mainly for the purchase of war material in France and the construction of railways. In January 1906 the national debt stood as follows:—Outstanding amount of the consolidated loans, 363,070,500 fr. (£14,522,820); internal debt, 15,603,774 fr. (£624,151); Eastern Rumelian debt, 1,910,208 (£76,408). In February 1907 a 4½% loan of 145,000,000 fr. at 85, secured on the surplus proceeds of the revenues already pledged to the loans of 1902 and 1904, was contracted with the Banque de Paris et des Pays Bas associated with some German and Austrian banks for the conversion of the loans of 1888 and 1889 (requiring about 53,000,000 fr.) and for railway construction and other purposes. The total external debt was thus raised to upwards of 450,000,000 fr. The Eastern Rumelian tribute and the rent of the Sarambey-Belovo railway, if capitalized at 6%, would represent a further sum of 50,919,100 fr. (£2,036,765). The national debt was not disproportionately great in comparison with annual revenue. After the union with Eastern Rumelia the budget receipts increased from 40,803,262 leva (£1,635,730) in 1886 to 119,655,507 leva (£4,786,220) in 1904; the estimated revenue for 1905 was 111,920,000 leva (£4,476,800), of which 41,179,000 (£1,647,160) were derived from direct and 38,610,000 (£1,544,400) from indirect taxation; the estimated expenditure was 111,903,281 leva (£4,476,131), the principal items being: public debt, 31,317,346 (£1,252,693); army, 26,540,720 (£1,061,628); education, 10,402,470 (£416,098); public works, 14,461,171 (£578,446); interior, 7,559,517 (£302,380). The actual receipts in 1905 were 127,011,393 leva. In 1895 direct taxation, which pressed heavily on the agricultural class, was diminished and indirect taxation (import duties and excise) considerably increased. In 1906 direct taxation amounted to 9 fr. 92 c., indirect to 8 fr. 58 c., per head of the population. The financial difficulties in which the country was involved at the close of the 19th century were attributable not to excessive indebtedness but to heavy outlay on public works, the army, and education, and to the maintenance of an unnecessary number of officials, the economic situation being aggravated by a succession of bad harvests. The war budget during ten years (1888-1897) absorbed the large sum of 275,822,017 leva (£11,033,300) or 35.77% of the whole national income within that period. In subsequent years military expenditure continued to increase; the total during the period since the union with Eastern Rumelia amounting to 599,520,698 leva (£23,980,800).

Communications.—In 1878 the only railway in Bulgaria was the Rustchuk-Varna line (137 m.), constructed by an English company in 1867. In Eastern Rumelia the line from Sarambey to Philippopolis and the Turkish frontier (122 m.), with a branch to Yamboli (66 m.), had been built by Baron Hirsch in 1873, and leased by the Turkish government to the Oriental Railways Company until 1958. It was taken over by the Bulgarian government in 1908 (see *History*, below). The construction of a railway from the Servian frontier at Tzaribrod to the Eastern Rumelian frontier at Vakarel was imposed on the principality by the Berlin Treaty, but political difficulties intervened, and the line, which touches Sofia, was not completed till 1888. In that year the Bulgarian government seized the short connecting line Belovo-Sarambey belonging to Turkey, and railway communication between Constantinople and the western capitals was established. Since that time great progress has been made in railway construction. In 1888, 240 m. of state railways were open to traffic; in 1899, 777 m.; in 1902, 880 m. Up to October 1908 all these lines were worked by the state, and, with the exception of the Belovo-Sarambey line (29 m.), which was worked under a convention with Turkey, were its property. The completion of the important line Radomir-Sofia-Shumen (November 1899) opened up the rich agricultural district between the Balkans and the Danube and connected Varna with the capital. Branches to Samovit and Rustchuk establish connexion with the Rumanian railway system on the opposite side of the river. It was hoped, with the consent of the Turkish government, to extend the line Sofia-Radomir-Kiustendil to Uskub, and thus to secure a direct route to Salonica and the Aegean. Road communication is still in an unsatisfactory condition. Roads are divided into three classes: "state roads," or main highways, maintained by the government; "district roads"

maintained by the district councils; and "inter-village roads" (*mezhduselski shosseta*), maintained by the communes. Repairs are effected by the *corvée* system with requisitions of material. There are no canals, and inland navigation is confined to the Danube. The Austrian *Donaudampschiffahrtsgesellschaft* and the Russian *Gagarine* steamship company compete for the river traffic; the grain trade is largely served by steamers belonging to Greek merchants. The coasting trade on the Black Sea is carried on by a Bulgarian steamship company; the steamers of the Austrian Lloyd, and other foreign companies call at Varna, and occasionally at Burgas.

The development of postal and telegraphic communication has been rapid. In 1886, 1,468,494 letters were posted, in 1903, 29,063,043. Receipts of posts and telegraphs in 1886 were £40,975, in 1903 £134,942. In 1903 there were 3261 m. of telegraph lines and 531 m. of telephones.

Towns.—The principal towns of Bulgaria are Sofia, the capital (Bulgarian *Sredetz,* a name now little used), pop. in January 1906, 82,187; Philippopolis, the capital of Eastern Rumelia (Bulg. *Plovdiv*), pop. 45,572; Varna, 37,155; Rustchuk (Bulg. *Russé*), 33,552; Sliven, 25,049; Shumla (Bulg. *Shumen*), 22,290; Plevna (Bulg. *Pleven*), 21,208; Stara-Zagora, 20,647; Tatar-Pazarjik, 17,549; Vidin, 16,168; Yamboli (Greek *Hyampolis*), 15,708; Dobritch (Turkish *Hajiolu-Pazarjik*), 15,369; Haskovo, 15,061; Vratza, 14,832; Stanimaka (Greek *Stenimachos*), 14,120; Razgrad, 13,783; Sistova (Bulg. *Svishtov*), 13,408; Burgas, 12,846; Kiustendil, 12,353; Trnovo, the ancient capital, 12,171. All these are described in separate articles.

Population.—The area of northern Bulgaria is 24,535 sq. m.; of Eastern Rumelia 12,705 sq. m.; of united Bulgaria, 37,240 sq. m. According to the census of the 12th of January 1906, the population of northern Bulgaria was 2,853,704; of Eastern Rumelia, 1,174,535; of united Bulgaria, 4,028,239 or 88 per sq. m. Bulgaria thus ranks between Rumania and Portugal in regard to area; between the Netherlands and Switzerland in regard to population: in density of population it may be compared with Spain and Greece.

The first census of united Bulgaria was taken in 1888: it gave the total population as 3,154,375. In January 1893 the population was 3,310,713; in January 1901, 3,744,283.

The movement of the population at intervals of five years has been as follows:—

Year.	Marriages.	Births (living).	Still-born.	Deaths.	Natural Increase.[1]
1882	19,795	74,642	300	38,884	35,758
1887	20,089	83,179	144	39,396	43,783
1892	27,553	117,883	321	103,550	14,333
1897	29,227	149,631	858	90,134	59,497
1902	36,041	149,542	823	91,093	58,449

[1] Excess of births over deaths.

The death-rate shows a tendency to rise. In the five years 1882-1886 the mean death-rate was 18.0 per 1000; in 1887-1891, 20.4; in 1892-1896, 27.0; in 1897-1902, 23.92. Infant mortality is high, especially among the peasants. As the less healthy infants rarely survive, the adult population is in general robust, hardy and long-lived. The census of January 1901 gives 2719 persons of 100 years and upwards. Young men, as a rule, marry betore the age of twenty-five, girls before eighteen. The number of illegitimate births is inconsiderable, averaging only 0.12 of the total. The population according to sex in 1901 is given as 1,909,567 males and 1,834,716 females, or 51 males to 49 females. A somewhat similar disparity may be observed in the other countries of the Peninsula. Classified according to occupation, 2,802,603 persons, or 74.85% of the population, are engaged in agriculture; 360,834 in various productive industries; 118,824 in the service of the government or the exercise of liberal professions, and 148,899 in commerce. The population according to race cannot be stated with absolute accuracy, but it is approximately shown by the census of 1901, which gives the various nationalities according to language as follows:—Bulgars, 2,888,219; Turks, 531,240; Rumans, 71,063; Greeks, 66,635; Gipsies (Tziganes), 89,549; Jews (Spanish [v.04 p.0777] speaking), 33,661; Tatars, 18,884; Armenians, 14,581; other nationalities, 30,451. The Bulgarian inhabitants of the Peninsula beyond the limits of the principality may, perhaps, be estimated at 1,500,000 or 1,600,000, and the grand total of the race possibly reaches 5,500,000.

Ethnology.—The Bulgarians, who constitute 77.14% of the inhabitants of the kingdom, are found in their purest type in the mountain districts, the Ottoman conquest and subsequent colonization having introduced a mixed population into the plains.

The devastation of the country which followed the Turkish invasion resulted in the extirpation or flight of a large proportion of the Bulgarian inhabitants of the lowlands, who were replaced by Turkish colonists. The mountainous districts, however, retained their original population and sheltered large numbers of the fugitives. The passage of the Turkish armies during the wars with Austria, Poland and Russia led to further Bulgarian emigrations. The flight to the Banat, where 22,000 Bulgarians still remain, took place in 1730. At the beginning of the 19th century the majority of the population of the Eastern Rumelian plain was Turkish. The Turkish colony, however, declined, partly in consequence of the drain caused by military service, while the Bulgarian remnant increased, notwithstanding a considerable emigration to Bessarabia before and after the Russo-Turkish campaign of 1828. Efforts were made by the Porte to strengthen the Moslem element by planting colonies of Tatars in 1861 and Circassians in 1864. The advance of the Russian army in 1877-1878 caused an enormous exodus of the Turkish population, of which only a small proportion returned to settle permanently. The emigration continued after the conclusion of peace, and is still in progress, notwithstanding the efforts of the Bulgarian government to arrest it. In twenty years (1879-1899), at least 150,000 Turkish peasants left Bulgaria. Much of the land thus abandoned still remains unoccupied. On the other hand, a considerable influx of Bulgarians from Macedonia, the vilayet of Adrianople, Bessarabia, and the Dobrudja took place within the same period, and the inhabitants of the mountain villages show a tendency to migrate into the richer districts of the plains.

The northern slopes of the Balkans from Belogradchik to Elena are inhabited almost exclusively by Bulgarians; in Eastern Rumelia the national element is strongest in the Sredna Gora and Rhodope. Possibly the most genuine representatives of the race are the Pomaks or Mahommedan Bulgarians, whose conversion to Islam preserved their women from the licence of the Turkish conqueror; they inhabit the highlands of Rhodope and certain districts in the neighbourhood of Lovtcha (Lovetch) and Plevna.

Retaining their Bulgarian speech and many ancient national usages, they may be compared with the indigenous Cretan, Bosnian and Albanian Moslems. The Pomaks in the principality are estimated at 26,000, but their numbers are declining. In the north-eastern district between the Yantra and the Black Sea the Bulgarian race is as yet thinly represented; most of the inhabitants are Turks, a quiet, submissive, agricultural population, which unfortunately shows a tendency to emigrate. The Black Sea coast is inhabited by a variety of races. The Greek element is strong in the maritime towns, and displays its natural aptitude for navigation and commerce. The Gagäuzi, a peculiar race of Turkish-speaking Christians, inhabit the littoral from Cape Eminé to Cape Kaliakra: they are of Turanian origin and descend from the ancient Kumani. The valleys of the Maritza and Arda are occupied by a mixed population consisting of Bulgarians, Greeks and Turks; the principal Greek colonies are in Stanimaka, Kavakly and Philippopolis. The origin of the peculiar Shôp tribe which inhabits the mountain tracts of Sofia, Breznik and Radomir is a mystery. The Shôps are conceivably a remnant of the aboriginal race which remained undisturbed in its mountain home during the Slavonic and Bulgarian incursions: they cling with much tenacity to their distinctive customs, apparel and dialect. The considerable Vlach or Ruman colony in the Danubian districts dates from the 18th century, when large numbers of Walachian peasants sought a refuge on Turkish soil from the tyranny of the boyars or nobles: the department of Vidin alone contains 36 Ruman villages with a population of 30,550. Especially interesting is the race of nomad shepherds from the Macedonian and the Aegean coast who come in thousands every summer to pasture their flocks on the Bulgarian mountains; they are divided into two tribes—the Kutzovlachs, or "lame Vlachs," who speak Rumanian, and the Hellenized Karakatchans or "black shepherds" (compare the Morlachs, or Mavro-vlachs, μαῦροι βλάχες, of Dalmatia), who speak Greek. The Tatars, a peaceable, industrious race, are chiefly found in the neighbourhood of Varna and Silistria; they were introduced as colonists by the Turkish government in 1861. They may be reckoned at 12,000. The gipsies, who are scattered in considerable numbers throughout the country, came into Bulgaria in the 14th century. They are for the most part Moslems, and retain their ancient Indian speech. They live in the utmost poverty, occupy separate cantonments in the villages, and are treated as outcasts by the rest of the population. The Bulgarians, being of mixed origin, possess few salient physical characteristics. The Slavonic type is far less pronounced than among the kindred races; the Ugrian or Finnish cast of features occasionally asserts itself in the central Balkans. The face is generally oval, the nose straight, the jaw somewhat heavy. The men, as a rule, are rather below middle height, compactly built, and, among the peasantry, very muscular; the women are generally deficient in beauty and rapidly grow old. The upper class, the so-called *intelligenzia*, is physically very inferior to the rural population.

National Character.—The character of the Bulgarians presents a singular contrast to that of the neighbouring nations. Less quick-witted than the Greeks, less prone to idealism than the Servians, less apt to assimilate the externals of civilization than the Rumanians, they possess in a remarkable degree the qualities of patience, perseverance and endurance, with the capacity for laborious effort peculiar to an agricultural race. The tenacity and determination with which they pursue their national aims may eventually enable them to vanquish their more brilliant competitors in the struggle for hegemony in the Peninsula. Unlike most southern races, the Bulgarians are reserved, taciturn, phlegmatic, unresponsive, and extremely suspicious of foreigners. The peasants are industrious, peaceable and orderly; the vendetta, as it exists in Albania, Montenegro and Macedonia, and the use of the knife in quarrels, so common in southern Europe, are alike unknown. The tranquillity of rural life has, unfortunately, been invaded by the intrigues of political agitators, and bloodshed is not uncommon at elections. All classes practise thrift bordering on parsimony, and any display of wealth is generally resented. The standard of sexual morality is high, especially in the rural districts; the unfaithful wife is an object of public contempt, and in former times was punished with death. Marriage ceremonies are elaborate and protracted, as is the case in most primitive communities; elopements are frequent, but usually take place with the consent of the parents on both sides, in order to avoid the expense of a regular wedding. The principal amusement on Sundays and holidays is the *choró* (χορός), which is danced on the village green to the strains of the *gaida* or bagpipe, and the *gûsla*, a rudimentary fiddle. The Bulgarians are religious in a simple way, but not fanatical, and the influence of the priesthood is limited. Many ancient superstitions linger among the peasantry, such as the belief in the vampire and the evil eye; witches and necromancers are numerous and are much consulted.

Government.—Bulgaria is a constitutional monarchy; by Art. iii. of the Berlin Treaty it was declared hereditary in the family of a prince "freely elected by the population and confirmed by the Sublime Porte with the assent of the powers." According to the constitution of Trnovo, voted by the Assembly of Notables on the 29th of April 1879, revised by the Grand Sobranye on the 27th of May 1893, and modified by the proclamation of a Bulgarian kingdom on the 5th of October 1908, the royal dignity descends in the direct male line. The king must profess the Orthodox faith, only the first elected sovereign and his immediate heir being released from this obligation. The legislative power is vested in the king in conjunction with the
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national assembly; he is supreme head of the army, supervises the executive power, and represents the country in its foreign relations. In case of a minority or an interregnum, a regency of three persons is appointed. The national representation is embodied in the Sobranye, or ordinary assembly (Bulgarian, *Sŭbranïe*, the Russian form *Sobranye* being usually employed by foreign writers), and the Grand Sobranye, which is convoked in extraordinary circumstances. The Sobranye is elected by manhood suffrage, in the proportion of 1 to 20,000 of the population, for a term of five years. Every Bulgarian citizen who can read and write and has completed his thirtieth year is eligible as a deputy. Annual sessions are held from the 27th of October to the 27th of December. All legislative and financial measures must first be discussed and voted by the Sobranye and then sanctioned and promulgated by the king. The government is responsible to the Sobranye, and the ministers, whether deputies or not, attend its sittings. The Grand Sobranye, which is elected in the proportion of 2 to every 20,000 inhabitants, is convoked to elect a new king, to appoint a regency, to sanction a change in the constitution, or to ratify an alteration in the boundaries of the kingdom. The executive is entrusted to a cabinet of eight members—the ministers of foreign affairs and religion, finance, justice, public works, the interior, commerce and agriculture, education and war. Local administration, which is organized on the Belgian model, is under the control of the minister of the interior. The country is divided into twenty-two departments (*okrŭg*, pl. *okrŭzi*), each administered by a prefect (*uprávitel*), assisted by a departmental council, and eighty-four sub-prefectures (*okolía*), each under a sub-prefect (*okoliiski natchálnik*). The number of these functionaries is excessive. The four principal towns have each in addition a prefect of police (*gradonatchalnik*) and one or more commissaries (*pristav*). The gendarmery numbers about 4000 men, or 1 to 825 of the inhabitants. The prefects and sub-

prefects have replaced the Turkish *mutessarifs* and *kaimakams*; but the system of municipal government, left untouched by the Turks, descends from primitive times. Every commune (*obshtina*), urban or rural, has its *kmet*, or mayor, and council; the commune is bound to maintain its primary schools, a public library or reading-room, &c.; the kmet possesses certain magisterial powers, and in the rural districts he collects the taxes. Each village, as a rule, forms a separate commune, but occasionally two or more villages are grouped together.

Justice.—The civil and penal codes are, for the most part, based on the Ottoman law. While the principality formed a portion of the Turkish empire, the privileges of the capitulations were guaranteed to foreign subjects (Berlin Treaty, Art. viii.). The lowest civil and criminal court is that of the village kmet, whose jurisdiction is confined to the limits of the commune; no corresponding tribunal exists in the towns. Each sub-prefecture and town has a justice of the peace—in some cases two or more; the number of these officials is 130. Next follows the departmental tribunal or court of first instance, which is competent to pronounce sentences of death, penal servitude and deprivation of civil rights; in specified criminal cases the judges are aided by three assessors chosen by lot from an annually prepared panel of forty-eight persons. Three courts of appeal sit respectively at Sofia, Rustchuk and Philippopolis. The highest tribunal is the court of cassation, sitting at Sofia, and composed of a president, two vice-presidents and nine judges. There is also a high court of audit (*vrkhovna smetna palata*), similar to the French *cour des comptes.* The judges are poorly paid and are removable by the government. In regard to questions of marriage, divorce and inheritance the Greek, Mahommedan and Jewish communities enjoy their own spiritual jurisdiction.

Army and Navy.—The organization of the military forces of the principality was undertaken by Russian officers, who for a period of six years (1879-1885) occupied all the higher posts in the army. In Eastern Rumelia during the same period the "militia" was instructed by foreign officers; after the union it was merged in the Bulgarian army. The present organization is based on the law of the 1st of January 1904. The army consists of: (1) the active or field army (*deïstvuyushta armia*), divided into (i.) the active army, (ii.) the active army reserve; (2) the reserve army (*reservna armia*); (3) the *opltchenïe* or militia; the two former may operate outside the kingdom, the latter only within the frontier for purposes of defence. In time of peace the active army (i.) alone is on a permanent footing.

The peace strength in 1905 was 2500 officers, 48,200 men and 8000 horses, the active army being composed of 9 divisions of infantry, each of 4 regiments, 5 regiments of cavalry together with 12 squadrons attached to the infantry divisions, 9 regiments of artillery each of 3 groups of 3 batteries, together with 2 groups of mountain artillery, each of 3 batteries, and 3 battalions of siege artillery; 9 battalions of engineers with 1 railway and balloon section and 1 bridging section. At the same date the army was locally distributed in nine divisional areas with headquarters at Sofia, Philippopolis, Sliven, Shumla, Rustchuk, Vratza, Plevna, Stara-Zagora and Dupnitza, the divisional area being subdivided into four districts, from each of which one regiment of four battalions was recruited and completed with reservists. In case of mobilization each of the nine areas would furnish 20,106 men (16,000 infantry, 1200 artillery, 1000 engineers, 300 divisional cavalry and 1606 transport and hospital services, &c.). The war strength thus amounted to 180,954 of the active army and its reserve, exclusive of the five regiments of cavalry. In addition the 36 districts each furnished 3 battalions of the reserve army and one battalion of opltchenïe, or 144,000 infantry, which with the cavalry regiments (3000 men) and the reserves of artillery, engineers, divisional cavalry, &c. (about 10,000), would bring the grand total in time of war to about 338,000 officers and men with 18,000 horses. The men of the reserve battalions are drafted into the active army as occasion requires, but the militia serves as a separate force. Military service is obligatory, but Moslems may claim exemption on payment of £20; the age of recruitment in time of peace is nineteen, in time of war eighteen. Each conscript serves two years in the infantry and subsequently eight years in the active reserve, or three years in the other corps and six years in the active reserve; he is then liable to seven years' service in the reserve army and finally passes into the opltchenïe. The Bulgarian peasant makes an admirable soldier—courageous, obedient, persevering, and inured to hardship; the officers are painstaking and devoted to their duties. The active army and reserve, with the exception of the engineer regiments, are furnished with the .315″ Mannlicher magazine rifle, the engineer and militia with the Berdan; the artillery in 1905 mainly consisted of 8.7- and 7.5-cm. Krupp guns (field) and 6.5 cm. Krupp (mountain), 12 cm. Krupp and 15 cm. Creuzot (Schneider) howitzers, 15 cm. Krupp and 12 cm. Creuzot siege guns, and 7.5 cm. Creuzot quick-firing guns; total of all description, 1154. Defensive works were constructed at various strategical points near the frontier and elsewhere, and at Varna and Burgas. The naval force consisted of a flotilla stationed at Rustchuk and Varna, where a canal connects Lake Devno with the sea. It was composed in 1905 of 1 prince's yacht, 1 armoured cruiser, 3 gunboats, 3 torpedo boats and 10 other small vessels, with a complement of 107 officers and 1231 men.

Religion.—The Orthodox Bulgarian National Church claims to be an indivisible member of the Eastern Orthodox communion, and asserts historic continuity with the autocephalous Bulgarian church of the middle ages. It was, however, declared schismatic by the Greek patriarch of Constantinople in 1872, although differing in no point of doctrine from the Greek Church. The Exarch, or supreme head of the Bulgarian Church, resides at Constantinople; he enjoys the title of "Beatitude" (*negovo Blazhenstvo*), receives an annual subvention of about £6000 from the kingdom, and exercises jurisdiction over the Bulgarian hierarchy in all parts of the Ottoman empire. The exarch is elected by the Bulgarian episcopate, the Holy Synod, and a general assembly (*obshti sbor*), in which the laity is represented; their choice, before the declaration of Bulgarian independence, was subject to the sultan's approval. The occupant of the dignity is titular metropolitan of a Bulgarian diocese. The organization of the church within the principality was regulated by statute in 1883. There are eleven eparchies or dioceses in the country, each administered by a metropolitan with a diocesan council; one diocese has also a suffragan bishop. Church government is vested in the Holy Synod, consisting of four metropolitans, which assembles once a year. The laity take part in the election of metropolitans and parish priests, only the "black clergy," or monks, being eligible for the episcopate. All ecclesiastical appointments are subject to the approval of the government. There are 2106 parishes (*eporii*) in the kingdom with 9 archimandrites, 1936 parish priests and 21 deacons, 78 monasteries with 184 monks, and 12 convents with 346 nuns. The celebrated monastery of Rila possesses a vast estate in the Rilska Planina; its abbot or *hegumen* owns no spiritual superior but the exarch. Ecclesiastical affairs are under the control of the minister of public worship; the clergy of all denominations are paid by the state, being free, however, to accept fees for baptisms, marriages, burials, the administering of oaths, &c. The census of January 1901 gives 3,019,999 persons of

the Orthodox faith (including 66,635 Patriarchist Greeks), 643,300 Mahommedans, 33,663 Jews, 28,569 Catholics, 13,809 Gregorian Armenians, 4524 Protestants and 419 whose religion is not stated. The Greek Orthodox community has four metropolitans dependent on the patriarchate. The Mahommedan community is rapidly diminishing; it is organized under 16 muftis who with their assistants receive a subvention from the government. The Catholics, who have two bishops, are for the most part the descendants of the medieval Paulicians; they are especially numerous in the neighbourhood of Philippopolis and Sistova. The Armenians have one bishop. The Protestants are mostly Methodists; since 1857 Bulgaria has been a special field of activity for American Methodist missionaries, who have established an important school at Samakov. The Berlin Treaty (Art. V.) forbade religious disabilities in regard to the enjoyment of civil and political rights, and guaranteed the free exercise of all religions.

Education.—No educational system existed in many of the rural districts before 1878; the peasantry was sunk in ignorance, and the older generation remained totally illiterate. In the towns the schools were under the superintendence of the Greek clergy, and Greek was the language of instruction. The first Bulgarian school was opened at Gabrovo in 1835 by the patriots Aprilov and Neophyt Rilski. After the Crimean War, Bulgarian schools began to appear in the villages of the Balkans and the south-eastern districts. The children of the wealthier class were generally educated abroad. The American institution of Robert College on the Bosporus rendered an invaluable service to the newly created state by providing it with a number of well-educated young men fitted for positions of responsibility. In 1878, after the liberation of the country, there were 1658 schools in the towns and villages. Primary education was declared obligatory from the first, but the scarcity of properly qualified teachers and the lack of all requisites proved serious impediments to educational organization. The government has made great efforts and incurred heavy expenditure for the spread of education; the satisfactory results obtained are largely due to the keen desire for learning which exists among the people. The present educational system dates from 1891. Almost all the villages now possess "national" (*narodni*) primary schools, maintained by the communes with the aid of a state subvention and supervised by departmental and district inspectors. The state also assists a large number of Turkish primary schools. The penalties for non-attendance are not very rigidly enforced, and it has been found necessary to close the schools in the rural districts during the summer, the children being required for labour in the fields.

The age for primary instruction is six to ten years; in 1890, 47.01% of the boys and 16.11% of the girls attended the primary schools; in 1898, 85% of the boys and 40% of the girls. In 1904 there were 4344 primary schools, of which 3060 were "national," or communal, and 1284 denominational (Turkish, Greek, Jewish, &c.), attended by 340,668 pupils, representing a proportion of 9.1 per hundred inhabitants. In addition to the primary schools, 40 infant schools for children of 3 to 6 years of age were attended by 2707 pupils. In 1888 only 327,766 persons, or 11% of the population, were literate; in 1893 the proportion rose to 19.88%; in 1901 to 23.9%.

In the system of secondary education the distinction between the classical and "real" or special course of study is maintained as in most European countries; in 1904 there were 175 secondary schools and 18 gymnasia (10 for boys and 8 for girls). In addition to these there are 6 technical and 3 agricultural schools; 5 of pedagogy, 1 theological, 1 commercial, 1 of forestry, 1 of design, 1 for surgeons' assistants, and a large military school at Sofia. Government aid is given to students of limited means, both for secondary education and the completion of their studies abroad. The university of Sofia, formerly known as the "high school," was reorganized in 1904; it comprises 3 faculties (philology, mathematics and law), and possesses a staff of 17 professors and 25 lecturers. The number of students in 1905 was 943.

Political History

The ancient Thraco-Illyrian race which inhabited the district between the Danube and the Aegean was expelled, or more probably absorbed, by the great Slavonic immigration which took place at various intervals between the end of the 3rd century after Christ and the beginning of the 6th. The numerous tumuli which are found in all parts of the country (see Herodotus v. 8) and some stone tablets with bas-reliefs remain as monuments of the aboriginal population; and certain structural peculiarities, which are common to the Bulgarian and Rumanian languages, may conceivably be traced to the influence of the primitive Illyrian speech, now probably represented by the Albanian. The Slavs, an agricultural people, were governed, even in those remote times, by the democratic local institutions to which they are still attached; they possessed no national leaders or central organization, and their only political unit was the *pleme*, or tribe. They were considerably influenced by contact with Roman civilization. It was reserved for a foreign race, altogether distinct in origin, religion and customs, to give unity and coherence to the scattered Slavonic groups, and to weld them into a compact and powerful state which for some centuries played an important part in the history of eastern Europe and threatened the existence of the Byzantine empire.

The Bulgars.—The Bulgars, a Turanian race akin to the Tatars, Huns, Avars, Petchenegs and Finns, made their appearance on the banks of the Pruth in the latter part of the 7th century. They were a horde of wild horsemen, fierce and barbarous, practising polygamy, and governed despotically by their *khans* (chiefs) and *boyars* or *bolyars* (nobles). Their original abode was the tract between the Ural mountains and the Volga, where the kingdom of Great (or Black) Bolgary existed down to the 13th century. In 679, under their khan Asparukh (or Isperikh), they crossed the Danube, and, after subjugating the Slavonic population of Moesia, advanced to the gates of Constantinople and Salonica. The East Roman emperors were compelled to cede to them the province of Moesia and to pay them an annual tribute. The invading horde was not numerous, and during the next two centuries it became gradually merged in the Slavonic population. Like the Franks in Gaul the Bulgars gave their name and a political organization to the more civilized race which they conquered, but adopted its language, customs and local institutions. Not a trace of the Ugrian or Finnish element is to be found in the Bulgarian speech. This complete assimilation of a conquering race may be illustrated by many parallels.

Early Dynasties.—The history of the early Bulgarian dynasties is little else than a record of continuous conflicts with the Byzantine emperors. The tribute first imposed on the Greeks by Asparukh was again exacted by Kardam (791-797) and Krum (802-815), a sovereign noted alike for his cruelty and his military and political capacity. Under his rule the Bulgarian realm extended from the Carpathians to the neighbourhood of Adrianople; Serdica (the present Sofia) was taken, and the valley of the Struma conquered. Prêslav, the Bulgarian capital, was attacked and burned by the emperor Nicephorus, but the

[v.04 p.0780]

Greek army on its return was annihilated in one of the Balkan passes; the emperor was slain, and his skull was converted by Krum into a goblet. The reign of Boris (852-884) is memorable for the introduction of Christianity into Bulgaria. Two monks of Salonica, SS. Cyril and Methodius, are generally reverenced as the national apostles; the scene of their labours, however, was among the Slavs of Moravia, and the Bulgars were evangelized by their disciples. Boris, finding himself surrounded by Christian states, decided from political motives to abandon paganism. He was baptized in 864, the emperor Michael III. acting as his sponsor. It was at this time that the controversies broke out which ended in the schism between the Churches of the East and West. Boris long wavered between Constantinople and Rome, but the refusal of the pope to recognize an autocephalous Bulgarian church determined him to offer his allegiance to the Greek patriarch. The decision was fraught with momentous consequences for the future of the race. The nation altered its religion in obedience to its sovereign, and some of the boyars who resisted the change paid with their lives for their fidelity to the ancient belief. The independence of the Bulgarian church was recognized by the patriarchate, a fact much dwelt upon in recent controversies. The Bulgarian primates subsequently received the title of patriarch; their see was transferred from Prêslav to Sofia, Voden and Prespa successively, and finally to Ochrida.

The First Empire.—The national power reached its zenith under Simeon (893-927), a monarch distinguished in the arts of war and peace. In his reign, says Gibbon, "Bulgaria assumed a rank among the civilized powers of the earth." His dominions extended from the Black Sea to the Adriatic, and from the borders of Thessaly to the Save and the Carpathians. Having become the most powerful monarch in eastern Europe, Simeon assumed the style of "Emperor and Autocrat of all the Bulgars and Greeks" (*tsar i samodrzhetz vsêm Blgarom i Grkom*), a title which was recognized by Pope Formosus. During the latter years of his reign, which were spent in peace, his people made great progress in civilization, literature nourished, and Prêslav, according to contemporary chroniclers, rivalled Constantinople in magnificence. After the death of Simeon the Bulgarian power declined owing to internal dissensions; the land was distracted by the Bogomil heresy (see Bogomils), and a separate or western empire, including Albania and Macedonia, was founded at Ochrida by Shishman, a boyar from Trnovo. A notable event took place in 967, when the Russians, under Sviatoslav, made their first appearance in Bulgaria. The Bulgarian tsar, Boris II., with the aid of the emperor John Zimisces, expelled the invaders, but the Greeks took advantage of their victory to dethrone Boris, and the first Bulgarian empire thus came to an end after an existence of three centuries. The empire at Ochrida, however, rose to considerable importance under Samuel, the son of Shishman (976-1014), who conquered the greater part of the Peninsula, and ruled from the Danube to the Morea. After a series of campaigns this redoubtable warrior was defeated at Bêlasitza by the emperor Basil II., surnamed Bulgaroktonos, who put out the eyes of 15,000 prisoners taken in the fight, and sent them into the camp of his adversary. The Bulgarian tsar was so overpowered by the spectacle that he died of grief. A few years later his dynasty finally disappeared, and for more than a century and a half (1018-1186) the Bulgarian race remained subject to the Byzantine emperors.

The Second Empire.—In 1186, after a general insurrection of Vlachs and Bulgars under the brothers Ivan and Peter Asên of Trnovo, who claimed descent from the dynasty of the Shishmanovtzi, the nation recovered its independence, and Ivan Asên assumed the title of "Tsar of the Bulgars and Greeks." The seat of the second, or "Bulgaro-Vlach" empire was at Trnovo, which the Bulgarians regard as the historic capital of their race. Kaloyan, the third of the Asên monarchs, extended his dominions to Belgrade, Nish and Skopïe (Uskub); he acknowledged the spiritual supremacy of the pope, and received the royal crown from a papal legate. The greatest of all Bulgarian rulers was Ivan Asên II. (1218-1241), a man of humane and enlightened character. After a series of victorious campaigns he established his sway over Albania, Epirus, Macedonia and Thrace, and governed his wide dominions with justice, wisdom and moderation. In his time the nation attained a prosperity hitherto unknown: commerce, the arts and literature flourished; Trnovo, the capital, was enlarged and embellished; and great numbers of churches and monasteries were founded or endowed. The dynasty of the Asêns became extinct in 1257, and a period of decadence began. Two other dynasties, both of Kuman origin, followed—the Terterovtzi, who ruled at Trnovo, and the Shishmanovtzi, who founded an independent state at Vidin, but afterwards reigned in the national capital. Eventually, on the 28th June 1330, a day commemorated with sorrow in Bulgaria, Tsar Michael Shishman was defeated and slain by the Servians, under Stephen Urosh III., at the battle of Velbûzhd (Kiustendil). Bulgaria, though still retaining its native rulers, now became subject to Servia, and formed part of the short-lived empire of Stephen Dushan (1331-1355). The Servian hegemony vanished after the death of Dushan, and the Christian races of the Peninsula, distracted by the quarrels of their petty princes, fell an easy prey to the advancing might of the Moslem invader.

The Turkish Conquest.—In 1340 the Turks had begun to ravage the valley of the Maritza; in 1362 they captured Philippopolis, and in 1382 Sofia. In 1366 Ivan Shishman III., the last Bulgarian tsar, was compelled to declare himself the vassal of the sultan Murad I., and to send his sister to the harem of the conqueror. In 1389 the rout of the Servians, Bosnians and Croats on the famous field of Kossovo decided the fate of the Peninsula. Shortly afterwards Ivan Shishman was attacked by the Turks; and Trnovo, after a siege of three months, was captured, sacked and burnt in 1393. The fate of the last Bulgarian sovereign is unknown: the national legend represents him as perishing in a battle near Samakov. Vidin, where Ivan's brother, Strazhimir, had established himself, was taken in 1396, and with its fall the last remnant of Bulgarian independence disappeared.

The five centuries of Turkish rule (1396-1878) form a dark epoch in Bulgarian history. The invaders carried fire and sword through the land; towns, villages and monasteries were sacked and destroyed, and whole districts were converted into desolate wastes. The inhabitants of the plains fled to the mountains, where they founded new settlements. Many of the nobles embraced the creed of Islam, and were liberally rewarded for their apostasy; others, together with numbers of the priests and people, took refuge across the Danube. All the regions formerly ruled by the Bulgarian tsars, including Macedonia and Thrace, were placed under the administration of a governor-general, styled the beylerbey of Rum-ili, residing at Sofia; Bulgaria proper was divided into the sanjaks of Sofia, Nikopolis, Vidin, Silistria and Kiustendil. Only a small proportion of the people followed the example of the boyars in abandoning Christianity; the conversion of the isolated communities now represented by the Pomaks took place at various intervals during the next three centuries. A new kind of feudal system replaced that of the boyars, and fiefs or *spahiliks* were conferred on the Ottoman chiefs and the renegade Bulgarian nobles. The Christian population was subjected to heavy imposts, the principal being the *haratch*, or capitation-tax, paid to the imperial treasury, and the tithe on agricultural produce, which was collected by the feudal lord. Among the

most cruel forms of oppression was the requisitioning of young boys between the ages of ten and twelve, who were sent to Constantinople as recruits for the corps of janissaries. Notwithstanding the horrors which attended the Ottoman conquest, the condition of the peasantry during the first three centuries of Turkish government was scarcely worse than it had been under the tyrannical rule of the boyars. The contemptuous indifference with which the Turks regarded the Christian *rayas* was not altogether to the disadvantage of the subject race. Military service was not exacted from the Christians, no systematic effort was made to extinguish either their religion or their language, and within certain limits they were allowed to retain their ancient local administration and the jurisdiction of their clergy in regard to inheritances and family affairs. At the time of the conquest certain towns and villages, known as the *voïnitchki sela*, [v.04 p.0781] obtained important privileges which were not infringed till the 18th century; on condition of furnishing contingents to the Turkish army or grooms for the sultan's horses they obtained exemption from most of the taxes and complete self-government under their *voïvodi* or chiefs. Some of them, such as Koprivshtitza in the Sredna Gora, attained great prosperity, which has somewhat declined since the establishment of the principality. While the Ottoman power was at its height the lot of the subject-races was far less intolerable than during the period of decadence, which began with the unsuccessful siege of Vienna in 1683. Their rights and privileges were respected, the law was enforced, commerce prospered, good roads were constructed, and the great caravans of the Ragusan merchants traversed the country. Down to the end of the 18th century there appears to have been only one serious attempt at revolt—that occasioned by the advance of Prince Sigismund Báthory into Walachia in 1595. A kind of guerilla warfare was, however, maintained in the mountains by the *kaiduti*, or outlaws, whose exploits, like those of the Greek *klepkts*, have been highly idealized in the popular folk-lore. As the power of the sultans declined anarchy spread through the Peninsula. In the earlier decades of the 18th century the Bulgarians suffered terribly from the ravages of the Turkish armies passing through the land during the wars with Austria. Towards its close their condition became even worse owing to the horrors perpetrated by the Krjalis, or troops of disbanded soldiers and desperadoes, who, in defiance of the Turkish authorities, roamed through the country, supporting themselves by plunder and committing every conceivable atrocity. After the peace of Belgrade (1737), by which Austria lost her conquests in the Peninsula, the Servians and Bulgarians began to look to Russia for deliverance, their hopes being encouraged by the treaty of Kuchuk Kaïnarji (1774), which foreshadowed the claim of Russia to protect the Orthodox Christians in the Turkish empire. In 1794 Pasvanoglu, one of the chiefs of the Krjalis, established himself as an independent sovereign at Vidin, putting to flight three large Turkish armies which were despatched against him. This adventurer possessed many remarkable qualities. He adorned Vidin with handsome buildings, maintained order, levied taxes and issued a separate coinage. He died in 1807. The memoirs of Sofronii, bishop of Vratza, present a vivid picture of the condition of Bulgaria at this time. "My diocese," he writes, "was laid desolate; the villages disappeared—they had been burnt by the Krjalis and Pasvan's brigands; the inhabitants were scattered far and wide over Walachia and other lands."

The National Revival.—At the beginning of the 19th century the existence of the Bulgarian race was almost unknown in Europe, even to students of Slavonic literature. Disheartened by ages of oppression, isolated from Christendom by their geographical position, and cowed by the proximity of Constantinople, the Bulgarians took no collective part in the insurrectionary movement which resulted in the liberation of Servia and Greece. The Russian invasions of 1810 and 1828 only added to their sufferings, and great numbers of fugitives took refuge in Bessarabia, annexed by Russia under the treaty of Bucharest. But the long-dormant national spirit now began to awake under the influence of a literary revival. The precursors of the movement were Paisii, a monk of Mount Athos, who wrote a history of the Bulgarian tsars and saints (1762), and Bishop Sofronii, whose memoirs have been already mentioned. After 1824 several works written in modern Bulgarian began to appear, but the most important step was the foundation, in 1835, of the first Bulgarian school at Gabrovo. Within ten years at least 53 Bulgarian schools came into existence, and five Bulgarian printing-presses were at work. The literary movement led the way to a reaction against the influence and authority of the Greek clergy. The spiritual domination of the Greek patriarchate had tended more effectually than the temporal power of the Turks to the effacement of Bulgarian nationality. After the conquest of the Peninsula the Greek patriarch became the representative at the Sublime Porte of the *Rûm-millet*, the Roman nation, in which all the Christian nationalities were comprised. The independent patriarchate of Trnovo was suppressed; that of Ochrida was subsequently Hellenized. The Phanariot clergy—unscrupulous, rapacious and corrupt—succeeded in monopolizing the higher ecclesiastical appointments and filled the parishes with Greek priests, whose schools, in which Greek was exclusively taught, were the only means of instruction open to the population. By degrees Greek became the language of the upper classes in all the Bulgarian towns, the Bulgarian language was written in Greek characters, and the illiterate peasants, though speaking the vernacular, called themselves Greeks. The Slavonic liturgy was suppressed in favour of the Greek, and in many places the old Bulgarian manuscripts, images, testaments and missals were committed to the flames. The patriots of the literary movement, recognizing in the patriarchate the most determined foe to a national revival, directed all their efforts to the abolition of Greek ecclesiastical ascendancy and the restoration of the Bulgarian autonomous church. Some of the leaders went so far as to open negotiations with Rome, and an archbishop of the Uniate Bulgarian church was nominated by the pope. The struggle was prosecuted with the utmost tenacity for forty years. Incessant protests and memorials were addressed to the Porte, and every effort was made to undermine the position of the Greek bishops, some of whom were compelled to abandon their sees. At the same time no pains were spared to diffuse education and to stimulate the national sentiment. Various insurrectionary movements were attempted by the patriots Rakovski, Panayot Khitoff, Haji Dimitr, Stephen Karaja and others, but received little support from the mass of the people. The recognition of Bulgarian nationality was won by the pen, not the sword. The patriarchate at length found it necessary to offer some concessions, but these appeared illusory to the Bulgarians, and long and acrimonious discussions followed. Eventually the Turkish government intervened, and on the 28th of February 1870 a firman was issued establishing the Bulgarian exarchate, with jurisdiction over fifteen dioceses, including Nish, Pirot and Veles; the other dioceses in dispute were to be added to these in case two-thirds of the Christian population so desired. The election of the first exarch was delayed till February 1872, owing to the opposition of the patriarch, who immediately afterwards excommunicated the new head of the Bulgarian church and all his followers. The official recognition now acquired tended to consolidate the Bulgarian nation and to prepare it for the political developments which were soon to follow. A great educational activity at once displayed itself in all the districts subjected to the new ecclesiastical power.

The Revolt of 1876.—Under the enlightened administration of Midhat Pasha (1864-1868) Bulgaria enjoyed

comparative prosperity, but that remarkable man is not remembered with gratitude by the people owing to the severity with which he repressed insurrectionary movements. In 1861, 12,000 Crimean Tatars, and in 1864 a still larger number of Circassians from the Caucasus, were settled by the Turkish government on lands taken without compensation from the Bulgarian peasants. The Circassians, a lawless race of mountaineers, proved a veritable scourge to the population in their neighbourhood. In 1875 the insurrection in Bosnia and Herzegovina produced immense excitement throughout the Peninsula. The fanaticism of the Moslems was aroused, and the Bulgarians, fearing a general massacre of Christians, endeavoured to anticipate the blow by organizing a general revolt. The rising, which broke out prematurely at Koprivshtitza and Panagurishté in May 1876, was mainly confined to the sanjak of Philippopolis. Bands of bashi-bazouks were let loose throughout the district by the Turkish authorities, the Pomaks, or Moslem Bulgarians, and the Circassian colonists were called to arms, and a succession of horrors followed to which a parallel can scarcely be found in the history of the middle ages. The principal scenes of massacre were Panagurishté, Perushtitza, Bratzigovo and Batak; at the last-named town, according to an official British report, 5000 men, women and children were put to the sword by the Pomaks under Achmet Aga, who was decorated by the sultan for this exploit. Altogether some 15,000 [v.04 p.0782] persons were massacred in the district of Philippopolis, and fifty-eight villages and five monasteries were destroyed. Isolated risings which took place on the northern side of the Balkans were crushed with similar barbarity. These atrocities, which were first made known by an English journalist and an American consular official, were denounced by Gladstone in a celebrated pamphlet which aroused the indignation of Europe. The great powers remained inactive, but Servia declared war in the following month, and her army was joined by 2000 Bulgarian volunteers. A conference of the representatives of the powers, held at Constantinople towards the end of the year, proposed, among other reforms, the organization of the Bulgarian provinces, including the greater part of Macedonia, in two vilayets under Christian governors, with popular representation. These recommendations were practically set aside by the Porte, and in April 1877 Russia declared war (see Russo-Turkish Wars, and Plevna). In the campaign which followed the Bulgarian volunteer contingent in the Russian army played an honourable part; it accompanied Gourko's advance over the Balkans, behaved with great bravery at Stara Zagora, where it lost heavily, and rendered valuable services in the defence of Shipka.

Treaties of San Stefano and Berlin.—The victorious advance of the Russian army to Constantinople was followed by the treaty of San Stefano (3rd March 1878), which realized almost to the full the national aspirations of the Bulgarian race. All the provinces of European Turkey in which the Bulgarian element predominated were now included in an autonomous principality, which extended from the Black Sea to the Albanian mountains, and from the Danube to the Aegean, enclosing Ochrida, the ancient capital of the Shishmans, Dibra and Kastoria, as well as the districts of Vranya and Pirot, and possessing a Mediterranean port at Kavala. The Dobrudja, notwithstanding its Bulgarian population, was not included in the new state, being reserved as compensation to Rumania for the Russian annexation of Bessarabia; Adrianople, Salonica and the Chalcidian peninsula were left to Turkey. The area thus delimited constituted three-fifths of the Balkan Peninsula, with a population of 4,000,000 inhabitants. The great powers, however, anticipating that this extensive territory would become a Russian dependency, intervened; and on the 13th of July of the same year was signed the treaty of Berlin, which in effect divided the "Big Bulgaria" of the treaty of San Stefano into three portions. The limits of the principality of Bulgaria, as then defined, and the autonomous province of Eastern Rumelia, have been already described; the remaining portion, including almost the whole of Macedonia and part of the vilayet of Adrianople, was left under Turkish administration. No special organization was provided for the districts thus abandoned; it was stipulated that laws similar to the organic law of Crete should be introduced into the various parts of Turkey in Europe, but this engagement was never carried out by the Porte. Vranya, Pirot and Nish were given to Servia, and the transference of the Dobrudja to Rumania was sanctioned. This artificial division of the Bulgarian nation could scarcely be regarded as possessing elements of permanence. It was provided that the prince of Bulgaria should be freely elected by the population, and confirmed by the Sublime Porte with the assent of the powers, and that, before his election, an assembly of Bulgarian notables, convoked at Trnovo, should draw up the organic law of the principality. The drafting of a constitution for Eastern Rumelia was assigned to a European commission.

The Constitution of Trnovo.—Pending the completion of their political organization, Bulgaria and Eastern Rumelia were occupied by Russian troops and administered by Russian officials. The assembly of notables, which met at Trnovo in 1879, was mainly composed of half-educated peasants, who from the first displayed an extremely democratic spirit, in which they proceeded to manipulate the very liberal constitution submitted to them by Prince Dondukov-Korsakov, the Russian governor-general. The long period of Turkish domination had effectually obliterated all social distinctions, and the radical element, which now formed into a party under Tzankoff and Karaveloff, soon gave evidence of its predominance. Manhood suffrage, a single chamber, payment of deputies, the absence of property qualification for candidates, and the prohibition of all titles and distinctions, formed salient features in the constitution now elaborated. The organic statute of Eastern Rumelia was largely modelled on the Belgian constitution. The governor-general, nominated for five years by the sultan with the approbation of the powers, was assisted by an assembly, partly representative, partly composed of *ex-officio* members; a permanent committee was entrusted with the preparation of legislative measures and the general supervision of the administration, while a council of six "directors" fulfilled the duties of a ministry.

Prince Alexander.—On the 29th of April 1879 the assembly at Trnovo, on the proposal of Russia, elected as first sovereign of Bulgaria Prince Alexander of Battenberg, a member of the grand ducal house of Hesse and a nephew of the tsar Alexander II. Arriving in Bulgaria on the 7th of July, Prince Alexander, then in his twenty-third year, found all the authority, military and civil, in Russian hands. The history of the earlier portion of his reign is marked by two principal features—a strong Bulgarian reaction against Russian tutelage and a vehement struggle against the autocratic institutions which the young ruler, under Russian guidance, endeavoured to inaugurate. Both movements were symptomatic of the determination of a strong-willed and egoistic race, suddenly liberated from secular oppression, to enjoy to the full the moral and material privileges of liberty. In the assembly at Trnovo the popular party had adopted the watchword "Bulgaria for the Bulgarians," and a considerable anti-Russian contingent was included in its ranks. Young and inexperienced, Prince Alexander, at the suggestion of the Russian consul-general, selected his first ministry from a small group of "Conservative" politicians whose views were in conflict with those of the parliamentary majority, but he was soon compelled to form a "Liberal" administration under Tzankoff and Karaveloff. The Liberals, once in power, initiated a violent campaign against foreigners in general and the

Russians in particular; they passed an alien law, and ejected foreigners from every lucrative position. The Russians made a vigorous resistance, and a state of chaos ensued. Eventually the prince, finding good government impossible, obtained the consent of the tsar to a change of the constitution, and assumed absolute authority on the 9th of May 1881. The Russian general Ernroth was appointed sole minister, and charged with the duty of holding elections for the Grand Sobranye, to which the right of revising the constitution appertained. So successfully did he discharge his mission that the national representatives, almost without debate, suspended the constitution and invested the prince with absolute powers for a term of seven years (July 1881). A period of Russian government followed under Generals Skobelev and Kaulbars, who were specially despatched from St Petersburg to enhance the authority of the prince. Their administration, however, tended to a contrary result, and the prince, finding himself reduced to impotence, opened negotiations with the Bulgarian leaders and effected a coalition of all parties on the basis of a restoration of the constitution. The generals, who had made an unsuccessful attempt to remove the prince, withdrew; the constitution of Trnovo was restored by proclamation (19th September 1883), and a coalition ministry was formed under Tzankoff. Prince Alexander, whose relations with the court of St Petersburg had become less cordial since the death of his uncle, the tsar Alexander II., in 1881, now incurred the serious displeasure of Russia, and the breach was soon widened by the part which he played in encouraging the national aspirations of the Bulgarians.

Union with Eastern Rumelia.—In Eastern Rumelia, where the Bulgarian population never ceased to protest against the division of the race, political life had developed on the same lines as in the principality. Among the politicians two parties had come into existence—the Conservatives or self-styled "Unionists," and the
[v.04 p.0783] Radicals, derisively called by their opponents "Kazioni" or treasury-seekers; both were equally desirous of bringing about the union with the principality. Neither party, however, while in power would risk the sweets of office by embarking in a hazardous adventure. It was reserved for the Kazioni, under their famous leader Zakharia Stoyánoff, who in early life had been a shepherd, to realize the national programme. In 1885 the Unionists were in office, and their opponents lost no time in organizing a conspiracy for the overthrow of the governor-general, Krstovitch Pasha. Their designs were facilitated by the circumstance that Turkey had abstained from sending troops into the province. Having previously assured themselves of Prince Alexander's acquiescence, they seized the governor-general and proclaimed the union with Bulgaria (18th September). The revolution took place without bloodshed, and a few days later Prince Alexander entered Philippopolis amid immense enthusiasm. His position now became precarious. The powers were scandalized at the infraction of the Berlin Treaty; Great Britain alone showed sympathy, while Russia denounced the union and urged the Porte to reconquer the revolted province—both powers thus reversing their respective attitudes at the congress of Berlin.

War with Servia.—The Turkish troops were massed at the frontier, and Servia, hoping to profit by the difficulties of her neighbour, suddenly declared war (14th November). At the moment of danger the Russian officers, who filled all the higher posts in the Bulgarian army, were withdrawn by order of the tsar. In these critical circumstances Prince Alexander displayed considerable ability and resource, and the nation gave evidence of hitherto unsuspected qualities. Contrary to general expectation, the Bulgarian army, imperfectly equipped and led by subaltern officers, successfully resisted the Servian invasion. After brilliant victories at Slivnitza (19th November) and Tsaribrod, Prince Alexander crossed the frontier and captured Pirot (27th November), but his farther progress was arrested by the intervention of Austria (see Servo-Bulgarian War). The treaty of Bucharest followed (3rd of March 1886), declaring, in a single clause, the restoration of peace. Servia, notwithstanding her aggression, escaped a war indemnity, but the union with Eastern Rumelia was practically secured. By the convention of Top-Khané (5th April) Prince Alexander was recognized by the sultan as governor-general of eastern Rumelia; a personal union only was sanctioned, but in effect the organic statute disappeared and the countries were administratively united. These military and diplomatic successes, which invested the prince with the attributes of a national hero, quickened the decision of Russia to effect his removal. An instrument was found in the discontent of several of his officers, who considered themselves slighted in the distribution of rewards, and a conspiracy was formed in which Tzankoff, Karaveloff (the prime minister), Archbishop Clement, and other prominent persons were implicated. On the night of the 21st of August the prince was seized in his palace by several officers and compelled, under menace of death, to sign his abdication; he was then hurried to the Danube at Rakhovo and transported to Russian soil at Reni. This violent act met with instant disapproval on the part of the great majority of the nation. Stamboloff, the president of the assembly, and Colonel Mutkuroff, commandant of the troops at Philippopolis, initiated a counter-revolution; the provisional government set up by the conspirators immediately fell, and a few days later the prince, who had been liberated by the Russian authorities, returned to the country amid every demonstration of popular sympathy and affection. His arrival forestalled that of a Russian imperial commissioner, who had been appointed to proceed to Bulgaria. He now committed the error of addressing a telegram to the tsar in which he offered to resign his crown into the hands of Russia. This unfortunate step, by which he ignored the suzerainty of Turkey, and represented Bulgaria as a Russian dependency, exposed him to a stern rebuff, and fatally compromised his position. The national leaders, after obtaining a promise from the Russian representative at Sofia that Russia would abstain from interference in the internal affairs of the country, consented to his departure; on the 8th of September he announced his abdication, and on the following day he left Bulgaria.

The Regency.—A regency was now formed, in which the prominent figure was Stamboloff, the most remarkable man whom modern Bulgaria has produced. A series of attempts to throw the country into anarchy were firmly dealt with, and the Grand Sobranye was summoned to elect a new prince. The candidature of the prince of Mingrelia was now set up by Russia, and General Kaulbars was despatched to Bulgaria to make known to the people the wishes of the tsar. He vainly endeavoured to postpone the convocation of the Grand Sobranye in order to gain time for the restoration of Russian influence, and proceeded on an electoral tour through the country. The failure of his mission was followed by the withdrawal of the Russian representatives from Bulgaria. The Grand Sobranye, which assembled at Trnovo, offered the crown to Prince Valdemar of Denmark, brother-in-law of the tsar, but the honour was declined, and an anxious period ensued, during which a deputation visited the principal capitals of Europe with the twofold object of winning sympathy for the cause of Bulgarian independence and discovering a suitable candidate for the throne.

Prince Ferdinand.—On the 7th of July 1887, the Grand Sobranye unanimously elected Prince Ferdinand of Saxe-Coburg-Gotha, a grandson, maternally, of King Louis Philippe. The new prince, who was twenty-six years of age, was at this time a lieutenant in the Austrian army. Undeterred by the difficulties of the

international situation and the distracted condition of the country, he accepted the crown, and took over the government on the 14th of August at Trnovo. His arrival, which was welcomed with enthusiasm, put an end to a long and critical interregnum, but the dangers which menaced Bulgarian independence were far from disappearing. Russia declared the newly-elected sovereign a usurper; the other powers, in deference to her susceptibilities, declined to recognize him, and the grand vizier informed him that his presence in Bulgaria was illegal. Numerous efforts were made by the partisans of Russia to disturb internal tranquillity, and Stamboloff, who became prime minister on the 1st of September, found it necessary to govern with a strong hand. A raid led by the Russian captain Nabokov was repulsed; brigandage, maintained for political purposes, was exterminated; the bishops of the Holy Synod, who, at the instigation of Clement, refused to pay homage to the prince, were forcibly removed from Sofia; a military conspiracy organized by Major Panitza was crushed, and its leader executed. An attempt to murder the energetic prime minister resulted in the death of his colleague, Beltcheff, and shortly afterwards Dr Vlkovitch, the Bulgarian representative at Constantinople, was assassinated. While contending with unscrupulous enemies at home, Stamboloff pursued a successful policy abroad. Excellent relations were established with Turkey and Rumania, valuable concessions were twice extracted from the Porte in regard to the Bulgarian episcopate in Macedonia, and loans were concluded with foreign financiers on comparatively favourable terms. His overbearing character, however, increased the number of his opponents, and alienated the goodwill of the prince.

In the spring of 1893 Prince Ferdinand married Princess Marie-Louise of Bourbon-Parma, whose family insisted on the condition that the issue of the marriage should be brought up in the Roman Catholic faith. In view of the importance of establishing a dynasty, Stamboloff resolved on the unpopular course of altering the clause of the constitution which required that the heir to the throne should belong to the Orthodox Church, and the Grand Sobranye, which was convoked at Trnovo in the summer, gave effect to this decision. The death of Prince Alexander, which took place in the autumn, and the birth of an heir, tended to strengthen the position of Prince Ferdinand, who now assumed a less compliant attitude towards the prime minister. In 1894 Stamboloff resigned office; a ministry was formed under Dr Stoïloff, and Prince Ferdinand inaugurated a policy of conciliation towards Russia with a view to obtaining his
[v.04 p.0784] recognition by the powers. A Russophil reaction followed, large numbers of political refugees returned to Bulgaria, and Stamboloff, exposed to the vengeance of his enemies, was assassinated in the streets of Sofia (15th July 1895).

The prince's plans were favoured by the death of the tsar Alexander III. in November 1894, and the reconciliation was practically effected by the conversion of his eldest son, Prince Boris, to the Orthodox faith (14th February 1896). The powers having signified their assent, he was nominated by the sultan prince of Bulgaria and governor-general of Eastern Rumelia (14th March). Russian influence now became predominant in Bulgaria, but the cabinet of St Petersburg wisely abstained from interfering in the internal affairs of the principality. In February 1896 Russia proposed the reconciliation of the Greek and Bulgarian churches and the removal of the exarch to Sofia. The project, which involved a renunciation of the exarch's jurisdiction in Macedonia, excited strong opposition in Bulgaria, and was eventually dropped. The death of Princess Marie-Louise (30th January 1899), caused universal regret in the country. In the same month the Stoïloff government, which had weakly tampered with the Macedonian movement (see Macedonia) and had thrown the finances into disorder, resigned, and a ministry under Grekoff succeeded, which endeavoured to mend the economic situation by means of a foreign loan. The loan, however, fell through, and in October a new government was formed under Ivanchoff and Radoslavoff. This, in its turn, was replaced by a *cabinet d'affaires* under General Petroff (January 1901).

In the following March Karaveloff for the third time became prime minister. His efforts to improve the financial situation, which now became alarming, proved abortive, and in January 1902 a Tzankovist cabinet was formed under Daneff, who succeeded in obtaining a foreign loan. Russian influence now became predominant, and in the autumn the grand-duke Nicholas, General Ignatiev, and a great number of Russian officers were present at the consecration of a Russian church and monastery in the Shipka pass. But the appointment of Mgr. Firmilian, a Servian prelate, to the important see of Uskub at the instance of Russia, the suspected designs of that power on the ports of Varna and Burgas, and her unsympathetic attitude in regard to the Macedonian Question, tended to diminish her popularity and that of the government. A cabinet crisis was brought about in May 1903, by the efforts of the Russian party to obtain control of the army, and the Stambolovists returned to power under General Petroff. A violent recrudescence of the Macedonian agitation took place in the autumn of 1902; at the suggestion of Russia the leaders were imprisoned, but the movement nevertheless gained force, and in August 1903 a revolt broke out in the vilayet of Monastir, subsequently spreading to the districts of northern Macedonia and Adrianople (see Macedonia). The barbarities committed by the Turks in repressing the insurrection caused great exasperation in the principality; the reserves were partially mobilized, and the country was brought to the brink of war. In pursuance of the policy of Stamboloff, the Petroff government endeavoured to inaugurate friendly relations with Turkey, and a Turco-Bulgarian convention was signed (8th April 1904) which, however, proved of little practical value.

The outrages committed by numerous Greek bands in Macedonia led to reprisals on the Greek population in Bulgaria in the summer of 1906, and the town of Anchialo was partially destroyed. On the 6th of November in that year Petroff resigned, and Petkoff, the leader of the Stambolovist party, formed a ministry. The prime minister, a statesman of undoubted patriotism but of overbearing character, was assassinated on the 11th of March 1907 by a youth who had been dismissed from a post in one of the agricultural banks, and the cabinet was reconstituted under Gudeff, a member of the same party.

Declaration of Independence.—During the thirty years of its existence the principality had made rapid and striking progress. Its inhabitants, among whom a strong sense of nationality had grown up, were naturally anxious to escape from the restrictions imposed by the treaty of Berlin. That Servia should be an independent state, while Bulgaria, with its greater economic and military resources, remained tributary to the Sultan, was an anomaly which all classes resented; and although the Ottoman suzerainty was little more than a constitutional fiction, and the tribute imposed in 1878 was never paid, the Bulgarians were almost unanimous in their desire to end a system which made their country the vassal of a Moslem state notorious for its maladministration and corruption. This desire was strengthened by the favourable reception accorded to Prince Ferdinand when he visited Vienna in February 1908, and by the so-called "Geshoff incident," *i.e.* the exclusion of M. Geshoff, the Bulgarian agent, from a dinner given by Tewfik Pasha, the Ottoman minister for foreign affairs, to the ministers of all the sovereign states represented at

Constantinople (12th of September 1908). This was interpreted as an insult to the Bulgarian nation, and as the explanation offered by the grand vizier was unsatisfactory, M. Geshoff was recalled to Sofia. At this time the bloodless revolution in Turkey seemed likely to bring about a fundamental change in the settled policy of Bulgaria. For many years past Bulgarians had hoped that their own orderly and progressive government, which had contrasted so strongly with the evils of Turkish rule, would entitle them to consideration, and perhaps to an accession of territory, when the time arrived for a definite settlement of the Macedonian Question. Now, however, the reforms introduced or foreshadowed by the Young Turkish party threatened to deprive Bulgaria of any pretext for future intervention; there was nothing to be gained by further acquiescence in the conditions laid down at Berlin. An opportunity for effective action occurred within a fortnight of M. Geshoff's recall, when a strike broke out on those sections of the Eastern Rumelian railways which were owned by Turkey and leased to the Oriental Railways Company. The Bulgarians alleged that during the strike Turkish troops were able to travel on the lines which were closed to all other traffic, and that this fact constituted a danger to their own autonomy. The government therefore seized the railway, in defiance of European opinion, and in spite of the protests of the suzerain power and the Oriental Railways Company. The bulk of the Turkish army was then in Asia, and the new régime was not yet firmly established, while the Bulgarian government were probably aware that Russia would not intervene, and that Austria-Hungary intended to annex Bosnia and Herzegovina, and thus incidentally to divert attention from their own violation of the treaty of Berlin. On the 5th of October Prince Ferdinand publicly proclaimed Bulgaria, united since the 6th of September 1885 (*i.e.* including Eastern Rumelia), an independent kingdom. This declaration was read aloud by the king in the church of the Forty Martyrs at Trnovo, the ancient capital of the Bulgarian tsars. The Porte immediately protested to the powers, but agreed to accept an indemnity. In February 1909 the Russian government proposed to advance to Bulgaria the difference between the £4,800,000 claimed by Turkey and the £1,520,000 which Bulgaria undertook to pay. A preliminary Russo-Turkish protocol was signed on the 16th of March, and in April, after the final agreement had been concluded, the independence of Bulgaria was recognized by the powers. Of the indemnity, £1,680,000 was paid on account of the Eastern Rumelian railways; the allocation of this sum between Turkey and the Oriental railways was submitted to arbitration. (See TURKEY: *History*.)

LANGUAGE AND LITERATURE

Language.—The Bulgarian is at once the most ancient and the most modern of the languages which constitute the Slavonic group. In its groundwork it presents the nearest approach to the old ecclesiastical Slavonic, the liturgical language common to all the Orthodox Slavs, but it has undergone more important modifications than any of the sister dialects in the simplification of its grammatical forms; and the analytical character of its development may be compared with that of the neo-Latin and Germanic languages. The introduction of the definite article, which appears in the form of a suffix, and the almost total disappearance of the ancient declensions, for which the use of prepositions has been substituted, distinguish the Bulgarian from all the other members of the Slavonic family. Notwithstanding these changes, which give the language an essentially modern aspect, its close affinity with the ecclesiastical Slavonic, the oldest written dialect, is regarded as established by several eminent scholars, such as Šafařik, Schleicher, Leskien and Brugman, and by many Russian philologists. These authorities agree in describing the liturgical language as "Old Bulgarian." A different view, however, is maintained by Miklosich, Kopitar and some others, who regard it as "Old Slovene." According to the more generally accepted theory, the dialect spoken by the Bulgarian population in the neighbourhood of Salonica, the birthplace of SS. Cyril and Methodius, was employed by the Slavonic apostles in their translations from the Greek, which formed the model for subsequent ecclesiastical literature. This view receives support from the fact that the two nasal vowels of the Church-Slavonic (the greater and lesser *ûs*), which have been modified in all the cognate languages except Polish, retain their original pronunciation locally in the neighbourhood of Salonica and Castoria; in modern literary Bulgarian the *rhinesmus* has disappeared, but the old nasal vowels preserve a peculiar pronunciation, the greater *ûs* changing to *ŭ*, as in English "but," the lesser to *ĕ*, as in "bet," while in Servian, Russian and Slovene the greater *ûs* becomes *ū* or *ō*, the lesser *e* or *ya*. The remnants of the declensions still existing in Bulgarian (mainly in pronominal and adverbial forms) show a close analogy to those of the old ecclesiastical language.

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The Slavonic apostles wrote in the 9th century (St Cyril died in 869, St Methodius in 885), but the original manuscripts have not been preserved. The oldest existing copies, which date from the 10th century, already betray the influence of the contemporary vernacular speech, but as the alterations introduced by the copyists are neither constant nor regular, it is possible to reconstruct the original language with tolerable certainty. The "Old Bulgarian," or archaic Slavonic, was an inflexional language of the synthetic type, containing few foreign elements in its vocabulary. The Christian terminology was, of course, mainly Greek; the Latin or German words which occasionally occur were derived from Moravia and Pannonia, where the two saints pursued their missionary labours. In course of time it underwent considerable modifications, both phonetic and structural, in the various Slavonic countries in which it became the liturgical language, and the various MSS. are consequently classified as "Servian-Slavonic," "Croatian-Slavonic," "Russian-Slavonic," &c., according to the different recensions. The "Russian-Slavonic" is the liturgical language now in general use among the Orthodox Slavs of the Balkan Peninsula owing to the great number of ecclesiastical books introduced from Russia in the 17th and 18th centuries; until comparatively recent times it was believed to be the genuine language of the Slavonic apostles. Among the Bulgarians the spoken language of the 9th century underwent important changes during the next three hundred years. The influence of these changes gradually asserts itself in the written language; in the period extending from the 12th to the 15th century the writers still endeavoured to follow the archaic model, but it is evident that the vernacular had already become widely different from the speech of SS. Cyril and Methodius. The language of the MSS. of this period is known as the "Middle Bulgarian"; it stands midway between the old ecclesiastical Slavonic and the modern speech.

In the first half of the 16th century the characteristic features of the modern language became apparent in the literary monuments. These features undoubtedly displayed themselves at a much earlier period in the oral speech; but the progress of their development has not yet been completely investigated. Much light may be thrown on this subject by the examination of many hitherto little-known manuscripts and by the scientific study of the folk-songs. In addition to the employment of the article, the loss of the noun-declensions, and the modification of the nasal vowels above alluded to, the disappearance in pronunciation of the final vowels *yer-golêm* and *yer-malúk*, the loss of the infinitive, and the increased variety of the conjugations, distinguish the modern from the ancient language. The suffix-article, which is derived from

the demonstrative pronoun, is a feature peculiar to the Bulgarian among Slavonic and to the Rumanian among Latin languages. This and other points of resemblance between these remotely related members of the Indo-European group are shared by the Albanian, probably the representative of the old Illyrian language, and have consequently been attributed to the influence of the aboriginal speech of the Peninsula. A demonstrative suffix, however, is sometimes found in Russian and Polish, and traces of the article in an embryonic state occur in the "Old Bulgarian" MSS. of the 10th and 11th centuries. In some Bulgarian dialects it assumes different forms according to the proximity or remoteness of the object mentioned. Thus *zhena-ta* is "the woman"; *zhena-va* or *zhena-sa*, "the woman close by"; *zhena-na*, "the woman yonder." In the borderland between the Servian and Bulgarian nationalities the local use of the article supplies the means of drawing an ethnological frontier; it is nowhere more marked than in the immediate neighbourhood of the Servian population, as, for instance, at Dibra and Prilep. The modern Bulgarian has admitted many foreign elements. It contains about 2000 Turkish and 1000 Greek words dispersed in the various dialects; some Persian and Arabic words have entered through the Turkish medium, and a few Rumanian and Albanian words are found. Most of these are rejected by the purism of the literary language, which, however, has been compelled to borrow the phraseology of modern civilization from the Russian, French and other European languages. The dialects spoken in the kingdom may be classed in two groups—the eastern and the western. The main point of difference is the pronunciation of the letter *yedvoïno*, which in the eastern has frequently the sound of *ya*, in the western invariably that of *e* in "pet." The literary language began in the western dialect under the twofold influence of Servian literature and the Church Slavonic. In a short time, however, the eastern dialect prevailed, and the influence of Russian literature became predominant. An anti-Russian reaction was initiated by Borgoroff (1818-1892), and has been maintained by numerous writers educated in the German and Austrian universities. Since the foundation of the university of Sofia the literary language has taken a middle course between the ultra-Russian models of the past generation and the dialectic Bulgarian. Little uniformity, however, has yet been attained in regard to diction, orthography or pronunciation.

The Bulgarians of pagan times are stated by the monk Khrabr, a contemporary of Tsar Simeon, to have employed a peculiar writing, of which inscriptions recently found near Kaspitchan may possibly be specimens. The earliest manuscripts of the "Old Bulgarian" are written in one or other of the two alphabets known as the glagolitic and Cyrillic (see SLAVS). The former was used by Bulgarian writers concurrently with the Cyrillic down to the 12th century. Among the orthodox Slavs the Cyrillic finally superseded the glagolitic; as modified by Peter the Great it became the Russian alphabet, which, with the revival of literature, was introduced into Servia and Bulgaria. Some Russian letters which are superfluous in Bulgarian have been abandoned by the native writers, and a few characters have been restored from the ancient alphabet.

Literature.—The ancient Bulgarian literature, originating in the works of SS. Cyril and Methodius and their disciples, consisted for the most part of theological works translated from the Greek. From the conversion of Boris down to the Turkish conquest the religious character predominates, and the influence of Byzantine literature is supreme. Translations of the gospels and epistles, lives of the saints, collections of sermons, exegetic religious works, translations of Greek chronicles, and miscellanies such as the *Sbornik* of St Sviatoslav, formed the staple of the national literature. In the time of Tsar Simeon, himself an author, considerable literary activity prevailed; among the more remarkable works of this period was the *Shestodnev*, or Hexameron, of John the exarch, an account of the creation. A little later the heresy of the Bogomils gave an impulse to controversial writing. The principal champions of orthodoxy were St Kosmâs and the monk Athanas of Jerusalem; among the Bogomils the *Questions of St Ivan Bogosloff*, a work containing a description of the beginning and the end of the world, was held in high esteem. Contemporaneously with the spread of this sect a number of apocryphal works, based on the Scripture narrative, but embellished with Oriental legends of a highly imaginative character, obtained great popularity. Together with these religious writings works of fiction, also of Oriental origin, made their appearance, such as the life of Alexander the Great, the story of Troy, the tales of *Stephanit and Ichnilat* and *Barlaam and Josaphat*, the latter founded on the biography of Buddha. These were for the most part reproductions or variations of the fantastical romances which circulated through Europe in the middle ages, and many of them have left traces in the national legends and folk-songs. In the 13th century, under the Asên dynasty, numerous historical works or chronicles (*lêtopisi*) were composed. State records appear to have existed, but none of them have been preserved. With the Ottoman conquest literature disappeared; the manuscripts became the food of moths and worms, or fell a prey to the fanaticism of the Phanariot clergy. The library of the patriarchs of Trnovo was committed to the flames by the Greek metropolitan Hilarion in 1825.

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The monk Païsii (born about 1720) and Bishop Sofronii (1739-1815) have already been mentioned as the precursors of the literary revival. The *Istoria Slaveno-Bolgarska* (1762) of Païsii, written in the solitude of Mount Athos, was a work of little historical value, but its influence upon the Bulgarian race was immense. An ardent patriot, Païsii recalls the glories of the Bulgarian tsars and saints, rebukes his fellow-countrymen for allowing themselves to be called Greeks, and denounces the arbitrary proceedings of the Phanariot prelates. The *Life and Sufferings of sinful Sofronii* (1804) describes in simple and touching language the condition of Bulgaria at the beginning of the 19th century. Both works were written in a modified form of the church Slavonic. The first printed work in the vernacular appears to have been the *Kyriakodromion*, a translation of sermons, also by Sofronii, published in 1806. The Servian and Greek insurrections quickened the patriotic sentiments of the Bulgarian refugees and merchants in Rumania, Bessarabia and southern Russia, and Bucharest became the centre of their political and literary activity. A modest *bukvar*, or primer, published at Kronstadt by Berovitch in 1824, was the first product of the new movement. Translations of the Gospels, school reading-books, short histories and various elementary treatises now appeared. With the multiplication of books came the movement for establishing Bulgarian schools, in which the monk Neophyt Rilski (1793-1881) played a leading part. He was the author of the first Bulgarian grammar (1835) and other educational works, and translated the New Testament into the modern language. Among the writers of the literary renaissance were George Rakovski (1818-1867), a fantastic writer of the patriotic type, whose works did much to stimulate the national zeal, Liuben Karaveloff (1837-1879), journalist and novelist, Christo Boteff (1847-1876), lyric poet, whose ode on the death of his friend Haji Dimitr, an insurgent leader, is one of the best in the language, and Petko Slaveikoff (died 1895), whose poems, patriotic, satirical and erotic, moulded the modern poetical language and exercised a great influence over the people. Gavril Krstovitch, formerly governor-general of eastern Rumelia, and Marin Drinoff, a Slavist of high repute, have written historical works. Stamboloff, the

statesman, was the author of revolutionary and satirical ballads; his friend Zacharia Stoyanoff (d. 1889), who began life as a shepherd, has left some interesting memoirs. The most distinguished Bulgarian man of letters is Ivan Vazoff (b. 1850), whose epic and lyric poems and prose works form the best specimens of the modern literary language. His novel *Pod Igoto* (Under the Yoke) has been translated into several European languages. The best dramatic work is *Ivanko*, a historical play by Archbishop Clement, who also wrote some novels. With the exception of Zlatarski's and Boncheff's geological treatises and contributions by Georgieff, Petkoff, Tosheff and Urumoff to Velnovski's *Flora Bulgarica*, no original works on natural science have as yet been produced; a like dearth is apparent in the fields of philosophy, criticism and fine art, but it must be remembered that the literature is still in its infancy. The ancient folk-songs have been preserved in several valuable collections; though inferior to the Servian in poetic merit, they deserve scientific attention. Several periodicals and reviews have been founded in modern times. Of these the most important are the *Perioditchesko Spisanie*, issued since 1869 by the Bulgarian Literary Society, and the *Sbornik*, a literary and scientific miscellany, formerly edited by Dr Shishmanoff, latterly by the Literary Society, and published by the government at irregular intervals.

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(J. D. B.)

BULGARIA, EASTERN, formerly a powerful kingdom which existed from the 5th to the 15th century on the middle Volga, in the present territory of the provinces of Samara, Simbirsk, Saratov and N. Astrakhan, perhaps extending also into Perm. The village Bolgari near Kanzañ, surrounded by numerous graves in which most interesting archaeological finds have been made, occupies the site of one of the cities—perhaps the capital—of that extinct kingdom. The history, *Tarikh Bulgar*, said to have been written in the 12th century by an Arabian cadi of the city Bolgari, has not yet been discovered; but the Arabian historians, Ibn Foslan, Ibn Haukal, Abul Hamid Andalusi, Abu Abdallah Harnati, and several others, who had visited the kingdom, beginning with the 10th century, have left descriptions of it. The Bulgars of the Volga were of Turkish origin, but may have assimilated Finnish and, later, Slavonian elements. In the 5th century they attacked the Russians in the Black Sea prairies, and afterwards made raids upon the Greeks. In 922, when they were converted to Islam, Ibn Foslan found them not quite nomadic, and already having some permanent settlements and houses in wood. Stone houses were built soon after that by Arabian architects. Ibn Dasta found amongst them agriculture besides cattle breeding. Trade with Persia and India, as also with the Khazars and the Russians, and undoubtedly with Biarmia (Urals), was, however, their chief occupation, their main riches being furs, leather, wool, nuts, wax and so on. After their conversion to Islam they began building forts, several of which are mentioned in Russian annals. Their chief town, Bolgari or Velikij Gorod (Great Town) of the Russian annals, was often raided by the Russians. In the 13th century it was conquered by the Mongols, and became for a time the seat of the khans of the Golden Horde. In the second half of the 15th century Bolgari became part of the Kazañ kingdom, lost its commercial and political importance, and was annexed to Russia after the fall of Kazañ.

(P. A. K.)

BULGARUS, an Italian jurist of the 12th century, born at Bologna, sometimes erroneously called Bulgarinus, which was properly the name of a jurist of the 15th century. He was the most celebrated of the famous "Four Doctors" of the law school of that university, and was regarded as the Chrysostom of the Gloss-writers, being frequently designated by the title of the "Golden Mouth" (*os aureum*). He died in 1166 A.D., at a very advanced age. Popular tradition represents all the Four Doctors (Bulgarus, Martinus Gosia, Hugo de Porta Ravennate and Jacobus de Boragine) as pupils of Irnerius (*q.v.*), but while there is no insuperable difficulty in point of time in accepting this tradition as far as regards Bulgarus, Savigny considers the general tradition inadmissible as regards the others. Martinus Gosia and Bulgarus were the chiefs of two opposite schools at Bologna, corresponding in many respects to the Proculians and Sabinians of Imperial Rome, Martinus being at the head of a school which accommodated the law to what his opponents styled the equity of "the purse" (*aequitas bursalis*), whilst Bulgarus adhered more closely to the letter of the law. The school of Bulgarus ultimately prevailed, and it numbered amongst its adherents Joannes Bassianus, Azo and Accursius, each of whom in his turn exercised a commanding influence over the course of legal studies at Bologna. Bulgarus took the leading part amongst the Four Doctors at the diet

of Roncaglia in 1158, and was one of the most trusted advisers of the emperor Frederick I. His most celebrated work is his commentary *De Regulis Juris*, which was at one time printed amongst the writings of Placentius, but has been properly reassigned to its true author by Cujacius, upon the internal evidence contained in the additions annexed to it, which are undoubtedly from the pen of Placentinus. This [v.04 p.0787] *Commentary*, which is the earliest extant work of its kind emanating from the school of the Gloss-writers, is, according to Savigny, a model specimen of the excellence of the method introduced by Irnerius, and a striking example of the brilliant results which had been obtained in a short space of time by a constant and exclusive study of the sources of law.

BULL, GEORGE (1634-1710), English divine, was born at Wells on the 25th of March 1634, and educated at Tiverton school, Devonshire. He entered Exeter College, Oxford, in 1647, but had to leave in 1649 in consequence of his refusal to take the oath of allegiance to the Commonwealth. He was ordained privately by Bishop Skinner in 1655. His first benefice held was that of St George's near Bristol, from which he rose successively to be rector of Suddington in Gloucestershire (1658), prebendary of Gloucester (1678), archdeacon of Llandaff (1686), and in 1705 bishop of St David's. He died on the 17th of February 1710. During the time of the Commonwealth he adhered to the forms of the Church of England, and under James II. preached strenuously against Roman Catholicism. His works display great erudition and powerful thinking. The *Harmonia Apostolica* (1670) is an attempt to show the fundamental agreement between the doctrines of Paul and James with regard to justification. The *Defensio Fidei Nicenae* (1685), his greatest work, tries to show that the doctrine of the Trinity was held by the ante-Nicene fathers of the church, and retains its value as a thorough-going examination of all the pertinent passages in early church literature. The *Judicium Ecclesiae Catholicae* (1694) and *Primitiva et Apostolica Traditio* (1710) won high praise from Bossuet and other French divines. Following on Bossuet's criticisms of the *Judicium*, Bull wrote a treatise on *The Corruptions of the Church of Rome*, which became very popular.

The best edition of Bull's works is that in 7 vols., published at Oxford by the Clarendon Press, under the superintendence of E. Burton, in 1827. This edition contains the *Life* by Robert Nelson. The *Harmonia, Defensio* and *Judicium* are translated in the Library of Anglo-Catholic Theology (Oxford, 1842-1855).

BULL, JOHN (*c.* 1562-1628), English composer and organist, was born in Somersetshire about 1562. After being organist in Hereford cathedral, he joined the Chapel Royal in 1585, and in the next year became a Mus. Bac. of Oxford. In 1591 he was appointed organist in Queen Elizabeth's chapel in succession to Blitheman, from whom he had received his musical education. In 1592 he received the degree of doctor of music at Cambridge University; and in 1596 he was made music professor at Gresham College, London. As he was unable to lecture in Latin according to the foundation-rules of that college, the executors of Sir Thomas Gresham made a dispensation in his favour by permitting him to lecture in English. He gave his first lecture on the 6th of October 1597. In 1601 Bull went abroad. He visited France and Germany, and was everywhere received with the respect due to his talents. Anthony Wood tells an impossible story of how at St Omer Dr Bull performed the feat of adding, within a few hours, forty parts to a composition already written in forty parts. Honourable employments were offered to him by various continental princes; but he declined them, and returned to England, where he was given the freedom of the Merchant Taylors' Company in 1606. He played upon a small pair of organs before King James I. on the 16th of July 1607, in the hall of the Company, and he seems to have been appointed one of the king's organists in that year. In the same year he resigned his Gresham professorship and married Elizabeth Walter. In 1613 he again went to the continent on account of his health, obtaining a post as one of the organists in the arch-duke's chapel at Brussels. In 1617 he was appointed organist to the cathedral of Notre Dame at Antwerp, and he died in that city on the 12th or 13th of March 1628. Little of his music has been published, and the opinions of critics differ much as to its merits (see Dr Willibald Nagel's *Geschichte der Musik in England*, ii. (1897), p. 155, &c.; and Dr Seiffert's *Geschichte der Klaviermusik* (1899), p. 54, &c.). Contemporary writers speak in the highest terms of Bull's skill as a performer on the organ and the virginals, and there is no doubt that he contributed much to the development of harpsichord music. Jan Swielinck (1562-1621), the great organist of Amsterdam, did not regard his work on composition as complete without placing in it a canon by John Bull, and the latter wrote a fantasia upon a fugue of Swielinck. For the ascription to Bull of the composition of the British national anthem, see National Anthems. Good modern reprints, *e.g.* of the Fitzwilliam *Virginal-Book*, "The King's Hunting Jig," and one or two other pieces, are in the repertories of modern pianists from Rubinstein onwards.

BULL, OLE BORNEMANN (1810-1880), Norwegian violinist, was born in Bergen, Norway, on the 5th of February 1810. At first a pupil of the violinist Paulsen, and subsequently self-taught, he was intended for the church, but failed in his examinations in 1828 and became a musician, directing the philharmonic and dramatic societies at Bergen. In 1829 he went to Cassel, on a visit to Spohr, who gave him no encouragement. He now began to study law, but on going to Paris he came under the influence of Paganini, and definitely adopted the career of a violin virtuoso. He made his first appearance in company with Ernst and Chopin at a concert of his own in Paris in 1832. Successful tours in Italy and England followed soon afterwards, and he was not long in obtaining European celebrity by his brilliant playing of his own pieces and arrangements. His first visit to the United States lasted from 1843 to 1845, and on his return to Norway he formed a scheme for the establishment of a Norse theatre in Bergen; this became an accomplished fact in 1850; but in consequence of harassing business complications he went again to America. During this visit (1852-1857) he bought 125,000 acres in Potter county, Pennsylvania, for a Norwegian colony, which was to have been called Oleana after his name; but his title turned out to be fraudulent, and the troubles he went through in connexion with the undertaking were enough to affect his health very seriously, though not to hinder him for long from the exercise of his profession. Another attempt to found an academy of music in Christiania had no permanent result. In 1836 he had married Alexandrine Félicie Villeminot, the grand-daughter of a lady to whom he owed much at the beginning of his musical career in Paris; she died in 1862. In 1870 he married Sara C. Thorpe of Wisconsin; henceforth he confined himself to the career of a violinist. He died at Lysö, near Bergen, on the 17th of August 1880. Ole Bull's "polacca guerriera" and many of his other violin pieces, among them two concertos, are interesting to the virtuoso, and his fame rests upon his prodigious technique. The memoir published by his widow in 1886 contains many illustrations of a career that was exceptionally brilliant; it gives a picture of a strong individuality, which often found expression in a somewhat boisterous form of practical humour.

There is a fountain and portrait statue to his memory in the Ole Bulls Plads in Bergen.

BULL, (1) The male of animals belonging to the section *Bovina* of the family *Bovidae* (*q.v.*), particularly the

uncastrated male of the domestic ox (*Bos taurus*). (See CATTLE.) The word, which is found in M.E. as *bole, bolle* (cf. Ger. *Bulle*, and Dutch *bul* or *bol*), is also used of the males of other animals of large size, *e.g.* the elephant, whale, &c. The O.E. diminutive form *bulluc*, meaning originally a young bull, or bull calf, survives in bullock, now confined to a young castrated male ox kept for slaughter for beef.

On the London and New York stock exchanges "bull" and "bear" are correlative technical slang terms. A "bull" is one who "buys for a rise," *i.e.* he buys stocks or securities, grain or other commodities (which, however, he never intends to take up), in the hope that before the date on which he must take delivery he will be able to sell the stocks, &c., at a higher price, taking as a profit the difference between the buying and selling price. A "bear" is the reverse of a "bull." He is one who "sells for a fall," *i.e.* he sells stock, &c., which he does not actually possess, in the hope of buying it at a lower price before the time at which he has contracted to deliver (see ACCOUNT; STOCK EXCHANGE). The word "bull," according to the *New English Dictionary*, was used in this sense as early as the beginning of the 18th century. The origin of the use is not known, though it is tempting to connect it with the fable of the frog and the bull.

[v.04 p.0788] The term "bull's eye" is applied to many circular objects, and particularly to the boss or protuberance left in the centre of a sheet of blown glass. This when cut off was formerly used for windows in small leaded panes. The French term *œil de bœuf* is used of a circular window. Other circular objects to which the word is applied are the centre of a target or a shot that hits the central division of the target, a plano-convex lens in a microscope, a lantern with a convex glass in it, a thick circular piece of glass let into the deck or side of a ship, &c., for lighting the interior, a ring-shaped block grooved round the outer edge, and with a hole through the centre through which a rope can be passed, and also a small lurid cloud which in certain latitudes presages a hurricane.

(2) The use of the word "bull," for a verbal blunder, involving a contradiction in terms, is of doubtful origin. In this sense it is used with a possible punning reference to papal bulls in Milton's *True Religion*, "and whereas the Papist boasts himself to be a Roman Catholick, it is a mere contradiction, one of the Pope's Bulls, as if he should say a universal particular, a Catholick schismatick." Probably this use may be traced to a M.E. word *bul*, first found in the *Cursor Mundi*, c. 1300, in the sense of falsehood, trickery, deceit; the *New English Dictionary* compares an O.Fr. *boul*, *boule* or *bole*, in the same sense. Although modern associations connect this type of blunder with the Irish, possibly owing to the many famous "bulls" attributed to Sir Boyle Roche (*q.v.*), the early quotations show that in the 17th century, when the meaning now attached to the word begins, no special country was credited with them.

(3) *Bulla* (Lat for "bubble"), which gives us another "bull" in English, was the term used by the Romans for any boss or stud, such as those on doors, sword-belts, shields and boxes. It was applied, however, more particularly to an ornament, generally of gold, a round or heart-shaped box containing an amulet, worn suspended from the neck by children of noble birth until they assumed the *toga virilis*, when it was hung up and dedicated to the household gods. The custom of wearing the bulla, which was regarded as a charm against sickness and the evil eye, was of Etruscan origin. After the Second Punic War all children of free birth were permitted to wear it; but those who did not belong to a noble or wealthy family were satisfied with a bulla of leather. Its use was only permitted to grown-up men in the case of generals who celebrated a triumph. Young girls (probably till the time of their marriage), and even favourite animals, also wore it (see Ficoroni, *La Bolla d' Oro*, 1732; Yates, *Archaeological Journal*, vi., 1849; viii., 1851). In ecclesiastical and medieval Latin, *bulla* denotes the seal of oval or circular form, bearing the name and generally the image of its owner, which was attached to official documents. A metal was used instead of wax in the warm countries of southern Europe. The best-known instances are the papal *bullae*, which have given their name to the documents (bulls) to which they are attached. (See DIPLOMATIC; SEALS; CURIA ROMANA; GOLDEN BULL.)

BULLER, CHARLES (1806-1848), English politician, son of Charles Buller (d. 1848), a member of a well-known Cornish family (see below), was born in Calcutta on the 6th of August 1806; his mother, a daughter of General William Kirkpatrick, was an exceptionally talented woman. He was educated at Harrow, then privately in Edinburgh by Thomas Carlyle, and afterwards at Trinity College, Cambridge, becoming a barrister in 1831. Before this date, however, he had succeeded his father as member of parliament for West Looe; after the passing of the Reform Bill of 1832 and the consequent disenfranchisement of this borough, he was returned to parliament by the voters of Liskeard. He retained this seat until he died in London on the 29th of November 1848, leaving behind him, so Charles Greville says, "a memory cherished for his delightful social qualities and a vast credit for undeveloped powers." An eager reformer and a friend of John Stuart Mill, Buller voted for the great Reform Bill, favoured other progressive measures, and presided over the committee on the state of the records and the one appointed to inquire into the state of election law in Ireland in 1836. In 1838 he went to Canada with Lord Durham as private secretary, and after rendering conspicuous service to his chief, returned with him to England in the same year. After practising as a barrister, Buller was made judge-advocate-general in 1846, and became chief commissioner of the poor law about a year before his death. For a long time it was believed that Buller wrote Lord Durham's famous "Report on the affairs of British North America." However, this is now denied by several authorities, among them being Durham's biographer, Stuart J. Reid, who mentions that Buller described this statement as a "groundless assertion" in an article which he wrote for the *Edinburgh Review*. Nevertheless it is quite possible that the "Report" was largely drafted by Buller, and it almost certainly bears traces of his influence. Buller was a very talented man, witty, popular and generous, and is described by Carlyle as "the genialest radical I have ever met." Among his intimate friends were Grote, Thackeray, Monckton Milnes and Lady Ashburton. A bust of Buller is in Westminster Abbey, and another was unveiled at Liskeard in 1905. He wrote "A Sketch of Lord Durham's mission to Canada," which has not been printed.

See T. Carlyle, *Reminiscences* (1881); and S.J. Reid, *Life and Letters of the 1st earl of Durham* (1906).

BULLER, SIR REDVERS HENRY (1839-1908), British general, son of James Wentworth Buller, M.P., of Crediton, Devonshire, and the descendant of an old Cornish family, long established in Devonshire, tracing its ancestry in the female line to Edward I., was born in 1839, and educated at Eton. He entered the army in 1858, and served with the 60th (King's Royal Rifles) in the China campaign of 1860. In 1870 he became captain, and went on the Red River expedition, where he was first associated with Colonel (afterwards Lord) Wolseley. In 1873-74 he accompanied the latter in the Ashantee campaign as head of the Intelligence Department, and was slightly wounded at the battle of Ordabai; he was mentioned in

despatches, made a C.B., and raised to the rank of major. In 1874 he inherited the family estates. In the Kaffir War of 1878-79 and the Zulu War of 1879 he was conspicuous as an intrepid and popular leader, and acquired a reputation for courage and dogged determination. In particular his conduct of the retreat at Inhlobane (March 28, 1879) drew attention to these qualities, and on that occasion he earned the V.C.; he was also created C.M.G. and made lieutenant-colonel and A.D.C. to the queen. In the Boer War of 1881 he was Sir Evelyn Wood's chief of staff; and thus added to his experience of South African conditions of warfare. In 1882 he was head of the field intelligence department in the Egyptian campaign, and was knighted for his services. Two years later he commanded an infantry brigade in the Sudan under Sir Gerald Graham, and was at the battles of El Teb and Tamai, being promoted major-general for distinguished service. In the Sudan campaign of 1884-85 he was Lord Wolseley's chief of staff, and he was given command of the desert column when Sir Herbert Stewart was wounded. He distinguished himself by his conduct of the retreat from Gubat to Gakdul, and by his victory at Abu Klea (February 16-17), and he was created K.C.B. In 1886 he was sent to Ireland to inquire into the "moonlighting" outrages, and for a short time he acted as under-secretary for Ireland; but in 1887 he was appointed quartermaster-general at the war office. From 1890 to 1897 he held the office of adjutant-general, attaining the rank of lieutenant-general in 1891. At the war office his energy and ability inspired the belief that he was fitted for the highest command, and in 1895, when the duke of Cambridge was about to retire, it was well known that Lord Rosebery's cabinet intended to appoint Sir Redvers as chief of the staff under a scheme of reorganization recommended by Lord Hartington's commission. On the eve of this change, however, the government was defeated, and its successors appointed Lord Wolseley to the command under the old title of commander-in-chief. In 1896 he was made a full general.

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In 1898 he took command of the troops at Aldershot, and when the Boer War broke out in 1899 he was selected to command the South African Field Force (see TRANSVAAL), and landed at Cape Town on the 31st of October. Owing to the Boer investment of Ladysmith and the consequent gravity of the military situation in Natal, he unexpectedly hurried thither in order to supervise personally the operations, but on the 15th of December his first attempt to cross the Tugela at Colenso (see LADYSMITH) was repulsed. The government, alarmed at the situation and the pessimistic tone of Buller's messages, sent out Lord Roberts to supersede him in the chief command, Sir Redvers being left in subordinate command of the Natal force. His second attempt to relieve Ladysmith (January 10-27) proved another failure, the result of the operations at Spion Kop (January 24) causing consternation in England. A third attempt (Vaalkrantz, February 5-7) was unsuccessful, but the Natal army finally accomplished its task in the series of actions which culminated in the victory of Pieter's Hill and the relief of Ladysmith on the 27th of February. Sir Redvers Buller remained in command of the Natal army till October 1900, when he returned to England (being created G.C.M.G.), having in the meanwhile slowly done a great deal of hard work in driving the Boers from the Biggarsberg (May 15), forcing Lang's Nek (June 12), and occupying Lydenburg (September 6). But though these latter operations had done much to re-establish his reputation for dogged determination, and he had never lost the confidence of his own men, his capacity for an important command in delicate and difficult operations was now seriously questioned. The continuance, therefore, in 1901 of his appointment to the important Aldershot command met with a vigorous press criticism, in which the detailed objections taken to his conduct of the operations before Ladysmith (and particularly to a message to Sir George White in which he seriously contemplated and provided for the contingency of surrender) were given new prominence. On the 10th of October 1901, at a luncheon in London, Sir Redvers Buller made a speech in answer to these criticisms in terms which were held to be a breach of discipline, and he was placed on half-pay a few days later. For the remaining years of his life he played an active part as a country gentleman, accepting in dignified silence the prolonged attacks on his failures in South Africa; among the public generally, and particularly in his own county, he never lost his popularity. He died on the 2nd of June 1908. He had married in 1882 Lady Audrey, daughter of the 4th Marquess Townshend, who survived him with one daughter.

A *Memoir*, by Lewis Butler, was published in 1909.

BULLET (Fr. *boulet*, diminutive of *boule*, ball). The original meaning (a "small ball") has, since the end of the 16th century, been narrowed down to the special case of the projectile used with small arms of all kinds, irrespective of its size or shape. (For details see AMMUNITION; GUN; RIFLE, &c.)

BULL-FIGHTING, the national Spanish sport. The Spanish name is *tauromaquia* (Gr. ταῦρος, bull, and μαχή, combat). Combats with bulls were common in ancient Thessaly as well as in the amphitheatres of imperial Rome, but probably partook more of the nature of worrying than fighting, like the bull-baiting formerly common in England. The Moors of Africa also possessed a sport of this kind, and it is probable that they introduced it into Andalusia when they conquered that province. It is certain that they held bull-fights in the half-ruined Roman amphitheatres of Merida, Cordova, Tarragona, Toledo and other places, and that these constituted the favourite sport of the Moorish chieftains. Although patriotic tradition names the great Cid himself as the original Spanish bull-fighter, it is probable that the first Spaniard to kill a bull in the arena was Don Rodrigo Diaz de Vivar, who about 1040, employing the lance, which remained for centuries the chief weapon used in the sport, proved himself superior to the flower of the Moorish knights. A spirited rivalry in the art between the Christian and Moorish warriors resulted, in which even the kings of Castile and other Spanish princes took an ardent interest. After the Moors were driven from Spain by Ferdinand II., bull-fighting continued to be the favourite sport of the aristocracy, the method of fighting being on horseback with the lance. At the time of the accession of the house of Austria it had become an indispensable accessory of every court function, and Charles V. ensured his popularity with the people by killing a bull with his own lance on the birthday of his son, Philip II. Philip IV. is also known to have taken a personal part in bull-fights. During this period the lance was discarded in favour of the short spear (*rejoncillo*), and the leg armour still worn by the *picadores* was introduced. The accession of the house of Bourbon witnessed a radical transformation in the character of the bullfight, which the aristocracy began gradually to neglect, admitting to the combats professional subordinates who, by the end of the 17th century, had become the only active participants in the bull-ring. The first great professional *espada* (*i.e.* swordsman, the chief bull-fighter, who actually kills the bull) was Francisco Romero, of Ronda in Andalusia (about 1700), who introduced the *estoque*, the sword still used to kill the bull, and the *muleta*, the red flag carried by the *espada* (see below), the spear falling into complete disuse.

For the past two centuries the art of bull-fighting has developed gradually into the spectacle of to-day. Imitations of the Spanish bull-fights have been repeatedly introduced into France and Italy, but the cruelty

of the sport has prevented its taking firm root. In Portugal a kind of bull-baiting is practised, in which neither man nor beast is much hurt, the bulls having their horns truncated and padded and never being killed. In Spain many vain attempts have been made to abolish the sport, by Ferdinand II. himself, instigated by his wife Isabella, by Charles III., by Ferdinand VI., and by Charles IV.; and several popes placed its devotees under the ban of excommunication with no perceptible effect upon its popularity. Before the introduction of railways there were comparatively few bull-rings (*plazas de toros*) in Spain, but these have largely multiplied in recent years, in both Spain and Spanish America. At the present day nearly every larger town and city in Spain has its *plaza de toros* (about 225 altogether), built in the form of the Roman circuses with an oval open arena covered with sand, surrounded by a stout fence about 6 ft. high. Between this and the seats of the spectators is a narrow passage-way, where those bull-fighters who are not at the moment engaged take their stations. The *plazas de toros* are of all sizes, from that of Madrid, which holds more than 12,000 spectators, down to those seating only two or three thousand. Every bull-ring has its hospital for the wounded, and its chapel where the *toreros* (bull-fighters) receive the Holy Eucharist.

The bulls used for fighting are invariably of well-known lineage and are reared in special establishments (*vacádas*), the most celebrated of which is now that of the duke of Veragua in Andalusia. When quite young they are branded with the emblems of their owners, and later are put to a test of their courage, only those that show a fighting spirit being trained further. When full grown, the health, colour, weight, character of horns, and action in attack are all objects of the keenest observation and study. The best bulls are worth from £40 to £60. About 1300 bulls are killed annually in Spain. Bull-fighters proper, most of whom are Andalusians, consist of *espadas* (or *matadores*), *banderilleros* and *picadores*, in addition to whom there are numbers of assistants (*chulos*), drivers and other servants. For each bull-fight two or three *espadas* are engaged, each providing his own quadrille (*cuadrilla*), composed of several *banderilleros* and *picadores*. Six bulls are usually killed during one *corrida* (bull-fight), the *espadas* engaged taking them in turn. The *espada* must have passed through a trying novitiate in the art at the royal school of bull-fighting, after which he is given his *alternativa*, or licence.

The bull-fight begins with a grand entry of all the bull-fighters with *alguaciles*, municipal officers in ancient costume, at the head, followed, in three rows, by the *espadas, banderilleros, picadores, chulos* and the richly caparisoned triple mule-team used to drag from the arena the carcasses of the slain bulls and horses. The greatest possible brilliance of costume and accoutrements is aimed at, and the picture presented is one of dazzling colour. The *espadas* and *banderilleros* wear short jackets and small-clothes of satin richly embroidered in gold and silver, with light silk stockings and heelless shoes; the *picadores* (pikemen on horseback) usually wear yellow, and their legs are enclosed in steel armour covered with leather as a protection against the horns of the bull.

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The fight is divided into three divisions (*suertes*). When the opening procession has passed round the arena the president of the *corrida*, usually some person of rank, throws down to one of the *alguaciles* the key to the *toril*, or bull-cells. As soon as the supernumeraries have left the ring, and the *picadores*, mounted upon blindfolded horses in wretched condition, have taken their places against the barrier, the door of the *toril* is opened, and the bull, which has been goaded into fury by the affixing to his shoulder of an iron pin with streamers of the colours of his breeder attached, enters the ring. Then begins the *suerte de picar*, or division of lancing. The bull at once attacks the mounted *picadores*, ripping up and wounding the horses, often to the point of complete disembowelment. As the bull attacks the horse, the *picador*, who is armed with a short-pointed, stout pike (*garrocha*), thrusts this into the bull's back with all his force, with the usual result that the bull turns its attention to another *picador*. Not infrequently, however, the rush of the bull and the blow dealt to the horse is of such force as to overthrow both animal and rider, but the latter is usually rescued from danger by the *chulos* and *banderilleros*, who, by means of their red cloaks (*capas*), divert the bull from the fallen *picador*, who either escapes from the ring or mounts a fresh horse. The number of horses killed in this manner is one of the chief features of the fight, a bull's prowess being reckoned accordingly. About 6000 horses are killed every year in Spain. At the sound of a trumpet the *picadores* retire from the ring, the dead horses are dragged out, and the second division of the fight, the *suerte de banderillear*, or planting the darts, begins. The *banderillas* are barbed darts about 18 in. long, ornamented with coloured paper, one being held in each hand of the bull-fighter, who, standing 20 or 30 yds. from the bull, draws its attention to him by means of violent gestures. As the bull charges, the *banderillero* steps towards him, dexterously plants both darts in the beast's neck, and draws aside in the nick of time to avoid its horns. Four pairs of *banderillas* are planted in this way, rendering the bull mad with rage and pain. Should the animal prove of a cowardly nature and refuse to attack repeatedly, *banderillas de fuego* (fire) are used. These are furnished with fulminating crackers, which explode with terrific noise as the bull careers about the ring. During this division numerous manœuvres are sometimes indulged in for the purpose of tiring the bull out, such as leaping between his horns, vaulting over his back with the *garrocha* as he charges, and inviting his rushes by means of elaborate flauntings of the cloak (*floréos*, flourishes).

Another trumpet-call gives the signal for the final division of the fight, the *suerte de matár* (killing). This is carried out by the *espada*, alone, his assistants being present only in the case of emergency or to get the bull back to the proper part of the ring, should he bolt to a distance. The *espada*, taking his stand before the box of the president, holds aloft in his left hand sword and *muleta* and in his right his hat, and in set phrases formally dedicates (*brinde*) the death of the bull to the president or some other personage of rank, finishing by tossing his hat behind his back and proceeding bareheaded to the work of killing the bull. This is a process accompanied by much formality. The *espada*, armed with the *estoque*, a sword with a heavy flat blade, brings the bull into the proper position by means of passes with the *muleta*, a small red silk flag mounted on a short staff, and then essays to kill him with a single thrust, delivered through the back of the neck close to the head and downward into the heart. This stroke is a most difficult one, requiring long practice as well as great natural dexterity, and very frequently fails of its object, the killing of the bull often requiring repeated thrusts. The stroke (*estocada*) is usually given *á volapié* (half running), the *espada* delivering the thrust while stepping forward, the bull usually standing still. Another method is *recibiéndo* (receiving), the *espada* receiving the onset of the bull upon the point of his sword. Should the bull need a *coup de grâce*, it is given by a *chulo*, called *puntilléro*, with a dagger which pierces the spinal marrow. The dead beast is then dragged out of the ring by the triple mule-team, while the *espada* makes a tour of honour, being acclaimed, in the case of a favourite, with the most extravagant enthusiasm. The ring is then raked over, a second bull is introduced, and the spectacle begins anew. Upon great occasions, such as a

coronation, a *corrida* in the ancient style is given by amateurs, who are clad in gala costumes without armour of any kind, and mounted upon steeds of good breed and condition. They are armed with sharp lances, with which they essay to kill the bull while protecting themselves and their steeds from his horns. As the bulls in these encounters have not been weakened by many wounds and tired out by much running, the performances of the gentlemen fighters are remarkable for pluck and dexterity.

See Moratin, *Origen y Progeso de las Fiestas de Toros*; Bedoya's *Historia del Toreo*; J.S. Lozano, *Manual de Tauromaquia* (Seville, 1882); A. Chapman and W.T. Buck, *Wild Spain* (London, 1893).

BULLFINCH (*Pyrrhula vulgaris*), the ancient English name given to a bird belonging to the family *Fringillidae* (see FINCH), of a bluish-grey and black colour above, and generally of a bright tile-red beneath, the female differing chiefly in having its under-parts chocolate-brown. It is a shy bird, not associating with other species, and frequents well-wooded districts, being very rarely seen on moors or other waste lands. It builds a shallow nest composed of twigs lined with fibrous roots, on low trees or thick underwood, only a few feet from the ground, and lays four or five eggs of a bluish-white colour speckled and streaked with purple. The young remain with their parents during autumn and winter, and pair in spring, not building their nests, however, till May. In spring and summer they feed on the buds of trees and bushes, choosing, it is said, such only as contain the incipient blossom, and thus doing immense injury to orchards and gardens. In autumn and winter they feed principally on wild fruits and on seeds. The note of the bullfinch, in the wild state, is soft and pleasant, but so low as scarcely to be audible; it possesses, however, great powers of imitation, and considerable memory, and can thus be taught to whistle a variety of tunes. Bullfinches are very abundant in the forests of Germany, and it is there that most of the piping bullfinches are trained. They are taught continuously for nine months, and the lesson is repeated throughout the first moulting, as during that change the young birds are apt to forget all that they have previously acquired. The bullfinch is a native of the northern countries of Europe, occurring in Italy and other southern parts only as a winter visitor. White and black varieties are occasionally met with; the latter are often produced by feeding the bullfinch exclusively on hempseed, when its plumage gradually changes to black. It rarely breeds in confinement, and hybrids between it and the canary have been produced on but few occasions.

BULLI, a town of Camden county, New South Wales, Australia, 59 m. by rail S. of Sydney. Pop. (1901) 2500. It is the headquarters of the Bulli Mining Company, whose coal-mine on the flank of the Illawarra Mountains is worked by a tunnel, 2 m. long, driven into the heart of the mountain. From this tunnel the coal is conveyed by rail for 1½ m. to a pier, whence it is shipped to Sydney, Melbourne and Brisbane by a fleet of steam colliers. The beautiful Bulli Pass, 1000 ft. above the sea, over the Illawarra range, is one of the most attractive tourist resorts in Australia.

BULLINGER, HEINRICH (1504-1575), Swiss reformer, son of Dean Heinrich Bullinger by his wife Anna (Wiederkehr), was born at Bremgarten, Aargau, on the 18th of July 1504. He studied at Emmerich and Cologne, where the teaching of Peter Lombard led him, through Augustine and Chrysostom, to first-hand study of the Bible. Next the writings of Luther and Melanchthon appealed to him. Appointed teacher (1522) in the cloister school of Cappel, he lectured on Melanchthon's *Loci Communes* (1521). He heard Zwingli at Zürich in 1527, and next year accompanied him to the disputation at Berne. He was made pastor of Bremgarten in 1529, and married Anna Adlischweiler, a nun, by whom he had eleven children. [v.04 p.0791] After the battle of Cappel (11th of October 1531), in which Zwingli fell, he left Bremgarten. On the 9th of December 1531 he was chosen to succeed Zwingli as chief pastor of Zürich. A strong writer and thinker, his spirit was essentially unifying and sympathetic, in an age when these qualities won little sympathy. His controversies on the Lord's Supper with Luther, and his correspondence with Lelio Sozini (see SOCINUS), exhibit, in different connexions, his admirable mixture of dignity and tenderness. With Calvin he concluded (1549) the *Consensus Tigurinus* on the Lord's Supper. The (second) Helvetic Confession (1566) adopted in Switzerland, Hungary, Bohemia and elsewhere, was his work. The volumes of the *Zurich Letters*, published by the Parker Society, testify to his influence on the English reformation in later stages. Many of his sermons were translated into English (reprinted, 4 vols., 1849). His works, mainly expository and polemical, have not been collected. He died at Zürich on the 17th of September 1575.

See Carl Pestalozzi, *Leben* (1858); Raget Christoffel, *H. Bullinger* (1875); Justus Heer, in Hauck's *Realencyklopadie* (1897).

(A. GO.*)

BULLION, a term applied to the gold and silver of the mines brought to a standard of purity. The word appears in an English act of 1336 in the French form "puissent sauvement porter à les exchanges ou bullion ... argent en plate, vessel d'argent, &c."; and apparently it is connected with *bouillon*, the sense of "boiling" being transferred in English to the melting of metal, so that *bullion* in the passage quoted meant "melting-house" or "mint." The first recorded instance of the use of the word for precious metal as such in the mass is in an act of 1451. From the use of gold and silver as a medium of exchange, it followed that they should approximate in all nations to a common degree of fineness; and though this is not uniform even in coins, yet the proportion of alloy in silver, and of carats alloy to carats fine in gold, has been reduced to infinitesimal differences in the bullion of commerce, and is a prime element of value even in gold and silver plate, jewelry, and other articles of manufacture. Bullion, whether in the form of coins, or of bars and ingots stamped, is subject, as a general rule of the London market, not only to weight but to assay, and receives a corresponding value.

BULLOCK, WILLIAM (*c.* 1657-*c.* 1740), English actor, "of great glee and much comic vivacity," was the original Clincher in Farquhar's *Constant Couple* (1699), Boniface in *The Beaux' Stratagem* (1707), and Sir Francis Courtall in Pavener's *Artful Wife* (1717). He played at all the London theatres of his time, and in the summer at a booth at Bartholomew Fair. He had three sons, all actors, of whom the eldest was Christopher Bullock (*c.* 1690-1724), who at Drury Lane, the Haymarket and Lincoln's Inn Fields displayed "a considerable versatility of talent." Christopher created a few original parts in comedies and farces of which he was the author or adapter:—*A Woman's Revenge* (1715); *Slip*; *Adventures of Half an Hour* (1716); *The Cobbler of Preston*; *Woman's a Riddle*; *The Perjurer* (1717); and *The Traitor* (1718).

BULLROARER, the English name for an instrument made of a small flat slip of wood, through a hole in one end of which a string is passed; swung round rapidly it makes a booming, humming noise. Though treated as a toy by Europeans, the bullroarer has had the highest mystic significance and sanctity among primitive people. This is notably the case in Australia, where it figures in the initiation ceremonies and is

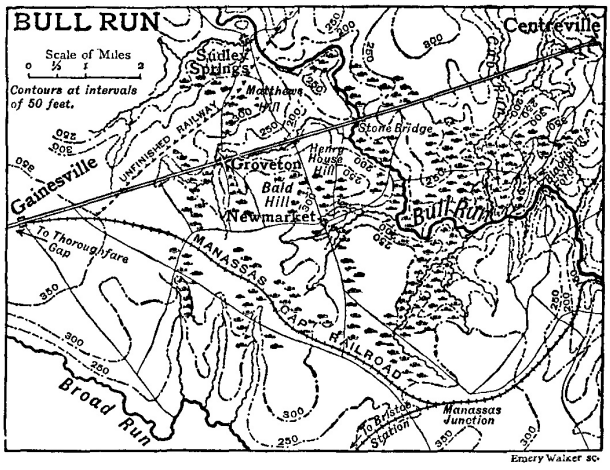
regarded with the utmost awe by the "blackfellows." Their bullroarers, or sacred "tunduns," are of two types, the "grandfather" or "man tundun," distinguished by its deep tone, and the "woman tundun," which, being smaller, gives forth a weaker, shriller note. Women or girls, and boys before initiation, are never allowed to see the tundun. At the Bora, or initiation ceremonies, the bullroarer's hum is believed to be the voice of the "Great Spirit," and on hearing it the women hide in terror. A Maori bullroarer is preserved in the British Museum, and travellers in Africa state that it is known and held sacred there. Thus among the Egba tribe of the Yoruba race the supposed "Voice of Oro," their god of vengeance, is produced by a bullroarer, which is actually worshipped as the god himself. The sanctity of the bullroarer has been shown to be very widespread. There is no doubt that the rhombus ῥόμβος which was whirled at the Greek mysteries was one. Among North American Indians it was common. At certain Moqui ceremonies the procession of dancers was led by a priest who whirled a bullroarer. The instrument has been traced among the Tusayan, Apache and Navaho Indians (J.G. Bourke, *Ninth Annual Report of Bureau of Amer. Ethnol.*, 1892), among the Koskimo of British Columbia (Fr. Boas, "Social Organization, &c., of the Kwakiutl Indians," *Report of the U.S. National Museum for 1895*), and in Central Brazil. In New Guinea, in some of the islands of the Torres Straits (where it is swung as a fishing-charm), in Ceylon (where it is used as a toy and figures as a sacred instrument at Buddhist festivals), and in Sumatra (where it is used to induce the demons to carry off the soul of a woman, and so drive her mad), the bullroarer is also found. Sometimes, as among the Minangkabos of Sumatra, it is made of the frontal bone of a man renowned for his bravery.

See A. Lang, *Custom and Myth* (1884); J.D.E. Schmeltz, *Das Schwirrholz* (Hamburg, 1896); A.C. Haddon, *The Study of Man*, and in the *Journ. Anthrop. Instit.* xix., 1890; G.M.C. Theal, *Kaffir Folk-Lore*; A.B. Ellis, *Yoruba-Speaking Peoples* (1894); R.C. Codrington, *The Melanesians* (1891).

BULL RUN, a small stream of Virginia, U.S.A., which gave the name to two famous battles in the American Civil War.

(1) The first battle of Bull Run (called by the Confederates Manassas) was fought on the 21st of July 1861 between the Union forces under Brigadier-General Irvin McDowell and the Confederates under General Joseph E. Johnston. Both armies were newly raised and almost untrained. After a slight action on the 18th at Blackburn's Ford, the two armies prepared for a battle. The Confederates were posted along Bull Run, guarding all the passages from the Stone Bridge down to the railway bridge. McDowell's forces rendezvoused around Centreville, and both commanders, sensible of the temper of their troops, planned a battle for the 21st. On his part McDowell ordered one of his four divisions to attack the Stone Bridge, two to make a turning movement via Sudley Springs, the remaining division (partly composed of regular troops) was to be in reserve and to watch the lower fords. The local Confederate commander, Brigadier-General P.G.T. Beauregard, had also intended to advance, and General Johnston, who arrived by rail on the evening of the 20th with the greater part of a fresh army, and now assumed command of the whole force, approved an offensive movement against Centreville for the 21st; but orders miscarried, and the Federal attack opened before the movement had begun. Johnston and Beauregard then decided to fight a defensive battle, and hurried up troops to support the single brigade of Evans which held the Stone Bridge. Thus there was no serious fighting at the lower fords of Bull Run throughout the day.

[v.04 p.0792]



The Federal staff was equally inexperienced, and the divisions engaged in the turning movement met with many unnecessary checks. At 6 A.M., when the troops told off for the frontal attack appeared before the Stone Bridge, the turning movement was by no means well advanced. Evans had time to change position so as to command both the Stone Bridge and Sudley Springs, and he was promptly supported by the brigades of Bee, Bartow and T.J. Jackson. About 9.30 the leading Federal brigade from Sudley Springs came into action, and two hours later Evans, Bee and Bartow had been driven off the Matthews hill in considerable confusion. But on the Henry House hill Jackson's brigade stood, as General Bee said to his men, "like a stone wall," and the defenders rallied, though the Federals were continually reinforced. The fighting on the Henry House hill was very severe, but McDowell, who dared not halt to re-form his enthusiastic volunteers, continued to attack. About 1.30 P.M. he brought up two regular batteries to the fighting line; but a Confederate regiment, being mistaken for friendly troops and allowed to approach, silenced the guns by close rifle fire, and from that time, though the hill was taken and retaken several times, the Federal attack made no further headway. At 2.45 more of Beauregard's troops had come up; Jackson's brigade charged with the bayonet, and at the same time the Federals were assailed in flank by the last brigades of Johnston's army, which arrived at the critical moment from the railway. They gave way at once, tired out, and conscious that the day was lost, and after one rally melted away slowly to the rear, the handful of regulars alone keeping their order. But when, at the defile of the Cub Run, they came under shell fire the retreat became a panic flight to the Potomac. The victors were too much exhausted to pursue, and the U.S. regulars of the reserve division formed a strong and steady rearguard. The losses were—Federals, 2896 men out of about 18,500 engaged; Confederates, 1982 men out of 18,000.

(2) The operations of the last days of August 1862, which include the second battle of Bull Run (second Manassas), are amongst the most complicated of the war. At the outset the Confederate general Lee's army (Longstreet's and Jackson's corps) lay on the Rappahannock, faced by the Federal Army of Virginia under Major-General John Pope, which was to be reinforced by troops from McClellan's army to a total strength of 150,000 men as against Lee's 60,000. Want of supplies soon forced Lee to move, though not to retreat, and his plan for attacking Pope was one of the most daring in all military history. Jackson with half the army was despatched on a wide turning movement which was to bring him via Salem and Thoroughfare Gap to Manassas Junction in Pope's rear; when Jackson's task was accomplished Lee and Longstreet were to follow him by the same route. Early on the 25th of August Jackson began his march round the right of Pope's army; on the 26th the column passed Thoroughfare Gap, and Bristoe Station, directly in Pope's rear, was reached on the same evening, while a detachment drove a Federal post from

Manassas Junction. On the 27th the immense magazines at the Junction were destroyed. On his side Pope had soon discovered Jackson's departure, and had arranged for an immediate attack on Longstreet. When, however, the direction of Jackson's march on Thoroughfare Gap became clear, Pope fell back in order to engage him, at the same time ordering his army to concentrate on Warrenton, Greenwich and Gainesville. He was now largely reinforced. On the evening of the 27th one of his divisions, marching to its point of concentration, met a division of Jackson's corps, near Bristoe Station; after a sharp fight the Confederate general, Ewell, retired on Manassas. Pope now realized that he had Jackson's corps in front of him at the Junction, and at once took steps to attack Manassas with all his forces. He drew off even the corps at Gainesville for his intended battle of the 28th; McDowell, however, its commander, on his own responsibility, left Ricketts's division at Thoroughfare Gap. But Pope's blow was struck in the air. When he arrived at Manassas on the 28th he found nothing but the ruins of his magazines, and one of McDowell's divisions (King's) marching from Gainesville on Manassas Junction met Jackson's infantry near Groveton. The situation had again changed completely. Jackson had no intention of awaiting Pope at Manassas, and after several feints made with a view to misleading the Federal scouts he finally withdrew to a hidden position between Groveton and Sudley Springs, to await the arrival of Longstreet, who, taking the same route as Jackson had done, arrived on the 28th at Thoroughfare Gap and, engaging Ricketts's division, finally drove it back to Gainesville. On the evening of this day Jackson's corps held the line Sudley Springs-Groveton, his right wing near Groveton opposing King's division; and Longstreet held Thoroughfare Gap, facing Ricketts at Gainesville. On Ricketts's right was King near Groveton, and the line was continued thence by McDowell's remaining division and by Sigel's corps to the Stone Bridge. At Centreville, 7 m. away, was Pope with three divisions, a fourth was north-east of Manassas Junction, and Porter's corps at Bristoe Station. Thus, while Ricketts continued at Gainesville to mask Longstreet, Pope could concentrate a superior force against Jackson, whom he now believed to be meditating a retreat to the Gap. But a series of misunderstandings resulted in the withdrawal of Ricketts and King, so that nothing now intervened between Longstreet and Jackson; while Sigel and McDowell's other division alone remained to face Jackson until such time as Pope could bring up the rest of his scattered forces. Jackson now closed on his left and prepared for battle, and on the morning of the 29th the Confederates, posted behind a high railway embankment, repelled two sharp attacks made by Sigel. Pope arrived at noon with the divisions from Centreville, which, led by the general himself and by Reno and Hooker, two of the bravest officers in the Union army, made a third and most desperate attack on Jackson's line. The latter, repulsing it with difficulty, carried its counter-stroke too far and was in turn repulsed by Grover's brigade of Hooker's division. Grover then made a fourth assault, but was driven back with terrible loss. The last assault, gallantly delivered by two divisions under Kearny and Stevens, drove the Confederate left out of its position; but a Confederate counter-attack, led by the brave Jubal Early, dislodged the assailants with the bayonet.

In the meanwhile events had taken place near Groveton which were, for twenty years after the war, the subject of controversy and recrimination (see PORTER, FITZ-JOHN). When Porter's and part of McDowell's corps, acting on various orders sent by Pope, approached Gainesville from the south-east, Longstreet had already reached that place, and the Federals thus encountered a force of unknown strength at the moment when Sigel's guns to the northward showed him to be closely engaged with Jackson. The two generals consulted, and McDowell marched off to join Sigel, while Porter remained to hold the new enemy in check. In this he succeeded; Longstreet, though far superior in numbers, made no forward move, and his advanced guard alone came into action. On the night of the 29th Lee reunited the wings of his army on the field of battle. He had forced Pope back many miles from the Rappahannock, and expecting that the Federals would retire to the line of Bull Run before giving battle, he now decided to wait for the last divisions of Longstreet's corps, which were still distant. But Pope, still sanguine, ordered a "general pursuit" of Jackson for the 30th. There was some ground for his suppositions, for Jackson had retired a short distance and Longstreet's advanced guard had also fallen back. McDowell, however, who was in general charge of the Federal right on the 30th, soon saw that Jackson was not retreating and stopped the "pursuit," and the attack on Jackson's right, which Pope had ordered Porter to make, was repulsed by Longstreet's overwhelming forces. Then Lee's whole line, 4 m. long, made its grand counter-stroke (4 P.M.). There was now no hesitation in Longstreet's attack; the Federal left was driven successively from every position it took up, and Longstreet finally captured Bald Hill. Jackson, though opposed by the greater part of Pope's forces, advanced to the Matthews hill, and his artillery threatened the Stone Bridge. The Federals, driven back to the banks of Bull Run, were only saved by the gallant defence of the Henry House
[v.04 p.0793] hill by the Pennsylvanian division of Reynolds and the regulars under Sykes. Pope withdrew under cover of night to Centreville. Here he received fresh reinforcements, but Jackson was already marching round his new right, and after the action of Chantilly (1st of September) the whole Federal army fell back to Washington. The Union forces present on the field on the 29th and 30th numbered about 63,000, the strength of Lee's army being on the same dates about 54,000. Besides their killed and wounded the Federals lost very heavily in prisoners.

BULLY (of uncertain origin, but possibly connected with a Teutonic word seen in many compounds, as the Low Ger. *bullerjaan*, meaning "noisy"; the word has also, with less probability, been derived from the Dutch *boel*, and Ger. *Buhle*, a lover), originally a fine, swaggering fellow, as in "Bully Bottom" in *A Midsummer Night's Dream*, later an overbearing ruffian, especially a coward who abuses his strength by ill-treating the weak; more technically a *souteneur*, a man who lives on the earnings of a prostitute. The term in its early use of "fine" or "splendid" survives in American slang.

BÜLOW, BERNHARD ERNST VON (1815-1879), Danish and German statesman, was the son of Adolf von Bülow, a Danish official, and was born at Cismar in Holstein on the 2nd of August 1815. He studied law at the universities of Berlin, Göttingen and Kiel, and began his political career in the service of Denmark, in the chancery of Schleswig-Holstein-Lauenburg at Copenhagen, and afterwards in the foreign office. In 1842 he became councillor of legation, and in 1847 Danish *chargé d'affaires* in the Hanse towns, where his intercourse with the merchant princes led to his marriage in 1848 with a wealthy heiress, Louise Victorine Rücker. When the insurrection broke out in the Elbe duchies (1848) he left the Danish service, and offered his services to the provisional government of Kiel, an offer that was not accepted. In 1849, accordingly, he re-entered the service of Denmark, was appointed a royal chamberlain and in 1850 sent to represent the duchies of Schleswig and Holstein at the restored federal diet of Frankfort. Here he came into intimate touch with Bismarck, who admired his statesmanlike handling of the growing complications of the Schleswig-Holstein Question. With the radical "Eider-Dane" party he was utterly out of sympathy; and when, in 1862, this party gained the upper hand, he was recalled from Frankfort. He now entered the

service of the grand-duke of Mecklenburg-Strelitz, and remained at the head of the grand-ducal government until 1867, when he became plenipotentiary for the two Mecklenburg duchies in the council of the German Confederation (Bundesrat), where he distinguished himself by his successful defence of the medieval constitution of the duchies against Liberal attacks. In 1873 Bismarck, who was in thorough sympathy with his views, persuaded him to enter the service of Prussia as secretary of state for foreign affairs, and from this time till his death he was the chancellor's most faithful henchman. In 1875 he was appointed Prussian plenipotentiary in the Bundesrat; in 1877 he became Bismarck's lieutenant in the secretaryship for foreign affairs of the Empire; and in 1878 he was, with Bismarck and Hohenlohe, Prussian plenipotentiary at the congress of Berlin. He died at Frankfort on the 20th of October 1879, his end being hastened by his exertions in connexion with the political crisis of that year. Of his six sons the eldest, Bernhard Heinrich Karl (see below), became chancellor of the Empire.

See the biography of H. von Petersdorff in *Allgemeine deutsche Biographie*, Band 47, p. 350.

BÜLOW, BERNHARD HEINRICH KARL MARTIN, Prince von (1849-), German statesman, was born on the 3rd of May 1849, at Klein-Flottbeck, in Holstein. The Bülow family is one very widely extended in north Germany, and many members have attained distinction in the civil and military service of Prussia, Denmark and Mecklenburg. Prince Bülow's great-uncle, Heinrich von Bülow, who was distinguished for his admiration of England and English institutions, was Prussian ambassador in England from 1827 to 1840, and married a daughter of Wilhelm von Humboldt (see the letters of Gabrielle von Bülow). His father, Bernhard Ernst von Bülow, is separately noticed above.

Prince Bülow must not be confused with his contemporary Otto v. Bülow (1827-1901), an official in the Prussian foreign office, who in 1882 was appointed German envoy at Bern, from 1892 to 1898 was Prussian envoy to the Vatican, and died at Rome on the 22nd of November 1901.

Bernhard von Bülow, after serving in the Franco-Prussian War, entered the Prussian civil service, and was then transferred to the diplomatic service. In 1876 he was appointed attaché to the German embassy in Paris, and after returning for a while to the foreign office at Berlin, became second secretary to the embassy in Paris in 1880. From 1884 he was first secretary to the embassy at St Petersburg, and acted as *chargé d'affaires*; in 1888 he was appointed envoy at Bucharest, and in 1893 to the post of German ambassador at Rome. In 1897, on the retirement of Baron Marshall von Bieberstein, he was appointed secretary of state for foreign affairs (the same office which his father had held) under Prince Hohenlohe, with a seat in the Prussian ministry. The appointment caused much surprise at the time, as Bülow was little known outside diplomatic circles. The explanations suggested were that he had made himself very popular at Rome and that his appointment was therefore calculated to strengthen the loosening bonds of the Triple Alliance, and also that his early close association with Bismarck would ensure the maintenance of the Bismarckian tradition. As foreign secretary Herr von Bülow was chiefly responsible for carrying out the policy of colonial expansion with which the emperor had identified himself, and in 1899, on bringing to a successful conclusion the negotiations by which the Caroline Islands were acquired by Germany, he was raised to the rank of count. On the resignation of Hohenlohe in 1900 he was chosen to succeed him as chancellor of the empire and president of the Prussian ministry.

The *Berliner Neueste Nachrichten*, commenting on this appointment, very aptly characterized the relations of the new chancellor to the emperor, in contrast to the position occupied by Bismarck. "The Germany of William II.," it said, "does not admit a Titan in the position of the highest official of the Empire. A cautious and versatile diplomatist like Bernhard von Bülow appears to be best adapted to the personal and political necessities of the present situation." Count Bülow, indeed, though, like Bismarck, a "realist," utilitarian and opportunist in his policy, made no effort to emulate the masterful independence of the great chancellor. He was accused, indeed, of being little more than the complacent executor of the emperor's will, and defended himself in the Reichstag against the charge. The substance of the relations between the emperor and himself, he declared, rested on mutual good-will, and added: "I must lay it down most emphatically that the prerogative of the emperor's personal initiative must not be curtailed, and will not be curtailed, by any chancellor.... As regards the chancellor, however, I say that no imperial chancellor worthy of the name ... would take up any position which in his conscience he did not regard as justifiable." It is clear that the position of a chancellor holding these views in relation to a ruler so masterful and so impulsive as the emperor William II. could be no easy one; and Bülow's long continuance in office is the best proof of his genius. His first conspicuous act as chancellor was a masterly defence in the Reichstag of German action in China, a defence which was, indeed, rendered easier by the fact that Prince Hohenlohe had—to use his own words—"dug a canal" for the flood of imperial ambition of which warning had been given in the famous "mailed fist" speech. Such incidents as this, however, though they served to exhibit consummate tact and diplomatic skill, give little index to the fundamental character of his work as chancellor. Of this it may be said, in general, that it carried on the best traditions of the Prussian service in whole-hearted devotion to the interests of the state. The accusation that he was an "agrarian" he thought it necessary to rebut in a speech delivered on the 18th of February 1906 to the German Handelstag. He was an agrarian, he declared, in so far as he came of a land-owning family, and was interested in the prosperity
[v.04 p.0794] of agriculture; but as chancellor, whose function it is to watch over the welfare of all classes, he was equally concerned with the interests of commerce and industry (*Kölnische Zeitung*, Feb. 20, 1906). Some credit for the immense material expansion of Germany under his chancellorship is certainly due to his zeal and self-devotion. This was generously recognized by the emperor in a letter publicly addressed to the chancellor on the 21st of May 1906, immediately after the passage of the Finance Bill. "I am fully conscious," it ran, "of the conspicuous share in the initiation and realization of this work of reform... which must be ascribed to the statesmanlike skill and self-sacrificing devotion with which you have conducted and promoted those arduous labours." Rumours had from time to time been rife of a "chancellor crisis" and Bülow's dismissal; in the *Berliner Tageblatt* this letter was compared to the "Never!" with which the emperor William I. had replied to Bismarck's proffered resignation.

On the 6th of June 1905 Count Bülow was raised to the rank of prince (*Fürst*), on the occasion of the marriage of the crown prince. The coincidence of this date with the fall of M. Delcassé, the French minister for foreign affairs—a triumph for Germany and a humiliation for France—was much commented on at the time (see *The Times*, June 7, 1905); and the elevation of Bismarck to the rank of prince in the Hall of Mirrors at Versailles was recalled. Whatever element of truth there may have been in this, however, the significance of the incident was much exaggerated.

On the 5th of April 1906, while attending a debate in the Reichstag, Prince Bülow was seized with illness, the result of overwork and an attack of influenza, and was carried unconscious from the hall. At first it was thought that the attack would be fatal, and Lord Fitzmaurice in the House of Lords compared the incident with that of the death of Chatham, a compliment much appreciated in Germany. The illness, however, quickly took a favourable turn, and after a month's rest the chancellor was able to resume his duties. In 1907 Prince Bülow was made the subject of a disgraceful libel, which received more attention than it deserved because it coincided with the Harden-Moltke scandals; his character was, however, completely vindicated, and the libeller, a journalist named Brand, received a term of imprisonment.

The parliamentary skill of Prince Bülow in holding together the heterogeneous elements of which the government majority in the Reichstag was composed, no less than the diplomatic tact with which he from time to time "interpreted" the imperial indiscretions to the world, was put to a rude test by the famous "interview" with the German emperor, published in the London *Daily Telegraph* of the 28th of October 1908 (see WILLIAM II., German emperor), which aroused universal reprobation in Germany. Prince Bülow assumed the official responsibility, and tendered his resignation to the emperor, which was not accepted; but the chancellor's explanation in the Reichstag on the 10th of November showed how keenly he felt his position. He declared his conviction that the disastrous results of the interview would "induce the emperor in future to observe that strict reserve, even in private conversations, which is equally indispensable in the interest of a uniform policy and for the authority of the crown," adding that, in the contrary case, neither he nor any successor of his could assume the responsibility (*The Times*, Nov. 11, 1908, p. 9). The attitude of the emperor showed that he had taken the lesson to heart. It was not the imperial indiscretions, but the effect of his budget proposals in breaking up the Liberal-Conservative *bloc*, on whose support he depended in the Reichstag, that eventually drove Prince Bülow from office (see GERMANY: *History*). At the emperor's request he remained to pilot the mutilated budget through the House; but on the 14th of July 1909 the acceptance of his resignation was announced.

Prince Bülow married, on the 9th of January 1886, Maria Anna Zoe Rosalia Beccadelli di Bologna, Princess Camporeale, whose first marriage with Count Karl von Dönhoff had been dissolved and declared null by the Holy See in 1884. The princess, an accomplished pianist and pupil of Liszt, was a step-daughter of the Italian statesman Minghetti.

See J. Penzler, *Graf Bülows Reden nebst urkundlichen Beiträgen zu seiner Politik* (Leipzig, 1903).

BÜLOW, DIETRICH HEINRICH, FREIHERR VON (1757-1807), Prussian soldier and military writer, and brother of General Count F.W. Bülow, entered the Prussian army in 1773. Routine work proved distasteful to him, and he read with avidity the works of the chevalier Folard and other theoretical writers on war, and of Rousseau. After sixteen years' service he left Prussia, and endeavoured without success to obtain a commission in the Austrian army. He then returned to Prussia, and for some time managed a theatrical company. The failure of this undertaking involved Bülow in heavy losses, and soon afterwards he went to America, where he seems to have been converted to, and to have preached, Swedenborgianism. On his return to Europe he persuaded his brother to engage in a speculation for exporting glass to the United States, which proved a complete failure. After this for some years he made a precarious living in Berlin by literary work, but his debts accumulated, and it was under great disadvantages that he produced his *Geist des Neueren Kriegssystems* (Hamburg, 1799) and *Der Feldzug 1800* (Berlin, 1801). His hopes of military employment were again disappointed, and his brother, the future field marshal, who had stood by him in all his troubles, finally left him. After wandering in France and the smaller German states, he reappeared at Berlin in 1804, where he wrote a revised edition of his *Geist des Neueren Kriegssystems* (Hamburg, 1805), *Lehrsätze des Neueren Kriegs* (Berlin, 1805), *Geschichte des Prinzen Heinrich von Preussen* (Berlin, 1805), *Neue Taktik der Neuern wie sie sein sollte* (Leipzig, 1805), and *Der Feldzug 1805* (Leipzig, 1806). He also edited, with G.H. von Behrenhorst (1733-1814) and others, *Annalen des Krieges* (Berlin, 1806). These brilliant but unorthodox works, distinguished by an open contempt of the Prussian system, cosmopolitanism hardly to be distinguished from high treason, and the mordant sarcasm of a disappointed man, brought upon Bülow the enmity of the official classes and of the government. He was arrested as insane, but medical examination proved him sane and he was then lodged as a prisoner in Colberg, where he was harshly treated, though Gneisenau obtained some mitigation of his condition. Thence he passed into Russian hands and died in prison at Riga in 1807, probably as a result of ill-treatment.

In Bülow's writings there is evident a distinct contrast between the spirit of his strategical and that of his tactical ideas. As a strategist (he claimed to be the first of strategists) he reduces to mathematical rules the practice of the great generals of the 18th century, ignoring "friction," and manœuvring his armies *in vacuo*. At the same time he professes that his system provides working rules for the armies of his own day, which in point of fact were "armed nations," infinitely more affected by "friction" than the small dynastic and professional armies of the preceding age. Bülow may therefore be considered as anything but a reformer in the domain of strategy. With more justice he has been styled the "father of modern tactics." He was the first to recognize that the conditions of swift and decisive war brought about by the French Revolution involved wholly new tactics, and much of his teaching had a profound influence on European warfare of the 19th century. His early training had shown him merely the pedantic *minutiae* of Frederick's methods, and, in the absence of any troops capable of illustrating the real linear tactics, he became an enthusiastic supporter of the methods, which (more of necessity than from judgment) the French revolutionary generals had adopted, of fighting in small columns covered by skirmishers. Battles, he maintained, were won by skirmishers. "We must organize disorder," he said; indeed, every argument of writers of the modern "extended order" school is to be found *mutatis mutandis* in Bülow, whose system acquired great prominence in view of the mechanical improvements in armament. But his tactics, like his strategy, were vitiated by the absence of "friction," and their dependence on the realization of an unattainable standard of bravery.

See von Voss, *H. von Bülow* (Köln, 1806); P. von Bülow, *Familienbuch der v. Bülow* (Berlin, 1859); Ed. von Bülow, *Aus dem Leben Dietrichs v. Bülow*, also *Vermischte Schriften aus dem Nachlass von Behrenhorst* (1845); Ed. von Bülow and von Rüstow, *Militärische und vermischte Schriften von Heinrich Dietrich v. Bülow* (Leipzig, 1853); Memoirs by Freiherr v. Meerheimb in *Allgemeine deutsche Biographie*, vol. 3 (Leipzig, 1876), and "Behrenhorst und Bülow" (*Historische Zeitschrift*, 1861, vi.); Max Jähns, *Geschichte der Kriegswissenschaften*, vol. iii. pp. 2133-2145 (Munich, 1891); General von Cämmerer (transl. von Donat), *Development of Strategical Science* (London, 1905), ch. i.

BÜLOW, FRIEDRICH WILHELM, Freiherr von, count of Dennewitz (1755-1816), Prussian general, was born on the 16th of February 1755, at Falkenberg in the Altmark; he was the elder brother of the foregoing. He received an excellent education, and entered the Prussian army in 1768, becoming ensign in 1772, and second lieutenant in 1775. He took part in the "Potato War" of 1778, and subsequently devoted himself to the study of his profession and of the sciences and arts. He was throughout his life devoted to music, his great musical ability bringing him to the notice of Frederick William II., and about 1790 he was conspicuous in the most fashionable circles of Berlin. He did not, however, neglect his military studies, and in 1792 he was made military instructor to the young prince Louis Ferdinand, becoming at the same time full captain. He took part in the campaigns of 1792-93-94 on the Rhine, and received for signal courage during the siege of Mainz the order *pour le mérite* and promotion to the rank of major. After this he went to garrison duty at Soldau. In 1802 he married the daughter of Colonel v. Auer, and in the following year he became lieutenant-colonel, remaining at Soldau with his corps. The vagaries and misfortunes of his brother Dietrich affected his happiness as well as his fortune. The loss of two of his children was followed in 1806 by the death of his wife, and a further source of disappointment was the exclusion of his regiment from the field army sent against Napoleon in 1806. The disasters of the campaign aroused his energies. He did excellent service under Lestocq's command in the latter part of the war, was wounded in action, and finally designated for a brigade command in Blücher's force. In 1808 he married the sister of his first wife, a girl of eighteen. He was made a major-general in the same year, and henceforward he devoted himself wholly to the regeneration of Prussia. The intensity of his patriotism threw him into conflict even with Blücher and led to his temporary retirement; in 1811, however, he was again employed. In the critical days preceding the War of Liberation he kept his troops in hand without committing himself to any irrevocable step until the decision was made. On the 14th of March 1813 he was made a lieutenant-general. He fought against Oudinot in defence of Berlin (see Napoleonic Campaigns), and in the summer came under the command of Bernadotte, crown prince of Sweden. At the head of an army corps Bülow distinguished himself very greatly in the battle of Gross Beeren, a victory which was attributed almost entirely to his leadership. A little later he won the great victory of Dennewitz, which for the third time checked Napoleon's advance on Berlin. This inspired the greatest enthusiasm in Prussia, as being won by purely Prussian forces, and rendered Bülow's popularity almost equal to that of Blücher. Bülow's corps played a conspicuous part in the final overthrow of Napoleon at Leipzig, and he was then entrusted with the task of evicting the French from Holland and Belgium. In an almost uniformly successful campaign he won a signal victory at Hoogstraaten, and in the campaign of 1814 he invaded France from the north-west, joined Blücher, and took part in the brilliant victory of Laon in March. He was now made general of infantry and received the title of Count Bülow von Dennewitz. In the short peace of 1814-1815 he was at Konigsberg as commander-in-chief in Prussia proper. He was soon called to the field again, and in the Waterloo campaign commanded the IV. corps of Blücher's army. He was not present at Ligny, but his corps headed the flank attack upon Napoleon at Waterloo, and bore the heaviest part in the fighting of the Prussian troops. He took part in the invasion of France, but died suddenly on the 25th of February 1816, a month after his return to the Königsberg command.

See *General Graf Bülow von Dennewitz, 1813-1814* (Leipzig, 1843); Varnhagen von Ense, *Leben des G. Grafen B. von D.* (Berlin, 1854).

BÜLOW, HANS GUIDO VON (1830-1894), German pianist and conductor, was born at Dresden, on the 8th of January 1830. At the age of nine he began to study music under Friedrich Wieck as part of a genteel education. It was only after an illness while studying law at Leipzig University in 1848 that he determined upon music as a career. At this time he was a pupil of Moritz Hauptmann. In 1849 revolutionary politics took possession of him. In the Berlin *Abendpost*, a democratic journal, the young aristocrat poured forth his opinions, which were strongly coloured by Wagner's *Art and Revolution*. Wagner's influence was musical no less than political, for a performance of *Lohengrin* under Liszt at Weimar in 1850 completed von Bülow's determination to abandon a legal career. From Weimar he went to Zürich, where the exile Wagner instructed him in the elements of conducting. But he soon returned to Weimar and Liszt; and in 1853 he made his first concert tour, which extended from Vienna to Berlin. Next he became principal professor of the piano at the Stern Academy, and married in his twenty-eighth year Liszt's daughter Cosima. For the following nine years von Bülow laboured incessantly in Berlin as pianist, conductor and writer of musical and political articles. Thence he removed to Munich, where, thanks to Wagner, he had been appointed *Hofkapellmeister* to Louis II., and chief of the Conservatorium. There, too, he organized model performances of *Tristan* and *Die Meistersinger*. In 1869 his marriage was dissolved, his wife subsequently marrying Wagner, an incident which, while preventing Bülow from revisiting Bayreuth, never dimmed his enthusiasm for Wagner's dramas. After a temporary stay in Florence, Bülow set out on tour again as a pianist, visiting most European countries as well as the United States of America, before taking up the post of conductor at Hanover, and, later, at Meiningen, where he raised the orchestra to a pitch of excellence till then unparalleled. In 1885 he resigned the Meiningen office, and conducted a number of concerts in Russia and Germany. At Frankfort he held classes for the higher development of piano-playing. He constantly visited England, for the last time in 1888, in which year he went to live in Hamburg. Nevertheless he continued to conduct the Berlin Philharmonic Concerts. He died at Cairo, on the 13th of February 1894. Bülow was a pianist of the highest order of intellectual attainment, an artist of remarkably catholic tastes, and a great conductor. A passionate hater of humbug and affectation, he had a ready pen, and a biting, sometimes almost rude wit, yet of his kindness and generosity countless tales were told. His compositions are few and unimportant, but his annotated editions of the classical masters are of great value. Bülow's writings and letters (*Briefe und Schriften*), edited by his widow, have been published in 8 vols. (Leipzig, 1895-1908).

BULRUSH, a name now generally given to *Typha latifolia*, the reed-mace or club-rush, a plant growing in lakes, by edges of rivers and similar localities, with a creeping underground stem, narrow, nearly flat leaves, 3 to 6 ft. long, arranged in opposite rows, and a tall stem ending in a cylindrical spike, half to one foot long, of closely packed male (above) and female (below) flowers. The familiar brown spike is a dense mass of minute one-seeded fruits, each on a long hair-like stalk and covered with long downy hairs, which render the fruits very light and readily carried by the wind. The name bulrush is more correctly applied to *Scirpus lacustris*, a member of a different family (Cyperaceae), a common plant in wet places, with tall spongy, usually leafless stems, bearing a tuft of many-flowered spikelets. The stems are used for matting, &c. The bulrush of Scripture, associated with the hiding of Moses, was the *Papyrus* (*q.v.*), also a member of the order Cyperaceae, which was abundant in the Nile.

BULSTRODE, SIR RICHARD (1610-1711), English author and soldier, was a son of Edward Bulstrode (1588-1659), and was educated at Pembroke College, Cambridge; after studying law in London he joined the army of Charles I. on the outbreak of the Civil War in 1642. In 1673 he became a resident agent of Charles II. at Brussels; in 1675 he was knighted; then following James II. into exile he died at St Germain on the 3rd of October 1711. Bulstrode is chiefly known by his *Memoirs and Reflections upon the Reign and Government of King Charles I. and King Charles II.*, published after his death in 1721. He also wrote *Life of James II.*, and *Original Letters written to the Earl of Arlington* (1712). The latter consists principally of letters written from Brussels giving an account of the important events which took place in the Netherlands during 1674.

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His second son, WHITELOCKE BULSTRODE (1650-1724), remained in England after the flight of James II.; he held some official positions, and in 1717 wrote a pamphlet in support of George I. and the Hanoverian succession. He published *A Discourse of Natural Philosophy*, and was a prominent Protestant controversialist. He died in London on the 27th of November 1724.

BULWARK (a word probably of Scandinavian origin, from *bol* or *bole*, a tree-trunk, and *werk*, work, in Ger. *Bollwerk*, which has also been derived from an old German *bolen*, to throw, and so a machine for throwing missiles), a barricade of beams, earth, &c., a work in 15th and 16th century fortifications designed to mount artillery (see BOULEVARD). On board ship the term is used of the woodwork running round the ship above the level of the deck. Figuratively it means anything serving as a defence.

BUMBOAT, a small boat which carries vegetables, provisions, &c., to ships lying in port or off the shore. The word is probably connected with the Dutch *bumboat* or *boomboot*, a broad Dutch fishing-boat, the derivation of which is either from *boom*, cf. Ger. *baum*, a tree, or from *bon*, a place in which fish is kept alive, and *boot*, a boat. It appears first in English in the Trinity House By-laws of 1685 regulating the scavenging boats attending ships lying in the Thames.

BUMBULUM, BOMBULUM or BUNIBULUM, a fabulous musical instrument described in an apocryphal letter of St Jerome to Dardanus,[1] and illustrated in a series of illuminated MSS. of the 9th to the 11th century, together with other instruments described in the same letter. These MSS. are the *Psalter of Emmeran*, 9th century, described by Martin Gerbert,[2] who gives a few illustrations from it; the Cotton MS. *Tiberius C. VI.* in the British Museum, 11th century; the famous *Boulogne Psalter*, A.D. 1000; and the *Psalter of Angers*, 9th century.[3] In the Cotton MS. the instrument consists of an angular frame, from which depends by a chain a rectangular metal plate having twelve bent arms attached in two rows of three on each side, one above the other. The arms appear to terminate in small rectangular bells or plates, and it is supposed that the standard frame was intended to be shaken like a sistrum in order to set the bells jangling. Sebastian Virdung[4] gives illustrations of these instruments of Jerome, and among them of the one called bumbulum in the Cotton MS., which Virdung calls *Fistula Hieronimi*. The general outline is the same, but instead of metal arms there is the same number of bent pipes with conical bore. Virdung explains, following the apocryphal letter, that the stand resembling the draughtsman's square represents the Holy Cross, the rectangular object dangling therefrom signifies Christ on the Cross, and the twelve pipes are the twelve apostles. Virdung's illustration, probably copied from an older work in manuscript, conforms more closely to the text of the letter than does the instrument in the Cotton MS. There is no evidence whatever of the actual existence of such an instrument during the middle ages, with the exception of this series of fanciful pictures drawn to illustrate an instrument known from description only. The word *bombulum* was probably derived from the same root as the βομβαύλιος of Aristophanes (*Acharnians*, 866) (βόμβος and αὐλός), a comic compound for a bag-pipe with a play on βομβυλιός, an insect that hums or buzzes (see BAG-PIPE). The original described in the letter, also from hearsay, was probably an early type of organ.

(K. S.)

[1] *Ad Dardanum, de diversis generibus musicorum instrumentorum.*

[2] *De Cantu et Musica Sacra* (1774).

[3] For illustrations see *Annales archéologiques*, iii. p. 82 et seq.

[4] *Musica getutscht und aussgezogen* (Basle, 1511).

BUN, a small cake, usually sweet and round. In Scotland the word is used for a very rich spiced type of cake and in the north of Ireland for a round loaf of ordinary bread. The derivation of the word has been much disputed. It has been affiliated to the old provincial French *bugne*, "swelling," in the sense of a "fritter," but the *New English Dictionary* doubts the usage of the word. It is quite as probable that it has a far older and more interesting origin, as is suggested by an inquiry into the origin of hot cross buns. These cakes, which are now solely associated with the Christian Good Friday, are traceable to the remotest period of pagan history. Cakes were offered by ancient Egyptians to their moon-goddess; and these had imprinted on them a pair of horns, symbolic of the ox at the sacrifice of which they were offered on the altar, or of the horned moon-goddess, the equivalent of Ishtar of the Assyro-Babylonians. The Greeks offered such sacred cakes to Astarte and other divinities. This cake they called *bous* (ox), in allusion to the ox-symbol marked on it, and from the accusative *boun* it is suggested that the word "bun" is derived. Diogenes Laertius (*c.* A.D. 200), speaking of the offering made by Empedocles, says "He offered one of the sacred liba, called a *bouse*, made of fine flour and honey." Hesychius (*c.* 6th century) speaks of the *boun*, and describes it as a kind of cake with a representation of two horns marked on it. In time the Greeks marked these cakes with a cross, possibly an allusion to the four quarters of the moon, or more probably to facilitate the distribution of the sacred bread which was eaten by the worshippers. Like the Greeks, the Romans eat cross-bread at public sacrifices, such bread being usually purchased at the doors of the temple and taken in with them,—a custom alluded to by St Paul in I Cor. x. 28. At Herculaneum two small loaves about 5 in. in diameter, and plainly marked with a cross, were found. In the Old Testament a reference is made in Jer. vii. 18-xliv. 19, to such sacred bread being offered to the moon goddess. The cross-bread was eaten by the pagan Saxons in honour of Eoster, their goddess of light. The Mexicans and Peruvians are shown to have had a similar custom. The custom, in fact, was practically universal, and the early Church adroitly adopted the pagan practice, grafting it on to the Eucharist. The *boun* with its Greek cross became akin to the Eucharistic bread or cross-marked wafers mentioned in St Chrysostom's *Liturgy*. In the

medieval church, buns made from the dough for the consecrated Host were distributed to the communicants after Mass on Easter Sunday. In France and other Catholic countries, such blessed bread is still given in the churches to communicants who have a long journey before they can break their fast. The Holy Eucharist in the Greek church has a cross printed on it. In England there seems to have early been a disposition on the part of the bakers to imitate the church, and they did a good trade in buns and cakes stamped with a cross, for as far back as 1252 the practice was forbidden by royal proclamation; but this seems to have had little effect. With the rise of Protestantism the cross bun lost its sacrosanct nature, and became a mere eatable associated for no particular reason with Good Friday. Cross-bread is not, however, reserved for that day; in the north of England people usually crossmark their cakes with a knife before putting them in the oven. Many superstitions cling round hot cross buns. Thus it is still a common belief that one bun should be kept for luck's sake to the following Good Friday. In Dorsetshire it is thought that a cross-loaf baked on that day and hung over the chimneypiece prevents the bread baked in the house during the year from "going stringy."

BUNBURY, HENRY WILLIAM (1750-1811), English caricaturist, was the second son of Sir William Bunbury, 5th baronet, of Mildenhall, Suffolk, and came of an old Norman family. He was educated at Westminster school and St Catharine's Hall, Cambridge, and soon showed a talent for drawing, and especially for humorous subjects. His more serious efforts did not rise to a high level, but his caricatures are as famous as those of his contemporaries Rowlandson and Gillray, good examples being his "Country Club" (1788), "Barber's Shop" (1811) and "A Long Story" (1782.) He was a popular character, and the friend of most of the notabilities of his day, whom he never offended by attempting political satire; and his easy circumstances and social position (he was colonel of the West Suffolk Militia, and was appointed equerry to the duke of York in 1787) enabled him to exercise his talents in comfort.

[v.04 p.0797] His son Sir Henry Edward Bunbury, Bart. (1778-1860), who succeeded to the family title on the death of his uncle, was a distinguished soldier, and rose to be a lieutenant-general; he was an active member of parliament, and the author of several historical works of value; and the latter's second son, Sir Edward Herbert Bunbury, also a member of parliament, was well known as a geographer and archaeologist, and author of a *History of Ancient Geography.*

BUNBURY, a seaport and municipal town of Wellington county, Western Australia, 112 m. by rail S. by W. of Perth. Pop. (1901) 2455. The harbour, known as Koombanah Bay, is protected by a breakwater built on a coral reef. Coal is worked on the Collie river, 30 m. distant, and is shipped from this port, together with tin, timber, sandal-wood and agricultural produce.

BUNCOMBE, or Bunkum (from Buncombe county, North Carolina, United States), a term used for insincere political action or speaking to gain support or the favour of a constituency, and so any humbug or clap-trap. The phrase "to talk for (or to) Buncombe" arose in 1820, during the debate on the Missouri Compromise in Congress; the member for the district containing Buncombe county confessed that his long and much interrupted speech was only made because his electors expected it, and that he was "speaking for Buncombe."

BUNCRANA, a market-town and watering-place of Co. Donegal, Ireland, in the north parliamentary division on the east shore of Lough Swilly, on the Londonderry & Lough Swilly & Letterkenny railway. Pop. (1901) 1316. There is a trade in agricultural produce, a salmon fishery, sea fisheries and a manufacture of linen. The town is beautifully situated, being flanked on the east and south by hills exceeding 1000 ft. The picturesque square keep of an ancient castle remains, but the present Buncrana Castle is a residence erected in 1717. The golf-links are well known.

BUNDABERG, a municipal town and river port of Cook county, Queensland, Australia, 10 m. from the mouth of the river Burnett, and 217 m. by rail N. by W. of Brisbane. Pop. (1901) 5200. It lies on both sides of the river, and connexion between the two ports is maintained by road and railway bridges. There are saw-mills, breweries, brickfields and distilleries in the town, and numerous sugar factories in the vicinity, notably at Millaquin, on the river below the town. There are wharves on both sides of the river, and the staple exports are sugar, golden-syrup and timber. The climate is remarkably healthy.

BUNDELKHAND, a tract of country in Central India, lying between the United and the Central Provinces. Historically it includes the five British districts of Hamirpur, Jalaun, Jhansi, Lalitpur and Banda, which now form part of the Allahabad division of the United Provinces, but politically it is restricted to a collection of native states, under the Bundelkhand agency. There are 9 states, 13 estates and the pargana of Alampur belonging to Indore state, with a total area of 9851 sq. m. and a total population (1901) of 1,308,326, showing a decrease of 13% in the decade, due to the effects of famine. The most important of the states are Orchha, Panna, Samthar, Charkhari, Chhatarpur, Datia, Bijawar and Ajaigarh. A branch of the Great Indian Peninsula railway traverses the north of the country. A garrison of all arms is stationed at Nowgong.

The surface of the country is uneven and hilly, except in the north-east part, which forms an irregular plain cut up by ravines scooped out by torrents during the periodical rains. The plains of Bundelkhand are intersected by three mountain ranges, the Bindhachal, Panna and Bander chains, the highest elevation not exceeding 2000 ft. above sea-level. Beyond these ranges the country is further diversified by isolated hills rising abruptly from a common level, and presenting from their steep and nearly inaccessible scarps eligible sites for castles and strongholds, whence the mountaineers of Bundelkhand have frequently set at defiance the most powerful of the native states of India. The general slope of the country is towards the north-east, as indicated by the course of the rivers which traverse or bound the territory, and finally discharge themselves into the Jumna.

The principal rivers are the Sind, Betwa, Ken, Baighin, Paisuni, Tons, Pahuj, Dhasan, Berma, Urmal and Chandrawal. The Sind, rising near Sironj in Malwa, marks the frontier line of Bundelkhand on the side of Gwalior. Parallel to this river, but more to the eastward, is the course of the Betwa. Still farther to the east flows the Ken, followed in succession by the Baighin, Paisuni and Tons. The Jumna and the Ken are the only two navigable rivers. Notwithstanding the large number of streams, the depression of their channels and height of their banks render them for the most part unsuitable for the purposes of irrigation,—which is conducted by means of *jhils* and tanks. These artificial lakes are usually formed by throwing embankments across the lower extremities of valleys, and thus arresting and accumulating the waters flowing through them. Some of the tanks are of great capacity; the Barwa Sagar, for instance, is 2½ m. in diameter.

Diamonds are found, particularly near the town of Panna, in a range of hills called by the natives Band-Ahil.

The mines of Maharajpur, Rajpur, Kimera and Gadasia have been famous for magnificent diamonds; and a very large one dug from the last was kept in the fort of Kalinjar among the treasures of Raja Himmat Bahadur. In the reign of the emperor Akbar the mines of Panna produced diamonds to the amount of £100,000 annually, and were a considerable source of revenue, but for many years they have not been so profitable.

The tree vegetation consists rather of jungle or copse than forest, abounding in game which is preserved by the native chiefs. There are also within these coverts several varieties of wild animals, such as the tiger, leopard, hyena, wild boar, *nilgái* and jackal.

The people represent various races. The Bundelas—the race who gave the name to the country—still maintain their dignity as chieftains, by disdaining to cultivate the soil, although by no means conspicuous for lofty sentiments of honour or morality. An Indian proverb avers that "one native of Bundelkhand commits as much fraud as a hundred Dandis" (weighers of grain and notorious rogues). About Datia and Jhansi the inhabitants are a stout and handsome race of men, well off and contented. The prevailing religion in Bundelkhand is Hinduism.

The earliest dynasty recorded to have ruled in Bundelkhand were the Garhwas, who were succeeded by the Parihars; but nothing is known of either. About A.D. 800 the Parihars are said to have been ousted by the Chandels, and Dangha Varma, chief of the Chandel Rajputs, appears to have established the earliest paramount power in Bundelkhand towards the close of the 10th century A.D. Under his dynasty the country attained its greatest splendour in the early part of the 11th century, when its raja, whose dominions extended from the Jumna to the Nerbudda, marched at the head of 36,000 horse and 45,000 foot, with 640 elephants, to oppose the invasion of Mahmud of Ghazni. In 1182 the Chandel dynasty was overthrown by Prithwi Raj, the ruler of Ajmer and Delhi, after which the country remained in ruinous anarchy until the close of the 14th century, when the Bundelas, a spurious offshoot of the Garhwa tribe of Rajputs, established themselves on the right bank of the Jumna. One of these took possession of Orchha by treacherously poisoning its chief. His successor succeeded in further aggrandizing the Bundela state, but he is represented to have been a notorious plunderer, and his character is further stained by the assassination of the celebrated Abul Fazl, the prime minister and historian of Akbar. Jajhar Singh, the third Bundela chief, unsuccessfully revolted against the court of Delhi, and his country became incorporated for a short time with the empire. The struggles of the Bundelas for independence resulted in the withdrawal of the royal troops, and the admission of several petty states as feudatories of the empire on condition of military service. The Bundelas, under Champat Rai and his son. Chhatar Sal, offered a successful resistance to the proselytizing efforts of Aurangzeb. On the occasion of a Mahommedan invasion in 1732, Chhatar Sal asked and obtained the assistance of the Mahratta Peshwa, whom he adopted as his son, giving him a third of his dominions. The Mahrattas gradually extended their influence over Bundelkhand, and in 1792 the peshwa was acknowledged as the lord paramount of the country. The Mahratta power was, however, on the decline; the flight of the peshwa from his capital to Bassein before the British arms changed the aspect of affairs, and by the treaty concluded between the peshwa and the British government, the districts of Banda and Hamirpur were transferred to the latter. Two chiefs then held the ceded districts, Himmat Bahadur, the leader of the Sanyasis, who promoted the views of the British, and Shamsher, who made common cause with the Mahrattas. In September 1803, the united forces of the English and Himmat Bahadur compelled Shamsher to retreat with his army. In 1809 Ajaigarh was besieged by a British force, and again three years later Kalinjar was besieged and taken after a heavy loss. In 1817, by the treaty of Poona, the British government acquired from the peshwa all his rights, interests and pretensions, feudal, territorial or pecuniary, in Bundelkhand. In carrying out the provisions of the treaty, an assurance was given by the British government that the rights of those interested in the transfer should be scrupulously respected, and the host of petty native principalities in the province is the best proof of the sincerity and good faith with which this clause has been carried out. During the mutiny of 1857, however, many of the chiefs rose against the British, the rani of Jhansi being a notable example.

[v.04 p.0798]

BUNDI, or Boondee, a native state of India, in the Rajputana agency, lying on the north-east of the river Chambal, in a hilly tract historically known as Haraoti, from the Hara sept of the great clan of Chauhan Rajputs, to which the maharao raja of Bundi belongs. It has an area of 2220 sq. m. Many parts of the state are wild and hilly, inhabited by a large Mina population, formerly notorious as a race of robbers. Two rivers, the Chambia and the Mej, water the state; the former is navigable by boats. In 1901 the population was 171,227, showing a decrease of 42% due to the effects of famine. The estimated revenue is £46,000, the tribute £8000. There is no railway, but the metalled road from Kotah to the British cantonment of Deoli passes through the state. The town of Bundi had a population in 1901 of 19,313. A school for the education of boys of high rank was opened in 1897.

The state of Bundi was founded about A.D. 1342 by the Hara chief Rao Dewa, or Deoraj, who captured the town from the Minas. Its importance, however, dates from the time of Rao Surjan, who succeeded to the chieftainship in 1554 and by throwing in his lot with the Mahommedan emperors of Delhi (1569) received a considerable accession of territory. From this time the rulers of Bundi bore the title of rao raja. In the 17th century their power was curtailed by the division of Haraoti into the two states of Kotah and Bundi; but they continued to play a prominent part in Indian history, and the title of maharao raja was conferred on Budh Singh for the part played by him in securing the imperial throne for Bahadur Shah I. after the death of Aurangzeb in 1707. In 1804 the maharao raja Bishan Singh gave valuable assistance to Colonel Monson in his disastrous retreat before Holkar, in revenge for which the Mahratas and Pindaris continually ravaged his state up to 1817. On the 10th of February 1818, by a treaty concluded with Bishan Singh, Bundi was taken under British protection. In 1821 Bishan Singh was succeeded by his son Ram Singh, who ruled till 1889. He is described as a grand specimen of the Rajput gentleman, and "the most conservative prince in conservative Rajputana." His rule was popular and beneficent; and though during the mutiny of 1857 his attitude was equivocal, he continued to enjoy the favour of the British government, being created G.C.S.I. and a counsellor of the empire in 1877 and C.I.E. in 1878. He was succeeded by his son Raghubir Singh, who was made a K.C.S.I. in 1897 and a G.C.I.E. in 1901.

BUNER, a valley on the Peshawar border of the North-West Frontier Province of India. It is a small mountain valley, dotted with villages and divided into seven sub-divisions. The Mora Hills and the Ilam

range divide it from Swat, the Sinawar range from Yusafzai, the Guru mountains from the Chamla valley, and the Duma range from the Puran Valley. It is inhabited by the Iliaszai and Malizai divisions of the Pathan tribe of Yusafzais, who are called after their country the Bunerwals. There is no finer race on the north-west frontier of India than the Bunerwals. Simple and austere in their habits, religious and truthful in their ways, hospitable to all who seek shelter amongst them, free from secret assassinations, they are bright examples of the Pathan character at its best. They are a powerful and warlike tribe, numbering 8000 fighting men. The Umbeyla Expedition of 1863 under Sir Neville Chamberlain was occasioned by the Bunerwals siding with the Hindostani Fanatics, who had settled down at Malka in their territory. In the end the Bunerwals were subdued by a force of 9000 British troops, and Malka was destroyed, but they made so fierce a resistance, in particular in their attack upon the "Crag" picket, that the Indian medal with a clasp for "Umbeyla" was granted in 1869 to the survivors of the expedition. The government of India refrained from interfering with the tribe again until the Buner campaign of 1897 under Sir Bindon Blood. Many Bunerwals took part in the attack of the Swatis on the Malakand fort, and a force of 3000 British troops was sent to punish them; but the tribe made only a feeble resistance at the passes into their country, and speedily handed in the arms demanded of them and made complete submission.

BUNGALOW (an Anglo-Indian word from the Hindustani *banglā*, belonging to Bengal), a one-storeyed house with a verandah and a projecting roof, the typical dwelling for Europeans in India; the name is also used for similar buildings which have become common for seaside and summer residences in America and Great Britain. Dak or dawk bungalows (from *dak* or *dawk*, a post, a relay of men for carrying the mails, &c.) are the government rest-houses established at intervals for the use of travellers on the high roads of India.

BUNGAY, a market-town in the Lowestoft parliamentary division of Suffolk, England; 113 m. N.E. from London on a branch from Beccles of the Great Eastern railway. Pop. (1901) 3314. It is picturesquely placed in a deep bend of the river Waveney, the boundary with Norfolk. Of the two parish churches that of St Mary has a fine Perpendicular tower, and that of Holy Trinity a round tower of which the lower part is Norman. St Mary's was attached to a Benedictine nunnery founded in 1160. The ruins of the castle date from 1281. They are fragmentary though massive; and there are traces of earth-works of much earlier date. The castle was a stronghold of the powerful family of Bigod, being granted to Roger Bigod, a Norman follower of the Conqueror, in 1075. A grammar school was founded in 1592. There are large printing-works, and founding and malting are prosecuted. There is a considerable carrying trade on the Waveney.

BUNION (a word usually derived from the Ital. *bugnone*, a swelling, but, according to the *New English Dictionary*, the late and rare literary use of the word makes an Italian derivation unlikely; there is an O. Eng. word "bunny," also meaning a swelling, and an O. Fr. *buigne*, modern *bigne*, showing a probable common origin now lost, cf. also "bunch"), an inflamed swelling of the *bursa mucosa*, the sac containing synovial fluid on the metatarsal joint of the big toe, or, more rarely, of the little toe. This may be accompanied by corns or suppuration, leading to an ulcer or even gangrene. The cause is usually pressure; removal of this, and general palliative treatment by dressings, &c. are usually effective, but in severe and obstinate cases a surgical operation may be necessary.

BUNKER HILL, the name of a small hill in Charlestown (Boston), Massachusetts, U.S.A., famous as the scene of the first considerable engagement in the American War of Independence (June 17, 1775). Bunker Hill (110 ft.) was connected by a ridge with Breed's Hill (75 ft.), both being on a narrow peninsula a short distance to the north of Boston, joined by a causeway with the mainland. Since the affair of Lexington (April 19, 1775) General Gage, who commanded the British forces, had remained inactive at Boston awaiting reinforcements from England; the headquarters of the Americans were at Cambridge, with
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advanced posts occupying much of the 4 m. separating Cambridge from Bunker Hill. When Gage received his reinforcements at the end of May, he determined to repair his strange neglect by which the hills on the peninsula had been allowed to remain unoccupied and unfortified. As soon as the Americans became aware of Gage's intention they determined to frustrate it, and accordingly, on the night of the 16th of June, a force of about 1200 men, under Colonel William Prescott and Major-General Israel Putnam, with some engineers and a few field-guns, occupied Breed's Hill—to which the name Bunker Hill is itself now popularly applied—and when daylight disclosed their presence to the British they had already strongly entrenched their position. Gage lost no time in sending troops across from Boston with orders to assault. The British force, between 2000 and 3000 strong, under (Sir) William Howe, supported by artillery and by the guns of men-of-war and floating batteries stationed in the anchorage on either side of the peninsula, were fresh and well disciplined. The American force consisted for the most part of inexperienced volunteers, numbers of whom were already wearied by the trench work of the night. As communication was kept up with their camp the numbers engaged on the hill fluctuated during the day, but at no time exceeded about 1500 men. The village of Charlestown, from which a galling musketry fire was directed against the British, was by General Howe's orders almost totally destroyed by hot shot during the attack. Instead of attempting to cut off the Americans by occupying the neck to the rear of their position, Gage ordered the advance to be made up the steep and difficult ascent facing the works on the hill. Whether or not in obedience—as tradition asserts—to an order to reserve fire until they could see the whites of their assailants' eyes, the American volunteers with admirable steadiness waited till the attack was on the point of being driven home, when they delivered a fire so sustained and deadly that the British line broke in disorder. A second assault, made like the first, with the precision and discipline of the parade-ground met the same fate, but Gage's troops had still spirit enough for a third assault, and this time they carried the position with the bayonet, capturing five pieces of ordnance and putting the enemy to flight. The loss of the British was 1054 men killed and wounded, among whom were 89 commissioned officers; while the American casualties amounted to 420 killed and wounded, including General Joseph Warren, and 30 prisoners. (See American War of Independence.)

The significance of the battle of Bunker Hill is not, however, to be gauged by the losses on either side, heavy as they were in proportion to the numbers engaged, nor by its purely military results, but by the moral effect which it produced; and when it is considered from this standpoint its far-reaching consequences can hardly be over-estimated. "It roused at once the fierce instinct of combat in America ..., and dispelled ... the almost superstitious belief in the impossibility of encountering regular troops with hastily levied volunteers ... No one questioned the conspicuous gallantry with which the provincial troops had supported a long fire from the ships and awaited the charge of the enemy, and British soldiers had been twice driven back in disorder before their fire."[1] The pride which Americans naturally felt in such

an achievement, and the self-confidence which it inspired, were increased when they learnt that the small force on Bunker Hill had not been properly reinforced, and that their ammunition was running short before they were dislodged from their position.[2] Had the character of the fighting on that day been other than it was; had the American volunteers been easily, and at the first assault, driven from their fortified position by the troops of George III., it is not impossible that the resistance to the British government would have died out in the North American colonies through lack of confidence in their own power on the part of the colonists. Bunker Hill, whatever it may have to teach the student of war, taught the American colonists in 1775 that the odds against them in the enterprise in which they had embarked were not so overwhelming as to deny them all prospect of ultimate success.

In 1843 a monument, 221 ft. high, in the form of an obelisk, of Quincy granite, was completed on Breed's Hill (now Bunker Hill) to commemorate the battle, when an address was delivered by Daniel Webster, who had also delivered the famous dedicatory oration at the laying of the corner-stone in 1825. Bunker Hill day is a state holiday.

See R. Frothingham, *The Centennial: Battle of Bunker Hill* (Boston, 1895), and *Life and Times of Joseph Warren* (Boston, 1865); Boston City Council, *Celebration of Centen. Aniv. of Battle of Bunker Hill* (Boston, 1875); G.E. Ellis, *Hist. of Battle of Bunker's* (Breed's) *Hill* (Boston, 1875); S. Sweet, *Who was the Commander at Bunker Hill?* (Boston, 1850); W.E.H. Lecky, *History of England in the Eighteenth Century*, vol. iii (London, 1883); Sir George O. Trevelyan, *The American Revolution* (London, 1899); Fortescue, *History of the British Army*, vol. iii. pp. 153 seq. (London, 1902).

(R. J. M.)

[1] W.E.H. Lecky, *History of England in the Eighteenth Century*, iii. 428.

[2] General Gage's despatch. *American Remembrancer*, 1776, part 11, p. 132.

BUNN, ALFRED (1796-1860), English theatrical manager, was appointed stage-manager of Drury Lane theatre, London, in 1823. In 1826 he was managing the Theatre Royal, Birmingham, and in 1833 he undertook the joint management of Drury Lane and Covent Garden, London. In this undertaking he met with vigorous opposition. A bill for the abolition of the patent theatres was passed in the House of Commons, but on Bunn's petition was thrown out by the House of Lords. He had difficulties first with his company, then with the lord chamberlain, and had to face the keen rivalry of the other theatres. A longstanding quarrel with Macready resulted in the tragedian assaulting the manager. In 1840 Bunn was declared a bankrupt, but he continued to manage Drury Lane till 1848. Artistically his control of the two chief English theatres was highly successful. Nearly every leading English actor played under his management, and he made a courageous attempt to establish English opera, producing the principal works of Balfe. He had some gift for writing, and most of the libretti of these operas were translated by himself. In *The Stage Before and Behind the Curtain* (3 vols., 1840) he gave a full account of his managerial experiences. He died at Boulogne on the 20th of December 1860.

BUNNER, HENRY CUYLER (1855-1896), American writer, was born in Oswego, New York, on the 3rd of August 1855. He was educated in New York City. From being a clerk in an importing house, he turned to journalism, and after some work as a reporter, and on the staff of the *Arcadian* (1873), he became in 1877 assistant editor of the comic weekly *Puck*. He soon assumed the editorship, which he held until his death in Nutley, N.J., on the 11th of May 1896. He developed *Puck* from a new struggling periodical into a powerful social and political organ. In 1886 he published a novel, *The Midge*, followed in 1887 by *The Story of a New York House*. But his best efforts in fiction were his short stories and sketches—*Short Sixes* (1891), *More Short Sixes* (1894), *Made in France* (1893), *Zadoc Pine and Other Stories* (1891), *Love in Old Cloathes and Other Stories* (1896), and *Jersey Street and Jersey Lane* (1896). His verses—*Airs from Arcady and Elsewhere* (1884), containing the well-known poem, *The Way to Arcady; Rowen* (1892); and *Poems* (1896), edited by his friend Brander Matthews—display a light play of imagination and a delicate workmanship. He also wrote clever *vers de société* and parodies. Of his several plays (usually written in collaboration), the best was *The Tower of Babel* (1883).

BUNSEN, CHRISTIAN CHARLES JOSIAS, Baron von (1791-1860), Prussian diplomatist and scholar, was born on the 25th of August 1791 at Korbach, an old town in the little German principality of Waldeck. His father was a farmer who was driven by poverty to become a soldier. Having studied at the Korbach grammar school and Marburg university, Bunsen went in his nineteenth year to Göttingen, where he supported himself by teaching and later by acting as tutor to W.B. Astor, the American merchant. He won the university prize essay of the year 1812 by a treatise on the *Athenian Law of Inheritance*, and a few months later the university of Jena granted him the honorary degree of doctor of philosophy. During 1813 he travelled with Astor in South Germany, and then turned to the study of the religion, laws, language and literature of the Teutonic races. He had read Hebrew when a boy, and now worked at Arabic at Munich, Persian at Leiden, and Norse at Copenhagen. At the close of 1815 he went to Berlin, to lay before Niebuhr the plan of research which he had mapped out. Niebuhr was so impressed with Bunsen's ability that, two years later, when he became Prussian envoy to the papal court, he made the young scholar his secretary. The intervening years Bunsen spent in assiduous labour among the libraries and collections of Paris and Florence. In July 1817 he married Frances Waddington, eldest daughter and co-heiress of B. Waddington of Llanover, Monmouthshire.

As secretary to Niebuhr, Bunsen was brought into contact with the Vatican movement for the establishment of the papal church in the Prussian dominions, to provide for the largely increased Catholic population. He was among the first to realize the importance of this new vitality on the part of the Vatican, and he made it his duty to provide against its possible dangers by urging upon the Prussian court the wisdom of fair and impartial treatment of its Catholic subjects. In this object he was at first successful, and both from the Vatican and from Frederick William III., who put him in charge of the legation on Niebuhr's resignation, he received unqualified approbation. Owing partly to the wise statesmanship of Count Spiegel, archbishop of Cologne, an arrangement was made by which the thorny question of "mixed" marriages (*i.e.* between Catholic and Protestant) would have been happily solved; but the archbishop died in 1835, the arrangement was never ratified, and the Prussian king was foolish enough to appoint as Spiegel's successor the narrow-minded partisan Baron Droste. The pope gladly accepted the appointment, and in two years the forward policy of the Jesuits had brought about the strife which Bunsen and Spiegel had tried to prevent. Bunsen rashly recommended that Droste should be seized, but the *coup* was so clumsily

attempted, that the incriminating documents were, it is said, destroyed in advance. The government, in this *impasse*, took the safest course, refused to support Bunsen, and accepted his resignation in April 1838.

After leaving Rome, where he had become intimate with all that was most interesting in the cosmopolitan society of the papal capital, Bunsen went to England, where, except for a short term as Prussian ambassador to Switzerland (1830-1841), he was destined to pass the rest of his official life. The accession to the throne of Prussia of Frederick William IV., on June 7th, 1840, made a great change in Bunsen's career. Ever since their first meeting in 1828 the two men had been close friends and had exchanged ideas in an intimate correspondence, published under Ranke's editorship in 1873. Enthusiasm for evangelical religion and admiration for the Anglican Church they held in common, and Bunsen was the instrument naturally selected for realizing the king's fantastic scheme of setting up at Jerusalem a Prusso-Anglican bishopric as a sort of advertisement of the unity and aggressive force of Protestantism. The special mission of Bunsen to England, from June to November 1841, was completely successful, in spite of the opposition of English high churchmen and Lutheran extremists. The Jerusalem bishopric, with the consent of the British government and the active encouragement of the archbishop of Canterbury and the bishop of London, was duly established, endowed with Prussian and English money, and remained for some forty years an isolated symbol of Protestant unity and a rock of stumbling to Anglican Catholics.

During his stay in England Bunsen had made himself very popular among all classes of society, and he was selected by Queen Victoria, out of three names proposed by the king of Prussia, as ambassador to the court of St James's. In this post he remained for thirteen years. His tenure of the office coincided with the critical period in Prussian and European affairs which culminated in the revolutions of 1848. With the visionary schemes of Frederick William, whether that of setting up a strict episcopal organization in the Evangelical Church, or that of reviving the defunct ideal of the medieval Empire, Bunsen found himself increasingly out of sympathy. He realized the significance of the signs that heralded the coming storm, and tried in vain to move the king to a policy which would have placed him at the head of a Germany united and free. He felt bitterly the humiliation of Prussia by Austria after the victory of the reaction; and in 1852 he set his signature reluctantly to the treaty which, in his view, surrendered the "constitutional rights of Schleswig and Holstein." His whole influence was now directed to withdrawing Prussia from the blighting influence of Austria and Russia, and attempting to draw closer the ties that bound her to Great Britain. On the outbreak of the Crimean War he urged Frederick William to throw in his lot with the western powers, and create a diversion in the north-east which would have forced Russia at once to terms. The rejection of his advice, and the proclamation of Prussia's attitude of "benevolent neutrality," led him in April 1854 to offer his resignation, which was accepted.

Bunsen's life as a public man was now practically at an end. He retired first to a villa on the Neckar near Heidelberg and later to Bonn. He refused to stand for a seat, in the Liberal interest, in the Lower House of the Prussian diet, but continued to take an active interest in politics, and in 1855 published in two volumes a work, *Die Zeichen der Zeit: Briefe, &c.*, which exercised an immense influence in reviving the Liberal movement which the failure of the revolution had crushed. In September 1857 Bunsen attended, as the king's guest, a meeting of the Evangelical Alliance at Berlin; and one of the last papers signed by Frederick William, before his mind gave way in October, was that which conferred upon him the title of baron and a peerage for life. In 1858, at the special request of the regent (afterwards the emperor) William, he took his seat in the Prussian Upper House, and, though remaining silent, supported the new ministry, of which his political and personal friends were members.

Literary work was, however, his main preoccupation during all this period. Two discoveries of ancient MSS. made during his stay in London, the one containing a shorter text of the *Epistles of St Ignatius*, and the other an unknown work *On all the Heresies*, by Bishop Hippolytus, had already led him to write his *Hippolytus and his Age: Doctrine and Practice of Rome under Commodus and Severus* (1852). He now concentrated all his efforts upon a translation of the Bible with commentaries. While this was in preparation he published his *God in History*, in which he contends that the progress of mankind marches parallel to the conception of God formed within each nation by the highest exponents of its thought. At the same time he carried through the press, assisted by Samuel Birch, the concluding volumes of his work (published in English as well as in German) *Egypt's Place in Universal History*—containing a reconstruction of Egyptian chronology, together with an attempt to determine the relation in which the language and the religion of that country stand to the development of each among the more ancient non-Aryan and Aryan races. His ideas on this subject were most fully developed in two volumes published in London before he quitted England—*Outlines of the Philosophy of Universal History as applied to Language and Religion* (2 vols., 1854).

In 1858 Bunsen's health began to fail; visits to Cannes in 1858 and 1859 brought no improvement, and he died on November 28th, 1860. One of his last requests having been that his wife would write down recollections of their common life, she published his *Memoirs* in 1868, which contain much of his private correspondence. The German translation of these *Memoirs* has added extracts from unpublished documents, throwing a new light upon the political events in which he played a part. Baron Humboldt's letters to Bunsen were printed in 1869.

Bunsen's English connexion, both through his wife (d. 1876) and through his own long residence in London, was further increased in his family. He had ten children, including five sons, Henry (1818-1855), Ernest (1810-1903), Karl (1821-1887), Georg (1824-1896) and Theodor (1832-1892). Of these Karl (Charles) and Theodor had careers in the German diplomatic service; and Georg, who for some time was an active politician in Germany, eventually retired to live in London; Henry, who was an English clergyman, became a naturalized Englishman, and Ernest, who in 1845 married an Englishwoman, Miss Gurney, subsequently resided and died in London. The form of "de" Bunsen was adopted for the surname in England. Ernest de Bunsen was a scholarly writer, who published various works both in German and in English, notably on Biblical chronology and other questions of comparative religion. His son, Sir Maurice de Bunsen (b. 1852), entered the English diplomatic service in 1877, and after a varied experience became minister at Lisbon in 1905.

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See also L. von Ranke, *Aus dem Briefwechsel Friedrich Wilhelms IV. mit Bunsen* (Berlin, 1873). The biography in the 9th edition of this encyclopaedia, which has been drawn upon above, was by Georg von Bunsen.

BUNSEN, ROBERT WILHELM VON (1811-1899), German chemist, was born at Göttingen on the 31st of March 1811, his father, Christian Bunsen, being chief librarian and professor of modern philology at the university. He himself entered the university in 1828, and in 1834 became *Privat-docent*. In 1836 he became teacher of chemistry at the Polytechnic School of Cassel, and in 1839 took up the appointment of professor of chemistry at Marburg, where he remained till 1851. In 1852, after a brief period in Breslau, he was appointed to the chair of chemistry at Heidelberg, where he spent the rest of his life, in spite of an urgent invitation to migrate to Berlin as successor to E. Mitscherlich. He retired from active work in 1889, and died at Heidelberg on the 16th of August 1899. The first research by which attention was drawn to Bunsen's abilities was concerned with the cacodyl compounds (see ARSENIC), though he had already, in 1834, discovered the virtues of freshly precipitated hydrated ferric oxide as an antidote to arsenical poisoning. It was begun in 1837 at Cassel, and during the six years he spent upon it he not only lost the sight of one eye through an explosion, but nearly killed himself by arsenical poisoning. It represents almost his only excursion into organic chemistry, and apart from its accuracy and completeness it is of historical interest in the development of that branch of the science as being the forerunner of the fruitful investigations on the organo-metallic compounds subsequently carried out by his English pupil, Edward Frankland. Simultaneously with his work on cacodyl, he was studying the composition of the gases given off from blast furnaces. He showed that in German furnaces nearly half the heat yielded by the fuel was being allowed to escape with the waste gases, and when he came to England, and in conjunction with Lyon Playfair investigated the conditions obtaining in English furnaces, he found the waste to amount to over 80%. These researches marked a stage in the application of scientific principles to the manufacture of iron, and they led also to the elaboration of Bunsen's famous methods of measuring gaseous volumes, &c., which form the subject of the only book he ever published (*Gasometrische Methoden*, 1857). In 1841 he invented the carbon-zinc electric cell which is known by his name, and which conducted him to several important achievements. He first employed it to produce the electric arc, and showed that from 44 cells a light equal to 1171.3 candles could be obtained with the consumption of one pound of zinc per hour. To measure this light he designed in 1844 another instrument, which in various modifications has come into extensive use—the grease-spot photometer. In 1852 he began to carry out electrolytical decompositions by the aid of the battery. By means of a very ingenious arrangement he obtained magnesium for the first time in the metallic state, and studied its chemical and physical properties, among other things demonstrating the brilliance and high actinic qualities of the flame it gives when burnt in air. From 1855 to 1863 he published with Roscoe a series of investigations on photochemical measurements, which W. Ostwald has called the "classical example for all future researches in physical chemistry." Perhaps the best known of the contrivances which the world owes to him is the "Bunsen burner" which he devised in 1855 when a simple means of burning ordinary coal gas with a hot smokeless flame was required for the new laboratory at Heidelberg. Other appliances invented by him were the ice-calorimeter (1870), the vapour calorimeter (1887), and the filter pump (1868), which was worked out in the course of a research on the separation of the platinum metals. Mention must also be made of another piece of work of a rather different character. Travelling was one of his favourite relaxations, and in 1846 he paid a visit to Iceland. There he investigated the phenomena of the geysers, the composition of the gases coming off from the fumaroles, their action on the rocks with which they came into contact, &c., and on his observations was founded a noteworthy contribution to geological theory. But the most far-reaching of his achievements was the elaboration, about 1859, jointly with G.R. Kirchhoff, of spectrum analysis, which has put a new weapon of extraordinary power into the hands both of chemists and astronomers. It led Bunsen himself almost immediately to the isolation of two new elements of the alkali group, caesium and rubidium. Having noticed some unknown lines in the spectra of certain salts he was examining, he set to work to obtain the substance or substances to which these were due. To this end he evaporated large quantities of the Dürkheim mineral water, and it says much both for his perseverance and powers of manipulation that he dealt with 40 tons of the water to get about 17 grammes of the mixed chlorides of the two substances, and that with about one-third of that quantity of caesium chloride was able to prepare the most important compounds of the element and determine their characteristics, even making goniometrical measurements of their crystals.

Bunsen founded no school of chemistry; that is to say, no body of chemical doctrine is associated with his name. Indeed, he took little or no part in discussions of points of theory, and, although he was conversant with the trend of the chemical thought of his day, he preferred to spend his energies in the collection of experimental data. One fact, he used to say, properly proved is worth all the theories that can be invented. But as a teacher of chemistry he was almost without rival, and his success is sufficiently attested by the scores of pupils who flocked from every part of the globe to study under him, and by the number of those pupils who afterwards made their mark in the chemical world. The secret of this success lay largely in the fact that he never delegated his work to assistants, but was constantly present with his pupils in the laboratory, assisting each with personal direction and advice. He was also one of the first to appreciate the value of practical work to the student, and he instituted a regular practical course at Marburg so far back as 1840. Though alive to the importance of applied science, he considered truth alone to be the end of scientific research, and the example he set his pupils was one of single-hearted devotion to the advancement of knowledge.

See Sir Henry Roscoe's "Bunsen Memorial Lecture," *Trans. Chem. Soc.*, 1900, which is reprinted (in German) with other obituary notices in an edition of Bunsen's collected works published by Ostwald and Bodenstein in 3 vols. at Leipzig in 1904.

BUNTER, the name applied by English geologists to the lower stage or subdivision of the Triassic rocks in the United Kingdom. The name has been adapted from the German *Buntsandstein, Der bunte Sandstein*, for it was in Germany that this continental type of Triassic deposit was first carefully studied. In France, the Bunter is known as the *Grès bigarré*. In northern and central Germany, in the Harz, Thuringia and Hesse, the Bunter is usually conformable with the underlying Permian formation; in the south-west and west, however, it transgresses on to older rocks, on to Coal Measures near Saarbruck, and upon the crystalline schists of Odenwald and the Black Forest.

The German subdivisions of the Bunter are as follows:—(1) *Upper Buntsandstein*, or *Röt*, mottled red and green marls and clays with occasional beds of shale, sandstone, gypsum, rocksalt and dolomite. In Hesse and Thuringia, a quartzitic sandstone prevails in the lower part. The "Rhizocorallium Dolomite" (*R. Jenense*, probably a sponge) of the latter district contains the only Bunter fauna of any importance. In Lorraine and the Eifel and Saar districts there are micaceous clays and sandstones with plant remains—

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the *Voltzia* sandstone. The lower beds in the Black Forest, Vosges, Odenwald and Lorraine very generally contain strings of dolomite and carnelian—the so-called "Carneol bank." (2) *Middle Buntsandstein-Hauptbuntsandstein* (900 ft.), the bulk of this subdivision is made up of weakly-cemented, coarse-grained sandstones, oblique lamination is very prevalent, and occasional conglomeratic beds make their appearance. The uppermost bed is usually fine-grained and bears the footprints of *Cheirotherium*. In the Vosges district, this subdivision of the Bunter is called the *Grès des Vosges,* or the *Grès principal*, which comprises: (i.) red micaceous and argillaceous sandstone; (ii.) the *conglomérat principal*; and (iii.) *Grès bigarré principal* (=*grès des Vosges*, properly so-called). (3) *Lower Buntsandstein*, fine-grained clayey and micaceous sandstones, red-grey, yellow, white and mottled. The cement of the sandstones is often felspathic; for this reason they yield useful porcelain clays in the Thuringerwald. Clay galls are common in the sandstones of some districts, and in the neighbourhood of the Harz an oolitic calcareous sandstone, *Rogenstein*, occurs. In eastern Hesse, the lowest beds are crumbly, shaly clays, *Brockelschiefern*.

The following are the subdivisions usually adopted in England:—(1) Upper Mottled Sandstone, red variegated sandstones, soft and generally free from pebbles. (2) Bunter Pebble Beds, harder red and brown sandstones with quartzose pebbles, very abundant in some places. (3) Lower Mottled Sandstone, very similar to the upper division. The Bunter beds occupy a large area in the midland counties where they form dry, healthy ground of moderate elevation (Cannock Chase, Trentham, Sherwood Forest, Sutton Coldfield, &c.). Southward they may be followed through west Somerset to the cliffs of Budleigh Salterton in Devon; while northward they pass through north Staffordshire, Cheshire and Lancashire to the Vale of Eden and St Bees, reappearing in Elgin and Arran. A deposit of these rocks lies in the Vale of Clwyd and probably flanks the eastern side of the Pennine Hills, although here it is not so readily differentiated from the Keuper beds. The English Bunter rests with a slight unconformity upon the older formations. It is generally absent in the south-eastern counties, but thickens rapidly in the opposite direction, as is shown by the following table:—

Lancashire and W. Cheshire.	Staffordshire.	Leicestershire and Warwickshire.
(1) 500 ft.	50-200 ft.	Absent
(2) 500-750 ft.	100-300 ft.	0-100 ft.
(3) 200-500 ft.	0-100 ft.	Absent

The material forming the Bunter beds of England came probably from the north-west, but in Devonshire there are indications which point to an additional source.

In the Alpine region, most of the Trias differs markedly from that of England and northern Germany, being of distinctly marine origin; here the Bunter is represented by the *Werfen beds* (from Werfen in Salzburg) in the northern Alps, a series of red and greenish-grey micaceous shales with gypsum, rock salt and limestones in the upper part; while in the southern Alps (S. Tirol) there is an upper series of red clays, the *Campil beds*, and a lower series of thin sandstones, the *Seis beds*. Mojsisovics von Mojsvar has pointed out that the Alpine Bunter belongs to the single zone of *Natica costata* and *Tirolites cassianus*.

Fossils in the Bunter are very scarce; in addition to the footprints of *Cheirotherium*, direct evidence of amphibians is found in such forms as *Trematosaurus* and *Mastodonsaurus. Myophoria costata* and *Gervillea Murchisoni* are characteristic fossils. Plants are represented by *Voltzia* and by equisetums and ferns.

In England, the Bunter sandstones frequently act as valuable reservoirs of underground water; sometimes they are used for building stone or for foundry sand. In Germany some of the harder beds have yielded building stones, which were much used in the middle ages in the construction of cathedrals and castles in southern Germany and on the Rhine. In the northern Eifel region, at Mechernich and elsewhere, this formation contains lead ore in the form of spots and patches (*Knotenerz*) in the sandstone; some of the lead ore was worked by the Romans.

For a consideration of the relationship of the Bunter beds to formations of the like age in other parts of the world, see Triassic System.

(J. A. H.)

BUNTING, JABEZ (1779-1858), English Wesleyan divine, was born of humble parentage at Manchester on the 13th of May 1779. He was educated at Manchester grammar school, and at the age of nineteen began to preach, being received into full connexion in 1803. He continued to minister for upwards of fifty-seven years in Manchester, Sheffield, Leeds, Liverpool, London and elsewhere. In 1835 he was appointed president of the first Wesleyan theological college (at Hoxton), and in this position he succeeded in materially raising the standard of education among Wesleyan ministers. He was four times chosen to be president of the conference, was repeatedly secretary of the "Legal Hundred," and for eighteen years was secretary to the Wesleyan Missionary Society. Under him Methodism ceased to be a society based upon Anglican foundation, and became a distinct church. He favoured the extension of lay power in committees, and was particularly zealous in the cause of foreign missions. Bunting was a popular preacher, and an effective platform speaker; in 1818 he was given the degree of M.A. by Aberdeen University, and in 1834 that of D.D. by Wesleyan University of Middletown, Conn., U.S.A. He died on the 16th of June 1858. His eldest son, William Maclardie Bunting (1805-1866), was also a distinguished Wesleyan minister; and his grandson Sir Percy William Bunting (b. 1836), son of T.P. Bunting, became prominent as a liberal nonconformist and editor of the *Contemporary Review* from 1882, being knighted in 1908.

See *Lives* of Jabez Bunting (1859) and W.M. Bunting (1870) by Thomas Percival Bunting.

BUNTING, properly the common English name of the bird called by Linnaeus *Emberiza miliaria*, but now used in a general sense for all members of the family *Emberizidae*, which are closely allied to the finches (*Fringillidae*), though, in Professor W.K. Parker's opinion, to be easily distinguished therefrom—the *Emberizidae* possessing what none of the *Fringillidae* do, an additional pair of palatal bones, "palato-maxillaries." It will probably follow from this diagnosis that some forms of birds, particularly those of the New World, which have hitherto been commonly assigned to the latter, really belong to the former, and among them the genera *Cardinalis* and *Phrygilus*. The additional palatal bones just named are also found in several other peculiarly American families, namely, *Tanagridae*, *Icteridae* and *Mniotiltidae*—whence it

may be perhaps inferred that the *Emberizidae* are of Transatlantic origin. The buntings generally may be also outwardly distinguished from the finches by their angular gape, the posterior portion of which is greatly deflected; and most of the Old-World forms, together with some of those of the New World, have a bony knob on the palate—a swollen outgrowth of the dentary edges of the bill. Correlated with this peculiarity the maxilla usually has the tomia sinuated, and is generally concave, and smaller and narrower than the mandible, which is also concave to receive the palatal knob. In most other respects the buntings greatly resemble the finches, but their eggs are generally distinguishable by the irregular hair-like markings on the shell. In the British Islands by far the commonest species of bunting is the yellow-hammer (*E. citrinella*), but the true bunting (or corn-bunting, or bunting-lark, as it is called in some districts) is a very well-known bird, while the reed-bunting (*E. schoeniclus*) frequents marshy soils almost to the exclusion of the two former. In certain localities in the south of England the cirl-bunting (*E. cirlus*) is also a resident; and in winter vast flocks of the snow-bunting (*Plectrophanes nivalis*), at once recognizable by its pointed wings and elongated hind-claws, resort to our shores and open grounds. This last is believed to breed sparingly on the highest mountains of Scotland, but the majority of the examples which visit us come from northern regions, for it is a species which in summer inhabits the whole circumpolar area. The ortolan (*E. hortulana*), so highly prized for its delicate flavour, occasionally appears in England, but the British Islands seem to lie outside its proper range. On the continent of Europe, in Africa and throughout Asia, many other species are found, while in America the number belonging to the family cannot at present be computed. The beautiful and melodious cardinal (*Cardinalis virginianus*), commonly called the Virginian nightingale, must be included in this family.

(A. N.)

BUNTING (a word of doubtful origin, possibly connected with *bunt*, to sift, or with the Ger. *bunt*, of varied colour), a loosely woven woollen cloth for making flags; the term is also used of a collection of flags, and particularly those of a ship.

[v.04 p.0803]

BUNYAN, JOHN (1628-1688), English religious writer, was born at Elstow, about a mile from Bedford, in November 1628. His father, Thomas Bunyan,[1] was a tinker, or, as he described himself, a "brasier." The tinkers then formed a hereditary caste, which was held in no high estimation. Bunyan's father had a fixed residence, and was able to send his son to a village school where reading and writing were taught.

The years of John's boyhood were those during which the Puritan spirit was in the highest vigour all over England; and nowhere had that spirit more influence than in Bedfordshire. It is not wonderful, therefore, that a lad to whom nature had given a powerful imagination and sensibility which amounted to a disease, should have been early haunted by religious terrors. Before he was ten his sports were interrupted by fits of remorse and despair; and his sleep was disturbed by dreams of fiends trying to fly away with him. As he grew older his mental conflicts became still more violent. The strong language in which he described them strangely misled all his earlier biographers except Southey. It was long an ordinary practice with pious writers to cite Bunyan as an instance of the supernatural power of divine grace to rescue the human soul from the lowest depths of wickedness. He is called in one book the most notorious of profligates; in another, the brand plucked from the burning. Many excellent persons, whose moral character from boyhood to old age has been free from any stain discernible to their fellow-creatures, have, in their autobiographies and diaries, applied to themselves, and doubtless with sincerity, epithets as severe as could be applied to Titus Oates or Mrs Brownrigg. It is quite certain that Bunyan was, at eighteen, what, in any but the most austerely puritanical circles, would have been considered as a young man of singular gravity and innocence. Indeed, it may be remarked that he, like many other penitents who, in general terms, acknowledge themselves to have been the worst of mankind, fired up, and stood vigorously on his defence, whenever any particular charge was brought against him by others. He declares, it is true, that he had let loose the reins on the neck of his lusts, that he had delighted in all transgressions against the divine law, and that he had been the ringleader of the youth of Elstow in all manner of vice. But when those who wished him ill accused him of licentious amours, he called on God and the angels to attest his purity. No woman, he said, in heaven, earth or hell, could charge him with having ever made any improper advances to her. Not only had he been strictly faithful to his wife; but he had, even before his marriage, been perfectly spotless. It does not appear from his own confessions, or from the railings of his enemies, that he ever was drunk in his life. One bad habit he contracted, that of using profane language; but he tells us that a single reproof cured him so effectually that he never offended again. The worst that can be laid to his charge is that he had a great liking for some diversions, quite harmless in themselves, but condemned by the rigid precisians among whom he lived, and for whose opinion he had a great respect. The four chief sins of which he was guilty were dancing, ringing the bells of the parish church, playing at tipcat and reading the history of Sir Bevis of Southampton. A rector of the school of Laud would have held such a young man up to the whole parish as a model. But Bunyan's notions of good and evil had been learned in a very different school; and he was made miserable by the conflict between his tastes and his scruples.

When he was about seventeen the ordinary course of his life was interrupted by an event which gave a lasting colour to his thoughts. He enlisted in the Parliamentary army,[2] and served during the Decisive campaign of 1645. All that we know of his military career is, that, at the siege of some town,[3] one of his comrades, who had marched with the besieging army instead of him, was killed by a shot. Bunyan ever after considered himself as having been saved from death by the special interference of Providence. It may be observed that his imagination was strongly impressed by the glimpse which he had caught of the pomp of war. To the last he loved to draw his illustrations of sacred things from camps and fortresses, from guns, drums, trumpets, flags of truce, and regiments arrayed each under its own banner. His Greatheart, his Captain Boanerges and his Captain Credence are evidently portraits, of which the originals were among those martial saints who fought and expounded in Fairfax's army.

In 1646 Bunyan returned home and married about two years later. His wife had some pious relations, and brought him as her only portion some pious books. His mind, excitable by nature, very imperfectly disciplined by education, and exposed to the enthusiasm which was then epidemic in England, began to be fearfully disordered. The story of the struggle is told in Bunyan's *Grace Abounding*.

In outward things he soon became a strict Pharisee. He was constant in attendance at prayers and sermons. His favourite amusements were, one after another, relinquished, though not without many painful struggles. In the middle of a game at tipcat he paused, and stood staring wildly upwards with his stick in his hand. He had heard a voice asking him whether he would leave his sins and go to heaven, or

keep his sins and go to hell; and he had seen an awful countenance frowning on him from the sky. The odious vice of bell-ringing he renounced; but he still for a time ventured to go to the church tower and look on while others pulled the ropes. But soon the thought struck him that, if he persisted in such wickedness, the steeple would fall on his head; and he fled in terror from the accursed place. To give up dancing on the village green was still harder; and some months elapsed before he had the fortitude to part with his darling sin. When this last sacrifice had been made, he was, even when tried by the maxims of that austere time, faultless. All Elstow talked of him as an eminently pious youth. But his own mind was more unquiet than ever. Having nothing more to do in the way of visible reformation, yet finding in religion no pleasures to supply the place of the juvenile amusements which he had relinquished, he began to apprehend that he lay under some special malediction; and he was tormented by a succession of fantasies which seemed likely to drive him to suicide or to Bedlam. At one time he took it into his head that all persons of Israelite blood would be saved, and tried to make out that he partook of that blood; but his hopes were speedily destroyed by his father, who seems to have had no ambition to be regarded as a Jew. At another time Bunyan was disturbed by a strange dilemma: "If I have not faith, I am lost; if I have faith, I can work miracles." He was tempted to cry to the puddles between Elstow and Bedford, "Be ye dry," and to stake his eternal hopes on the event. Then he took up a notion that the day of grace for Bedford and the neighbouring villages was past; that all who were to be saved in that part of England were already converted; and that he had begun to pray and strive some months too late. Then he was harassed by doubts whether the Turks were not in the right and the Christians in the wrong. Then he was troubled by a maniacal impulse which prompted him to pray to the trees, to a broomstick, to the parish bull.

As yet, however, he was only entering the valley of the shadow of death. Soon the darkness grew thicker. Hideous forms floated before him. Sounds of cursing and wailing were in his ears. His way ran through stench and fire, close to the mouth of the bottomless pit. He began to be haunted by a strange curiosity about the unpardonable sin, and by a morbid longing to commit it. But the most frightful of all the forms [v.04 p.0804] which his disease took was a propensity to utter blasphemy, and especially to renounce his share in the benefits of the redemption. Night and day, in bed, at table, at work, evil spirits, as he imagined, were repeating close to his ear the words, "Sell him, sell him." He struck at the hobgoblins; he pushed them from him; but still they were ever at his side. He cried out in answer to them, hour after hour, "Never, never; not for thousands of worlds; not for thousands." At length, worn out by this long agony, he suffered the fatal words to escape him, "Let him go if he will." Then his misery became more fearful than ever. He had done what could not be forgiven. He had forfeited his part of the great sacrifice. Like Esau, he had sold his birthright; and there was no longer any place for repentance. "None," he afterwards wrote, "knows the terrors of those days but myself." He has described his sufferings with singular energy, simplicity and pathos. He envied the brutes; he envied the very stones on the street, and the tiles on the houses. The sun seemed to withhold its light and warmth from him. His body, though cast in a sturdy mould, and though still in the highest vigour of youth, trembled whole days together with the fear of death and judgment. He fancied that this trembling was the sign set on the worst reprobates, the sign which God had put on Cain. The unhappy man's emotion destroyed his power of digestion. He had such pains that he expected to burst asunder like Judas, whom he regarded as his prototype.

Neither the books which Bunyan read, nor the advisers whom he consulted, were likely to do much good in a case like his. His small library had received a most unseasonable addition, the account of the lamentable end of Francis Spira. One ancient man of high repute for piety, whom the sufferer consulted, gave an opinion which might well have produced fatal consequences. "I am afraid," said Bunyan, "that I have committed the sin against the Holy Ghost." "Indeed," said the old fanatic, "I am afraid that you have."

At length the clouds broke; the light became clearer and clearer; and the enthusiast who had imagined that he was branded with the mark of the first murderer, and destined to the end of the arch-traitor, enjoyed peace and a cheerful confidence in the mercy of God. Years elapsed, however, before his nerves, which had been so perilously overstrained, recovered their tone. When he had joined a Baptist society at Bedford, and was for the first time admitted to partake of the eucharist, it was with difficulty that he could refrain from imprecating destruction on his brethren while the cup was passing from hand to hand. After he had been some time a member of the congregation he began to preach; and his sermons produced a powerful effect. He was indeed illiterate; but he spoke to illiterate men. The severe training through which he had passed had given him such an experimental knowledge of all the modes of religious melancholy as he could never have gathered from books; and his vigorous genius, animated by a fervent spirit of devotion, enabled him not only to exercise a great influence over the vulgar, but even to extort the half-contemptuous admiration of scholars. Yet it was long before he ceased to be tormented by an impulse which urged him to utter words of horrible impiety in the pulpit.[4] Bunyan was finally relieved from the internal sufferings which had embittered his life by sharp persecution from without. He had been five years a preacher when the Restoration put it in the power of the Cavalier gentlemen and clergymen all over the country to oppress the dissenters. In November 1660 he was flung into Bedford gaol; and there he remained, with some intervals of partial and precarious liberty, during twelve years. The authorities tried to extort from him a promise that he would abstain from preaching; but he was convinced that he was divinely set apart and commissioned to be a teacher of righteousness, and he was fully determined to obey God rather than man. He was brought before several tribunals, laughed at, caressed, reviled, menaced, but in vain. He was facetiously told that he was quite right in thinking that he ought not to hide his gift; but that his real gift was skill in repairing old kettles. He was compared to Alexander the coppersmith. He was told that if he would give up preaching he should be instantly liberated. He was warned that if he persisted in disobeying the law he would be liable to banishment, and that if he were found in England after a certain time his neck would be stretched. His answer was, "If you let me out to-day, I will preach again to-morrow." Year after year he lay patiently in a dungeon, compared with which the worst prison now to be found in the island is a palace.[5] His fortitude is the more extraordinary because his domestic feelings were unusually strong. Indeed, he was considered by his stern brethren as somewhat too fond and indulgent a parent. He had four small children, and among them a daughter who was blind, and whom he loved with peculiar tenderness. He could not, he said, bear even to let the wind blow on her; and now she must suffer cold and hunger; she must beg; she must be beaten; "yet," he added, "I must, I must do it."

His second wife, whom he had married just before his arrest, tried in vain for his release; she even petitioned the House of Lords on his behalf. While he lay in prison he could do nothing in the way of his old trade for the support of his family. He determined, therefore, to take up a new trade. He learned to make

long-tagged thread laces; and many thousands of these articles were furnished by him to the hawkers. While his hands were thus busied he had other employments for his mind and his lips. He gave religious instruction to his fellow-captives, and formed from among them a little flock, of which he was himself the pastor. He studied indefatigably the few books which he possessed. His two chief companions were the Bible and Fox's *Book of Martyrs*. His knowledge of the Bible was such that he might have been called a living concordance; and on the margin of his copy of the *Book of Martyrs* are still legible the ill-spelt lines of doggerel in which he expressed his reverence for the brave sufferers, and his implacable enmity to the mystical Babylon.

Prison life gave him leisure to write, and during his first imprisonment he wrote, in addition to several tracts and some verse, *Grace Abounding to the Chief of Sinners*, the narrative of his own religious experience. The book was published in 1666. A short period of freedom was followed by a second offence and a further imprisonment. Bunyan's works were coarse, indeed, but they showed a keen mother wit, a great command of the homely mother tongue, an intimate knowledge of the English Bible, and a vast and dearly bought spiritual experience. They therefore, when the corrector of the press had improved the syntax and the spelling, were well received.

Much of Bunyan's time was spent in controversy. He wrote sharply against the Quakers, whom he seems always to have held in utter abhorrence. He wrote against the liturgy of the Church of England. No two things, according to him, had less affinity than the form of prayer and the spirit of prayer. Those, he said with much point, who have most of the spirit of prayer are all to be found in gaol; and those who have most zeal for the form of prayer are all to be found at the alehouse. The doctrinal Articles, on the other hand, he warmly praised and defended. The most acrimonious of all his works is his *Defence of Justification by Faith*, an answer to what Bunyan calls "the brutish and beastly latitudinarianism" of Edward Fowler, afterwards bishop of Gloucester, an excellent man, but not free from the taint of Pelagianism.

[v.04 p.0805]

Bunyan had also a dispute with some of the chiefs of the sect to which he belonged. He doubtless held with perfect sincerity the distinguishing tenet of that sect, but he did not consider that tenet as one of high importance, and willingly joined in communion with pious Presbyterians and Independents. The sterner Baptists, therefore, loudly pronounced him a false brother. A controversy arose which long survived the original combatants. The cause which Bunyan had defended with rude logic and rhetoric against Kiffin and Danvers has since been pleaded by Robert Hall with an ingenuity and eloquence such as no polemical writer has ever surpassed.

During the years which immediately followed the Restoration, Bunyan's confinement seems to have been strict. But as the passions of 1660 cooled, as the hatred with which the Puritans had been regarded while their reign was recent gave place to pity, he was less and less harshly treated. The distress of his family, and his own patience, courage and piety, softened the hearts of his judges. Like his own Christian in the cage, he found protectors even among the crowd at Vanity Fair. The bishop of the diocese, Dr Barlow, is said to have interceded for him. At length the prisoner was suffered to pass most of his time beyond the walls of the gaol, on condition, as it should seem, that he remained within the town of Bedford.

He owed his complete liberation to one of the worst acts of one of the worst governments that England has ever seen. In 1671 the Cabal was in power. Charles II. had concluded the treaty by which he bound himself to set up the Roman Catholic religion in England. The first step which he took towards that end was to annul, by an unconstitutional exercise of his prerogative, all the penal statutes against the Roman Catholics; and in order to disguise his real design, he annulled at the same time the penal statutes against Protestant nonconformists. Bunyan was consequently set at large.[6] In the first warmth of his gratitude he published a tract, in which he compared Charles to that humane and generous Persian king, who, though not himself blest with the light of the true religion, favoured the chosen people, and permitted them, after years of captivity, to rebuild their beloved temple.

Before he left his prison he had begun the book which has made his name immortal.[7] The history of that book is remarkable. The author was, as he tells us, writing a treatise, in which he had occasion to speak of the stages of the Christian progress. He compared that progress, as many others had compared it, to a pilgrimage. Soon his quick wit discovered innumerable points of similarity which had escaped his predecessors. Images came crowding on his mind faster than he could put them into words, quagmires and pits, steep hills, dark and horrible glens, soft vales, sunny pastures, a gloomy castle, of which the courtyard was strewn with the skulls and bones of murdered prisoners, a town all bustle and splendour, like London on the Lord Mayor's Day, and the narrow path, straight as a rule could make it, running on up hill and down hill, through city and through wilderness, to the Black River and the Shining Gate. He had found out, as most people would have said, by accident, as he would doubtless have said, by the guidance of Providence, where his powers lay. He had no suspicion, indeed, that he was producing a masterpiece. He could not guess what place his allegory would occupy in English literature; for of English literature he knew nothing. Those who suppose him to have studied the *Faery Queen* might easily be confuted, if this were the proper place for a detailed examination of the passages in which the two allegories have been thought to resemble each other. The only work of fiction, in all probability, with which he could compare his *Pilgrim* was his old favourite, the legend of Sir Bevis of Southampton. He would have thought it a sin to borrow any time from the serious business of his life, from his expositions, his controversies and his lace tags, for the purpose of amusing himself with what he considered merely as a trifle. It was only, he assures us, at spare moments that he returned to the House Beautiful, the Delectable Mountains and the Enchanted Ground. He had no assistance. Nobody but himself saw a line till the whole was complete. He then consulted his pious friends. Some were pleased. Others were much scandalized. It was a vain story, a mere romance, about giants, and lions, and goblins, and warriors, sometimes fighting with monsters, and sometimes regaled by fair ladies in stately palaces. The loose atheistical wits at Will's might write such stuff to divert the painted Jezebels of the court; but did it become a minister of the gospel to copy the evil fashions of the world? There had been a time when the cant of such fools would have made Bunyan miserable. But that time was past; and his mind was now in a firm and healthy state. He saw that in employing fiction to make truth clear and goodness attractive, he was only following the example which every Christian ought to propose to himself; and he determined to print.

The *Pilgrim's Progress* was published in February 1678. Soon the irresistible charm of a book which gratified the imagination of the reader with all the action and scenery of a fairy tale, which exercised his ingenuity by setting him to discover a multitude of curious analogies, which interested his feelings for

human beings, frail like himself, and struggling with temptations from within and from without, which every moment drew a smile from him by some stroke of quaint yet simple pleasantry, and nevertheless left on his mind a sentiment of reverence for God and of sympathy for man, began to produce its effect. In puritanical circles, from which plays and novels were strictly excluded, that effect was such as no work of genius, though it were superior to the *Iliad*, to *Don Quixote* or to *Othello*, can ever produce on a mind accustomed to indulge in literary luxury. A second edition came out in the autumn with additions; and the demand became immense. The eighth edition, which contains the last improvements made by the author, was published in 1682, the ninth in 1684, the tenth in 1685. The help of the engraver had early been called in; and tens of thousands of children looked with terror and delight on execrable copperplates, which represented Christian thrusting his sword into Apollyon, or writhing in the grasp of Giant Despair. In Scotland, and in some of the colonies, the *Pilgrim* was even more popular than in his native country. Bunyan has told us, with very pardonable vanity, that in New England his dream was the daily subject of the conversation of thousands, and was thought worthy to appear in the most superb binding. He had numerous admirers in Holland, and amongst the Huguenots of France.

He continued to work the gold-field which he had discovered, and to draw from it new treasures, not indeed with quite such ease and in quite such abundance as when the precious soil was still virgin, but yet with success, which left all competition far behind. In 1680 appeared the *Life and Death of Mr Badman*; in 1684 the second part of the *Pilgrim's Progress*. In 1682 appeared the *Holy War*, which if the *Pilgrim's Progress* did not exist, would be the best allegory that ever was written.

Bunyan's place in society was now very different from what it had been. There had been a time when many dissenting ministers, who could talk Latin and read Greek, had affected to treat him with scorn. But his fame and influence now far exceeded theirs. He had so great an authority among the Baptists that he was popularly called Bishop Bunyan. His episcopal visitations were annual. From Bedford he rode every year to London, and preached there to large and attentive congregations. From London he went his circuit through the country, animating the zeal of his brethren, collecting and distributing alms and making up quarrels. The magistrates seem in general to have given him little trouble. But there is reason to believe that, in the year 1685, he was in some danger of again occupying his old quarters in Bedford gaol. In that year the rash and wicked enterprise of Monmouth gave the government a pretext for prosecuting the
[v.04 p.0806] nonconformists; and scarcely one eminent divine of the Presbyterian. Independent or Baptist persuasion remained unmolested. Baxter was in prison: Howe was driven into exile: Henry was arrested.

Two eminent Baptists, with whom Bunyan had been engaged in controversy, were in great peril and distress. Danvers was in danger of being hanged; and Kiffin's grandsons were actually hanged. The tradition is that, during those evil days, Bunyan was forced to disguise himself as a wagoner, and that he preached to his congregation at Bedford in a smock-frock, with a cart-whip in his hand. But soon a great change took place. James II. was at open war with the church, and found it necessary to court the dissenters. Some of the creatures of the government tried to secure the aid of Bunyan. They probably knew that he had written in praise of the indulgence of 1672, and therefore hoped that he might be equally pleased with the indulgence of 1687. But fifteen years of thought, observation and commerce with the world had made him wiser. Nor were the cases exactly parallel. Charles was a professed Protestant; James was a professed Papist. The object of Charles's indulgence was disguised; the object of James's indulgence was patent. Bunyan was not deceived. He exhorted his hearers to prepare themselves by fasting and prayer for the danger which menaced their civil and religious liberties, and refused even to speak to the courtier who came down to remodel the corporation of Bedford, and who, as was supposed, had it in charge to offer some municipal dignity to the bishop of the Baptists.

Bunyan did not live to see the Revolution.[8] In the summer of 1688 he undertook to plead the cause of a son with an angry father, and at length prevailed on the old man not to disinherit the young one. This good work cost the benevolent intercessor his life. He had to ride through heavy rain. He came drenched to his lodgings on Snow Hill, was seized with a violent fever, and died in a few days (August 31). He was buried in Bunhill Fields; and many Puritans, to whom the respect paid by Roman Catholics to the reliques and tombs of saints seemed childish or sinful, are said to have begged with their dying breath that their coffins might be placed as near as possible to the coffin of the author of the *Pilgrim's Progress*.

The fame of Bunyan during his life, and during the century which followed his death, was indeed great, but was almost entirely confined to religious families of the middle and lower classes. Very seldom was he during that time mentioned with respect by any writer of great literary eminence. Young coupled his prose with the poetry of the wretched D'Urfey. In the *Spiritual Quixote*, the adventures of Christian are ranked with those of Jack the Giant-Killer and John Hickathrift. Cowper ventured to praise the great allegorist, but did not venture to name him. It is a significant circumstance that, for a long time all the numerous editions of the *Pilgrim's Progress* were evidently meant for the cottage and the servants' hall. The paper, the printing, the plates, were all of the meanest description. In general, when the educated minority and the common people differ about the merit of a book, the opinion of the educated minority finally prevails. The *Pilgrim's Progress* is perhaps the only book about which the educated minority has come over to the opinion of the common people.

The attempts which have been made to improve and to imitate this book are not to be numbered. It has been done into verse; it has been done into modern English. The Pilgrimage of Tender Conscience, the Pilgrimage of Good Intent, the Pilgrimage of Seek Truth, the Pilgrimage of Theophilus, the Infant Pilgrim, the Hindoo Pilgrim, are among the many feeble copies of the great original. But the peculiar glory of Bunyan is that those who most hated his doctrines have tried to borrow the help of his genius. A Catholic version of his parable may be seen with the head of the virgin in the title-page. On the other hand, those Antinomians for whom his Calvinism is not strong enough, may study the Pilgrimage of Hephzibah, in which nothing will be found which can be construed into an admission of free agency and universal redemption. But the most extraordinary of all the acts of Vandalism by which a fine work of art was ever defaced was committed in the year 1853. It was determined to transform the *Pilgrim's Progress* into a Tractarian book. The task was not easy; for it was necessary to make two sacraments the most prominent objects in the allegory, and of all Christian theologians, avowed Quakers excepted, Bunyan was the one in whose system the sacraments held the least prominent place. However, the Wicket Gate became a type of baptism, and the House Beautiful of the eucharist. The effect of this change is such as assuredly the ingenious person who made it never contemplated. For, as not a single pilgrim passes through the Wicket Gate in infancy, and as Faithful hurries past the House Beautiful without stopping, the lesson which the

fable in its altered shape teaches, is that none but adults ought to be baptized, and that the eucharist may safely be neglected. Nobody would have discovered from the original *Pilgrim's Progress* that the author was not a Paedobaptist. To turn his book into a book against Paedobaptism, was an achievement reserved for an Anglo-Catholic divine. Such blunders must necessarily be committed by every man who mutilates parts of a great work, without taking a comprehensive view of the whole.

(M.)

The above article has been slightly corrected as to facts, as compared with its form in the 9th edition. Bunyan's works were first partially collected in a folio volume (1692) by his friend Charles Doe. A larger edition (2 vols., 1736-1737) was edited by Samuel Wilson of the Barbican. In 1853 a good edition (3 vols., Glasgow) was produced by George Offer. Southey's edition (1830) of the *Pilgrim's Progress* contained his *Life* of Bunyan. Since then various editions of the *Pilgrim's Progress*, many illustrated (by Cruikshank, Byam Shaw, W. Strang and others), have appeared. An interesting life by "the author of *Mark Rutherford*" (W. Hale White) was published in 1904. Other lives are by J.A. Froude (1880) in the "English Men of Letters" series, and E. Venables (1888); but the standard work on the subject is *John Bunyan; his Life, Times and Work* (1885), by the Rev. J. Brown of Bedford. A bronze statue, by Boehm, was presented to the town by the duke of Bedford in 1874.

[1] The name, in various forms as Buignon, Buniun, Bonyon or Binyan, appears in the local records of Elstow and the neighbouring parishes at intervals from as far back as 1199. They were small freeholders, but all the property except the cottage had been lost in the time of Bunyan's grandfather. Bunyan's own account of his family as the "meanest and most despised of all the families of the land" must be put down to his habitual self-depreciation. Thomas Bunyan had a forge and workshop at Elstow.

[2] There is no direct evidence to show on which side he fought, but the balance of probability justifies this view.

[3] There is no means of identifying the place besieged. It has been assumed to be Leicester, which was captured by the Royalists in May 1645, and recovered by Fairfax in the next month.

[4] Bunyan had joined, in 1653, the nonconformist community which met under a certain Mr Gifford at St John's church, Bedford. This congregation was not Baptist, properly so called, as the question of baptism, with other doctrinal points, was left open. When Bunyan removed to Bedford in 1655, he became a deacon of this church, and two years later he was formally recognized as a preacher, his fame soon spreading through the neighbouring counties. His wife died soon after their removal to Bedford, and he also lost his friend and pastor, Mr Gifford. His earliest work was directed against Quaker mysticism and appeared in 1656. It was entitled *Some Gospel Truths Opened*; it was followed in the same year by a second tract in the same sense, *A Vindication of Gospel Truths*.

[5] He was not, however, as has often been stated, confined in the old gaol which stood on the bridge over the Ouse, but in the county gaol.

[6] His formal pardon is dated the 13th of September 1672; but five months earlier he had received a royal licence to preach, and acted for the next three years as pastor of the nonconformist body to which he belonged, in a barn on the site of which stands the present Bunyan Meeting.

[7] It is now generally supposed that Bunyan wrote his *Pilgrim's Progress*, not during his twelve years' imprisonment, but during a short period of incarceration in 1675, probably in the old gaol on the bridge.

[8] He had resumed his pastorate in Bedford after his imprisonment of 1675, and, although he frequently preached in London to crowded congregations, and is said in the last year of his life to have been, of course unofficially, chaplain to Sir John Shorter, lord mayor of London, he remained faithful to his own congregation.

BUNZLAU, a town of Germany, in Prussian Silesia, on the right bank of the Bober, 27 m. from Liegnitz on the Berlin-Breslau railway, which crosses the river by a great viaduct. Pop. (1900) 14,590. It has a handsome market square, an Evangelical and a Roman Catholic church, and monuments to the Russian field marshal Kutusov, who died here, and to the poet Martin Opitz von Boberfeld. The Bunzlau pottery is famous; woollen and linen cloth are manufactured, and there is a considerable trade in grain and cattle. Bunzlau (Boleslavia) received its name in the 12th century from Duke Boleslav, who separated it from the duchy of Glogau. Its importance was increased by numerous privileges and the possession of extensive mining works. It was frequently captured and recaptured in the wars of the 17th century, and in 1739 was completely destroyed by fire. On the 30th of August 1813 the French were here defeated on the retreat from the Katzbach by the Silesian army of the allies.

BUONAFEDE, APPIANO (1716-1793), Italian philosopher, was born at Comachio, in Ferrara, and died in Rome. He became professor of theology at Naples in 1740, and, entering the religious body of the Celestines, rose to be general of the order. His principal works, generally published under the assumed name of "Agatopisto Cromazione," are on the history of philosophy:—*Della Istoria e delle Indole di ogni Filosofia*, 7 vols., 1772 seq.; and *Della Restaurazione di ogni Filosofia ne' Secoli*, xvi., xvii., xviii., 3 vols., 1789 (German trans. by C. Heydenreich). The latter gives a valuable account of 16th-century Italian philosophy. His other works are *Istoria critica e filosofica del suicidio* (1761); *Delle conquiste celebri esaminate col naturale diritto delle genti* (1763); *Storia critica del moderno diritto di natura e delle genti* (1789); and a few poems and philosophic comedies.

[v.04 p.0807]

BUOY (15th century "boye"; through O.Fr. or Dutch, from Lat. *boia*, fetter; the word is now usually pronounced as "boy," and it has been spelt in that form; but Hakluyt's *Voyages* spells it "bwoy," and this seems to indicate a different pronunciation, which is also given in some modern dictionaries), a floating body employed to mark the navigable limits of channels, their fairways, sunken dangers or isolated rocks, mined or torpedo grounds, telegraph cables, or the position of a ship's anchor after letting go; buoys are also used for securing a ship to instead of anchoring. They vary in size and construction from a log of wood to steel mooring buoys for battleships or a steel gas buoy.

In 1882 a conference was held upon a proposal to establish a uniform system of buoyage. It was under the presidency of the then duke of Edinburgh, and consisted of representatives from the various bodies interested. The questions of colour, visibility, shape and size were considered, and any modifications necessary owing to locality. The committee proposed the following uniform system of buoyage, and it is now adopted by the general lighthouse authorities of the United Kingdom:—

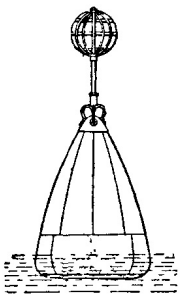


Fig. 1.

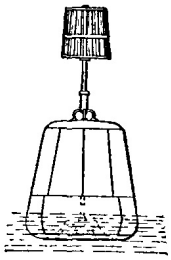


Fig. 2.

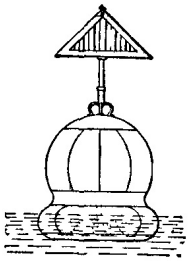


Fig. 3.

(1) The mariner when approaching the coast must determine his position on the chart, and note the direction of flood tide. (2) The term "starboard-hand" shall denote that side which would be on the right hand of the mariner either going with the main stream of the flood, or entering a harbour, river or estuary from seaward; the term "port-hand" shall denote the left hand of the mariner in the same circumstances. (3)[1] Buoys showing the pointed top of a cone above water shall be called conical (fig. 1) and shall always be starboard-hand buoys, as above defined. (4)[1] Buoys showing a flat top above water shall be called can (fig. 2) and shall always be port-hand buoys, as above defined. (5) Buoys showing a domed top above water shall be called spherical (fig. 3) and shall mark the ends of middle grounds. (6) Buoys having a tall central structure on a broad face shall be called pillar buoys (fig. 4), and like all other special buoys, such as bell buoys, gas buoys, and automatic sounding buoys, shall be placed to mark special positions either on the coast or in the approaches to harbours. (7) Buoys showing only a mast above water shall be called spar-buoys (fig. 5).[2] (8) Starboard-hand buoys shall always be painted in one colour only. (9) Port-hand buoys shall be painted of another characteristic colour, either single or parti-colour. (10) Spherical buoys (fig. 3) at the ends of middle grounds shall always be distinguished by horizontal stripes of white colour, (11) Surmounting beacons, such as staff and globe and others,[3] shall always be painted of one dark colour. (12) Staff and globe (fig. 1) shall only be used on starboard-hand buoys, staff and cage (fig. 2) on port hand; diamonds (fig. 7) at the outer ends of middle grounds; and triangles (fig. 3) at the inner ends. (13) Buoys on the same side of a channel, estuary or tideway may be distinguished from each other by names, numbers or letters, and where necessary by a staff surmounted with the appropriate beacon. (14) Buoys intended for moorings (fig. 6) may be of shape and colour according to the discretion of the authority within whose jurisdiction they are laid, but for marking submarine telegraph cables the colour shall be green with the word "Telegraph" painted thereon in white letters.

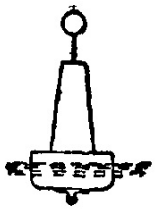


Fig. 4.

Fig. 5.

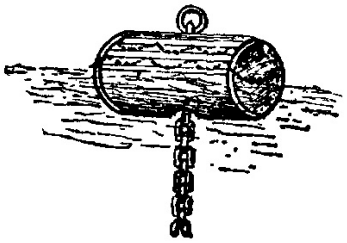


Fig. 6.

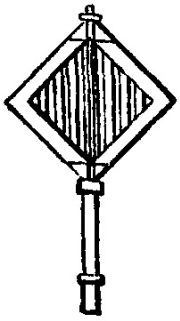
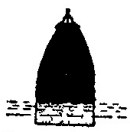


Fig. 7.

Buoying and Marking of Wrecks.—(15) Wreck buoys in the open sea, or in the approaches to a harbour or estuary, shall be coloured green, with the word "Wreck" painted in white letters on them. (16) When possible, the buoy should be laid near to the side of the wreck next to mid-channel. (17) When a wreck-marking vessel is used, it shall, if possible, have its top sides coloured green, with the word "Wreck" in white letters thereon, and shall exhibit by day, three balls on a yard 20 ft. above the sea, two placed vertically at one end and one at the other, the single ball being on the side nearer to the wreck; in fog a gong or bell is rung in quick succession at intervals not exceeding one minute (wherever practicable); by night, three white fixed lights are similarly arranged as the balls in daytime, but the ordinary riding lights are not shown. (18) In narrow waters or in rivers and harbours under the jurisdiction of local authorities, the same rules may be adopted, or at discretion, varied as follows:—When a wreck-marking vessel is used she shall carry a cross-yard on a mast with two balls by day, placed horizontally not less than 6 nor more than 12 ft. apart, and by night two lights similarly placed. When a barge or open boat only is used, a flag or ball may be shown in the daytime. (19) The position in which the marking vessel is placed with reference to the wreck shall be at the discretion of the local authority having jurisdiction. A uniform system by shape has been adopted by the Mersey Dock and Harbour Board, to assist a mariner by night, and, in addition, where practicable, a uniform colour; the fairway buoys are specially marked by letter, shape and colour.

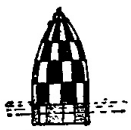


Single Colour

Fig. 8.

Vertical Stripes

Fig. 9.



Chequered

Fig. 10.

Horizontal Stripes

Fig. 11.

British India has practically adopted the British system, United States and Canada have the same uniform system; in the majority of European maritime countries and China various uniform systems have been adopted. In Norway and Russia the compass system is used, the shape, colour and surmountings of the buoys indicating the compass bearing of the danger from the buoy; this method is followed in the open sea by Sweden. An international uniform system of buoyage, although desirable, appears impracticable. Germany employs yellow buoys to mark boundaries of quarantine stations. The question of shape versus colour, irrespective of size, is a disputed one; the shape is a better guide at night and colour in the daytime. All markings (figs. 8, 9, 10 and 11) should be subordinate to the main colour of the buoy; the varying backgrounds and atmospheric conditions render the question a complex one.

London Trinity House buoys are divided into five classes, their use depending on whether the spot to be

marked is in the open sea or otherwise exposed position, or in a sheltered harbour, or according to the depth of water and weight of moorings, or the importance of the danger. Buoys are moored with specially tested cables; the eye at the base of the buoy is of wrought iron to prevent it becoming "reedy" and the cable is secured to blocks (see ANCHOR) or mushroom anchors according to the nature of the ground. London Trinity House buoys are built of steel, with bulkheads to lessen the risk of their sinking by collision, and, with the exception of bell buoys, do not contain water ballast. In 1878 gas buoys, with fixed and occulting lights of 10-candle power, were introduced. In 1896 Mr T. Matthews, engineer-in-chief in the London Trinity Corporation, developed the present design (fig. 12). It is of steel, the lower plates being 5/8 in. and the upper 7/16 in. in thickness, thus adding to the stability. The buoy holds 380 cub. ft. of gas, and exhibits an occulting light for 2533 hours. This light is placed 10 ft. above the sea, and, with an intensity of 50 candles, is visible 8 m. It occults every ten seconds, and there is seven seconds' visibility, with three seconds' obscuration. The occultations are actuated by a double valve arrangement. In the body of the apparatus there is a gas chamber having sufficient capacity, in the case of an occulting light, for maintaining the flame in action for seven seconds, and by means of a by-pass a jet remains alight in the centre of the burner. During the period of three seconds' darkness the gas chamber is re-charged, and at the end of that period is again opened to the main burner by a tripping arrangement of the valve, and remains in action seven seconds. The gas chamber of the buoy, charged to five atmospheres, is replenished from a steamer fitted with a pump and transport receivers carrying indicating valves, the receivers being charged to ten atmospheres. Practically no inconvenience has resulted from saline or other deposits, the glazing (glass) of the lantern being thoroughly cleaned when re-charging the buoy. Acetylene, generated from calcium carbide inside the buoy, is also used. Electric light is exhibited from some buoys in the United States. In England an automatic electric buoy has been suggested, worked by the motion of the waves, which cause a stream of water to act on a turbine connected with a dynamo generating electricity. Boat-shaped buoys are also used (river Humber) for carrying a light and bell. The Courtenay whistling buoy (fig. 13) is actuated by the undulating movement of the waves. A hollow cylinder extends from the lower part of the buoy to still water below the movement of the waves, ensuring that the water inside keeps at mean level, whilst the buoy follows the movements of the waves. By a special apparatus the compressed air is forced through the whistle at the top of the buoy, and the air is replenished by two tubes at the upper part of the buoy. It is fitted with a rudder and secured in the usual manner. Automatic buoys cannot be relied on in calm days with a smooth sea. The nun buoy (fig. 14) for indicating the position of an anchor after letting go, is secured to the crown of the anchor by a buoy rope. It is usually made of galvanized iron, and consists of two cones joined together at the base. It is painted red for the port anchor and green for the starboard.

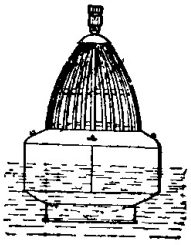


FIG. 12.

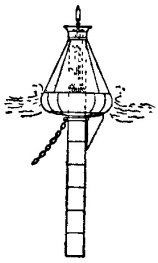


FIG. 13.

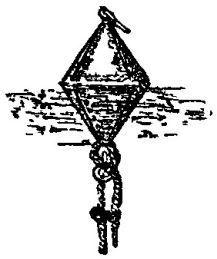


FIG. 14.

[v.04 p.0808]

Mooring buoys (fig. 6) for battleships are built of steel in four watertight compartments, and have sufficient buoyancy to keep afloat should a compartment be pierced; they are 13 ft. long with a diameter of 6½ ft. The mooring cable (bridle) passes through a watertight 16-in. trunk pipe, built vertically in the centre of the buoy, and is secured to a "rocking shackle" on the upper surface of the buoy. Large mooring buoys are usually protected by horizontal wooden battens and are fitted with life chains.

(J. W. D.)

[1] In carrying out the above system the Northern Lights Commissioners have adopted a red colour for conical or starboard-hand buoys, and black colour for can or port-hand buoys, and this system is applicable to the whole of Scotland.

[2] Useful where floating ice is encountered.

[3] St George and St Andrew crosses are principally employed to surmount shore beacons.

BUPALUS AND **ATHENIS,** sons of Archermus, and members of the celebrated school of sculpture in marble which flourished in Chios in the 6th century B.C. They were contemporaries of the poet Hipponax (about 540 B.C.), whom they were said to have caricatured. Their works consisted almost entirely of draped female figures, Artemis, Fortune, the Graces, whence the Chian school has been well called a school of Madonnas. Augustus brought many of the works of Bupalus and Athenis to Rome, and placed them on the gable of the temple of Apollo Palatinus.

BUPHONIA, in Greek antiquities, a sacrificial ceremony, forming part of the Diipolia, a religious festival held on the 14th of the month Skirophorion (June-July) at Athens, when a labouring ox was sacrificed to Zeus Polieus as protector of the city in accordance with a very ancient custom. The ox was driven forward to the altar, on which grain was spread, by members of the family of the Kentriadae (from κέντρον, a goad), on whom this duty devolved hereditarily. When it began to eat, one of the family of the Thaulonidae advanced with an axe, slew the ox, then immediately threw away the axe and fled. The axe, as being polluted by murder, was now carried before the court of the Prytaneum (which tried inanimate objects for homicide) and there charged with having caused the death of the ox, for which it was thrown into the sea. Apparently this is an early instance analogous to deodand (*q.v.*). Although the slaughter of a labouring ox was forbidden, it was considered excusable in the exceptional circumstances; none the less it was regarded as a murder.

Porphyrius, *De Abstinentia*, ii. 29; Aelian, *Var. Hist.* viii. 3; Schol. Aristoph. *Nubes*, 485; Pausanias, i. 24, 28; see also Band, *De Diipoliorum Sacro Atheniensium* (1873).

BUR, or BURR (apparently the same word as Danish *borre*, burdock, cf. Swed. *kard-boore*), a prickly fruit or head of fruits, as of the burdock. In the sense of a woody outgrowth on the trunk of a tree, or "gnaur," the effect of a crowded bud-development, the word is probably adapted from the Fr. *bourre*, a vine-bud.

BURANO, a town of Venetia, in the province of Venice, on an island in the lagoons, 6 m. N.E. of Venice by

sea. Pop. (1901) 8169. It is a fishing town, with a large royal school of lace-making employing some 500 girls. It was founded, like all the towns in the lagoons, by fugitives from the mainland cities at the time of the barbarian invasions. Torcello is a part of the commune of Burano.

BURAUEN, a town of the province of Leyte, island of Leyte, Philippine Islands, on the Dagitan river, 21 m. S. by W. of Tacloban, the capital. Pop. (1903) 18,197. Burauen is situated in a rich hemp-growing region, and hemp is its only important product. The language is Visayan.

BURBAGE, JAMES (d. 1597), English actor, is said to have been born at Stratford-on-Avon. He was a member of the earl of Leicester's players, probably for several years before he is first mentioned (1574) as being at the head of the company. In 1576, having secured the lease of land at Shoreditch, Burbage erected there the successful house which was known for twenty years as *The* Theatre from the fact that it was the first ever erected in London. He seems also to have been concerned in the erection of a second theatre in the same locality, the Curtain, and later, in spite of all difficulties and a great deal of local opposition, he started what became the most celebrated home of the rising drama,—the Blackfriars theatre, built in 1596 near the old Dominican friary.

His son Richard Burbage (*c.* 1567-1619), more celebrated than his father, was the Garrick of the Elizabethan stage, and acted all the great parts in Shakespeare's plays. He, too, is said to have been born at Stratford-on-Avon, and made his first appearance at an early age at one of his father's theatres. He had established a reputation by the time he was twenty, and in the next dozen years was the most popular English actor, the "Roscius" of his day. At the time of his father's death, a lawsuit was in progress against the lessor from whom James Burbage held the land on which The Theatre stood. This suit was continued by Richard and his brother Cuthbert, and in 1569 they pulled down the Shoreditch house and used the materials to erect the Globe theatre, famous for its connexion with Shakespeare. They occupied it as a summer playhouse, retaining the Blackfriars, which was roofed in, for winter performances. In this venture [v.04 p.0809] Richard Burbage had Shakespeare and others as his partners, and it was in one or the other of these houses that he gained his greatest triumphs, taking the leading part in almost every new play. He was specially famous for his impersonation of Richard III. and other Shakespearian characters, and it was in tragedy that he especially excelled. Every playwright of his day endeavoured to secure his services. He died on the 13th of March 1619. Richard Burbage was a painter as well as an actor. The Felton portrait of Shakespeare is attributed to him, and there is a portrait of a woman, undoubtedly by him, preserved at Dulwich College.

BURBOT, or Eel-Pout (*Lota vulgaris*), a fish of the family Gadidae, which differs from the ling in the dorsal and anal fins reaching the caudal, and in the small size of all the teeth. It exceeds a length of 3 ft. and is a freshwater fish, although examples are exceptionally taken in British estuaries and in the Baltic; some specimens are handsomely marbled with dark brown, with black blotches on the back and dorsal fins. It is very locally distributed in central and northern Europe, and an uncommon fish in England. Its flesh is excellent. The American burbot (*Lota maculosa*) is coarser, and not favoured for the table.

BURCKHARDT, JAKOB (1818-1897), Swiss writer on art, was born at Basel on the 25th of May 1818; he was educated there and at Neuchâtel, and till 1839 was intended to be a pastor. In 1838 he made his first journey to Italy, and also published his first important articles *Bemerkungen über schweizerische Kathedralen*. In 1839 he went to the university of Berlin, where he studied till 1843, spending part of 1841 at Bonn, where he was a pupil of Franz Kugler, the art historian, to whom his first book, *Die Kunstwerke D. belgischen Städte* (1842), was dedicated. He was professor of history at the university of Basel (1845-1847, 1849-1855 and 1858-1893) and at the federal polytechnic school at Zurich (1855-1858). In 1847 he brought out new editions of Kugler's two great works, *Geschichte der Malerei* and *Kunstgeschichte*, and in 1853 published his own work, *Die Zeit Constantins des Grossen*. He spent the greater part of the years 1853-1854 in Italy, where he collected the materials for one of his most famous works, *Der Cicerone: eine Anleitung sum Genuss der Kunstwerke Italiens*, which was dedicated to Kugler and appeared in 1855 (7th German edition, 1899; English translation of the sections relating to paintings, by Mrs A.H. Clough, London, 1873). This work, which includes sculpture and architecture, as well as painting, has become indispensable to the art traveller in Italy. About half of the original edition was devoted to the art of the Renaissance, so that Burckhardt was naturally led on to the preparation of his two other celebrated works, *Die Cultur der Renaissance in Italien* (1860, 5th German edition 1896, and English translation, by S.G.C. Middlemore, in 2 vols., London, 1878), and the *Geschichte der Renaissance in Italien* (1867, 3rd German edition 1891). In 1867 he refused a professorship at Tübingen, and in 1872 another (that left vacant by Ranke) at Berlin, remaining faithful to Basel. He died in 1897.

See Life by Hans Trog in the *Basler Jahrbuch* for 1898, pp. 1-172.

(W. A. B. C.)

BURCKHARDT, JOHN LEWIS [Johann Ludwig] (1784-1817), Swiss traveller and orientalist, was born at Lausanne on the 24th of November 1784. After studying at Leipzig and Göttingen he visited England in the summer of 1806, carrying a letter of introduction from the naturalist Blumenbach to Sir Joseph Banks, who, with the other members of the African Association, accepted his offer to explore the interior of Africa. After studying in London and Cambridge, and inuring himself to all kinds of hardships and privations, Burckhardt left England in March 1809 for Malta, whence he proceeded, in the following autumn, to Aleppo. In order to obtain a better knowledge of oriental life he disguised himself as a Mussulman, and took the name of Sheikh Ibrahim Ibn Abdallah. After two years passed in the Levant he had thoroughly mastered Arabic, and had acquired such accurate knowledge of the Koran, and of the commentaries upon its religion and laws, that after a critical examination the most learned Mussulmans entertained no doubt of his being really what he professed to be, a learned doctor of their law. During his residence in Syria he visited Palmyra, Damascus, Lebanon and thence journeyed via Petra to Cairo with the intention of joining a caravan to Fezzan, and of exploring from there the sources of the Niger. In 1812, whilst waiting for the departure of the caravan, he travelled up the Nile as far as Dar Mahass; and then, finding it impossible to penetrate westward, he made a journey through the Nubian desert in the character of a poor Syrian merchant, passing by Berber and Shendi to Suakin, on the Red Sea, whence he performed the pilgrimage to Mecca by way of Jidda. At Mecca he stayed three months and afterwards visited Medina. After enduring privations and sufferings of the severest kind, he returned to Cairo in June 1815 in a state of great exhaustion; but in the spring of 1816 he travelled to Mount Sinai, whence he returned to Cairo in June,

and there again made preparations for his intended journey to Fezzan. Several hindrances prevented his prosecuting this intention, and finally, in April 1817, when the long-expected caravan prepared to depart, he was seized with illness and died on the 15th of October. He had from time to time carefully transmitted to England his journals and notes, and a very copious series of letters, so that nothing which appeared to him to be interesting in the various journeys he made has been lost. He bequeathed his collection of 800 vols. of oriental MSS. to the library of Cambridge University.

His works were published by the African Association in the following order:—*Travels in Nubia* (to which is prefixed a biographical memoir) (1819); *Travels in Syria and the Holy Land* (1822); *Travels in Arabia* (1829); *Arabic Proverbs, or the Manners and Customs of the Modern Egyptians* (1830); *Notes on the Bedouins and Wahabys* (1831).

BURDEAU, AUGUSTE LAURENT (1851-1894), French politician, was the son of a labourer at Lyons. Forced from childhood to earn his own living, he was enabled to secure an education by bursarships at the Lycée at Lyons and at the Lycée Louis Le Grand in Paris. In 1870 he was at the École Normale Supérieure in Paris, but enlisted in the army, and was wounded and made prisoner in 1871. In 1874 he became professor of philosophy, and translated several works of Herbert Spencer and of Schopenhauer into French. His extraordinary aptitude for work secured for him the position of *chef de cabinet* under Paul Bert, the minister of education, in 1881. In 1885 he was elected deputy for the department of the Rhone, and distinguished himself in financial questions. He was several times minister, and became minister of finance in the cabinet of Casimir-Périer (from the 3rd of November 1893 to the 22nd of May 1894). On the 5th of July 1894 he was elected president of the chamber of deputies. He died on the 12th of December 1894, worn out with overwork.

BURDEN, or BURTHEN, (1) (A.S. *byrthen*, from *beran*, to bear), a load, both literally and figuratively; especially the carrying capacity of a ship; in mining and smelting, the tops or heads of stream-work which lie over the stream of tin, and the proportion of ore and flux to fuel in the charge of a blast-furnace. In Scots and English law the term is applied to an encumbrance on real or personal property. (2) (From the Fr. *bourdon*, a droning, humming sound) an accompaniment to a song, or the refrain of a song; hence a chief or recurrent topic, as "the burden of a speech."

BURDER, GEORGE (1752-1832), English Nonconformist divine, was born in London on the 5th of June 1752. In early manhood he was an engraver, but in 1776 he began preaching, and was minister of the Independent church at Lancaster from 1778 to 1783. Subsequently he held charges at Coventry (1784-1803) and at Fetter Lane, London (1803-1832). He was one of the founders of the British and Foreign Bible Society, the Religious Tract Society, and the London Missionary Society, and was secretary to the last-named for several years. As editor of the *Evangelical Magazine* and author of *Village Sermons*, he commanded a wide influence. He died on the 29th of May 1832, and a Life (by H. Burder) appeared in 1833.

[v.04 p.0810]

BURDETT, SIR FRANCIS (1770-1844), English politician, was the son of Francis Burdett by his wife Eleanor, daughter of William Jones of Ramsbury manor, Wiltshire, and grandson of Sir Robert Burdett, Bart. Born on the 25th of January 1770, he was educated at Westminster school and Oxford, and afterwards travelled in France and Switzerland. He was in Paris during the earlier days of the French Revolution, a visit which doubtless influenced his political opinions. Returning to England he married in 1793 Sophia, daughter of Thomas Coutts the banker, and this lady brought him a large fortune. In 1796 he became member of parliament for Boroughbridge, having purchased this seat from the representatives of the 4th duke of Newcastle, and in 1797 succeeded his grandfather as fifth baronet. In parliament he soon became prominent as an opponent of Pitt, and as an advocate of popular rights. He denounced the war with France, the suspension of the Habeas Corpus Act, the proposed exclusion of John Horne Tooke from parliament, and quickly became the idol of the people. He was instrumental in securing an inquiry into the condition of Coldbath Fields prison, but as a result of this step he was for a time prevented by the government from visiting any prison in the kingdom. In 1797 he made the acquaintance of Horne Tooke, whose pupil he became, not only in politics, but also in philology. At the general election of 1802 Burdett was a candidate for the county of Middlesex, but his return was declared void in 1804, and in the subsequent contest he was defeated. In 1805 this return was amended in his favour, but as this was again quickly reversed, Burdett, who had spent an immense sum of money over the affair, declared he would not stand for parliament again.

At the general election of 1806 Burdett was a leading supporter of James Paull, the reform candidate for the city of Westminster; but in the following year a misunderstanding led to a duel between Burdett and Paull in which both combatants were wounded. At the general election in 1807 Burdett, in spite of his reluctance, was nominated for Westminster, and amid great enthusiasm was returned at the top of the poll. He took up again the congenial work of attacking abuses and agitating for reform, and in 1810 came sharply into collision with the House of Commons. A radical named John Gale Jones had been committed to prison by the House, a proceeding which was denounced by Burdett, who questioned the power of the House to take this step, and vainly attempted to secure the release of Jones. He then issued a revised edition of his speech on this occasion, and it was published by William Cobbett in the *Weekly Register*. The House voted this action a breach of privilege, and the speaker issued a warrant for Burdett's arrest. Barring himself in his house, he defied the authorities, while the mob gathered in his defence. At length his house was entered, and under an escort of soldiers he was conveyed to the Tower. Released when parliament was prorogued, he caused his supporters much disappointment by returning to Westminster by water, and so avoiding a demonstration in his honour. He then brought actions against the speaker and the serjeant-at-arms, but the courts upheld the action of the House. In parliament Burdett denounced corporal punishment in the army, and supported all attempts to check corruption, but his principal efforts were directed towards procuring a reform of parliament, and the removal of Roman Catholic disabilities. In 1809 he had proposed a scheme of parliamentary reform, and returning to the subject in 1817 and 1818 he anticipated the Chartist movement by suggesting universal male suffrage, equal electoral districts, vote by ballot, and annual parliaments; but his motions met with very little support. He succeeded, however, in carrying a resolution in 1825 that the House should consider the laws concerning Roman Catholics. This was followed by a bill embodying his proposals, which passed the Commons but was rejected by the Lords. In 1827 and 1828 he again proposed resolutions on this subject, and saw his proposals become law in 1829. In 1820 Burdett had again come into serious conflict with the government. Having severely censured its action with reference to the "Manchester massacre," he was prosecuted at Leicester assizes,

fined £1000, and committed to prison for three months. After the passing of the Reform Bill in 1832 the ardour of the veteran reformer was somewhat abated, and a number of his constituents soon took umbrage at his changed attitude. Consequently he resigned his seat early in 1837, but was re-elected. However, at the general election in the same year he forsook Westminster and was elected member for North Wiltshire, which seat he retained, acting in general with the Conservatives, until his death on the 23rd of January 1844. He left a son, Robert, who succeeded to the baronetcy, and five daughters, the youngest of whom became the celebrated Baroness Burdett-Coutts. Impetuous and illogical, Burdett did good work as an advocate of free speech, and an enemy of corruption. He was exceedingly generous, and spent money lavishly in furthering projects of reform.

See A. Stephens, *Life of Horne Tooke* (London, 1813); Spencer Walpole, *History of England* (London, 1878-1886); C. Abbot, Baron Colchester, *Diary and Correspondence* (London, 1861).

(A. W. H.*)

BURDETT-COUTTS, ANGELA GEORGINA BURDETT-COUTTS, Baroness (1814-1906), English philanthropist, youngest daughter of Sir Francis Burdett, was born on the 21st of April 1814. When she was three-and-twenty, she inherited practically the whole of the immense wealth of her grandfather Thomas Coutts (approaching two millions sterling, a fabulous sum in those days), by the will of the duchess of St Albans, who, as the actress Henrietta Mellon, had been his second wife and had been left it on his death in 1821. Miss Burdett then took the name of Coutts in addition to her own. "The faymale heiress, Miss Anjaley Coutts," as the author of the *Ingoldsby Legends* called her in his ballad on the queen's coronation in that year (1837), at once became a notable subject of public curiosity and private cupidity; she received numerous offers of marriage, but remained resolutely single, devoting herself and her riches to philanthropic work, which made her famous for well-applied generosity. In May 1871 she was created a peeress, as Baroness Burdett-Coutts of Highgate and Brookfield, Middlesex. On the 18th of July 1872 she was presented at the Guildhall with the freedom of the city of London, the first case of a woman being admitted to that fellowship. It was not till 1881 that, when sixty-seven years old, she married William Lehman Ashmead-Bartlett, an American by birth, and brother of Sir E.A. Ashmead-Bartlett, the Conservative member of parliament; and he then took his wife's name, entering the House of Commons as member for Westminster, 1885. Full of good works, and of social interest and influence, the baroness lived to the great age of ninety-two, dying at her house in Stratton Street, Piccadilly, on the 30th of December 1906, of bronchitis. She was buried in Westminster Abbey.

The extent of her benefactions during her long and active life can only be briefly indicated; but the baroness must remain a striking figure in the social history of Victorian England, for the thoughtful and conscientious care with which she "held her wealth in trust" for innumerable good objects. It was her aim to benefit the working-classes in ways involving no loss of independence or self-respect. She carefully avoided taking any side in party politics, but she was actively interested in phases of Imperial extension which were calculated to improve the condition of the black races, as in Africa, or the education and relief of the poor or suffering in any part of the world. Though she made no special distinction of creed in her charities, she was a notable benefactor of the Church of England, building and endowing churches and church schools, endowing the bishoprics of Cape Town and of Adelaide (1847), and founding the bishopric of British Columbia (1857). Among her many educational endowments may be specified the St Stephen's Institute in Vincent Square, Westminster (1846); she started sewing schools in Spitalfields when the silk trade began to fail; helped to found the shoe-black brigade; and placed hundreds of destitute boys in training-ships for the navy and merchant service. She established Columbia fish market (1869) in Bethnal Green, and presented it to the city, but owing to commercial difficulties this effort, which cost her over £200,000, proved abortive. She supported various schemes of emigration to the colonies; and in Ireland helped to promote the fishing industry by starting schools, and providing boats, besides advancing £250,000 in 1880 for supplying seed to the impoverished tenants. She was devoted to the protection of animals and prevention of cruelty, and took up with characteristic zeal the cause of the costermongers' donkeys, building stables for them on her Columbia market estate, and giving prizes for the best-kept animals. She helped to inaugurate the society for the prevention of cruelty to children, and was a keen supporter of the ragged school union. Missionary efforts of all sorts; hospitals and nursing; industrial homes and refuges; relief funds, &c., found in her a generous supporter. She was associated with Louisa Twining and Florence Nightingale; and in 1877-1878 raised the Turkish compassionate fund for the starving peasantry and fugitives in the Russo-Turkish War (for which she obtained the order of the Medjidieh, a solitary case of its conference on a woman). She relieved the distressed in far-off lands as well as at home, her helping hand being stretched out to the Dyaks of Borneo and the aborigines of Australia. She was a liberal patroness of the stage, literature and the arts, and delighted in knowing all the cultured people of the day. In short, her position in England for half a century may well be summed up in words attributed to King Edward VII., "after my mother (Queen Victoria) the most remarkable woman in the kingdom."

[v.04 p.0811]

BURDON-SANDERSON, SIR JOHN SCOTT, Bart. (1828-1905), English physiologist, was born at West Jesmand, near Newcastle, on the 21st of December 1828. A member of a well-known Northumbrian family, he received his medical education at the university of Edinburgh and at Paris. Settling in London, he became medical officer of health for Paddington in 1856 and four years later physician to the Middlesex and the Brompton Consumption hospitals. When diphtheria appeared in England in 1858 he was sent to investigate the disease at the different points of outbreak, and in subsequent years he carried out a number of similar inquiries, *e.g.* into the cattle plague and into cholera in 1866. He became first principal of the Brown Institution at Lambeth in 1871, and in 1874 was appointed Jodrell professor of physiology at University College, London, retaining that post till 1882. When the Waynflete chair of physiology was established at Oxford in 1882, he was chosen to be its first occupant, and immediately found himself the object of a furious anti-vivisectionist agitation. The proposal that the university should spend £10,000 in providing him with a suitable laboratory, lecture-rooms, &c., in which to carry on his work, was strongly opposed, by some on grounds of economy, but largely because he was an upholder of the usefulness and necessity of experiments upon animals. It was, however, eventually carried by a small majority (88 to 85), and in the same year the Royal Society awarded him a royal medal in recognition of his researches into the electrical phenomena exhibited by plants and the relations of minute organisms to disease, and of the services he had rendered to physiology and pathology. In 1885 the university of Oxford was asked to vote £500 a year for three years for the purposes of the laboratory, then approaching completion. This proposal

was fought with the utmost bitterness by Sanderson's opponents, the anti-vivisectionists including E.A. Freeman, John Ruskin and Bishop Mackarness of Oxford. Ultimately the money was granted by 412 to 244 votes. In 1895 Sanderson was appointed regius professor of medicine at Oxford, resigning the post in 1904; in 1899 he was created a baronet. His attainments, both in biology and medicine, brought him many honours. He was Croonian lecturer to the Royal Society in 1867 and 1877 and to the Royal College of Physicians in 1891; gave the Harveian oration before the College of Physicians in 1878; acted as president of the British Association at Nottingham in 1893; and served on three royal commissions—Hospitals (1883), Tuberculosis, Meat and Milk (1890), and University for London (1892). He died at Oxford on the 23rd of November 1905.

BURDWAN, or BARDWAN, a town of British India, in Bengal, which gives its name to a district and to a division. It has a station on the East Indian railway, 67 m. N.W. from Calcutta. Pop. (1901) 35,022. The town consists really of numerous villages scattered over an area of 9 sq. m., and is entirely rural in character. It contains several interesting ancient tombs, and at Nawab Hat, some 2 m. distant, is a group of 108 Siva *lingam* temples built in 1788. The place was formerly very unhealthy, but this has been to a large extent remedied by the establishment of water-works, a good supply of water being derived from the river Banka. Within the town, the principal objects of interest are the palaces and gardens of the maharaja. The chief educational institution is the Burdwan Raj college, which is entirely supported out of the maharaja's estate.

The town owes its importance entirely to being the headquarters of the maharaja of Burdwan, the premier nobleman of lower Bengal, whose rent-roll is upwards of £300,000. The *raj* was founded in 1657 by Abu Ra Kapur, of the Kapur Khatri family of Kotli in Lahore, Punjab, whose descendants served in turn the Mogul emperors and the British government. The great prosperity of the *raj* was due to the excellent management of Maharaja Mahtab Chand (d. 1879), whose loyalty to the government—especially during the Santal rebellion of 1855 and the mutiny of 1857—was rewarded with the grant of a coat of arms in 1868 and the right to a personal salute of 13 guns in 1877. Maharaja Bijai Chand Mahtab (b. 1881), who succeeded his adoptive father in 1888, earned great distinction by the courage with which he risked his life to save that of Sir Andrew Fraser, the lieutenant-governor of Bengal, on the occasion of the attempt to assassinate him made by Bengali malcontents on the 7th of November 1908.

The DISTRICT OF BURDWAN lies along the right bank of the river Bhagirathi or Hugli. It has an area of 2689 sq. m. It is a flat plain, and its scenery is uninteresting. Chief rivers are the Bhagirathi, Damodar, Ajai, Banka, Kunur and Khari, of which only the Bhagirathi is navigable by country cargo boats throughout the year. The district was acquired by the East India Company under the treaty with Nawab Mir Kasim in 1760, and confirmed by the emperor Shah Alam in 1765. The land revenue was fixed in perpetuity with the zemindar in 1793. In 1901 the population was 1,532,475, showing an increase of 10% in the decade. There are several indigo factories. The district suffered from drought in 1896-1897. The Eden Canal, 20 m. long, has been constructed for irrigation. The weaving of silk is the chief native industry. As regards European industries, Burdwan takes the first place in Bengal. It contains the great coal-field of Raniganj, first opened in 1874, with an output of more than three million tons. The Barrakur ironworks produce pig-iron, which is reported to be as good as that of Middlesbrough. Apart from Burdwan town and Raniganj, the chief places are the river-marts of Katwa and Kalna. The East Indian railway has several lines running through the district.

The DIVISION OF BURDWAN comprises the six districts of Burdwan, Birbhum, Bankura, Midnapore, Hugli and Howrah, with a total area of 13,949 sq. m., and a population in 1901 of 8,240,076.

BUREAU (a Fr. word from *burel* or *bureau*, a coarse cloth used for coverings), a writing-table or desk (*q.v.*), also in America a low chest of drawers. From the meaning of "desk," the word is applied to an office or place of business, and particularly a government department; in the United States the term is used of certain subdivisions of the executive departments, as the bureau of statistics, a division of the treasury department. The term "bureaucracy" is often employed to signify the concentration of administrative power in bureaux or departments, and the undue interference by officials not only in the details of government, but in matters outside the scope of state interference. The word is also frequently used in the sense of "red-tapism."

BURFORD, a market town in the Woodstock parliamentary division of Oxfordshire, England, 18 m. W.N.W. of Oxford. Pop. (1901) 1146. It is pleasantly situated in the valley of the Windrush, the broad, picturesque main street sloping upward from the stream, beside which stands the fine church, to the summit of the ridge flanking the valley on the south, along which runs the high road from Oxford. The church of St John the Baptist has a nave and aisles, mainly Perpendicular in appearance owing to alterations in that period, but actually of earlier construction, the south aisle flanked by two beautiful chapels and an ornate porch; transepts and a central tower, and choir with flanking chapels. The massive Norman tower contrasts strongly with the delicate Perpendicular spire rising upon it. The church contains many interesting memorials, and, in the nave, a Perpendicular shrine dedicated to St Peter. Near the church is the half-ruined priory house, built in the 17th century, and containing much fine plaster ornament characteristic of the period; a curious chapel adjoins it. William Lenthall, speaker of the Long Parliament, was granted this mansion, died here in 1662, and is buried in the church. In the High Street nearly every house is of some antiquity. The Tolsey or old town hall is noteworthy among them; and under one of the houses is an Early English crypt. Burford is mentioned as the scene of a synod in 705; in 752 Cuthred, king of the West Saxons, fighting for independence, here defeated Æthelbald, king of Mercia; and in 1649 the town and district were the scene of victorious operations by Cromwell.

[v.04 p.0812]

BURG, a town of Germany, in Prussian Saxony, on the river Ihle, and the railway from Berlin to Magdeburg, 14 m. N.E. of the latter. Pop. (1900) 22,432. It is noted for its cloth manufactures and boot-making, which afford employment to a great part of its population. The town belonged originally to the lordship of Querfurt, passed with this into the possession of the archbishops of Magdeburg in 1496, and was ceded in 1635 with other portions of the Magdeburg territories to Saxony; in 1687 it was ceded to Brandenburg. It owes its prosperity to the large influx of industrious French, Palatinate and Walloon refugees, which took place about the end of the 17th century.

BURGAGE (from Lat. *burgus*, a borough), a form of tenure, both in England and Scotland, applicable to the property connected with the old municipal corporations and their privileges. In England, it was a

tenure whereby houses or tenements in an ancient borough were held of the king or other person as lord at a certain rent. The term is of less practical importance in the English than in the Scottish system, where it held an important place in the practice of conveyancing, real property having been generally divided into feudal-holding and burgage-holding. Since the Conveyancing (Scotland) Act 1874, there is, however, not much distinction between burgage tenure and free holding. It is usual to speak of the English burgage-tenure as a relic of Saxon freedom resisting the shock of the Norman conquest and its feudalism, but it is perhaps more correct to consider it a local feature of that general exemption from feudality enjoyed by the *municipia* as a relic of their ancient Roman constitution. The reason for the system preserving for so long its specifically distinct form in Scottish conveyancing was because burgage-holding was an exception to the system of subinfeudation which remained prevalent in Scotland when it was suppressed in England. While other vassals might hold of a graduated hierarchy of overlords up to the crown, the burgess always held directly of the sovereign. It is curious that while in England the burgage-tenure was deemed a species of socage, to distinguish it from the military holdings, in Scotland it was strictly a military holding, by the service of watching and warding for the defence of the burgh. In England the franchises enjoyed by burgesses, freemen and other consuetudinary constituencies in burghs, were dependent on the character of the burgage-tenure. Tenure by burgage was subject to a variety of customs, the principal of which was Borough-English (*q.v.*).

See Pollock and Maitland, *History of English Law* (1898).

BURGAS (sometimes written *Burghaz*, *Bourgas* or *Borgas*, and, in the middle ages, *Pyrgos*), a seaport, and capital of the department of Burgas, in Bulgaria (Eastern Rumelia), on the gulf of Burgas, an inlet of the Black Sea, in 42° 27′ N. and 27° 35′ E. Pop. (1906) 12,846. Burgas is built on a low foreland, between the lagoons of Ludzha, on the north, and Kara-Yunus, on the west; it faces towards the open sea on the east, and towards its own harbour on the south. The principal approach is a broad isthmus on the north-west, along which runs the railway to Philippopolis and Adrianople. Despite its small population and the rivalry of Varna and the Turkish port of Dedeagatch, Burgas has a considerable transit trade. Its fine harbour, formally opened in 1904, has an average depth of five fathoms; large vessels can load at the quays, and the outer waters of the gulf are well lit by lighthouses on the islets of Hagios Anastasios and Megalo-Nisi. In 1904, the port accommodated over 1400 ships, of about 700,000 tons. These included upwards of 800 Bulgarian and Turkish sailing-vessels, engaged in the coasting trade. Fuel, machinery and miscellaneous goods are imported, chiefly from Austria-Hungary, Belgium, Germany and the United Kingdom; the exports include grain, wool, tallow, cheese, butter, attar of roses, &c. Pottery and pipes are manufactured from clay obtained in the neighbourhood.

BURGDORF (Fr. *Berthoud*), an industrial town in the Swiss canton of Bern. It is built on the left bank of the Emme and is 14 m. by rail N.E. of Bern. The lower (or modern) town is connected by a curious spiral street with the upper (or old) town. The latter is picturesquely perched on a hill, at a height of 1942 ft. above sea-level (or 167 ft. above the river); it is crowned by the ancient castle and by the 15th-century parish church, in the former of which Pestalozzi set up his educational establishment between 1798 and 1804. A large trade is carried on at Burgdorf in the cheese of the Emmenthal, while among the industrial establishments are railway works, and factories of cloth, white lead and tinfoil. In 1900 the population was 8404, practically all Protestants and German-speaking. A fine view of the Bernese Alps is obtained from the castle, while a still finer one may be enjoyed from the Lueg hill (2917 ft.), north-east of the town. The castle dates from the days of the dukes of Zäringen (11th-12th centuries), the last of whom (Berchtold V.) built walls round the town at its foot, and granted it a charter of liberties. On the extinction (1218) of that dynasty both castle and town passed to the counts of Kyburg, and from them, with the rest of their possessions, in 1272 by marriage to the cadet line of the Habsburgs. By that line they were sold in 1384, with Thun, to the town of Bern, whose bailiffs ruled in the castle till 1798.

(W. A. B. C.)

BURGEE (of unknown origin), a small three-cornered or swallow-tailed flag or pennant used by yachts or merchant vessels; also a kind of small coal burnt in engine furnaces.

BÜRGER, GOTTFRIED AUGUST (1748-1794), German poet, was born on the 1st of January 1748 at Molmerswende near Halberstadt, of which village his father was the Lutheran pastor. He was a backward child, and at the age of twelve was practically adopted by his maternal grandfather, Bauer, at Aschersleben, who sent him to the *Pädagogium* at Halle. Hence in 1764 he passed to the university, as a student of theology, which, however, he soon abandoned for the study of jurisprudence. Here he fell under the influence of C.A. Klotz (1738-1771), who directed Bürger's attention to literature, but encouraged rather than discouraged his natural disposition to a wild and unregulated life. In consequence of his dissipated habits, he was in 1767 recalled by his grandfather, but on promising to reform was in 1768 allowed to enter the university of Göttingen as a law student. As he continued his wild career, however, his grandfather withdrew his support and he was left to his own devices. Meanwhile he had made fair progress with his legal studies, and had the good fortune to form a close friendship with a number of young men of literary tastes. In the Göttingen *Musenalmanach*, edited by H. Boie and F.W. Gotter, Bürger's first poems were published, and by 1771 he had already become widely known as a poet. In 1772, through Boie's influence, Bürger obtained the post of "*Amtmann*" or district magistrate at Altengleichen near Göttingen. His grandfather was now reconciled to him, paid his debts and established him in his new sphere of activity. Meanwhile he kept in touch with his Göttingen friends, and when the "Göttinger Bund" or "Hain" was formed, Bürger, though not himself a member, kept in close touch with it. In 1773 the ballad *Lenore* was published in the *Musenalmanach*. This poem, which in dramatic force and in its vivid realization of the weird and supernatural remains without a rival, made his name a household word in Germany. In 1774 Bürger married Dorette Leonhart, the daughter of a Hanoverian official; but his passion for his wife's younger sister Auguste (the "Molly" of his poems and elegies) rendered the union unhappy and unsettled his life. In 1778 Bürger became editor of the *Musenalmanach*, and in the same year published the first collection of his poems. In 1780 he took a farm at Appenrode, but in three years lost so much money that he had to abandon the venture. Pecuniary troubles oppressed him, and being accused of neglecting his official duties, and feeling his honour attacked, he gave up his official position and removed in 1784 to Göttingen, where he established himself as *Privat-docent*. Shortly before his removal thither his wife died (30th of July 1784), and on the 29th of June in the next year he married his sister-in-law "Molly." Her death on the 9th of January 1786 affected him deeply. He appeared to lose at once all courage and all bodily and mental vigour. He still continued to teach in Göttingen; at the jubilee of the foundation of the

university in 1787 he was made an honorary doctor of philosophy, and in 1789 was appointed extraordinary professor in that faculty, though without a stipend. In the following year he married a third time, his wife being a certain Elise Hahn, who, enchanted with his poems, had offered him her heart and hand. Only a few weeks of married life with his "Schwabenmädchen" sufficed to prove his mistake, and after two and a half years he divorced her. Deeply wounded by Schiller's criticism, in the 14th and 15th part of the *Allgemeine Literaturzeitung* of 1791, of the 2nd edition of his poems, disappointed, wrecked in fortune and health, Bürger eked out a precarious existence as a teacher in Göttingen until his death there on the 8th of June 1794.

Bürger's character, in spite of his utter want of moral balance, was not lacking in noble and lovable qualities. He was honest in purpose, generous to a fault, tender-hearted and modest. His talent for popular poetry was very considerable, and his ballads are among the finest in the German language. Besides *Lenore, Das Lied vom braven Manne, Die Kuh, Der Kaiser und der Abt* and *Der wilde Jäger* are famous. Among his purely lyrical poems, but few have earned a lasting reputation; but mention may be made of *Das Blümchen Wunderhold, Lied an den lieben Mond*, and a few love songs. His sonnets, particularly the elegies, are of great beauty.

Editions of Bürger's *Samtliche Schriften* appeared at Göttingen, 1817 (incomplete); 1829-1833 (8 vols.), and 1835 (one vol.); also a selection by E. Grisebach (5th ed., 1894). The *Gedichte* have been published in innumerable editions, the best being that by A. Sauer (2 vols., 1884). *Briefe von und an Burger* were edited by A. Strodtmann in 4 vols. (1874). On Bürger's life see the biography by H. Prohle (1856), the introduction to Sauer's edition of the poems, and W. von Wurzbach, *G.A. Burger* (1900).

BURGERS, THOMAS FRANÇOIS (1834-1881), president of the Transvaal Republic, was born in Cape Colony on the 15th of April 1834, and was educated at Utrecht, Holland, where he took the degree of doctor of theology. On his return to South Africa he was ordained minister of the Dutch Reformed Church, and stationed at Hanover in Cape Colony, where he exercised his ministrations for eight years. In 1862 his preaching attracted attention, and two years later an ecclesiastical tribunal suspended him for heretical opinions. He appealed, however, to the colonial government, which had appointed him, and obtained judgment in his favour, which was confirmed by the privy council of England on appeal in 1865. On the resignation of M.W. Pretorius and the refusal of President Brand of the Orange Free State to accept the office, Burgers was elected president of the Transvaal, taking the oath on the 1st of July 1872. In 1873 he endeavoured to persuade Montsioa to agree to an alteration in the boundary of the Barolong territory as fixed by the Keate award, but failed (see Bechuanaland). In 1875 Burgers, leaving the Transvaal in charge of Acting-President Joubert, went to Europe mainly to promote a scheme for linking the Transvaal to the coast by a railway from Delagoa Bay, which was that year definitely assigned to Portugal by the MacMahon award. With the Portuguese Burgers concluded a treaty, December 1875, providing for the construction of the railway. After meeting with refusals of financial help in London, Burgers managed to raise £90,000 in Holland, and bought a quantity of railway plant, which on its arrival at Delagoa Bay was mortgaged to pay freight, and this, so far as Burgers was concerned, was the end of the matter. In June 1876 he induced the raad to declare war against Sikukuni (Secocoeni), a powerful native chief in the eastern Transvaal. The campaign was unsuccessful, and with its failure the republic fell into a condition of lawlessness and insolvency, while a Zulu host threatened invasion. Burgers in an address to the raad (3rd of March 1877) declared "I would rather be a policeman under a strong government than the president of such a state. It is you—-you members of the raad and the Boers—who have lost the country, who have sold your independence for a drink." Sir Theophilus Shepstone, who had been sent to investigate the condition of affairs in the Transvaal, issued on the 12th of April a proclamation annexing the Transvaal to Great Britain. Burgers fully acquiesced in the necessity for annexation. He accepted a pension from the British government, and settled down to farming in Hanover, Cape Colony. He died at Richmond in that colony on the 9th of December 1881, and in the following year a volume of short stories, *Tooneelen uit ons dorp*, originally written by him for the Cape *Volksblad*, was published at the Hague for the benefit of his family. A patriot, a fluent speaker both in Dutch and in English, and possessed of unbounded energy, the failure of Burgers was due to his fondness for large visionary plans, which he attempted to carry out with insufficient means (see Transvaal: *History*).

For the annexation period see John Martineau, *The Life of Sir Bartle Frere*, vol. ii. chap, xviii. (London, 1895).

BURGERSDYK, or Burgersdicius, **FRANCIS** (1590-1629), Dutch logician, was born at Lier, near Delft, and died at Leiden. After a brilliant career at the university of Leiden, he studied theology at Saumur, where while still very young he became professor of philosophy. After five years he returned to Leiden, where he accepted the chair of logic and moral philosophy, and afterwards that of natural philosophy. His *Logic* was at one time widely used, and is still valuable. He wrote also *Idea Philosophiae Moralis* (1644).

BURGES, GEORGE (1786-1864), English classical scholar, was born in India. He was educated at Charterhouse school and Trinity College, Cambridge, taking his degree in 1807, and obtaining one of the members' prizes both in 1808 and 1809. He stayed up at Cambridge and became a most successful "coach." He had a great reputation as a Greek scholar, and was a somewhat acrimonious critic of rival scholars, especially Bishop Blomfield. Subsequently he fell into embarrassed circumstances through injudicious speculation, and in 1841 a civil list pension of £100 per annum was bestowed upon him. He died at Ramsgate, on the 11th of January 1864. Burges was a man of great learning and industry, but too fond of introducing arbitrary emendations into the text of classical authors. His chief works are: Euripides' *Troades* (1807) and *Phoenissae* (1809); Aeschylus' *Supplices* (1821), *Eumenides* (1822) and *Prometheus* (1831); Sophocles' *Philoctetes* (1833); E.F. Poppo's *Prolegomena to Thucydides* (1837), an abridged translation with critical remarks; *Hermesianactis Fragmenta* (1839). He also edited some of the dialogues of Plato with English notes, and translated nearly the whole of that author and the Greek anthology for Bohn's Classical library. He was a frequent contributor to the *Classical Journal* and other periodicals, and dedicated to Byron a play called *The Son of Erin*, or, *The Cause of the Greeks* (1823).

BURGESS, DANIEL (1645-1713), English Presbyterian divine, was born at Staines, in Middlesex, where his father was minister. He was educated under Busby at Westminster school, and in 1660 was sent to Magdalen Hall, Oxford, but not being able conscientiously to subscribe the necessary formulae he quitted the university without taking his degree. In 1667, after taking orders, he was appointed by Roger Boyle, first Lord Orrery, to the headmastership of a school recently established by that nobleman at Charleville,

Co. Cork, and soon after he became private chaplain to Lady Mervin, near Dublin. There he was ordained by the local presbytery, and on returning to England was imprisoned for preaching at Marlborough. He soon regained his liberty, and went to London, where he speedily gathered a large and influential congregation, as much by the somewhat excessive fervour of his piety as by the vivacious illustrations which he frequently employed in his sermons. He was a master of epigram, and theologically inclined to Calvinism. The Sacheverell mob gutted his chapel in 1710, but the government repaired the building. Besides preaching, he gave instruction to private pupils, of whom the most distinguished was Henry St John, afterwards Lord Bolingbroke. His son, Daniel Burgess (d. 1747), was secretary to the princess of Wales, and in 1723 obtained a *regium donum* or government grant of £500 half-yearly for dissenting ministers.

BURGESS, THOMAS (1756-1837), English divine, was born at Odiham, in Hampshire. He was educated at Winchester, and at Corpus Christi College, Oxford. Before graduating, he edited a reprint of John Burton's *Pentalogia*. In 1781 he brought out an annotated edition of Richard Dawes's *Miscellanea Critica* (reprinted, Leipzig, 1800). In 1783 he became a fellow of his college, and in 1785 was appointed chaplain to Shute Barrington, bishop of Salisbury, through whose influence he obtained a prebendal stall, which he held till 1803. In 1788 he published his *Considerations on the Abolition of Slavery*, in which he advocated the principle of gradual emancipation. In 1791 he accompanied Barrington to Durham, where he did evangelistic work among the poorer classes. In 1803 he was appointed to the vacant bishopric of St David's, which he held for twenty years with great success. He founded the Society for Promoting Christian Knowledge in the diocese, and also St David's College at Lampeter, which he liberally endowed. In 1820 he was appointed first president of the recently founded Royal Society of Literature; and three years later he was promoted to the see of Salisbury, over which he presided for twelve years, prosecuting his benevolent designs with unwearied industry. As at St David's, so at Salisbury, he founded a Church Union Society for the assistance of infirm and distressed clergymen. He strenuously opposed both Unitarianism and Catholic emancipation. He died on the 19th of February 1837.

A list of his works, which are very numerous, will be found in his biography by J.S. Harford (2nd ed., 1841). In addition to those already referred to may be mentioned his *Essay on the Study of Antiquities*, *The First Principles of Christian Knowledge*; *Reflections on the Controversial Writings of Dr Priestley*, *Emendationes in Suidam et Hesychium et alios Lexicographos Graecos*; *The Bible, and nothing but the Bible, the Religion of the Church of England*.

BURGESS (Med. Lat. *burgensis*, from *burgus*, a borough, a town), a term, in its earliest sense, meaning an inhabitant of a borough, one who occupied a tenement therein, but now applied solely to a registered parliamentary, or more strictly, municipal voter. An early use of the word was to denote a member elected to parliament by his fellow citizens in a borough. In some of the American colonies (*e.g.* Virginia), a "burgess" was a member of the legislative body, which was termed the "House of Burgesses." Previously to the Municipal Reform Act 1835, burgess was an official title in some English boroughs, and in this sense is still used in some of the states of the United States, as in Connecticut, New Jersey, Pennsylvania. *The Burgess-roll* is the register or official list of burgesses in a borough.

BURGH [Bourke, Burke], the name of an historic Irish house, associated with Connaught for more than seven centuries. It was founded by William de Burgh, brother of Hubert de Burgh (*q.v.*). Before the death of Henry II. (1189) he received a grant of lands from John as lord of Ireland. At John's accession (1199) he was installed in Thomond and was governor of Limerick. In 1199-1201 he was supporting in turn Cathal Carrach and Cathal Crovderg for the native throne, but he was expelled from Limerick in 1203, and, losing his Connaught, though not his Munster estates, died in 1205. His son Richard, in 1227, received the land of "Connok" [Connaught], as forfeited by its king, whom he helped to fight. From 1228 to 1232 he held the high office of justiciar of Ireland. In 1234 he sided with the crown against Richard, earl marshal, who fell in battle against him. Dying in 1243, he was succeeded as lord of Connaught by his son Richard, and then (1248) by his younger son Walter, who carried on the family warfare against the native chieftains, and added greatly to his vast domains by obtaining (c. 1255) from Prince Edward a grant of "the county of Ulster," in consequence of which he was styled later earl of Ulster. At his death in 1271, he was succeeded by his son Richard as 2nd earl. In 1286 Richard ravaged and subdued Connaught, and deposed Bryan O'Neill as chief native king, substituting a nominee of his own. The native king of Connaught was also attacked by him, in favour of that branch of the O'Conors whom his own family supported. He led his forces from Ireland to support Edward I. in his Scottish campaigns, and on Edward Bruce's invasion of Ulster in 1315 Richard marched against him, but he had given his daughter Elizabeth in marriage to Robert Bruce, afterwards king of Scotland, about 1304. Occasionally summoned to English parliaments, he spent most of his forty years of activity in Ireland, where he was the greatest noble of his day, usually fighting the natives or his Anglo-Norman rivals. The patent roll of 1290 shows that in addition to his lands in Ulster, Connaught and Munster, he had held the Isle of Man, but had surrendered it to the king.

His grandson and successor William, the 3rd earl (1326-1333), was the son of John de Burgh by Elizabeth, lady of Clare, sister and co-heir of the last Clare earl of Hertford (d. 1314). He married a daughter of Henry, earl of Lancaster, and was appointed lieutenant of Ireland in 1331, but was murdered in his 21st year, leaving a daughter, the sole heiress, not only of the de Burgh possessions, but of vast Clare estates. She was married in childhood to Lionel, son of Edward III., who was recognized in her right as earl of Ulster, and their direct representative, the duke of York, ascended the throne in 1461 as Edward IV., since when the earldom of Ulster has been only held by members of the royal family.

On the murder of the 3rd earl (1333), his male kinsmen, who had a better right, by native Irish ideas, to the succession than his daughter, adopted Irish names and customs, and becoming virtually native chieftains succeeded in holding the bulk of the de Burgh territories. Their two main branches were those of "MacWilliam Eighter" in southern Connaught, and "MacWilliam Oughter" to the north of them, in what is now Mayo. The former held the territory of Clanricarde, lying in the neighbourhood of Galway, and in 1543 their chief, as Ulick "Bourck, *alias* Makwilliam," surrendered it to Henry VIII., receiving it back to hold, by English custom, as earl of Clanricarde and Lord Dunkellin. The 4th earl (1601-1635) distinguished himself on the English side in O'Neill's rebellion and afterwards, and obtained the English earldom of St Albans in 1628, his son Ulick receiving further the Irish marquessate of Clanricarde (1646). His cousin and heir, the 6th earl (1657-1666) was uncle of the 8th and 9th earls (1687-1722), both of whom fought for James II. and paid the penalty for doing so in 1691, but the 9th earl was restored in 1702, and his great-grandson, the 12th earl, was created marquess of Clanricarde in 1789. He left no son, but the marquessate

was again revived in 1825, for his nephew the 14th earl, whose heir is the present marquess. The family, which changed its name from Bourke to de Burgh in 1752, and added that of Canning in 1862, still own a vast estate in County Galway.

In 1603 "the MacWilliam Oughter," Theobald Bourke, similarly resigned his territory in Mayo, and received it back to hold by English tenure. In 1627 he was created Viscount Mayo. The 2nd and 3rd viscounts (1629-1663) suffered at Cromwell's hands, but the 4th was restored to his estates (some 50,000 acres) in 1666. The peerage became extinct or dormant on the death of the 8th viscount in 1767. In 1781 John Bourke, a Mayo man, believed to be descended from the line of "MacWilliam Oughter," was created Viscount Mayo, and four years later earl of Mayo, a peerage still extant. In 1872 the 6th earl was murdered in the Andaman Islands when viceroy of India.

[v.04 p.0815]

The baronies of Bourke of Connell (1580) and Bourke of Brittas (1618), both forfeited in 1691, were bestowed on branches of the family which has also still representatives in the baronetage and landed gentry of Ireland.

The lords Burgh or Borough of Gainsborough (1487-1599) were a Lincolnshire family believed to be descended from a younger son of Hubert de Burgh. The 5th baron was lord deputy of Ireland in 1597, and his younger brother, Sir John (d. 1594), a distinguished soldier and sailor.

(J. H. R.)

BURGH, HUBERT DE (d. 1243), chief justiciar of England in the reign of John and Henry III., entered the royal service in the reign of Richard I. He traced his descent from Robert of Mortain, half brother of the Conqueror and first earl of Cornwall; he married about 1200 the daughter of William de Vernon, earl of Devon; and thus, from the beginning of his career, he stood within the circle of the great ruling families. But he owed his high advancement to exceptional ability as an administrator and a soldier. Already in 1201 he was chamberlain to King John, the sheriff of three shires, the constable of Dover and Windsor castles, the warden of the Cinque Ports and of the Welsh Marches. He served with John in the continental wars which led up to the loss of Normandy. It was to his keeping that the king first entrusted the captive Arthur of Brittany. Coggeshall is our authority for the tale, which Shakespeare has immortalized, of Hubert's refusal to permit the mutilation of his prisoner; but Hubert's loyalty was not shaken by the crime to which Arthur subsequently fell a victim. In 1204 Hubert distinguished himself by a long and obstinate defence of Chinon, at a time when nearly the whole of Poitou had passed into French hands. In 1213 he was appointed seneschal of Poitou, with a view to the invasion of France which ended disastrously for John in the next year.

Both before and after the issue of the Great Charter Hubert adhered loyally to the king; he was rewarded, in June 1215, with the office of chief justiciar. This office he retained after the death of John and the election of William, the earl marshal, as regent. But, until the expulsion of the French from England, Hubert was entirely engaged with military affairs. He held Dover successfully through the darkest hour of John's fortunes; he brought back Kent to the allegiance of Henry III.; he completed the discomfiture of the French and their allies by the naval victory which he gained over Eustace the Monk, the noted privateer and admiral of Louis, in the Straits of Dover (Aug. 1217). The inferiority of the English fleet has been much exaggerated, for the greater part of the French vessels were transports carrying reinforcements and supplies. But Hubert owed his success to the skill with which he manœuvred for the weather-gage, and his victory was not less brilliant than momentous. It compelled Louis to accept the treaty of Lambeth, under which he renounced his claims to the crown and evacuated England. As the saviour of the national cause the justiciar naturally assumed after the death of William Marshal (1219) the leadership of the English loyalists. He was opposed by the legate Pandulf (1218-1221), who claimed the guardianship of the kingdom for the Holy See; by the Poitevin Peter des Roches, bishop of Winchester, who was the young king's tutor; by the foreign mercenaries of John, among whom Falkes de Bréauté took the lead; and by the feudal party under the earls of Chester and Albemarle. On Pandulf's departure the pope was induced to promise that no other legate should be appointed in the lifetime of Archbishop Stephen Langton. Other opponents were weakened by the audacious stroke of 1223, when the justiciar suddenly announced the resumption of all the castles, sheriffdoms and other grants which had been made since the king's accession. A plausible excuse was found in the next year for issuing a sentence of confiscation and banishment against Falkes de Bréauté. Finally in 1227, Hubert having proclaimed the king of age, dismissed the bishop of Winchester from his tutorship.

Hubert now stood at the height of his power. His possessions had been enlarged by four successive marriages, particularly by that which he contracted in 1221 with Margaret, the sister of Alexander II. of Scotland; in 1227 he received the earldom of Kent, which had been dormant since the disgrace of Odo of Bayeux. But the favour of Henry III. was a precarious foundation on which to build. The king chafed against the objections with which his minister opposed wild plans of foreign conquest and inconsiderate concessions to the papacy. They quarrelled violently in 1229, at Portsmouth, when the king was with difficulty prevented from stabbing Hubert, because a sufficient supply of ships was not forthcoming for an expedition to France. In 1231 Henry lent an ear to those who asserted that the justiciar had secretly encouraged armed attacks upon the aliens to whom the pope had given English benefices. Hubert was suddenly disgraced and required to render an account of his long administration. The blow fell suddenly, a few weeks after his appointment as justiciar of Ireland. It was precipitated by one of those fits of passion to which the king was prone; but the influence of Hubert had been for some time waning before that of Peter des Roches and his nephew Peter des Rievaux. Some colour was given to their attacks by Hubert's injudicious plea that he held a charter from King John which exempted him from any liability to produce accounts. But the other charges, far less plausible than that of embezzlement, which were heaped upon the head of the fallen favourite, are evidence of an intention to crush him at all costs. He was dragged from the sanctuary at Bury St Edmunds, in which he had taken refuge, and was kept in strait confinement until Richard of Cornwall, the king's brother, and three other earls offered to be his sureties. Under their protection he remained in honourable detention at Devizes Castle. On the outbreak of Richard Marshal's rebellion (1233), he was carried off by the rebels to the Marshal stronghold of Striguil, in the hope that his name would add popularity to their cause. In 1234 he was admitted, along with the other supporters of the fallen Marshal, to the benefit of a full pardon. He regained his earldom and held it till his death, although he was once in serious danger from the avarice of the king (1239), who was tempted by Hubert's enormous wealth to revive the charge of treason.

In his lifetime Hubert was a popular hero; Matthew Paris relates how, at the time of his disgrace, a common smith refused with an oath to put fetters on the man "who restored England to the English." Hubert's ambition of founding a great family was not realized. His earldom died with him, though he left two sons. In constitutional history he is remembered as the last of the great justiciars. The office, as having become too great for a subject, was now shorn of its most important powers and became politically insignificant.

See Roger of Wendover's *Flores Historiarum*, edited for the English Historical Society by H.O. Coxe (4 vols., 1841-1844); the *Chronica Majora* of Matthew Paris, edited by H.R. Luard for the Rolls Series (7 vols., 1872-1883); the *Histoire des ducs de Normandie*, edited by F. Michel for the Soc. de l'Hist. de France (Paris, 1840); the *Histoire de Guillaume le Marechal*, edited by Paul Meyer for the same society (3 vols., Paris, 1891, &c.); J.E. Doyle's *Official Baronage of England*, ii. pp. 271-274; R. Pauli's *Geschichte von England*, vol. iii.; W. Stubbs's *Constitutional History of England*, vol. ii.

(H. W. C. D.)

BURGHERSH, HENRY (1292-1340), English bishop and chancellor, was a younger son of Robert, Baron Burghersh (d. 1305), and a nephew of Bartholomew, Lord Badlesmere, and was educated in France. In 1320 owing to Badlesmere's influence Pope John XXII. appointed him bishop of Lincoln in spite of the fact that the chapter had already made an election to the vacant bishopric, and he secured the position without delay. After the execution of Badlesmere in 1322 Burghersh's lands were seized by Edward II., and the pope was urged to deprive him; about 1326, however, his possessions were restored, a proceeding which did not prevent him from joining Edward's queen, Isabella, and taking part in the movement which led to the deposition and murder of the king. Enjoying the favour of the new king, Edward III., the bishop became chancellor of England in 1328; but he failed to secure the archbishopric of Canterbury which became vacant about the same time, and was deprived of his office of chancellor and imprisoned when Isabella lost her power in 1330. But he was soon released and again in a position of influence. He was treasurer of England from 1334 to 1337, and high in the favour and often in the company of Edward III.; he was sent on several important errands, and entrusted with important commissions. He died at Ghent on the 4th of December 1340.

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The bishop's brother, Bartholomew Burghersh (d. 1355), became Baron Burghersh on the death of his brother Stephen in 1310. He acted as assistant to Badlesmere until the execution of the latter; and then, trusted by Edward III., was constable of Dover Castle and warden of the Cinque Ports. He filled other important positions, served Edward III. both as a diplomatist and a soldier, being present at the battle of Crecy in 1346; and retaining to the last the royal confidence, died in August 1355. His son and successor, Bartholomew (d. 1369), was one of the first knights of the order of the Garter, and earned a great reputation as a soldier, specially distinguishing himself at the battle of Poitiers in 1356.

BURGHLEY, WILLIAM CECIL, Baron (1521-1508), was born, according to his own statement, on the 13th of September 1521 at the house of his mother's father at Bourne, Lincolnshire. Pedigrees, elaborated by Cecil himself with the help of Camden, the antiquary, associated him with the Cecils or Sitsyllts of Altyrennes in Herefordshire, and traced his descent from an Owen of the time of King Harold and a Sitsyllt of the reign of Rufus. The connexion with the Herefordshire family is not so impossible as the descent from Sitsyllt; but the earliest authentic ancestor of the lord treasurer is his grandfather, David, who, according to Burghley's enemies, "kept the best inn" in Stamford. David somehow secured the favour of Henry VII., to whom he seems to have been yeoman of the guard. He was serjeant-at-arms to Henry VIII. in 1526, sheriff of Northamptonshire in 1532, and a justice of the peace for Rutland. His eldest son, Richard, yeoman of the wardrobe (d. 1554), married Jane, daughter of William Heckington of Bourne, and was father of three daughters and Lord Burghley.

William, the only son, was put to school first at Grantham and then at Stamford. In May 1535, at the age of fourteen, he went up to St John's College, Cambridge, where he was brought into contact with the foremost educationists of the time, Roger Ascham and John Cheke, and acquired an unusual knowledge of Greek. He also acquired the affections of Cheke's sister, Mary, and was in 1541 removed by his father to Gray's Inn, without, after six years' residence at Cambridge, having taken a degree. The precaution proved useless, and four months later Cecil committed one of the rare rash acts of his life in marrying Mary Cheke. The only child of this marriage, Thomas, the future earl of Exeter, was born in May 1542, and in February 1543 Cecil's first wife died. Three years later he married (21st of December 1546) Mildred, daughter of Sir Anthony Cooke, who was ranked by Ascham with Lady Jane Grey as one of the two most learned ladies in the kingdom, and whose sister, Anne, became the wife of Sir Nicholas, and the mother of Sir Francis, Bacon.

Cecil, meanwhile, had obtained the reversion to the office of *custos rotulorum brevium*, and, according to his autobiographical notes, sat in parliament in 1543; but his name does not occur in the imperfect parliamentary returns until 1547, when he was elected for the family borough of Stamford. Earlier in that year he had accompanied Protector Somerset on his Pinkie campaign, being one of the two "judges of the Marshalsea," *i.e.* in the courts-martial. The other was William Patten, who states that both he and Cecil began to write independent accounts of the campaign, and that Cecil generously communicated his notes for Patten's narrative, which has been reprinted more than once.

In 1548 he is described as the protector's master of requests, which apparently means that he was clerk or registrar of the court of requests which the protector, possibly at Latimer's instigation, illegally set up in Somerset House "to hear poor men's complaints." He also seems to have acted as private secretary to the protector, and was in some danger at the time of the protector's fall (October 1549). The lords opposed to Somerset ordered his detention on the 10th of October, and in November he was in the Tower. On the 25th of January 1550 he was bound over in recognizances to the value of a thousand marks. However, he soon ingratiated himself with Warwick, and on the 15th of September 1550 he was sworn one of the king's two secretaries. He was knighted on the 11th of October 1551, on the eve of Somerset's second fall, and was congratulated on his success in escaping his benefactor's fate. In April he became chancellor of the order of the Garter. But service under Northumberland was no bed of roses, and in his diary Cecil recorded his release in the phrase *ex misero aulico factus liber et mei juris*. His responsibility for Edward's illegal "devise" of the crown has been studiously minimized by Cecil himself and by his biographers. Years afterwards, he pretended that he had only signed the "devise" as a witness, but in his apology to Queen Mary he did not venture to allege so flimsy an excuse; he preferred to lay stress on the extent to which he

succeeded in shifting the responsibility on to the shoulders of his brother-in-law, Sir John Cheke, and other friends, and on his intrigues to frustrate the queen to whom he had sworn allegiance. There is no doubt that he saw which way the wind was blowing, and disliked Northumberland's scheme; but he had not the courage to resist the duke to his face. As soon, however, as the duke had set out to meet Mary, Cecil became the most active intriguer against him, and to these efforts, of which he laid a full account before Queen Mary, he mainly owed his immunity. He had, moreover, had no part in the divorce of Catherine or in the humiliation of Mary in Henry's reign, and he made no scruple about conforming to the religious reaction. He went to mass, confessed, and out of sheer zeal and in no official capacity went to meet Cardinal Pole on his pious mission to England in December 1554, again accompanying him to Calais in May 1555. It was rumoured in December 1554 that Cecil would succeed Sir William Petre as secretary, an office which, with his chancellorship of the Garter, he had lost on Mary's accession. Probably the queen had more to do with the falsification of this rumour than Cecil, though he is said to have opposed in the parliament of 1555—in which he represented Lincolnshire—a bill for the confiscation of the estates of the Protestant refugees. But the story, even as told by his biographer (Peck, *Desiderata Curiosa*, i. 11), does not represent Cecil's conduct as having been very courageous; and it is more to his credit that he found no seat in the parliament of 1558, for which Mary had directed the return of "discreet and good Catholic members."

By that time Cecil had begun to trim his sails to a different breeze. He was in secret communication with Elizabeth before Mary died, and from the first the new queen relied on Cecil as she relied on no one else. Her confidence was not misplaced; Cecil was exactly the kind of minister England then required. Personal experience had ripened his rare natural gift for avoiding dangers. It was no time for brilliant initiative or adventurous politics; the need was to avoid Scylla and Charybdis, and a *via media* had to be found in church and state, at home and abroad. Cecil was not a political genius; no great ideas emanated from his brain. But he was eminently a safe man, not an original thinker, but a counsellor of unrivalled wisdom. Caution was his supreme characteristic; he saw that above all things England required time. Like Fabius, he restored the fortunes of his country by deliberation. He averted open rupture until England was strong enough to stand the shock. There was nothing heroic about Cecil or his policy; it involved a callous attitude towards struggling Protestants abroad. Huguenots and Dutch Were aided just enough to keep them going in the struggles which warded danger off from England's shores. But Cecil never developed that passionate aversion from decided measures which became a second nature to his mistress. His intervention in Scotland in 1559-1560 showed that he could strike on occasion; and his action over the execution of Mary, queen of Scots, proved that he was willing to take responsibility from which Elizabeth shrank. Generally he was in favour of more decided intervention on behalf of continental Protestants than Elizabeth would admit, but it is not always easy to ascertain the advice he gave. He has left endless memoranda lucidly setting forth the pros and cons of every course of action; but there are few indications of the line which he actually recommended when it came to a decision. How far he was personally responsible for the Anglican Settlement, the Poor Laws, and the foreign policy of the reign, how far he was
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thwarted by the baleful influence of Leicester and the caprices of the queen, remains to a large extent a matter of conjecture. His share in the settlement of 1559 was considerable, and it coincided fairly with his own somewhat indeterminate religious views. Like the mass of the nation, he grew more Protestant as time wore on; he was readier to persecute Papists than Puritans; he had no love for ecclesiastical jurisdiction, and he warmly remonstrated with Whitgift over his persecuting Articles of 1583. The finest encomium was passed on him by the queen herself, when she said, "This judgment I have of you, that you will not be corrupted with any manner of gifts, and that you will be faithful to the state."

From 1558 for forty years the biography of Cecil is almost indistinguishable from that of Elizabeth and from the history of England. Of personal incident, apart from his mission to Scotland in 1560, there is little. He represented Lincolnshire in the parliament of 1559, and Northamptonshire in that of 1563, and he took an active part in the proceedings of the House of Commons until his elevation to the peerage; but there seems no good evidence for the story that he was proposed as speaker in 1563. In January 1561 he was given the lucrative office of master of the court of wards in succession to Sir Thomas Parry, and he did something to reform that instrument of tyranny and abuse. In February 1559 he was elected chancellor of Cambridge University in succession to Cardinal Pole; he was created M.A. of that university on the occasion of Elizabeth's visit in 1564, and M.A. of Oxford on a similar occasion in 1566. On the 25th of February 1571 he was raised to the peerage as Baron Burghley of Burghley[1] (or Burleigh); the fact that he continued to act as secretary after his elevation illustrates the growing importance of that office, which under his son became a secretaryship of state. In 1572, however, the marquess of Winchester, who had been lord high treasurer under Edward, Mary and Elizabeth, died, and Burghley succeeded to his post. It was a signal triumph over Leicester; and, although Burghley had still to reckon with cabals in the council and at court, his hold over the queen strengthened with the lapse of years. Before he died, Robert, his only surviving son by his second wife, was ready to step into his shoes as the queen's principal adviser. Having survived all his rivals, and all his children except Robert and the worthless Thomas, Burghley died at his London house on the 4th of August 1598, and was buried in St Martin's, Stamford.

Burghley's private life was singularly virtuous; he was a faithful husband, a careful father and a considerate master. A book-lover and antiquary, he made a special hobby of heraldry and genealogy. It was the conscious and unconscious aim of the age to reconstruct a new landed aristocracy on the ruins of the old, and Burghley was a great builder and planter. All the arts of architecture and horticulture were lavished on Burghley House and Theobalds, which his son exchanged for Hatfield. His public conduct does not present itself in quite so amiable a light. As the marquess of Winchester said of himself, he was sprung from the willow rather than the oak, and he was not the man to suffer for convictions. The interest of the state was the supreme consideration, and to it he had no hesitation in sacrificing individual consciences. He frankly disbelieved in toleration; "that state," he said, "could never be in safety where there was a toleration of two religions. For there is no enmity so great as that for religion; and therefore they that differ in the service of their God can never agree in the service of their country." With a maxim such as this, it was easy for him to maintain that Elizabeth's coercive measures were political and not religious. To say that he was Machiavellian is meaningless, for every statesman is so more or less; especially in the 16th century men preferred efficiency to principle. On the other hand, principles are valueless without law and order; and Burghley's craft and subtlety prepared a security in which principles might find some scope.

The sources and authorities for Burghley's life are endless. The most important collection of documents is at Hatfield, where there are some ten thousand papers covering the period down to Burghley's death;

these have been calendared in 8 volumes by the Hist. MSS. Comm. At least as many others are in the Record Office and British Museum, the Lansdowne MSS. especially containing a vast mass of his correspondence; see the catalogues of Cotton, Harleian, Royal, Sloane, Egerton and Additional MSS. in the British Museum, and the Calendars of Domestic, Foreign, Spanish, Venetian, Scottish and Irish State Papers.

Other official sources are the *Acts of the Privy Council* (vols. i.-xxix.); Lords' and Commons' Journals, D'Ewes' Journals, Off. Ret. M.P.'s; Rymer's *Foedera*; Collins's *Sydney State Papers*; Nichols's *Progresses of Elizabeth*. See also Strype's Works (26 vols.), Parker, Soc. Publ. (56 vols.); Camden's *Annales*; Holinshed, Stow and Speed's *Chron.*; Hayward's *Annals*; Machyn's *Diary*, Leycester Corr., Egerton Papers (Camden Soc.). For Burghley's early life, see Cooper's *Athenae Cantab.*; Baker's *St John's Coll., Camb.*, ed. Mayor; *Letters and. Papers of Henry VIII.*; Tytler's *Edward VI.*; Nichols's *Lit. Remains of Edward VI.*; Leadam's *Court of Requests, Chron. of Queen Jane* (Camden Soc.) and throughout Froude's *Hist.* No satisfactory life of Burghley has yet appeared; some valuable anonymous notes, probably by Burghley's servant Francis Alford, were printed in Peck's *Desiderata Curiosa* (1732), i. 1-66; other notes are in Naunton's *Fragmenta Regalia*. Lives by Collins (1732), Charlton and Melvil (1738), were followed by Nares's biography in three of the most ponderous volumes (1828-1831) in the language; this provoked Macaulay's brilliant but misleading essay. M.A.S. Hume's *Great Lord Burghley* (1898) is largely a piecing together of the references to Burghley in the same author's *Calendar of Simancas MSS.* The life by Dr Jessopp (1904) is an expansion of his article in the *Dict. Nat. Biog.*; it is still only a sketch, though the volume contains a mass of genealogical and other incidental information by other hands.

(A. F. P.)

[1] This was the form always used by Cecil himself.

BURGKMAIR, HANS or John (1473-? 1531), German painter and engraver on wood, believed to have been a pupil of Albrecht Dürer, was born at Augsburg. Professor Christ ascribes to him about 700 woodcuts, most of them distinguished by that spirit and freedom which we admire in the works of his supposed master. His principal work is the series of 135 prints representing the triumphs of the emperor Maximilian I. They are of large size, executed in chiaroscuro, from two blocks, and convey a high idea of his powers. Burgkmair was also an excellent painter in fresco and in distemper, specimens of which are in the galleries of Munich and Vienna, carefully and solidly finished in the style of the old German school.

BURGLARY (*burgi latrocinium*; in ancient English law, *hamesucken*[1]), at common law, the offence of breaking and entering the dwelling-house of another with intent to commit a felony. The offence and its punishment are regulated in England by the Larceny Act 1861. The four important points to be considered in connexion with the offence of burglary are (1) the time, (2) the place, (3) the manner and (4) the intent. The *time*, which is now the essence of the offence, was not considered originally to have been very material, the gravity of the crime lying principally in the invasion of the sanctity of a man's domicile. But at some period before the reign of Edward VI. it had become settled that time was essential to the offence, and it was not adjudged burglary unless committed by night. The day was then accounted as beginning at sunrise, and ending immediately after sunset, but it was afterwards decided that if there were left sufficient daylight or twilight to discern the countenance of a person, it was no burglary. This, again, was superseded by the Larceny Act 1861, for the purpose of which night is deemed to commence at nine o'clock in the evening of each day, and to conclude at six o'clock in the morning of the next succeeding day.

The *place* must, according to Sir E. Coke's definition, be a mansion-house, *i.e.* a man's dwelling-house or private residence. No building, although within the same curtilage as the dwelling-house, is deemed to be a part of the dwelling-house for the purposes of burglary, unless there is a communication between such building and dwelling-house either immediate or by means of a covered and enclosed passage leading from the one to the other. Chambers in a college or in an inn of court are the dwelling-house of the owner; so also are rooms or lodgings in a private house, provided the owner dwells elsewhere, or enters by a different outer door from his lodger, otherwise the lodger is merely an inmate and his apartment a parcel of the one dwelling-house.

[v.04 p.0818] As to the *manner*, there must be both a breaking and an entry. Both must be at night, but not necessarily on the same night, provided that in the breaking and in the entry there is an intent to commit a felony. The breaking may be either an actual breaking of any external part of a building; or opening or lifting any closed door, window, shutter or lock; or entry by means of a threat, artifice or collusion with persons inside; or by means of such a necessary opening as a chimney. If an entry is obtained through an open window, it will not be burglary, but if an inner door is afterwards opened, it immediately becomes so. Entry includes the insertion through an open door or window, or any aperture, of any part of the body or of any instrument in the hand to draw out goods. The entry may be before the breaking, for the Larceny Act 1861 has extended the definition of burglary to cases in which a person enters another's dwelling with intent to commit felony, or being in such house commits felony therein, and in either case *breaks out* of such dwelling-house by night.

Breaking and entry must be with the *intent* to commit a felony, otherwise it is only trespass. The felony need not be a larceny, it may be either murder or rape. The punishment is penal servitude for life, or any term not less than three years, or imprisonment not exceeding two years, with or without hard labour.

Housebreaking in English law is to be distinguished from burglary, in that it is not essential that it should be committed at night, nor in a dwelling-house. It may, according to the Larceny Act 1861, be committed in a school-house, shop, warehouse or counting-house. Every burglary involves housebreaking, but every housebreaking does not amount to burglary. The punishment for housebreaking is penal servitude for any term not exceeding fourteen years and not less than three years, or imprisonment for any term not exceeding two years, with or without hard labour.

In the United States the common-law definition of burglary has been modified by statute in many states, so as to cover what is defined in England as housebreaking; the maximum punishment nowhere exceeds imprisonment for twenty years.

Authorities.—Pollock and Maitland, *History of English Law*; Stephen, *History of Criminal Law*; Archbold, *Pleading and Evidence in Criminal Cases*; Russell, *On Crimes and Misdemeanours*; Stephen,

Commentaries.

[1] In Scots law, the word *hamesucken* meant the feloniously beating or assaulting a man in his own house.

BURGON, JOHN WILLIAM (1813-1888), English divine, was born at Smyrna on the 21st of August 1813, the son of a Turkey merchant, who was a skilled numismatist and afterwards became an assistant in the antiquities department of the British Museum. His mother was a Greek. After a few years of business life, Burgon went to Worcester College, Oxford, in 1841, gained the Newdigate prize, took his degree in 1845, and won an Oriel fellowship in 1846. He was much influenced by his brother-in-law, the scholar and theologian Henry John Rose (1800-1873), a churchman of the old conservative type, with whom he used to spend his long vacations. Burgon made Oxford his headquarters, while holding a living at some distance. In 1863 he was made vicar of St Mary's, having attracted attention by his vehement sermons against *Essays and Reviews*. In 1867 he was appointed Gresham professor of divinity. In 1871 he published a defence of the genuineness of the twelve last verses of St Mark's Gospel. He now began an attack on the proposal for a new lectionary for the Church of England, based largely upon his objections to the principles for determining the authority of MS. readings adopted by Westcott and Hort, which he assailed in a memorable article in the *Quarterly Review* for 1881. This, with his other articles, was reprinted in 1884 under the title of *The Revision Revised*. His biographical essays on H.L. Mansel and others were also collected, and published under the title of *Twelve Good Men* (1888). Protests against the inclusion of Dr Vance Smith among the revisers, against the nomination of Dean Stanley to be select preacher in the university of Oxford, and against the address in favour of toleration in the matter of ritual, followed in succession. In 1876 Burgon was made dean of Chichester. He died on the 4th of August 1888. His life was written by Dean E.M. Goulburn (1892). Vehement and almost passionate in his convictions, Burgon nevertheless possessed a warm and kindly heart. He may be described as a high churchman of the type prevalent before the rise of the Tractarian school. His extensive collection of transcripts from the Greek Fathers, illustrating the text of the New Testament, was bequeathed to the British Museum.

BURGONET, or BURGANET (from Fr. *bourguignote*, Burgundian helmet), a form of light helmet or head-piece, which was in vogue in the 16th and 17th centuries. In its normal form the burgonet was a large roomy cap with a brim shading the eyes, cheek-pieces or flaps, a comb, and a guard for the back of the neck. In many cases a vizor, or other face protection, and a chin-piece are found in addition, so that this piece of armour is sometimes mistaken for an armet (*q.v.*), but it can always be distinguished by the projecting brim in front. The morion and cabasset have no face, cheek or neck protection. The typical head-piece of the 17th-century soldier in England and elsewhere is a burgonet skull-cap with a straight brim, neck-guard and often, in addition, a fixed vizor of three thin iron bars which are screwed into, and hang down from, the brim in front of the eyes.

BURGOS, a province of northern Spain; bounded on the N.E. by Biscay and Álava, E. by Logroño, S.E. by Soria, S. by Segovia, S.W. by Valladolid, W. by Palencia, and N.W. by Santander. Pop. (1900) 338,828; area, 5480 sq. m. Burgos includes the isolated county of Treviño, which is shut in on all sides by territory belonging to Álava. The northern and north-eastern districts of the province are mountainous, and the central and southern form part of the vast and elevated plateau of Old Castile. The extreme northern region is traversed by part of the great Cantabrian chain. Eastwards are the highest peaks of the province in the Sierra de la Demanda (with the Cerro de San Millan, 6995 ft. high) and in the Sierra de Neila. On the eastern frontier, midway between these highlands and the Cantabrian chain, two comparatively low ranges, running east and west of Pancorbo, kave a gap through which run the railway and roads connecting Castile with the valley of the Ebro. This Pancorbo Pass has often been called the "Iron Gates of Castile," as a handful of men could hold it against an army. South and west of this spot begins the plateau, generally covered with snow in winter, and swept by such cold winds that Burgos is considered, with Soria and Segovia, one of the coldest regions of the peninsula. The Ebro runs eastwards through the northern half of the province, but is not navigable. The Douro, or Duero, crosses the southern half, running west-north-west; it also is unnavigable in its upper valley. The other important streams are the Pisuerga, flowing south towards Palencia and Valladolid, and the Arlanzón, which flows through Burgos for over 75m.

The variations of temperature are great, as from 9° to 20° of frost have frequently been recorded in winter, while the mean summer temperature is 64° (Fahr.). As but little rain falls in summer, and the soil is poor, agriculture thrives only in the valleys, especially that of the Ebro. In live-stock, however, Burgos is one of the richest of Spanish provinces. Horses, mules, asses, goats, cattle and pigs are bred in considerable numbers, but the mainstay of the peasantry is sheep-farming. Vast ranges of almost uninhabited upland are reserved as pasture for the flocks, which at the beginning of the 20th century contained more than 500,000 head of sheep. Coal, china-clay and salt are obtained in small quantities, but, out of more than 150 mines registered, only 4 were worked in 1903. The other industries of the province are likewise undeveloped, although there are many small potteries, stone quarries, tanneries and factories for the manufacture of linen and cotton of the coarsest description. The ancient cloth and woollen industries, for which Burgos was famous in the past, have almost disappeared. Trade is greatly hindered by the lack of adequate railway communication, and even of good roads. The Northern railways from Madrid to the French frontier cross the province in the central districts; the Valladolid-Bilbao line traverses the Cantabrian mountains, in the north; and the Valladolid-Saragossa line skirts the Douro valley, in the south. The only important town in the province is Burgos, the capital (pop. 30,167). Few parts of Spain are poorer; education makes little progress, and least of all in the thinly peopled rural districts, with their widely scattered hamlets. The peasantry have thus every inducement to migrate to the Basque Provinces, Catalonia and other relatively prosperous regions; and consequently the population does not increase, despite the excess of births over deaths.

BURGOS, the capital formerly of Old Castile, and since 1833 of the Spanish province of Burgos, on the river Arlanzón, and on the Northern railways from Madrid to the French frontier. Pop. (1900) 30,167. Burgos, in the form of an amphitheatre, occupies the lower slopes of a hill crowned by the ruins of an ancient citadel. It faces the Arlanzón, a broad and swift stream, with several islands in mid-channel. Three stone bridges lead to the suburb of La Vega, on the opposite bank. On all sides, except up the castle hill, fine avenues and public gardens are laid out, notably the Paseo de la Isla, extending along the river to the west. Burgos itself was originally surrounded by a wall, of which few fragments remain; but although its streets and broad squares, such as the central Plaza Mayór, or Plaza de la Constitucion, have often quite a

modern appearance, the city retains much of its picturesque character, owing to the number and beauty of its churches, convents and palaces. Unaffected by the industrial activity of the neighbouring Basque Provinces, it has little trade apart from the sale of agricultural produce and the manufacture of paper and leathern goods.

But it is rich in architectural and antiquarian interest. The citadel was founded in 884 by Diego Rodriguez Porcelos, count of Castile; in the 10th century it was held against the kings of Leon by Count Fernan Gonzalez, a mighty warrior; and even in 1812 it was successfully defended by a French garrison against Lord Wellington and his British troops. Within its walls the Spanish national hero, the Cid Campeador, was wedded to Ximena of Oviedo in 1074; and Prince Edward of England (afterwards King Edward I.) to Eleanor of Castile in 1254. Statues of Porcelos, Gonzalez and the Cid, of Nuño Rasura and Lain Calvo, the first elected magistrates of Burgos, during its brief period of republican rule in the 10th century, and of the emperor Charles V., adorn the massive Arco de Santa Maria, which was erected between 1536 and 1562, and commemorates the return of the citizens to their allegiance, after the rebellion against Charles V. had been crushed in 1522. The interior of this arch serves as a museum. Tradition still points to the site of the Cid's birthplace; and a reliquary preserved in the town hall contains his bones, and those of Ximena, brought hither after many changes, including a partial transference to Sigmaringen in Germany.

Other noteworthy buildings in Burgos are the late 15th century Casa del Cordón, occupied by the captain-general of Old Castile; the Casa de Miranda, which worthily represents the best domestic architecture of Spain in the 16th century; and the barracks, hospitals and schools. Burgos is the see of an archbishop, whose province comprises the diocese of Palencia, Pamplona, Santander and Tudela. The cathedral, founded in 1221 by Ferdinand III. of Castile and the English bishop Maurice of Burgos, is a fine example of florid Gothic, built of white limestone (see ARCHITECTURE, Plate II. fig. 65). It was not completed until 1567, and the architects principally responsible for its construction were a Frenchman in the 13th century and a German in the 15th. Its cruciform design is almost hidden by the fifteen chapels added at all angles to the aisles and transepts, by the beautiful 14th-century cloister on the north-west and the archiepiscopal palace on the south-west. Over the three central doorways of the main or western façade rise two lofty and graceful towers. Many of the monuments within the cathedral are of considerable artistic and historical interest. The chapel of Corpus Christi contains the chest which the Cid is said to have filled with sand and subsequently pawned for a large sum to the credulous Jews of Burgos. The legend adds that he redeemed his pledge. In the aisleless Gothic church of Santa Agueda, or Santa Gadéa, tradition relates that the Cid compelled Alphonso VI. of Leon, before his accession to the throne of Castile in 1072, to swear that he was innocent of the murder of Sancho his brother and predecessor on the throne. San Estéban, completed between 1280 and 1350, and San Nicolás, dating from 1505, are small Gothic churches, each with a fine sculptured doorway. Many of the convents of Burgos have been destroyed, and those which survive lie chiefly outside the city. At the end of the Paseo de la Isla stands the nunnery of Santa Maria la Real de las Huelgas, originally a summer palace (*huelga*, "pleasure-ground") of the kings of Castile. In 1187 it was transformed into a Cistercian convent by Alphonso VIII., who invested the abbess with almost royal prerogatives, including the power of life and death, and absolute rule over more than fifty villages. Alphonso and his wife Eleanor, daughter of Henry II. of England, are buried here. The Cartuja de Miraflores, a Carthusian convent, founded by John II. of Castile (1406-1454), lies 2 m. south-east of Burgos. Its church contains a monument of exceptional beauty, carved by Gil de Siloë in the 15th century, for the tomb of John and his second wife, Isabella of Portugal. The convent of San Pedro de Cardeña, 7 m. south-east of Burgos, was the original burial-place of the Cid, in 1099, and of Ximena, in 1104. About 50 m. from the city is the abbey of Silos, which appears to have been founded under the Visigothic kings, as early as the 6th century. It was restored in 919 by Fernan Gonzalez, and in the 11th century became celebrated throughout Europe, under the rule of St Dominic or Domingo. It was reoccupied in 1880 by French Benedictine monks.

The known history of Burgos begins in 884 with the foundation of the citadel. From that time forward it steadily increased in importance, reaching the height of its prosperity in the 15th century, when, alternately with Toledo, it was occupied as a royal residence, but rapidly declining when the court was finally removed to Madrid in 1560. Being on one of the principal military roads of the kingdom, it suffered severely during the Peninsular War. In 1808 it was the scene of the defeat of the Spanish army by the French under Marshal Soult. It was unsuccessfully besieged by Wellington in 1812, but was surrendered to him at the opening of the campaign of the following year.

Of the extensive literature relating to Burgos, much remains unedited and in manuscript. A general description of the city and its monuments is given by A. Llacayo y Santa Maria in *Burgos, &c.* (Burgos, 1889). See also *Architectural, Sculptural and Picturesque Studies in Burgos and its Neighbourhood*, a valuable series of architectural drawings in folio, by J.B. Waring (London, 1852). The following are monographs on particular buildings:—*Historia de la Catedral de Burgos, &c.*, by P. Orcajo (Burgos, 1856); *El Castillo de Burgos*, by E. de Oliver-Copons (Barcelona, 1893); *La Real Cartuja de Miraflores*, by F. Tarin y Juaneda (Burgos, 1896). For the history of the city see *En Burgos*, by V. Balaguér (Burgos, 1895); *Burgos en las comunidades de Castilla* and *Cosas de la vieja Burgos*, both by A. Salvá (Burgos, 1895 and 1892). The following relate both to the city and to the province of Burgos:—*Burgos, &c.*, by R. Amador de los Ríos, in the series entitled *España* (Barcelona, 1888); *Burgos y su provincia*, anon. (Vitoria, 1898); *Intento de un diccionario biográfico y bibliográfico de autores de la prov. de Burgos*, by M. Anibarro and M. Rives (Madrid, 1890).

BURGOYNE, JOHN (1722-1792), English general and dramatist, entered the army at an early age. In 1743 he made a runaway marriage with a daughter of the earl of Derby, but soon had to sell his commission to meet his debts, after which he lived abroad for seven years. By Lord Derby's interest Burgoyne was then reinstated at the outbreak of the Seven Years' War, and in 1758 he became captain and lieutenant-colonel in the foot guards. In 1758-1759 he participated in expeditions made against the French coast, and in the latter year he was instrumental in introducing light cavalry into the British army. The two regiments then formed were commanded by Eliott (afterwards Lord Heathfield) and Burgoyne. In 1761 he sat in parliament for Midhurst, and in the following year he served as brigadier-general in Portugal, winning particular distinction by his capture of Valencia d'Alcantara and of Villa Velha. In 1768 he became M.P. for Preston, and for the next few years he occupied himself chiefly with his parliamentary duties, in which he was remarkable for his general outspokenness and, in particular, for his attacks on Lord Clive. At the same time he devoted much attention to art and drama (his first play, *The Maid of the Oaks*, being produced by Garrick in 1775), and gambled recklessly. In the army he had by this time

become a major-general, and on the outbreak of the American War of Independence he was appointed to a command. In 1777 he was at the head of the British reinforcements designed for the invasion of the colonies from Canada. In this disastrous expedition he gained possession of Ticonderoga (for which he was made a lieutenant-general) and Fort Edward; but, pushing on, was detached from his communications with Canada, and hemmed in by a superior force at Saratoga (*q.v.*). On the 17th of October his troops, about 3500 in number, laid down their arms. The success was the greatest the colonists had yet gained, and it proved the turning-point in the war. The indignation in England against Burgoyne was great, but perhaps unjust. He returned at once, with the leave of the American general, to defend his conduct, and demanded, but never obtained, a trial. He was deprived of his regiment and a governorship which he held. In 1782, however, when his political friends came into office, he was restored to his rank, given a colonelcy, and made commander-in-chief in Ireland and a privy councillor. After the fall of the Rockingham government in 1783, Burgoyne withdrew more and more into private life, his last public service being his participation in the impeachment of Warren Hastings. In his latter years he was principally occupied in literary and dramatic work. His comedy, *The Heiress*, which appeared in 1786, ran through ten editions within a year, and was translated into several foreign tongues. He died suddenly on the 4th of June 1792. General Burgoyne, whose wife died in June 1776 during his absence in Canada, had several natural children (born between 1782 and 1788) by Susan Caulfield, an opera singer, one of whom became Field Marshal Sir J.F. Burgoyne. His *Dramatic and Poetical Works* appeared in two vols., 1808.

See E.B. de Fonblanque, *Political and Military Episodes from the Life and Correspondence of Right Hon. J. Burgoyne* (1876); and W.L. Stone, *Campaign of Lieut.-Gen. J. Burgoyne, &c.* (Albany, N.Y., 1877).

BURGOYNE, SIR JOHN FOX, Bart. (1782-1871), British field marshal, was an illegitimate son of General John Burgoyne (*q.v.*). He was educated at Eton and Woolwich, obtained his commission in 1798, and served in 1800 in the Mediterranean. In 1805, when serving on the staff of General Fox in Sicily, he was promoted second captain. He accompanied the unfortunate Egyptian expedition of 1807, and was with Sir John Moore in Sweden in 1808 and in Portugal in 1808-9. In the Corunna campaign Burgoyne held the very responsible position of chief of engineers with the rear-guard of the British army (see Peninsular War). He was with Wellesley at the Douro in 1809, and was promoted captain in the same year, after which he was engaged in the construction of the lines of Torres Vedras in 1810. He blew up Fort Concepcion on the river Turones, and was present at Busaco and Torres Vedras. In 1811 he was employed in the unsuccessful siege of Badajoz, and in 1812 he won successively the brevets of major and lieutenant-colonel, for his skilful performance of engineer duties at the historic sieges of Ciudad Rodrigo and Badajoz. He was present in the same year (1812) at the siege and battle of Salamanca, and after the battle of Vittoria in 1813 he became commanding engineer on Lord Wellington's staff. At the close of the war he received the C.B., a reward which, he justly considered, was not commensurate with his services. In 1814-1815 he served at New Orleans and Mobile. Burgoyne was largely employed, during the long peace which followed Waterloo, in other public duties as well as military work. He sat on numerous commissions, and served for fifteen years as chairman of the Irish board of public works. He became a major-general and K.C.B. in 1838, and inspector-general of fortifications in 1845. In 1851 he was promoted lieutenant-general, and in the following year received the G.C.B. When the Crimean War broke out he accompanied Lord Raglan's headquarters to the East, superintended the disembarkation at Old Fort, and was in effect the principal engineer adviser to the English commander during the first part of the siege of Sevastopol. He was recalled early in 1855, and though he was at first bitterly criticized by the public for his part in the earlier and unsuccessful operations against the fortress the wisdom of his advice was ultimately recognized. In 1856 he was created a baronet, and promoted to the full rank of general. In 1858 he was present at the second funeral of Napoleon I. as Queen Victoria's representative, and in 1865 he was made constable of the Tower of London. Three years later, on resigning his post as inspector-general of fortifications, he was made a field marshal. Parliament granted him, at the same time, a pension of £1500. He died on the 7th of October 1871, a year after the tragic death of his only son, Captain Hugh Talbot Burgoyne, V.C. (1833-1870), who was in command of H.M.S. "Captain" when that vessel went down in the Bay of Biscay (September 7, 1870).

See *Life and Correspondence of F.M. Sir John Fox Burgoyne* (edited by Lt.-Col. Hon. G. Wrottesley, R.E., London, 1873); Sir Francis Head, *A Sketch of the Life and Death of F.M. Sir John Burgoyne* (London, 1872); *Military Opinions of General Sir John Burgoyne* (ed. Wrottesley, London, 1859), a collection of the most important of Burgoyne's contributions to military literature.

BURGRAVE, the Eng. form, derived through the Fr., of the Ger. *Burggraf* and Flem. *burg* or *burch-graeve* (med. Lat. *burcgravius* or *burgicomes*), *i.e.* count of a castle or fortified town. The title is equivalent to that of castellan (Lat. *castellanus*) or *châtelain* (*q.v.*). In Germany, owing to the peculiar conditions of the Empire, though the office of burgrave had become a sinecure by the end of the 13th century, the title, as borne by feudal nobles having the status of princes of the Empire, obtained a quasi-royal significance. It is still included among the subsidiary titles of several sovereign princes; and the king of Prussia, whose ancestors were burgraves of Nuremberg for over 200 years, is still styled burgrave of Nuremberg.

BURGRED, king of Mercia, succeeded to the throne in 852, and in 852 or 853 called upon Æthelwulf of Wessex to aid him in subduing the North Welsh. The request was granted and the campaign proved successful, the alliance being sealed by the marriage of Burgred to Æthelswith, daughter of Æthelwulf. In 868 the Mercian king appealed to Æthelred and Alfred for assistance against the Danes, who were in possession of Nottingham. The armies of Wessex and Mercia did no serious fighting, and the Danes were allowed to remain through the winter. In 874 the march of the Danes from Lindsey to Repton drove Burgred from his kingdom. He retired to Rome and died there.

See *Saxon Chronicle* (Earle and Plummer), years 852-853, 868, 874.

BURGUNDIO, sometimes erroneously styled Burgundius, an Italian jurist of the 12th century. He was a professor at the university of Paris, and assisted at the Lateran Council in 1179, dying at a very advanced age in 1194. He was a distinguished Greek scholar, and is believed on the authority of Odofredus to have translated into Latin, soon after the Pandects were brought to Bologna, the various Greek fragments which occur in them, with the exception of those in the 27th book, the translation of which has been attributed to Modestinus. The Latin translations ascribed to Burgundio were received at Bologna as an integral part of the text of the Pandects, and form part of that known as *The Vulgate* in distinction from the Florentine text.

BURGUNDY. The name of Burgundy (Fr. *Bourgogne*, Lat. *Burgundia*) has denoted very diverse political and geographical areas at different periods of history and as used by different writers. The name is derived from the Burgundians (*Burgundi, Burgondiones*), a people of Germanic origin, who at first settled between the Oder and the Vistula. In consequence of wars against the Alamanni, in which the latter had the advantage, the Burgundians, after having taken part in the great invasion of Radagaisus in 407, were obliged in 411 to take refuge in Gaul, under the leadership of their chief Gundicar. Under the title of allies of the Romans, they established themselves in certain cantons of the Sequani and of upper Germany, receiving a part of the lands, houses and serfs that belonged to the inhabitants. Thus was founded the first kingdom of Burgundy, the boundaries of which were widened at different times by Gundicar and his son
[v.04 p.0821] Gunderic; its chief towns being Vienne, Lyons, Besançon, Geneva, Autun and Mâcon. Gundibald (d. 516), grandson of Gunderic, is famous for his codification of the Burgundian law, known consequently as *Lex Gundobada,* in French *Loi Gombette*. His son Sigismund, who was canonized by the church, founded the abbey of St Maurice at Agaunum. But, incited thereto by Clotilda, the daughter of Chilperic (a brother of Gundibald, and assassinated by him), the Merovingian kings attacked Burgundy. An attempt made in 524 by Clodomer was unsuccessful; but in 534 Clotaire (Chlothachar) and his brothers possessed themselves of the lands of Gundimar, brother and successor of Sigismund, and divided them between them. In 561 the kingdom of Burgundy was reconstructed by Guntram, son of Clotaire I., and until 613 it formed a separate state under the government of a prince of the Merovingian family.

After 613 Burgundy was one of the provinces of the Frankish kingdom, but in the redistributions that followed the reign of Charlemagne the various parts of the ancient kingdom had different fortunes. In 843, by the treaty of Verdun, Autun, Chalon, Mâcon, Langres, &c., were apportioned to Charles the Bald, and Lyons with the country beyond the Saône to Lothair I. On the death of the latter the duchy of Lyons (Lyonnais and Viennois) was given to Charles of Provence, and the diocese of Besançon with the country beyond the Jura to Lothair, king of Lorraine. In 879 Boso founded the kingdom of Provence, wrongly called the kingdom of Cisjuran Burgundy, which extended to Lyons, and for a short time as far as Mâcon (see PROVENCE).

In 888 the kingdom of Juran Burgundy was founded by Rudolph I., son of Conrad, count of Auxerre, and the German king Arnulf could not succeed in expelling the usurper, whose authority was recognized in the diocese of Besançon, Basel, Lausanne, Geneva and Sion. For a short time his son and successor Rudolph II. (912-937) disputed the crown of Italy with Hugh of Provence, but finally abandoned his claims in exchange for the ancient kingdom of Provence, *i.e.* the country bounded by the Rhône, the Alps and the Mediterranean. His successor, Conrad the Peaceful (93 7-993), whose sister Adelaide married Otto the Great, was hardly more than a vassal of the German kings. The last king of Burgundy, Rudolph III. (993-1032), being deprived of all but a shadow of power by the development of the secular and ecclesiastical aristocracy—especially by that of the powerful feudal houses of the counts of Burgundy (see FRANCHE-COMTÉ), Savoy and Provence—died without issue, bequeathing his lands to the emperor Conrad II. Such was the origin of the imperial rights over the kingdom designated after the 13th century as the kingdom of Arles, which extended over a part of what is now Switzerland (from the Jura to the Aar), and included Franche-Comté, Lyonnais, Dauphiné, Savoy and Provence.

The name of Burgundy now gradually became restricted to the countship of that name, which included the district between the Jura and the Saône, in later times called Franche-Comté, and to the *duchy* which had been created by the Carolingian kings in the portion of Burgundy that had remained French, with the object of resisting Boso. This duchy had been granted to Boso's brother, Richard the Justiciary, count of Autun. It comprised at first the countships of Autun, Mâcon, Chalon-sur-Saône, Langres, Nevers, Auxerre and Sens, but its boundaries and designations changed many times in the course of the 10th century. Duke Henry died in 1002; and in 1015, after a war which lasted thirteen years, the French king Robert II. reunited the duchy to his kingdom, despite the opposition of Otto William, count of Burgundy, and gave it to his son Henry, afterwards King Henry I. As king of France, the latter in 1032 bestowed the duchy upon his brother Robert, from whom sprang that first ducal house of Burgundy which flourished until 1361. A grandson of this Robert, who went to Spain to fight the Arabs, became the founder of the kingdom of Portugal; but in general the first Capet dukes of Burgundy were pacific princes who took little part in the political events of their time, or in that religious movement which was so marked in Burgundy, at Cluny to begin with, afterwards among the disciples of William of St Bénigne of Dijon, and later still among the monks of Cîteaux. In the 12th and 13th centuries we may mention Duke Hugh III. (1162-1193), who played an active part in the wars that marked the beginning of Philip Augustus's reign; Odo (Eudes) III. (1193-1218), one of Philip Augustus's principal supporters in his struggle with King John of England; Hugh IV. (1218-1272), who acquired the countships of Châlon and Auxonne, Robert II. (1272-1309), one of whose daughters, Margaret, married Louis X. of France, and another, Jeanne, Philip of Valois; Odo (Eudes) IV. (1315-1350), who gained the countship of Artois in right of his wife, Jeanne of France, daughter of Philip V. the Tall and of Jeanne, countess of Burgundy.

In 1361, on the death of Duke Philip de Rouvres, son of Jeanne of Auvergne and Boulogne, who had married the second time John II. of France, surnamed the Good, the duchy of Burgundy returned to the crown of France. In 1363 John gave it, with hereditary rights, to his son Philip, surnamed the Bold, thus founding that second Capet house of Burgundy which filled such an important place in the history of France during the 14th and 15th centuries, acquiring as it did a territorial power which proved redoubtable to the kingship itself. By his marriage with Margaret of Flanders Philip added to his duchy, on the death of his father-in-law, Louis of Male, in 1384, the countships of Burgundy and Flanders; and in the same year he purchased the countship of Charolais from John, count of Armagnac. On the death of Charles V. in 1380 Philip and his brothers, the dukes of Anjou and Berry, had possessed themselves of the regency, and it was he who led Charles VI. against the rebellious Flemings, over whom the young king gained the victory of Roosebeke in 1382. Momentarily deprived of power during the period of the "Marmousets'" government, he devoted himself to the administration of his own dominions, establishing in 1386 an audit-office (*chambre des comptes*) at Dijon and another at Lille. In 1396 he refused to take part personally in the expedition against the Turks which ended in the disaster of Nicopolis, and would only send his son John, then count of Nevers. In 1392 the king's madness caused Philip's recall to power along with the other princes of the blood, and from this time dates that hostility between the party of Burgundy and the party of Orleans which was to become so intense when in May 1404 Duke Philip had been succeeded by his son, John the Fearless.

In 1407 the latter caused the assassination of his political rival, Louis of Orleans, the king's brother.

Forced to quit Paris for a time, he soon returned, supported in particular by the gild of the butchers and by the university. The monk Jean Petit pronounced an apology for the murder (1408).

The victory of Hasbain which John achieved on the 23rd of September 1408 over the Liégeois, who had attacked his brother-in-law, John of Bavaria, bishop of Liége, still further strengthened his power and reputation, and during the following years the struggle between the Burgundians and the partisans of the duke of Orleans—or Armagnacs, as they were called—went on with varying results. In 1413 a reaction took place in Paris; John the Fearless was once more expelled from the capital, and only returned there in 1418, thanks to the treason of Perrinet Leclerc, who yielded up the town to him. In 1419, just when he was thinking of making advances towards the party of the dauphin (Charles VII.), he was assassinated by members of that party, during an interview between himself and the dauphin at the bridge of Montereau.

This event inclined the new duke of Burgundy, Philip the Good, towards an alliance with England. In 1420 he signed the treaty of Troyes, which recognized Henry V. as the legitimate successor of Charles VI.; in 1423 he gave his sister Anne in marriage to John, duke of Bedford; and during the following years the Burgundian troops supported the English pretender. But a dispute between him and the English concerning the succession in Hainaut, their refusal to permit the town of Orleans to place itself under his rule, and the defeats sustained by them, all combined to embroil him with his allies, and in 1435 he concluded the treaty of Arras with Charles VII. The king relieved the duke of all homage for his estates during his lifetime, and gave up to him the countships of Mâcon, Auxerre, Bar-sur-Seine and Ponthieu; and, reserving the right of redemption, the towns of the Somme (Roye, Montdidier, Péronne, &c.). Besides this Philip had acquired Brabant and Holland in 1433 as the inheritance of his mother. He gave an asylum to the dauphin Louis when exiled from Charles VII.'s court, but refused to assist him against his father, and henceforth rarely intervened in French affairs. He busied himself particularly with the administration of his state, founding the university of Dôle, having records made of Burgundian customs, and seeking to develop the commerce and industries of Flanders. A friend to letters and the arts, he was the protector of writers like Olivier de la Marche, and of sculptors of the school of Dijon. He also desired to revive ancient chivalry as he conceived it, and in 1429 founded the order of the Golden Fleece; while during the last years of his life he devoted himself to the preparation of a crusade against the Turks. Neither these plans, however, nor his liberality, prevented his leaving a well-filled treasury and enlarged dominions when he died in 1467.

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Philip's successor was his son by his third wife, Isabel of Portugal, Charles, surnamed the Bold, count of Charolois, born in 1433. To him his father had practically abandoned his authority during his last years. Charles had taken an active part in the so-called wars "for the public weal," and in the coalitions of nobles against the king which were so frequent during the first years of Louis XI.'s reign. His struggle against the king is especially marked by the interview at Péronne in 1468, when the king had to confirm the duke in his possession of the towns of the Somme, and by a fruitless attempt which Charles the Bold made on Beauvais in 1472. Charles sought above all to realize a scheme already planned by his father. This was to annex territory which would reunite Burgundy with the northern group of her possessions (Flanders, Brabant, &c.), and to obtain the emperor's recognition of the kingdom of "Belgian Gaul." In 1469 he bought the landgraviate of Alsace and the countship of Ferrette from the archduke Sigismund of Austria, and in 1473 the aged duke Arnold ceded the duchy of Gelderland to him. In the same year he had an interview at Trier with the emperor Frederick III., when he offered to give his daughter and heiress, Mary of Burgundy, in marriage to the emperor's son Maximilian in exchange for the concession of the royal title. But the emperor, uneasy at the ambition of the "grand-duke of the West," did not pursue the negotiations.

Meanwhile the tyranny of the duke's lieutenant Peter von Hagenbach, who was established at Ferrette as governor (*grand bailli* or *Landvogt*) of Upper Alsace, had brought about an insurrection. The Swiss supported the cause of their allies, the inhabitants of the free towns of Alsace, and Duke René II. of Lorraine also declared war against Charles. In 1474 the Swiss invaded Franche-Comté and achieved the victory of Hericourt. In 1475 Charles succeeded in conquering Lorraine, but an expedition against the Swiss ended in the defeat of Grandson (February 1476). In the same year the duke was again beaten at Morat, and the Burgundian nobles had to abandon to the victors a considerable amount of booty. Finally the duke of Lorraine returned to his dominions; Charles advanced against him, but on the 6th of January 1477 he was defeated and killed before Nancy.

By his wife, Isabella of Bourbon, he only left a daughter, Mary, and Louis XI. claimed possession of her inheritance as guardian to the young princess. He succeeded in getting himself acknowledged in the duchy and countship of Burgundy, which were occupied by French garrisons. But Mary, alarmed by this annexation, and by the insurrection at Ghent (secretly fomented by Louis), decided to marry the archduke Maximilian of Austria, to whom she had already been promised (August 1477), and hostilities soon broke out between the two princes. Mary died through a fall from her horse in March 1482, and in the same year the treaty of Arras confirmed Louis XI. in possession of the duchy. Franche-Comté and Artois were to form the dowry of the little Margaret of Burgundy, daughter of Mary and Maximilian, who was promised in marriage to the dauphin. As to the lands proceeding from the succession of Charles the Bold, which had returned to the Empire (Brabant, Hainaut, Limburg, Namur, Gelderland, &c.), they constituted the "Circle of Burgundy" from 1512 onward.

We know that the title of duke of Burgundy was revived in 1682 for a short time by Louis XIV. in favour of his grandson Louis, the pupil of Fénelon. But from the 16th to the 18th century Burgundy constituted a military government bounded on the north by Champagne, on the south by Lyonnais, on the east by Franche-Comté, on the west by Bourbonnais and Nivernais. It comprised Dijonnais, Autunois, Auxois, and the *pays de la montagne* or Country of the Mountain (Châtillon-sur-Seine), with the "counties" of Chalonnais, Mâconnais, Auxerrois and Bar-sur-Seine, and, so far as administration went, the annexes of Bresse, Bugey, Valromey and the country of Gex. Burgundy was a *pays d'états*. The estates, whose privileges the dukes at first, and later Louis XI., had to swear to maintain, had their assembly at Dijon, usually under the presidency of the governor of the province, the bishop of Autun as representing the clergy, and the mayor of Dijon representing the third estate. In the judiciary point of view the greater part of Burgundy depended on the parlement of Dijon; but Auxerrois and Mâconnais were amenable to the parlement of Paris.

See also U. Plancher, *Histoire générale et particulière de Bourgogne* (Dijon, 1739—1781, 4 vols. 8vo); Courtépée, *Description générale et particulière du duché de Bourgogne* (Dijon, 1774-1785, 7 vols. 8vo); O.

Jahn. *Geschichte der Burgundionen* (Halle, 1874, 2 vols. 8vo); E. Petit de Vausse, *Histoire des dues de Bourgogne de la race capétienne* (Paris, 1885-1905, 9 vols. 8vo); B. de Barante, *Histoire des ducs de Bourgogne de la maison de Valois* (Paris, 1833—1836, 13 vols. 8vo); the marquis Léon E.S.J. de Laborde, *Les Ducs de Bourgogne: Études sur les lettres, les arts et l'industrie pendant le XV siècle* (Paris, 1849-1851, 3 vols. 8vo).

(R. Po.)

BURHANPUR, a town of British India in the Nimar district of the Central Provinces, situated on the north bank of the river Tapti, 310 m. N.E. of Bombay, and 2 m. from the Great Indian Peninsula railway station of Lalbagh. It was founded in A.D. 1400 by a Mahommedan prince of the Farukhi dynasty of Khandesh, whose successors held it for 200 years, when the Farukhi kingdom was annexed to the empire of Akbar. It formed the chief seat of the government of the Deccan provinces of the Mogul empire till Shah Jahan removed the capital to Aurangabad in 1635. Burhanpur was plundered in 1685 by the Mahrattas, and repeated battles were fought in its neighbourhood in the struggle between that race and the Mussulmans for the supremacy of India. In 1739 the Mahommedans finally yielded to the demand of the Mahrattas for a fourth of the revenue, and in 1760 the Nizam of the Deccan ceded Burhanpur to the peshwa, who in 1778 transferred it to Sindhia. In the Mahratta War the army under General Wellesley, afterwards the duke of Wellington, took Burhanpur (1803), but the treaty of the same year restored it to Sindhia. It remained a portion of Sindhia's dominions till 1860-1861, when, in consequence of certain territorial arrangements, the town and surrounding estates were ceded to the British government. Under the Moguls the city covered an area of about 5 sq. m., and was about 10½ m. in circumference. In the *Ain-í-Akbari* it is described as a "large city, with many gardens, inhabited by all nations, and abounding with handicraftsmen." Sir Thomas Roe, who visited it in 1614, found that the houses in the town were "only mud cottages, except the prince's house, the chan's and some few others." In 1865-1866 the city contained 8000 houses, with a population of 34,137, which had decreased to 33,343 in 1901. Burhanpur is celebrated for its muslins, flowered silks, and brocades, which, according to Tavernier, who visited it in 1668, were exported in great quantities to Persia, Egypt, Turkey, Russia and Poland. The gold and silver wires used in the manufacture of these fabrics are drawn with considerable care and skill; and in order to secure the purity of the metals employed for their composition, the wire-drawing under the native rule was done under government inspection. The town of Burhanpur and its manufactures were long on the decline, but during recent times have made a slight recovery. The buildings of interest in the town are a palace, built by Akbar, called the Lal Kila or the Red Fort, and the Jama Masjid or Great Mosque, built by Ali Khan, one of the Farukhi dynasty, in 1588. A considerable number of Boras, a class of commercial Mahommedans, reside here.

[v.04 p.0823]

BURI, or Bure, in Norse mythology, the grandfather of Odin. In the creation of the world he was born from the rocks, licked by the cow Andhumla (darkness). He was the father of Bor, and the latter, wedded to Bestla, the daughter of the giant Bolthorn (evil), became the father of Odin, the Scandinavian Jove.

BURIAL and **BURIAL ACTS** (in O. Eng. *byrgels*, whence *byriels*, wrongly taken as a plural, and so Mid. Eng. *buryel*, from O. Eng. *byrgan*, properly to protect, cover, to bury). The main lines of the law of burial in England may be stated very shortly. Every person has the right to be buried in the churchyard or burial ground of the parish where he dies, with the exception of executed felons, who are buried in the precincts of the prison or in a place appointed by the home office. At common law the person under whose roof a death takes place has a duty to provide for the body being carried to the grave decently covered; and the executors or legal representatives of the deceased are bound to bury or dispose of the body in a manner becoming the estate of the deceased, according to their discretion, and they are not bound to fulfil the wishes he may have expressed in this respect. The disposal must be such as will not expose the body to violation, or offend the feelings or endanger the health of the living; and cremation under proper restrictions is allowable. In the case of paupers dying in a parish house, or shipwrecked persons whose bodies are cast ashore, the overseers or guardians are responsible for their burial; and in the case of suicides the coroner has a similar duty. The expenses of burial are payable out of the deceased's estate in priority to all other debts. A husband liable for the maintenance of his wife is liable for her funeral expenses; the parents for those of their children, if they have the means of paying. Legislation has principally affected (1) places of burial, (2) mode of burial, (3) fees for burial, and (4) disinterment.

1. The overcrowded state of churchyards and burial grounds gradually led to the passing of a group of statutes known as the Burial Acts, extending from 1852 up to 1900. By these acts a general system was set up, the aim of which was to remedy the existing deficiencies of accommodation by providing new burial grounds and closing old ones which should be dangerous to health, and to establish a central authority, the home office (now for most purposes the Local Government Board) to superintend all burial grounds with a view to the protection of the public health and the maintenance of public decency in burials. The Local Government Board thus has the power to obtain by order in council the closing of any burial ground it thinks fit, while its consent is necessary to the opening of any new burial ground; and it also has power to direct inspection of any burial ground or cemetery, and to regulate burials in common graves in statutory cemeteries and to compel persons in charge of vaults or places of burial to take steps necessary for preventing their becoming dangerous or injurious to health. The vestry of any parish, whether a common-law or ecclesiastical one, was thus authorized to provide itself with a new burial ground, if its existing one was no longer available; such ground might be wholly or partly consecrated, and chapels might be provided for the performance of burial service. The ground was put under the management of a burial board, consisting of ratepayers elected by the vestry, and the consecrated portion of it took the place of the churchyard in all respects. Disused churchyards and burial grounds in the metropolis may be used as open spaces for recreation, and only buildings for religious purposes can be built on them (1881, 1884, 1887). The Local Government Act 1894 introduced a change into the government of burial grounds (consequent on the general change made in parochial government) by transferring, or allowing to be transferred, the powers, duties, property and liabilities of the burial boards in urban districts to the district councils, and in rural parishes to the parish councils and parish meetings; and by allowing rural parishes to adopt the Burials Acts, and provide and manage new burial grounds by the parish council, or a burial board elected by the parish meeting.

2. The mode of burial is a matter of ecclesiastical cognizance; in the case of churchyards and elsewhere it is in the discretion of the owners of the burial ground. The Local Government Board now makes regulations for burials in burial grounds provided under the Burial Acts; for cemeteries provided under the

Public Health Act 1879. Private cemeteries and burial grounds make their own regulations. Burial may now take place either with or without a religious service in consecrated ground. Before 1880 no body could be buried in consecrated ground except with the service of the Church, which the incumbent of the parish or a person authorized by him was bound to perform; but the canons and prayer-book refused the use of the office for excommunicated persons, *majori excommunicatione*, for some grievous and notorious crime, and no person able to testify of his repentance, unbaptized persons, and persons against whom a verdict of *felo de se* had been found. But by the Burial Laws Amendment Act 1880, the bodies of persons entitled to be buried in parochial burial grounds, whether churchyards or graveyards, may be buried there, on proper notice being given to the minister, without the performance of the service of the Church of England, and either without any religious service or with a Christian and orderly religious service at the grave, which may be conducted by any person invited to do so by the person in charge of the funeral. Clergymen of the Church of England are also by the act allowed, but are not obliged, to use the burial service in any unconsecrated burial ground or cemetery, or building therein, in any case in which it could be used in consecrated ground. In cases where it may not be so used, and where such is the wish of those in charge of the service, the clergy may use a form of service approved by the bishop without being liable to any ecclesiastical or temporal penalty. Except as altered by this act, it is still the law that "the Church knows no such indecency as putting a body into consecrated ground without the service being at the same time performed"; and nothing in the act authorizes the use of the service on the burial of a *felo de se*, which, however, may take place in any way allowed by the act of 1880. The proper performance of the burial office is provided for by the Public Worship Regulation Act 1874. Statutory provision is made by the criminal law in this act for the preservation of order in burial grounds and protection of funeral services.

3. Fees are now payable by custom or under statutory powers on all burials. In a churchyard the parson must perform the office of burial for parishioners, even if the customary fee is denied, and it is doubtful who is liable to pay it. The custom must be immemorial and invariable. If not disputed, its payment can be enforced in the ecclesiastical court; if disputed, its validity must be tried by a temporal court. A special contract for the payment of an annual fee in the case of a non-parishioner can be enforced in the latter court. In the case of paupers and shipwrecked persons the fees are payable by the parish. In other parochial burial grounds and cemeteries the duties and rights to fees of the incumbents, clerks and sextons of the parishes for which the ground has been provided are the same as in burials in the churchyard. Burial authorities may fix the fees payable in such grounds, subject to the approval of the home secretary; but the fees for services rendered by ministers of religion and sextons must be the same in the consecrated as in the unconsecrated part of the burial ground, and no incumbent of a parish or a clerk may receive any fee upon burials except for services rendered by them (act of 1900). On burials under the act of 1880 the same fees are payable as if the burial had taken place with the service of the Church.

4. A corpse is not the subject of property, nor capable of holding property. If interred in consecrated ground, it is under the protection of the ecclesiastical court; if in unconsecrated, it is under that of the temporal court. In the former case it is an ecclesiastical offence, and in either case it is a misdemeanour, [v.04 p.0824] to disinter or remove it without proper authority, whatever the motive for such an act may be. Such proper authority is (1) a faculty from the ordinary, where it is to be removed from one consecrated place of burial to another, and this is often done on sanitary grounds or to meet the wishes of relatives, and has been done for secular purposes, *e.g.* widening a thoroughfare, by allowing part of the burial ground (disused) to be thrown into it; but it has been refused where the object was to cremate the remains, or to transfer them from a churchyard to a Roman Catholic burial ground; (2) a licence from the home secretary, where it is desired to transfer remains from one unconsecrated place of burial to another; (3) by order of the coroner, in cases of suspected crime. There has been considerable discussion as to the boundary line of jurisdiction between (1) and (2), and whether the disinterment of a body from consecrated ground for purposes of identification falls within, (1) only or within both (1) and (2); and an attempt by the ecclesiastical court to enforce a penalty for that purpose without a licence has been prohibited by the temporal court.

See also CHURCHYARD; and, for methods of disposal of the dead, CEMETERY; CREMATION, and FUNERAL RITES.

AUTHORITIES.—Baker, *Law of Burials* (6th ed. by Thomas, London, 1898); Phillimore, *Ecclestastical Law* (2nd ed., London, 1895); Cripps, *Law of Church and Clergy* (6th ed., London, 1886).

(G. G. P.*)

BURIAL SOCIETIES, a form of friendly societies, existing mainly in England, and constituted for the purpose of providing by voluntary subscriptions, for insuring money to be paid on the death of a member, or for the funeral expenses of the husband, wife or child of a member, or of the widow of a deceased member. (See FRIENDLY SOCIETIES.)

BURIATS, a Mongolian race, who dwell in the vicinity of the Baikal Lake, for the most part in the government of Irkutsk and the Trans-Baikal Territory. They are divided into various tribes or clans, which generally take their names from the locality they frequent. These tribes are subdivided according to kinship. The Buriats are a broad-shouldered race inclined to stoutness, with small slanting eyes, thick lips, high cheekbones, broad and flat noses and scanty beards. The men shave their heads and wear a pigtail like the Chinese. In summer they dress in silk and cotton gowns, in winter in furs and sheepskins. Their principal occupation is the rearing of cattle and horses. The Buriat horse is famous for its power of endurance, and the attachment between master and animal is very great. At death the horse should, according to their religion, be sacrificed at its owner's grave; but the frugal Buriat heir usually substitutes an old hack, or if he has to tie up the valuable steed to the grave to starve he does so only with the thinnest of cords so that the animal soon breaks his tether and gallops off to join the other horses. In some districts the Buriats have learned agriculture from the Russians, and in Irkutsk are really better farmers than the latter. They are extraordinarily industrious at manuring and irrigation. They are also clever at trapping and fishing. In religion the Buriats are mainly Buddhists; and their head lama (Khambo Lama) lives at the Goose Lake (Guisinoe Ozero). Others are Shamanists, and their most sacred spot is the Shamanic stone at the mouth of the river Angar. Some thousands of them around Lake Baikal are Christians. A knowledge of reading and writing is common, especially among the Trans-Baikal Buriats, who possess books of their own, chiefly translated from the Tibetan. Their own language is Mongolian, and of three distinct dialects. It was in the 16th century that the Russians first came in touch with the Buriats, who were long known by the name of Bratskiye, "Brotherly," given them by the Siberian colonists. In the

town of Bratskiyostrog, which grew up around the block-house built in 1631 at the confluence of the Angara and Oka to bring them into subjection, this title is perpetuated. The Buriats made a vigorous resistance to Russian aggression, but were finally subdued towards the end of the 17th century, and are now among the most peaceful of Russian peoples.

See J.G. Gruelin, *Siberia*; Pierre Simon Pallas, *Sammlungen historischer Nachrichten über die mongolischen Volkerschaften* (St Petersburg, 1776-1802); M.A. Castrén, *Versuch einer buriatischen Sprachlehre* (1857); Sir H.H. Howorth, *History of the Mongols* (1876-1888).

BURIDAN, JEAN [Joannes Buridanus] (c. 1297-c. 1358), French philosopher, was born at Béthune in Artois. He studied in Paris under William of Occam. He was professor of philosophy in the university of Paris, was rector in 1327, and in 1345 was deputed to defend its interests before Philip of Valois and at Rome. He was more than sixty years old in 1358, but the year of his death is not recorded. The tradition that he was forced to flee from France along with other nominalists, and founded the university of Vienna in 1356, is unsupported and in contradiction to the fact that the university was founded by Frederick II. in 1237. An ordinance of Louis XI., in 1473, directed against the nominalists, prohibited the reading of his works. In philosophy Buridan was a rationalist, and followed Occam in denying all objective reality to universals, which he regarded as mere words. The aim of his logic is represented as having been the devising of rules for the discovery of syllogistic middle terms; this system for aiding slow-witted persons became known as the *pons asinorum*. The parts of logic which he treated with most minuteness are modal propositions and modal syllogisms. In commenting on Aristotle's *Ethics* he dealt in a very independent manner with the question of free will, his conclusions being remarkably similar to those of John Locke. The only liberty which he admits is a certain power of suspending the deliberative process and determining the direction of the intellect. Otherwise the will is entirely dependent on the view of the mind, the last result of examination. The comparison of the will unable to act between two equally balanced motives to an ass dying of hunger between two equal and equidistant bundles of hay is not found in his works, and may have been invented by his opponents to ridicule his determinism. That he was not the originator of the theory known as "liberty of indifference" (*liberum arbitrium indifferentiae*) is shown in G. Fonsegrive's *Essai sur le libre arbitre*, pp. 119, 199 (1887).

His works are:—*Summula de dialectica* (Paris, 1487); *Compendium logicae* (Venice, 1489); *Quaestiones in viii. libros physicorum* (Paris, 1516); *In Aristotelis Metaphysica* (1518); *Quaestiones in x. libros ethicorum Aristotelis* (Paris, 1489; Oxford, 1637); *Quaestiones in viii. libros politicorum Aristotelis* (1500). See K. Prantl's *Geschichte der Logik*, bk. iv. 14-38; Stöckl's *Geschichte der Philosophie des Mittelalters*, ii. 1023-1028; Herzog-Hauck, *Realencyklopadie*, s.v. (1897).

BURKE, EDMUND (1729-1797), British statesman and political writer. His is one of the greatest names in the history of political literature. There have been many more important statesmen, for he was never tried in a position of supreme responsibility. There have been many more effective orators, for lack of imaginative suppleness prevented him from penetrating to the inner mind of his hearers; defects in delivery weakened the intrinsic persuasiveness of his reasoning; and he had not that commanding authority of character and personality which has so often been the secret of triumphant eloquence. There have been many subtler, more original and more systematic thinkers about the conditions of the social union. But no one that ever lived used the general ideas of the thinker more successfully to judge the particular problems of the statesman. No one has ever come so close to the details of practical politics, and at the same time remembered that these can only be understood and only dealt with by the aid of the broad conceptions of political philosophy. And what is more than all for perpetuity of fame, he was one of the great masters of the high and difficult art of elaborate composition.

A certain doubtfulness hangs over the circumstances of Burke's life previous to the opening of his public career. The very date of his birth is variously stated. The most probable opinion is that he was born at Dublin on the 12th of January 1729, new style. Of his family we know little more than his father was a Protestant attorney, practising in Dublin, and that his mother was a Catholic, a member of the family of Nagle. He had at least one sister, from whom descended the only existing representatives of Burke's family; and he had at least two brothers, Garret Burke and Richard Burke, the one older and the other younger than Edmund. The sister, afterwards Mrs French, was brought up and remained throughout life in
[v.04 p.0825] the religious faith of her mother; Edmund and his brothers followed that of their father. In 1741 the three brothers were sent to school at Ballitore in the county of Kildare, kept by Abraham Shackleton, an Englishman, and a member of the Society of Friends. He appears to have been an excellent teacher and a good and pious man. Burke always looked back on his own connexion with the school at Ballitore as among the most fortunate circumstances of his life. Between himself and a son of his instructor there sprang up a close and affectionate friendship, and, unlike so many of the exquisite attachments of youth, this was not choked by the dust of life, nor parted by divergence of pursuit. Richard Shackleton was endowed with a grave, pure and tranquil nature, constant and austere, yet not without those gentle elements that often redeem the drier qualities of his religious persuasion. When Burke had become one of the most famous men in Europe, no visitor to his house was more welcome than the friend with whom long years before he had tried poetic flights, and exchanged all the sanguine confidences of boyhood. And we are touched to think of the simple-minded guest secretly praying, in the solitude of his room in the fine house at Beaconsfield, that the way of his anxious and overburdened host might be guided by a divine hand.

In 1743 Burke became a student at Trinity College, Dublin, where Oliver Goldsmith was also a student at the same time. But the serious pupil of Abraham Shackleton would not be likely to see much of the wild and squalid sizar. Henry Flood, who was two years younger than Burke, had gone to complete his education at Oxford. Burke, like Goldsmith, achieved no academic distinction. His character was never at any time of the academic cast. The minor accuracies, the limitation of range, the treading and re-treading of the same small patch of ground, the concentration of interest in success before a board of examiners, were all uncongenial to a nature of exuberant intellectual curiosity and of strenuous and self-reliant originality. His knowledge of Greek and Latin was never thorough, nor had he any turn for critical niceties. He could quote Homer and Pindar, and he had read Aristotle. Like others who have gone through the conventional course of instruction, he kept a place in his memory for the various charms of Virgil and Horace, of Tacitus and Ovid; but the master whose page by night and by day he turned with devout hand, was the copious, energetic, flexible, diversified and brilliant genius of the declamations for Archias the poet and for Milo, against Catiline and against Antony, the author of the disputations at Tusculum and the orations against Verres. Cicero was ever to him the mightiest of the ancient names. In English literature

Milton seems to have been more familiar to him than Shakespeare, and Spenser was perhaps more of a favourite with him than either.

It is too often the case to be a mere accident that men who become eminent for wide compass of understanding and penetrating comprehension, are in their adolescence unsettled and desultory. Of this Burke is a signal illustration. He left Trinity in 1748, with no great stock of well-ordered knowledge. He neither derived the benefits nor suffered the drawbacks of systematic intellectual discipline.

After taking his degree at Dublin he went in the year 1750 to London to keep terms at the Temple. The ten years that followed were passed in obscure industry. Burke was always extremely reserved about his private affairs. All that we know of Burke exhibits him as inspired by a resolute pride, a certain stateliness and imperious elevation of mind. Such a character, while free from any weak shame about the shabby necessities of early struggles, yet is naturally unwilling to make them prominent in after life. There is nothing dishonourable in such an inclination. "I was not swaddled and rocked and dandled into a legislator," wrote Burke when very near the end of his days: "*Nitor in adversum* is the motto for a man like me. At every step of my progress in life (for in every step I was traversed and opposed), and at every turnpike I met, I was obliged to show my passport. Otherwise no rank, no toleration even, for me."

All sorts of whispers have been circulated by idle or malicious gossip about Burke's first manhood. He is said to have been one of the numerous lovers of his fascinating countrywoman, Margaret Woffington. It is hinted that he made a mysterious visit to the American colonies. He was for years accused of having gone over to the Church of Rome, and afterwards recanting. There is not a tittle of positive evidence for these or any of the other statements to Burke's discredit. The common story that he was a candidate for Adam Smith's chair of moral philosophy at Glasgow, when Hume was rejected in favour of an obscure nobody (1751), can be shown to be wholly false. Like a great many other youths with an eminent destiny before them, Burke conceived a strong distaste for the profession of the law. His father, who was an attorney of substance, had a distaste still stronger for so vagrant a profession as letters were in that day. He withdrew the annual allowance, and Burke set to work to win for himself by indefatigable industry and capability in the public interest that position of power or pre-eminence which his detractors acquired either by accident of birth and connexions or else by the vile arts of political intrigue. He began at the bottom of the ladder, mixing with the Bohemian society that haunted the Temple, practising oratory in the free and easy debating societies of Covent Garden and the Strand, and writing for the booksellers.

In 1756 he made his first mark by a satire upon Bolingbroke entitled *A Vindication of Natural Society*. It purported to be a posthumous work from the pen of Bolingbroke, and to present a view of the miseries and evils arising to mankind from every species of artificial society. The imitation of the fine style of that magnificent writer but bad patriot is admirable. As a satire the piece is a failure, for the simple reason that the substance of it might well pass for a perfectly true, no less than a very eloquent statement of social blunders and calamities. Such acute critics as Chesterfield and Warburton thought the performance serious. Rousseau, whose famous discourse on the evils of civilization had appeared six years before, would have read Burke's ironical vindication of natural society without a suspicion of its irony. There have indeed been found persons who insist that the *Vindication* was a really serious expression of the writer's own opinions. This is absolutely incredible, for various reasons. Burke felt now, as he did thirty years later, that civil institutions cannot wisely or safely be measured by the tests of pure reason. His sagacity discerned that the rationalism by which Bolingbroke and the deistic school believed themselves to have overthrown revealed religion, was equally calculated to undermine the structure of political government. This was precisely the actual course on which speculation was entering in France at that moment. His *Vindication* is meant to be a reduction to an absurdity. The rising revolutionary school in France, if they had read it, would have taken it for a demonstration of the theorem to be proved. The only interest of the piece for us lies in the proof which it furnishes, that at the opening of his life Burke had the same scornful antipathy to political rationalism which flamed out in such overwhelming passion at its close.

In the same year (1756) appeared the *Philosophical Inquiry into the Origin of our Ideas on the Sublime and Beautiful*, a crude and narrow performance in many respects, yet marked by an independent use of the writer's mind, and not without fertile suggestion. It attracted the attention of the rising aesthetic school in Germany. Lessing set about the translation and annotation of it, and Moses Mendelssohn borrowed from Burke's speculation at least one of the most fruitful and important ideas of his own influential theories on the sentiments. In England the *Inquiry* had considerable vogue, but it has left no permanent trace in the development of aesthetic thought.

Burke's literary industry in town was relieved by frequent excursions to the western parts of England, in company with William Burke. There was a lasting intimacy between the two namesakes, and they seem to have been involved together in some important passages of their lives; but we have Edmund Burke's authority for believing that they were probably not kinsmen. The seclusion of these rural sojourns, originally dictated by delicate health, was as wholesome to the mind as to the body. Few men, if any, have ever acquired a settled mental habit of surveying human affairs broadly, of watching the play of passion, interest, circumstance, in all its comprehensiveness, and of applying the instruments of general conceptions and wide principles to its interpretation with respectable constancy, unless they have at some early period of their manhood resolved the greater problems of society in independence and isolation. By 1756 the cast of Burke's opinions was decisively fixed, and they underwent no radical change.

[v.04 p.0826]

He began a series of *Hints on the Drama*. He wrote a portion of an *Abridgment of the History of England*, and brought it down as far as the reign of John. It included, as was natural enough in a warm admirer of Montesquieu, a fragment on law, of which he justly said that it ought to be the leading science in every well-ordered commonwealth. Burke's early interest in America was shown by an *Account of the European Settlements* on that continent. Such works were evidently a sign that his mind was turning away from abstract speculation to the great political and economic fields, and to the more visible conditions of social stability and the growth of nations. This interest in the concrete phenomena of society inspired him with the idea of the *Annual Register* (1759), which he designed to present a broad grouping of the chief movements of each year. The execution was as excellent as the conception, and if we reflect that it was begun in the midst of that momentous war which raised England to her climax of territorial greatness in East and West, we may easily realize how the task of describing these portentous and far-reaching events would be likely to strengthen Burke's habits of wide and laborious observation, as well as to give him firmness and confidence in the exercise of his own judgment. Dodsley gave him £100 for each annual

volume, and the sum was welcome enough, for towards the end of 1756 Burke had married. His wife was the daughter of a Dr Nugent, a physician at Bath. She is always spoken of by his friends as a mild, reasonable and obliging person, whose amiability and gentle sense did much to soothe the too nervous and excitable temperament of her husband. She had been brought up, there is good reason to believe, as a Catholic, and she was probably a member of that communion at the time of her marriage. Dr Nugent eventually took up his residence with his son-in-law in London, and became a popular member of that famous group of men of letters and artists whom Boswell has made so familiar and so dear to all later generations. Burke, however, had no intention of being dependent. His consciousness of his own powers animated him with a most justifiable ambition, if ever there was one, to play a part in the conduct of national affairs. Friends shared this ambition on his behalf; one of these was Lord Charlemont. He introduced Burke to William Gerard Hamilton (1759), now only remembered by the nickname "single-speech," derived from the circumstance of his having made a single brilliant speech in the House of Commons, which was followed by years of almost unbroken silence. Hamilton was by no means devoid of sense and acuteness, but in character he was one of the most despicable men then alive. There is not a word too many nor too strong in the description of him by one of Burke's friends, as "a sullen, vain, proud, selfish, cankered-hearted, envious reptile." The reptile's connexion, however, was for a time of considerable use to Burke. When he was made Irish secretary, Burke accompanied him to Dublin, and there learnt Oxenstiern's eternal lesson, that awaits all who penetrate behind the scenes of government, *quam parva sapientia mundus regitur*.

The penal laws against the Catholics, the iniquitous restrictions on Irish trade and industry, the selfish factiousness of the parliament, the jobbery and corruption of administration, the absenteeism of the landlords, and all the other too familiar elements of that mischievous and fatal system, were then in full force. As was shown afterwards, they made an impression upon Burke that was never effaced. So much iniquity and so much disorder may well have struck deep on one whose two chief political sentiments were a passion for order and a passion for justice. He may have anticipated with something of remorse the reflection of a modern historian, that the absenteeism of her landlords has been less of a curse to Ireland than the absenteeism of her men of genius. At least he was never an absentee in heart. He always took the interest of an ardent patriot in his unfortunate country; and, as we shall see, made more than one weighty sacrifice on behalf of the principles which he deemed to be bound up with her welfare.

When Hamilton retired from his post, Burke accompanied him back to London, with a pension of £300 a year on the Irish Establishment. This modest allowance he hardly enjoyed for more than a single year. His patron having discovered the value of so laborious and powerful a subaltern, wished to bind Burke permanently to his service. Burke declined to sell himself into final bondage of this kind. When Hamilton continued to press his odious pretensions they quarrelled (1765), and Burke threw up his pension. He soon received a more important piece of preferment than any which he could ever have procured through Hamilton.

The accession of George III. to the throne in 1760 had been followed by the disgrace of Pitt, the dismissal of Newcastle, and the rise of Bute. These events marked the resolution of the court to change the political system which had been created by the Revolution of 1688. That system placed the government of the country in the hands of a territorial oligarchy, composed of a few families of large possessions, fairly enlightened principles, and shrewd political sense. It had been preserved by the existence of a Pretender. The two first kings of the house of Hanover could only keep the crown on their own heads by conciliating the Revolution families and accepting Revolution principles. By 1760 all peril to the dynasty was at an end. George III., or those about him, insisted on substituting for the aristocratic division of political power a substantial concentration of it in the hands of the sovereign. The ministers were no longer to be the members of a great party, acting together in pursuance of a common policy accepted by them all as a united body; they were to become nominees of the court, each holding himself answerable not to his colleagues but to the king, separately, individually and by department. George III. had before his eyes the government of his cousin the great Frederick; but not every one can bend the bow of Ulysses, and, apart from difference of personal capacity and historic tradition, he forgot that a territorial and commercial aristocracy cannot be dealt with in the spirit of the barrack and the drill-ground. But he made the attempt, and resistance to that attempt supplies the keynote to the first twenty-five years of Burke's political life.

Along with the change in system went high-handed and absolutist tendencies in policy. The first stage of the new experiment was very short. Bute, in a panic at the storm of unpopularity that menaced him, resigned in 1763. George Grenville and the less enlightened section of the Whigs took his place. They proceeded to tax the American colonists, to interpose vexatiously against their trade, to threaten the liberty of the subject at home by general warrants, and to stifle the liberty of public discussion by prosecutions of the press. Their arbitrary methods disgusted the nation, and the personal arrogance of the ministers at last disgusted the king. The system received a temporary check. Grenville fell, and the king was forced to deliver himself into the hands of the orthodox section of the Whigs. The marquess of Rockingham (July 10, 1765) became prime minister, and he was induced to make Burke his private secretary. Before Burke had begun his duties, an incident occurred which illustrates the character of the two men. The old duke of Newcastle, probably desiring a post for some nominee of his own, conveyed to the ear of the new minister various absurd rumours prejudicial to Burke,—that he was an Irish papist, that his real name was O'Bourke, that he had been a Jesuit, that he was an emissary from St Omer's. Lord Rockingham repeated these tales to Burke, who of course denied them with indignation. His chief declared himself satisfied, but Burke, from a feeling that the indispensable confidence between them was impaired, at once expressed a strong desire to resign his post. Lord Rockingham prevailed upon him to reconsider his resolve, and from that day until Lord Rockingham's death in 1782, their relations were those of the closest friendship and confidence.

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The first Rockingham administration only lasted a year and a few days, ending in July 1766. The uprightness and good sense of its leaders did not compensate for the weakness of their political connexions. They were unable to stand against the coldness of the king, against the hostility of the powerful and selfish faction of Bedford Whigs, and, above all, against the towering predominance of William Pitt. That Pitt did not join them is one of the many fatal miscarriages of history, as it is one of the many serious reproaches to be made against that extraordinary man's chequered and uneven course. An alliance between Pitt and the Rockingham party was the surest guarantee of a wise and liberal policy towards the colonies. He went further than they did, in holding, like Lord Camden, the doctrine that taxation went with representation, and that therefore parliament had no right to tax the unrepresented

colonists. The ministry asserted, what no competent jurist would now think of denying, that parliament is sovereign; but they went heartily with Pitt in pronouncing the exercise of the right of taxation in the case of the American colonists to be thoroughly impolitic and inexpedient. No practical difference, therefore, existed upon the important question of the hour. But Pitt's prodigious egoism, stimulated by the mischievous counsels of men of the stamp of Lord Shelburne, prevented the fusion of the only two sections of the Whig party that were at once able, enlightened and disinterested enough to carry on the government efficiently, to check the arbitrary temper of the king, and to command the confidence of the nation. Such an opportunity did not return.

The ministerial policy towards the colonies was defended by Burke with splendid and unanswerable eloquence. He had been returned to the House of Commons for the pocket borough of Wendover, and his first speech (January 27, 1766) was felt to be the rising of a new light. For the space of a quarter of a century, from this time down to 1790, Burke was one of the chief guides and inspirers of a revived Whig party. The "age of small factions" was now succeeded by an age of great principles, and selfish ties of mere families and persons were transformed into a union resting on common conviction and patriotic aims. It was Burke who did more than any one else to give to the Opposition, under the first half of the reign of George III., this stamp of elevation and grandeur. Before leaving office the Rockingham government repealed the Stamp Act; confirmed the personal liberty of the subject by forcing on the House of Commons one resolution against general warrants, and another against the seizure of papers; and relieved private houses from the intrusion of officers of excise, by repealing the cider tax. Nothing so good was done in an English parliament for nearly twenty years to come. George Grenville, whom the Rockinghams had displaced, and who was bitterly incensed at their formal reversal of his policy, printed a pamphlet to demonstrate his own wisdom and statesmanship. Burke replied in his *Observations on a late Publication on the Present State of the Nation* (1769), in which he showed for the first time that he had not only as much knowledge of commerce and finance, and as firm a hand, in dealing with figures as Grenville himself, but also a broad, general and luminous way of conceiving and treating politics, in which neither then nor since has he had any rival among English publicists.

It is one of the perplexing points in Burke's private history to know how he lived during these long years of parliamentary opposition. It is certainly not altogether mere impertinence to ask of a public man how he gets what he lives upon, for independence of spirit, which is so hard to the man who lays his head on the debtor's pillow, is the prime virtue in such men. Probity in money is assuredly one of the keys to character, though we must be very careful in ascertaining and proportioning all the circumstances. Now, in 1769, Burke bought an estate at Beaconsfield, in the county of Buckingham. It was about 600 acres in extent, was worth some £500 a year, and cost £22,000. People have been asking ever since how the penniless man of letters was able to raise so large a sum in the first instance, and how he was able to keep up a respectable establishment afterwards. The suspicions of those who are never sorry to disparage the great have been of various kinds. Burke was a gambler, they hint, in Indian stock, like his kinsmen Richard and William, and like Lord Verney, his political patron at Wendover. Perhaps again, his activity on behalf of Indian princes, like the raja of Tanjore, was not disinterested and did not go unrewarded. The answer to all these calumnious innuendoes is to be found in documents and title-deeds of decisive authority, and is simple enough. It is, in short, this. Burke inherited a small property from his elder brother, which he realized. Lord Rockingham advanced him a certain sum (£6000). The remainder, amounting to no less than two-thirds of the purchase-money, was raised on mortgage, and was never paid off during Burke's life. The rest of the story is equally simple, but more painful. Burke made some sort of income out of his 600 acres; he was for a short time agent for New York, with a salary of £700; he continued to work at the *Annual Register* down to 1788. But, when all is told, he never made as much as he spent; and in spite of considerable assistance from Lord Rockingham, amounting it is sometimes said to as much as £30,000, Burke, like the younger Pitt, got every year deeper into debt. Pitt's debts were the result of a wasteful indifference to his private affairs. Burke, on the contrary, was assiduous and orderly, and had none of the vices of profusion. But he had that quality which Aristotle places high among the virtues—the noble mean of Magnificence, standing midway between the two extremes of vulgar ostentation and narrow pettiness. He was indifferent to luxury, and sought to make life, not commodious nor soft, but high and dignified in a refined way. He loved art, filled his house with statues and pictures, and extended a generous patronage to the painters. He was a collector of books, and, as Crabbe and less conspicuous men discovered, a helpful friend to their writers. Guests were ever welcome at his board; the opulence of his mind and the fervid copiousness of his talk naturally made the guests of such a man very numerous. *Non invideo equidem, miror magis*, was Johnson's good-natured remark, when he was taken over his friend's fine house and pleasant gardens. Johnson was of a very different type. There was something in this external dignity which went with Burke's imperious spirit, his spacious imagination, his turn for all things stately and imposing. We may say, if we please, that Johnson had the far truer and loftier dignity of the two; but we have to take such men as Burke with the defects that belong to their qualities. And there was no corruption in Burke's outlay. When the Pitt administration was formed in 1766, he might have had office, and Lord Rockingham wished him to accept it, but he honourably took his fate with the party. He may have spent £3000 a year, where he would have been more prudent to spend only £2000. But nobody was wronged; his creditors were all paid in time, and his hands were at least clean of traffic in reversions, clerkships, tellerships and all the rest of the rich sinecures which it was thought no shame in those days for the aristocracy of the land and the robe to wrangle for, and gorge themselves upon, with the fierce voracity of famishing wolves. The most we can say is that Burke, like Pitt, was too deeply absorbed in beneficent service in the affairs of his country, to have for his own affairs the solicitude that would have been prudent.

In the midst of intense political preoccupations, Burke always found time to keep up his intimacy with the brilliant group of his earlier friends. He was one of the commanding figures at the club at the Turk's Head, with Reynolds and Garrick, Goldsmith and Johnson. The old sage who held that the first Whig was the Devil, was yet compelled to forgive Burke's politics for the sake of his magnificent gifts. "I would not talk to him of the Rockingham party," he used to say, "but I love his knowledge, his genius, his diffusion and affluence of conversation." And everybody knows Johnson's vivid account of him: "Burke, Sir, is such a man that if you met him for the first time in the street, where you were stopped by a drove of oxen, and you and he stepped aside to take shelter but for five minutes, he'd talk to you in such a manner that when you parted you would say, 'This is an extraordinary man.'" They all grieved that public business should draw to party what was meant for mankind. They deplored that the nice and difficult test of answering Berkeley had not been undertaken, as was once intended, by Burke, and sighed to think what an admirable display

of subtlety and brilliance such a contention would have afforded them, had not politics "turned him from active philosophy aside." There was no jealousy in this. They did not grudge Burke being the first man in the House of Commons, for they admitted that he would have been the first man anywhere.

With all his hatred for the book-man in politics, Burke owed much of his own distinction to that generous richness and breadth of judgment which had been ripened in him by literature and his practice in it. He showed that books are a better preparation for statesmanship than early training in the subordinate posts and among the permanent officials of a public department. There is no copiousness of literary reference in his work, such as over-abounded in the civil and ecclesiastical publicists of the 17th century. Nor can we truly say that there is much, though there is certainly some, of that tact which literature is alleged to confer on those who approach it in a just spirit and with the true gift. The influence of literature on Burke lay partly in the direction of emancipation from the mechanical formulae of practical politics; partly in the association which it engendered, in a powerful understanding like his, between politics and the moral forces of the world, and between political maxims and the old and great sentences of morals; partly in drawing him, even when resting his case on prudence and expediency, to appeal to the widest and highest sympathies; partly, and more than all, in opening his thoughts to the many conditions, possibilities and "varieties of untried being," in human character and situation, and so giving an incomparable flexibility to his methods of political approach.

This flexibility is not to be found in his manner of composition. That derives its immense power from other sources; from passion, intensity, imagination, size, truth, cogency of logical reason. Those who insist on charm, on winningness in style, on subtle harmonies and fine exquisiteness of suggestion, are disappointed in Burke: they even find him stiff and over-coloured. And there are blemishes of this kind. His banter is nearly always ungainly, his wit blunt, as Johnson said, and often unseasonable. As is usual with a man who has not true humour, Burke is also without true pathos. The thought of wrong or misery moved him less to pity for the victim than to anger against the cause. Again, there are some gratuitous and unredeemed vulgarities; some images that make us shudder. But only a literary fop can be detained by specks like these.

The varieties of Burke's literary or rhetorical method are very striking. It is almost incredible that the superb imaginative amplification of the description of Hyder Ali's descent upon the Carnatic should be from the same pen as the grave, simple, unadorned *Address to the King* (1777), where each sentence falls on the ear with the accent of some golden-tongued oracle of the wise gods. His stride is the stride of a giant, from the sentimental beauty of the picture of Marie Antoinette at Versailles, or the red horror of the tale of Debi Sing in Rungpore, to the learning, positiveness and cool judicial mastery of the *Report on the Lords' Journals* (1794), which Philip Francis, no mean judge, declared on the whole to be the "most eminent and extraordinary" of all his productions. But even in the coolest and driest of his pieces there is the mark of greatness, of grasp, of comprehension. In all its varieties Burke's style is noble, earnest, deep-flowing, because his sentiment was lofty and fervid, and went with sincerity and ardent disciplined travail of judgment. He had the style of his subjects; the amplitude, the weightiness, the laboriousness, the sense, the high flight, the grandeur, proper to a man dealing with imperial themes, with the fortunes of great societies, with the sacredness of law, the freedom of nations, the justice of rulers. Burke will always be read with delight and edification, because in the midst of discussions on the local and the accidental, he scatters apophthegms that take us into the regions of lasting wisdom. In the midst of the torrent of his most strenuous and passionate deliverances, he suddenly rises aloof from his immediate subject, and in all tranquillity reminds us of some permanent relation of things, some enduring truth of human life or human society. We do not hear the organ tones of Milton, for faith and freedom had other notes in the 18th century. There is none of the complacent and wise-browed sagacity of Bacon, for Burke's were days of personal strife and fire and civil division. We are not exhilarated by the cheerfulness, the polish, the fine manners of Bolingbroke, for Burke had an anxious conscience, and was earnest and intent that the good should triumph. And yet Burke is among the greatest of those who have wrought marvels in the prose of our English tongue.

Not all the transactions in which Burke was a combatant could furnish an imperial theme. We need not tell over again the story of Wilkes and the Middlesex election. The Rockingham ministry had been succeeded by a composite government, of which it was intended that Pitt, now made Lord Chatham and privy seal, should be the real chief. Chatham's health and mind fell into disorder almost immediately after the ministry had been formed. The duke of Grafton was its nominal head, but party ties had been broken, the political connexions of the ministers were dissolved, and, in truth, the king was now at last a king indeed, who not only reigned but governed. The revival of high doctrines of prerogative in the crown was accompanied by a revival of high doctrines of privilege in the House of Commons, and the ministry was so smitten with weakness and confusion as to be unable to resist the current of arbitrary policy, and not many of them were even willing to resist it. The unconstitutional prosecution of Wilkes was followed by the fatal recourse to new plans for raising taxes in the American colonies. These two points made the rallying ground of the new Whig opposition. Burke helped to smooth matters for a practical union between the Rockingham party and the powerful triumvirate, composed of Chatham, whose understanding had recovered from its late disorder, and of his brothers-in-law, Lord Temple and George Grenville. He was active in urging petitions from the freeholders of the counties, protesting against the unconstitutional invasion of the right of election. And he added a durable masterpiece to political literature in a pamphlet which he called *Thoughts on the Cause of the Present Discontents* (1770). The immediate object of this excellent piece was to hold up the court scheme of weak, divided and dependent administrations in the light of its real purpose and design; to describe the distempers which had been engendered in parliament by the growth of royal influence and the faction of the king's friends; to show that the newly formed Whig party had combined for truly public ends, and was no mere family knot like the Grenvilles and the Bedfords; and, finally, to press for the hearty concurrence both of public men and of the nation at large in combining against "a faction ruling by the private instructions of a court against the general sense of the people." The pamphlet was disliked by Chatham on the one hand, on no reasonable grounds that we can discover; it was denounced by the extreme popular party of the Bill of Rights, on the other hand, for its moderation and conservatism. In truth, there is as strong a vein of conservative feeling in the pamphlet of 1770 as in the more resplendent pamphlet of 1790. "Our constitution," he said, "stands on a nice equipoise, with steep precipices and deep waters upon all sides of it. In removing it from a dangerous leaning towards one side, there may be a risk of oversetting it on the other. Every project of a material change in a government so complicated as ours is a matter full of difficulties; in which a considerate man

will not be too ready to decide, a prudent man too ready to undertake, or an honest man too ready to promise." Neither now nor ever had Burke any other real conception of a polity for England than government by the territorial aristocracy in the interests of the nation at large, and especially in the interests of commerce, to the vital importance of which in our economy he was always keenly and wisely alive. The policy of George III., and the support which it found among men who were weary of Whig factions, disturbed this scheme, and therefore Burke denounced both the court policy and the court party with all his heart and all his strength.

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Eloquence and good sense, however, were impotent in the face of such forces as were at this time arrayed against a government at once strong and liberal. The court was confident that a union between Chatham and the Rockinghams was impossible. The union was in fact hindered by the waywardness and the absurd pretences of Chatham, and the want of force in Lord Rockingham. In the nation at large, the late violent ferment had been followed by as remarkable a deadness and vapidity, and Burke himself had to admit a year or two later that any remarkable robbery at Hounslow Heath would make more conversation than all the disturbances of America. The duke of Grafton went out, and Lord North became the head of a government, which lasted twelve years (1770-1782), and brought about more than all the disasters that Burke had foretold as the inevitable issue of the royal policy. For the first six years of this lamentable period Burke was actively employed in stimulating, informing and guiding the patrician chiefs of his party. "Indeed, Burke," said the duke of Richmond, "you have more merit than any man in keeping us together." They were well-meaning and patriotic men, but it was not always easy to get them to prefer politics to fox-hunting. When he reached his lodgings at night after a day in the city or a skirmish in the House of Commons, Burke used to find a note from the duke of Richmond or the marquess of Rockingham, praying him to draw a protest to be entered on the Journals of the Lords, and in fact he drew all the principal protests of his party between 1767 and 1782. The accession of Charles James Fox to the Whig party, which took place at this time, and was so important an event in its history, was mainly due to the teaching and influence of Burke. In the House of Commons his industry was almost excessive. He was taxed with speaking too often, and with being too forward. And he was mortified by a more serious charge than murmurs about superfluity of zeal. Men said and said again that he was Junius. His very proper unwillingness to stoop to deny an accusation, that would have been so disgraceful if it had been true, made ill-natured and silly people the more convinced that it was not wholly false. But whatever the London world may have thought of him, Burke's energy and devotion of character impressed the better minds in the country. In 1774 he received the great distinction of being chosen as one of its representatives by Bristol, then the second town in the kingdom.

In the events which ended in the emancipation of the American colonies from the monarchy, Burke's political genius shone with an effulgence that was worthy of the great affairs over which it shed so magnificent an illumination. His speeches are almost the one monument of the struggle on which a lover of English greatness can look back with pride and a sense of worthiness, such as a churchman feels when he reads Bossuet, or an Anglican when he turns over the pages of Taylor or of Hooker. Burke's attitude in these high transactions is really more impressive than Chatham's, because he was far less theatrical than Chatham; and while he was no less nobly passionate for freedom and justice, in his passion was fused the most strenuous political argumentation and sterling reason of state. On the other hand he was wholly free from that quality which he ascribed to Lord George Sackville, a man "apt to take a sort of undecided, equivocal, narrow ground, that evades the substantial merits of the question, and puts the whole upon some temporary, local, accidental or personal consideration." He rose to the full height of that great argument. Burke here and everywhere else displayed the rare art of filling his subject with generalities, and yet never intruding commonplaces. No publicist who deals as largely in general propositions has ever been as free from truisms; no one has ever treated great themes with so much elevation, and yet been so wholly secured against the pitfalls of emptiness and the vague. And it is instructive to compare the foundation of all his pleas for the colonists with that on which they erected their own theoretic declaration of independence. The American leaders were impregnated with the metaphysical ideas of rights which had come to them from the rising revolutionary school in France. Burke no more adopted the doctrines of Jefferson in 1776 than he adopted the doctrines of Robespierre in 1793. He says nothing about men being born free and equal, and on the other hand he never denies the position of the court and the country at large, that the home legislature, being sovereign, had the right to tax the colonies. What he does say is that the exercise of such a right was not practicable; that if it were practicable, it was inexpedient; and that, even if this had not been inexpedient, yet, after the colonies had taken to arms, to crush their resistance by military force would not be more disastrous to them than it would be unfortunate for the ancient liberties of Great Britain. Into abstract discussion he would not enter. "Show the thing you contend for to be reason; show it to be common sense; show it to be the means of attaining some useful end." "The question with me is not whether you have a right to render your people miserable, but whether it is not your interest to make them happy." There is no difference in social spirit and doctrine between his protests against the maxims of the English common people as to the colonists, and his protests against the maxims of the French common people as to the court and the nobles; and it is impossible to find a single principle either asserted or implied in the speeches on the American revolution which was afterwards repudiated in the writings on the revolution in France.

It is one of the signs of Burke's singular and varied eminence that hardly any two people agree precisely which of his works to mark as the masterpiece. Every speech or tract that he composed on a great subject becomes, as we read it, the rival of every other. But the *Speech on Conciliation* (1775) has, perhaps, been more universally admired than any of his other productions, partly because its maxims are of a simpler and less disputable kind than those which adorn the pieces on France, and partly because it is most strongly characterized by that deep ethical quality which is the prime secret of Burke's great style and literary mastery. In this speech, moreover, and in the only less powerful one of the preceding year upon American taxation, as well as in the *Letter to the Sheriffs of Bristol* in 1777, we see the all-important truth conspicuously illustrated that half of his eloquence always comes of the thoroughness with which he gets up his case. No eminent man has ever done more than Burke to justify the definition of genius as the consummation of the faculty of taking pains. Labour incessant and intense, if it was not the source, was at least an inseparable condition of his power. And magnificent rhetorician though he was, his labour was given less to his diction than to the facts; his heart was less in the form than the matter. It is true that his manuscripts were blotted and smeared, and that he made so many alterations in the proofs that the printer found it worth while to have the whole set up in type afresh. But there is no polish in his style, as in that of Junius for example, though there is something a thousand times better than polish. "Why will you

not allow yourself to be persuaded," said Francis after reading the *Reflections*, "that polish is material to preservation?" Burke always accepted the rebuke, and flung himself into vindication of the sense, substance and veracity of what he had written. His writing is magnificent, because he knew so much, thought so comprehensively, and felt so strongly.

The succession of failures in America, culminating in Cornwallis's surrender at Yorktown in October 1781, wearied the nation, and at length the persistent and powerful attacks of the opposition began to tell. "At this time," wrote Burke, in words of manly self-assertion, thirteen years afterwards, "having a momentary lead (1780-1782), so aided and so encouraged, and as a feeble instrument in a mighty hand—I do not say I saved my country—I am sure I did my country important service. There were few indeed at that time that did not acknowledge it. It was but one voice, that no man in the kingdom better deserved an honourable provision should be made for him." In the spring of 1782 Lord North resigned. It seemed as if the court
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system which Burke had been denouncing for a dozen years was now finally broken, and as if the party which he had been the chief instrument in instructing, directing and keeping together must now inevitably possess power for many years to come. Yet in a few months the whole fabric had fallen, and the Whigs were thrown into opposition for the rest of the century. The story cannot be omitted in the most summary account of Burke's life. Lord Rockingham came into office on the fall of North. Burke was rewarded for services beyond price by being made paymaster of the forces, with the rank of a privy councillor. He had lost his seat for Bristol two years before, in consequence of his courageous advocacy of a measure of tolerance for the Catholics, and his still more courageous exposure of the enormities of the commercial policy of England towards Ireland. He sat during the rest of his parliamentary life (to 1794) for Malton, a pocket borough first of Lord Rockingham's, then of Lord Fitzwilliam's. Burke's first tenure of office was very brief. He had brought forward in 1780 a comprehensive scheme of economical reform, with the design of limiting the resources of jobbery and corruption which the crown was able to use to strengthen its own sinister influence in parliament. Administrative reform was, next to peace with the colonies, the part of the scheme of the new ministry to which the king most warmly objected. It was carried out with greater moderation than had been foreshadowed in opposition. But at any rate Burke's own office was not spared. While Charles Fox's father was at the pay-office (1765-1778) he realized as the interest of the cash balances which he was allowed to retain in his hands, nearly a quarter of a million of money. When Burke came to this post the salary was settled at £4000 a year. He did not enjoy the income long. In July 1782 Lord Rockingham died; Lord Shelburne took his place; Fox, who inherited from his father a belief in Lord Shelburne's duplicity, which his own experience of him as a colleague during the last three months had made stronger, declined to serve under him. Burke, though he had not encouraged Fox to take this step, still with his usual loyalty followed him out of office. This may have been a proper thing to do if their distrust of Shelburne was incurable, but the next step, coalition with Lord North against him, was not only a political blunder, but a shock to party morality, which brought speedy retribution. Either they had been wrong, and violently wrong, for a dozen years, or else Lord North was the guiltiest political instrument since Strafford. Burke attempted to defend the alliance on the ground of the substantial agreement between Fox and North in public aims. The defence is wholly untenable. The Rockingham Whigs were as substantially in agreement on public affairs with the Shelburne Whigs as they were with Lord North. The movement was one of the worst in the history of English party. It served its immediate purpose, however, for Lord Shelburne found himself (February 24, 1783) too weak to carry on the government, and was succeeded by the members of the coalition, with the duke of Portland for prime minister (April 2, 1783). Burke went back to his old post at the pay-office and was soon engaged in framing and drawing the famous India Bill. This was long supposed to be the work of Fox, who was politically responsible for it. We may be sure that neither he nor Burke would have devised any government for India which they did not honestly believe to be for the advantage both of that country and of England. But it cannot be disguised that Burke had thoroughly persuaded himself that it was indispensable in the interests of English freedom to strengthen the party hostile to the court. As we have already said, dread of the peril to the constitution from the new aims of George III. was the main inspiration of Burke's political action in home affairs for the best part of his political life. The India Bill strengthened the anti-court party by transferring the government of India to seven persons named in the bill, and neither appointed nor removable by the crown. In other words, the bill gave the government to a board chosen directly by the House of Commons; and it had the incidental advantage of conferring on the ministerial party patronage valued at £300,000 a year, which would remain for a fixed term of years out of reach of the king. In a word, judging the India Bill from a party point of view, we see that Burke was now completing the aim of his project of economic reform. That measure had weakened the influence of the crown by limiting its patronage. The measure for India weakened the influence of the crown by giving a mass of patronage to the party which the king hated. But this was not to be. The India Bill was thrown out by means of a royal intrigue in the Lords, and the ministers were instantly dismissed (December 18, 1783). Young William Pitt, then only in his twenty-fifth year, had been chancellor of the exchequer in Lord Shelburne's short ministry, and had refused to enter the coalition government from an honourable repugnance to join Lord North. He was now made prime minister. The country in the election of the next year ratified the king's judgment against the Portland combination; and the hopes which Burke had cherished for a political lifetime were irretrievably ruined.

The six years that followed the great rout of the orthodox Whigs were years of repose for the country, but it was now that Burke engaged in the most laborious and formidable enterprise of his life, the impeachment of Warren Hastings for high crimes and misdemeanours in his government of India. His interest in that country was of old date. It arose partly from the fact of William Burke's residence there, partly from his friendship with Philip Francis, but most of all, we suspect, from the effect which he observed Indian influence to have in demoralizing the House of Commons. "Take my advice for once in your life," Francis wrote to Shee; "lay aside 40,000 rupees for a seat in parliament: in this country that alone makes all the difference between somebody and nobody." The relations, moreover, between the East India Company and the government were of the most important kind, and occupied Burke's closest attention from the beginning of the American war down to his own India Bill and that of Pitt and Dundas. In February 1785 he delivered one of the most famous of all his speeches, that on the nabob of Arcot's debts. The real point of this superb declamation was Burke's conviction that ministers supported the claims of the fraudulent creditors in order to secure the corrupt advantages of a sinister parliamentary interest. His proceedings against Hastings had a deeper spring. The story of Hastings's crimes, as Macaulay says, made the blood of Burke boil in his veins. He had a native abhorrence of cruelty, of injustice, of disorder, of oppression, of tyranny, and all these things in all their degrees marked Hastings's

course in India. They were, moreover, concentrated in individual cases, which exercised Burke's passionate imagination to its profoundest depths, and raised it to such a glow of fiery intensity as has never been rivalled in our history. For it endured for fourteen years, and was just as burning and as terrible when Hastings was acquitted in 1795, as in the select committee of 1781 when Hastings's enormities were first revealed. "If I were to call for a reward," wrote Burke, "it would be for the services in which for fourteen years, without intermission, I showed the most industry and had the least success, I mean in the affairs of India; they are those on which I value myself the most; most for the importance; most for the labour; most for the judgment; most for constancy and perseverance in the pursuit." Sheridan's speech in the House of Commons upon the charge relative to the begums of Oude probably excelled anything that Burke achieved, as a dazzling performance abounding in the most surprising literary and rhetorical effects. But neither Sheridan nor Fox was capable of that sustained and overflowing indignation at outraged justice and oppressed humanity, that consuming moral fire, which burst forth again and again from the chief manager of the impeachment, with such scorching might as drove even the cool and intrepid Hastings beyond all self-control, and made him cry out with protests and exclamations like a criminal writhing under the scourge. Burke, no doubt, in the course of that unparalleled trial showed some prejudice; made some minor overstatements of his case; used many intemperances; and suffered himself to be provoked into expressions of heat and impatience by the cabals of the defendant and his party, and the intolerable incompetence of the tribunal. It is one of the inscrutable perplexities of human
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affairs, that in the logic of practical life, in order to reach conclusions that cover enough for truth, we are constantly driven to premises that cover too much, and that in order to secure their right weight to justice and reason good men are forced to fling the two-edged sword of passion into the same scale. But these excuses were mere trifles, and well deserve to be forgiven, when we think that though the offender was in form acquitted, yet Burke succeeded in these fourteen years of laborious effort in laying the foundations once for all of a moral, just, philanthropic and responsible public opinion in England with reference to India, and in doing so performed perhaps the most magnificent service that any statesman has ever had it in his power to render to humanity.

Burke's first decisive step against Hastings was a motion for papers in the spring of 1786; the thanks of the House of Commons to the managers of the impeachment were voted in the summer of 1794. But in those eight years some of the most astonishing events in history had changed the political face of Europe. Burke was more than sixty years old when the states-general met at Versailles in the spring of 1789. He had taken a prominent part on the side of freedom in the revolution which stripped England of her empire in the West. He had taken a prominent part on the side of justice, humanity and order in dealing with the revolution which had brought to England new empire in the East. The same vehement passion for freedom, justice, humanity and order was roused in him at a very early stage of the third great revolution in his history—the revolution which overthrew the old monarchy in France. From the first Burke looked on the events of 1789 with doubt and misgiving. He had been in France in 1773, where he had not only the famous vision of Marie Antoinette at Versailles, "glittering like the morning star, full of life, and splendour and joy," but had also supped and discussed with some of the destroyers, the encyclopaedists, "the sophisters, economists and calculators." His first speech on his return to England was a warning (March 17, 1773) that the props of good government were beginning to fail under the systematic attacks of unbelievers, and that principles were being propagated that would not leave to civil society any stability. The apprehension never died out in his mind; and when he knew that the principles and abstractions, the un-English dialect and destructive dialectic, of his former acquaintances were predominant in the National Assembly, his suspicion that the movement would end in disastrous miscarriage waxed into certainty.

The scene grew still more sinister in his eyes after the march of the mob from Paris to Versailles in October, and the violent transport of the king and queen from Versailles to Paris. The same hatred of lawlessness and violence which fired him with a divine rage against the Indian malefactors was aroused by the violence and lawlessness of the Parisian insurgents. The same disgust for abstractions and naked doctrines of right that had stirred him against the pretensions of the British parliament in 1774 and 1776, was revived in as lively a degree by political conceptions which he judged to be identical in the French assembly of 1789. And this anger and disgust were exasperated by the dread with which certain proceedings in England had inspired him, that the aims, principles, methods and language which he so misdoubted or abhorred in France were likely to infect the people of Great Britain.

In November 1790 the town, which had long been eagerly expecting a manifesto from Burke's pen, was electrified by the *Reflections on the Revolution in France, and on the proceedings in certain societies in London relative to that event*. The generous Windham made an entry in his diary of his reception of the new book. "What shall be said," he added, "of the state of things, when it is remembered that the writer is a man decried, persecuted and proscribed; not being much valued even by his own party, and by half the nation considered as little better than an ingenious madman?" But the writer now ceased to be decried, persecuted and proscribed, and his book was seized as the expression of that new current of opinion in Europe which the more recent events of the Revolution had slowly set flowing. Its vogue was instant and enormous. Eleven editions were exhausted in little more than a year, and there is probably not much exaggeration in the estimate that 30,000 copies were sold before Burke's death seven years afterwards. George III. was extravagantly delighted; Stanislaus of Poland sent Burke words of thanks and high glorification and a gold medal. Catherine of Russia, the friend of Voltaire and the benefactress of Diderot, sent her congratulations to the man who denounced French philosophers as miscreants and wretches. "One wonders," Romilly said, by and by, "that Burke is not ashamed at such success." Mackintosh replied to him temperately in the *Vindiciae Gallicae*, and Thomas Paine replied to him less temperately but far more trenchantly and more shrewdly in the *Rights of Man*. Arthur Young, with whom he had corresponded years before on the mysteries of deep ploughing and fattening hogs, added a cogent polemical chapter to that ever admirable work, in which he showed that he knew as much more than Burke about the old system of France as he knew more than Burke about soils and roots. Philip Francis, to whom he had shown the proof-sheets, had tried to dissuade Burke from publishing his performance. The passage about Marie Antoinette, which has since become a stock piece in books of recitation, seemed to Francis a mere piece of foppery; for was she not a Messalina and a jade? "I know nothing of your story of Messalina," answered Burke; "am I obliged to prove judicially the virtues of all those I shall see suffering every kind of wrong and contumely and risk of life, before I endeavour to interest others in their sufferings?... Are not high rank, great splendour of descent, great personal elegance and outward accomplishments ingredients of moment in forming the interest we take in the misfortunes of men?... I tell you again that the recollection of the manner in which I saw the queen of France in 1774, and the contrast between that brilliancy, splendour

and beauty, with the prostrate homage of a nation to her, and the abominable scene of 1780 which I was describing, *did* draw tears from me and wetted my paper. These tears came again into my eyes almost as often as I looked at the description,—they may again. You do not believe this fact, nor that these are my real feelings; but that the whole is affected, or as you express it, downright foppery. My friend, I tell you it is truth; and that it is true and will be truth when you and I are no more; and will exist as long as men with their natural feelings shall exist" (*Corr.* iii. 139).

Burke's conservatism was, as such a passage as this may illustrate, the result partly of strong imaginative associations clustering round the more imposing symbols of social continuity, partly of a sort of corresponding conviction in his reason that there are certain permanent elements of human nature out of which the European order had risen and which that order satisfied, and of whose immense merits, as of its mighty strength, the revolutionary party in France were most fatally ignorant. When Romilly saw Diderot in 1783, the great encyclopaedic chief assured him that submission to kings and belief in God would be at an end all over the world in a very few years. When Condorcet described the Tenth Epoch in the long development of human progress, he was sure not only that fulness of light and perfection of happiness would come to the sons of men, but that they were coming with all speed. Only those who know the incredible rashness of the revolutionary doctrine in the mouths of its most powerful professors at that time; only those who know their absorption in ends and their inconsiderateness about means, can feel how profoundly right Burke was in all this part of his contention. Napoleon, who had begun life as a disciple of Rousseau, confirmed the wisdom of the philosophy of Burke when he came to make the Concordat. That measure was in one sense the outcome of a mere sinister expediency, but that such a measure was expedient at all sufficed to prove that Burke's view of the present possibilities of social change was right, and the view of the Rousseauites and too sanguine Perfectibilitarians wrong. As we have seen, Burke's very first niece, the satire on Bolingbroke, sprang from his conviction that merely rationalistic or destructive criticism, applied to the vast complexities of man in the social union, is either mischievous or futile, and mischievous exactly in proportion as it is not futile.

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To discuss Burke's writings on the Revolution would be to write first a volume upon the abstract theory of society, and then a second volume on the history of France. But we may make one or two further remarks. One of the most common charges against Burke was that he allowed his imagination and pity to be touched only by the sorrows of kings and queens, and forgot the thousands of oppressed and famine-stricken toilers of the land. "No tears are shed for nations," cried Francis, whose sympathy for the Revolution was as passionate as Burke's execration of it. "When the provinces are scourged to the bone by a mercenary and merciless military power, and every drop of its blood and substance extorted from it by the edicts of a royal council, the case seems very tolerable to those who are not involved in it. When thousands after thousands are dragooned out of their country for the sake of their religion, or sent to row in the galleys for selling salt against law,—when the liberty of every individual is at the mercy of every prostitute, pimp or parasite that has access to power or any of its basest substitutes,—my mind, I own, is not at once prepared to be satisfied with gentle palliatives for such disorders" (*Francis to Burke*, November 3, 1790). This is a very terse way of putting a crucial objection to Burke's whole view of French affairs in 1789. His answer was tolerably simple. The Revolution, though it had made an end of the Bastille, did not bring the only real practical liberty, that is to say, the liberty which comes with settled courts of justice, administering settled laws, undisturbed by popular fury, independent of everything but law, and with a clear law for their direction. The people, he contended, were no worse off under the old monarchy than they will be in the long run under assemblies that are bound by the necessity of feeding one part of the community at the grievous charge of other parts, as necessitous as those who are so fed; that are obliged to flatter those who have their lives at their disposal by tolerating acts of doubtful influence on commerce and agriculture, and for the sake of precarious relief to sow the seeds of lasting want; that will be driven to be the instruments of the violence of others from a sense of their own weakness, and, by want of authority to assess equal and proportioned charges upon all, will be compelled to lay a strong hand upon the possessions of a part. As against the moderate section of the Constituent Assembly this was just.

One secret of Burke's views of the Revolution was the contempt which he had conceived for the popular leaders in the earlier stages of the movement. In spite of much excellence of intention, much heroism, much energy, it is hardly to be denied that the leaders whom that movement brought to the surface were almost without exception men of the poorest political capacity. Danton, no doubt, was abler than most of the others, yet the timidity or temerity with which he allowed himself to be vanquished by Robespierre showed that even he was not a man of commanding quality. The spectacle of men so rash, and so incapable of controlling the forces which they seemed to have presumptuously summoned, excited in Burke both indignation and contempt. And the leaders of the Constituent who came first on the stage, and hoped to make a revolution with rose-water, and hardly realized any more than Burke did how rotten was the structure which they had undertaken to build up, almost deserved his contempt, even if, as is certainly true, they did not deserve his indignation. It was only by revolutionary methods, which are in their essence and for a time as arbitrary as despotic methods, that the knot could be cut. Burke's vital error was his inability to see that a root and branch revolution was, under the conditions, inevitable. His cardinal position, from which he deduced so many important conclusions, namely, that, the parts and organs of the old constitution of France were sound, and only needed moderate invigoration, is absolutely mistaken and untenable. There was not a single chamber in the old fabric that was not crumbling and tottering. The court was frivolous, vacillating, stone deaf and stone blind; the gentry were amiable, but distinctly bent to the very last on holding to their privileges, and they were wholly devoid both of the political experience that only comes of practical responsibility for public affairs, and of the political sagacity that only comes of political experience. The parliaments or tribunals were nests of faction and of the deepest social incompetence. The very sword of the state broke short in the king's hand. If the king or queen could either have had the political genius of Frederick the Great, or could have had the good fortune to find a minister with that genius, and the good sense and good faith to trust and stand by him against mobs of aristocrats and mobs of democrats; if the army had been sound and the states-general had been convoked at Bourges or Tours instead of at Paris, then the type of French monarchy and French society might have been modernized without convulsion. But none of these conditions existed.

When he dealt with the affairs of India Burke passed over the circumstances of our acquisition of power in that continent. "There is a sacred veil to be drawn over the beginnings of all government," he said. "The first step to empire is revolution, by which power is conferred; the next is good laws, good order, good

institutions, to give that power stability." Exactly on this broad principle of political force, revolution was the first step to the assumption by the people of France of their own government. Granted that the Revolution was inevitable and indispensable, how was the nation to make the best of it? And how were surrounding nations to make the best of it? This was the true point of view. But Burke never placed himself at such a point. He never conceded the postulate, because, though he knew France better than anybody in England except Arthur Young, he did not know her condition well enough. "Alas!" he said, "they little know how many a weary step is to be taken before they can form themselves into a mass which has a true political personality."

Burke's view of French affairs, however consistent with all his former political conceptions, put an end to more than one of his old political friendships. He had never been popular in the House of Commons, and the vehemence, sometimes amounting to fury, which he had shown in the debates on the India Bill, on the regency, on the impeachment of Hastings, had made him unpopular even among men on his own side. In May 1789—that memorable month of May in which the states-general marched in impressive array to hear a sermon at the church of Notre Dame at Versailles—a vote of censure had actually been passed on him in the House of Commons for a too severe expression used against Hastings. Fox, who led the party, and Sheridan, who led Fox, were the intimates of the prince of Wales; and Burke would have been as much out of place in that circle of gamblers and profligates as Milton would have been out of place in the court of the Restoration. The prince, as somebody said, was like his father in having closets within cabinets and cupboards within closets. When the debates on the regency were at their height we have Burke's word that he was not admitted to the private counsels of the party. Though Fox and he were on friendly terms in society, yet Burke admits that for a considerable period before 1790 there had been between them "distance, coolness and want of confidence, if not total alienation on his part." The younger Whigs had begun to press for shorter parliaments, for the ballot, for redistribution of political power. Burke had never looked with any favour on these projects. His experience of the sentiment of the populace in the two greatest concerns of his life,—American affairs and Indian affairs,—had not been likely to prepossess him in favour of the popular voice as the voice of superior political wisdom. He did not absolutely object to some remedy in the state of representation (*Corr.* ii. 387), still he vigorously resisted such proposals as the duke of Richmond's in 1780 for manhood suffrage. The general ground was this:—"The machine itself is well enough to answer any good purpose, provided the materials were sound. But what signifies the arrangement of rottenness?"

Bad as the parliaments of George III. were, they contained their full share of eminent and capable men; and, what is more, their very defects were the exact counterparts of what we now look back upon as the prevailing stupidity in the country. What Burke valued was good government. His *Report on the Causes of the Duration of Mr Hastings's Trial* shows how wide and sound were his views of law reform. His *Thoughts on Scarcity* attest his enlightenment on the central necessities of trade and manufacture, and even furnished arguments to Cobden fifty years afterwards. Pitt's parliaments were competent to discuss, and willing to pass, all measures for which the average political intelligence of the country was ripe. Burke did not believe that altered machinery was at that time needed to improve the quality of legislation. If wiser legislation followed the great reform of 1832, Burke would have said this was because the political intelligence of the country had improved.

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Though averse at all times to taking up parliamentary reform, he thought all such projects downright crimes in the agitation of 1791-1792. This was the view taken by Burke, but it was not the view of Fox, nor of Sheridan, nor of Francis, nor of many others of his party, and difference of opinion here was naturally followed by difference of opinion upon affairs in France. Fox, Grey, Windham, Sheridan, Francis, Lord Fitzwilliam, and most of the other Whig leaders, welcomed the Revolution in France. And so did Pitt, too, for some time. "How much the greatest event it is that ever happened in the world," cried Fox, with the exaggeration of a man ready to dance the carmagnole, "and how much the best!" The dissension between a man who felt so passionately as Burke, and a man who spoke so impulsively as Charles Fox, lay in the very nature of things. Between Sheridan and Burke there was an open breach in the House of Commons upon the Revolution so early as February 1790, and Sheridan's influence with Fox was strong. This divergence of opinion destroyed all the elation that Burke might well have felt at his compliments from kings, his gold medals, his twelve editions. But he was too fiercely in earnest in his horror of Jacobinism to allow mere party associations to guide him. In May 1791 the thundercloud burst, and a public rupture between Burke and Fox took place in the House of Commons.

The scene is famous in English parliamentary annals. The minister had introduced a measure for the division of the province of Canada and for the establishment of a local legislature in each division. Fox in the course of debate went out of his way to laud the Revolution, and to sneer at some of the most effective passages in the *Reflections*. Burke was not present, but he announced his determination to reply. On the day when the Quebec Bill was to come on again, Fox called upon Burke, and the pair walked together from Burke's house in Duke Street down to Westminster. The Quebec Bill was recommitted, and Burke at once rose and soon began to talk his usual language against the Revolution, the rights of man, and Jacobinism whether English or French. There was a call to order. Fox, who was as sharp and intolerant in the House as he was amiable out of it, interposed with some words of contemptuous irony. Pitt, Grey, Lord Sheffield, all plunged into confused and angry debate as to whether the French Revolution was a good thing, and whether the French Revolution, good or bad, had anything to do with the Quebec Bill. At length Fox, in seconding a motion for confining the debate to its proper subject, burst into the fatal question beyond the subject, taxing Burke with inconsistency, and taunting him with having forgotten that ever-admirable saying of his own about the insurgent colonists, that he did not know how to draw an indictment against a whole nation. Burke replied in tones of firm self-repression; complained of the attack that had been made upon him; reviewed Fox's charges of inconsistency; enumerated the points on which they had disagreed, and remarked that such disagreements had never broken their friendship. But whatever the risk of enmity, and however bitter the loss of friendship, he would never cease from the warning to flee from the French constitution. "But there is no loss of friends," said Fox in an eager undertone. "Yes," said Burke, "there *is* a loss of friends. I know the penalty of toy conduct. I have done my duty at the price of my friend—our friendship is at an end." Fox rose, but was so overcome that for some moments he could not speak. At length, his eyes streaming with tears, and in a broken voice, he deplored the breach of a twenty years' friendship on a political question. Burke was inexorable. To him the political question was so vivid, so real, so intense, as to make all personal sentiment no more than dust in the balance. Burke confronted Jacobinism with the relentlessness of a Jacobin. The rupture was never healed, and Fox and he had no

relations with one another henceforth beyond such formal interviews as took place in the manager's box in Westminster Hall in connexion with the impeachment.

A few months afterwards Burke published the *Appeal from the New to the Old Whigs*, a grave, calm and most cogent vindication of the perfect consistency of his criticisms upon the English Revolution of 1688 and upon the French Revolution of 1789, with the doctrines of the great Whigs who conducted and afterwards defended in Anne's reign the transfer of the crown from James to William and Mary. The *Appeal* was justly accepted as a satisfactory performance for the purpose with which it was written. Events, however, were doing more than words could do, to confirm the public opinion of Burke's sagacity and foresight. He had always divined by the instinct of hatred that the French moderates must gradually be swept away by the Jacobins, and now it was all coming true. The humiliation of the king and queen after their capture at Varennes; the compulsory acceptance of the constitution; the plain incompetence of the new Legislative Assembly; the growing violence of the Parisian mob, and the ascendency of the Jacobins at the Common Hall; the fierce day of the 20th of June (1792), when the mob flooded the Tuileries, and the bloodier day of the 10th of August, when the Swiss guard was massacred and the royal family flung into prison; the murders in the prisons in September; the trial and execution of the king in January (1793); the proscription of the Girondins in June, the execution of the queen in October—if we realize the impression likely to be made upon the sober and homely English imagination by such a heightening of horror by horror, we may easily understand how people came to listen to Burke's voice as the voice of inspiration, and to look on his burning anger as the holy fervour of a prophet of the Lord.

Fox still held to his old opinions as stoutly as he could, and condemned and opposed the war which England had declared against the French republic. Burke, who was profoundly incapable of the meanness of letting personal estrangement blind his eyes to what was best for the commonwealth, kept hoping against hope that each new trait of excess in France would at length bring the great Whig leader to a better mind. He used to declaim by the hour in the conclaves at Burlington House upon the necessity of securing Fox; upon the strength which his genius would lend to the administration in its task of grappling with the sanguinary giant; upon the impossibility, at least, of doing either with him or without him. Fox's most important political friends who had long wavered, at length, to Burke's great satisfaction, went over to the side of the government. In July 1794 the duke of Portland, Lord Fitzwilliam, Windham and Grenville took office under Pitt. Fox was left with a minority which was satirically said not to have been more than enough to fill a hackney coach. "That is a calumny," said one of the party, "we should have filled two." The war was prosecuted with the aid of both the great parliamentary parties of the country, and with the approval of the great bulk of the nation. Perhaps the one man in England who in his heart approved of it less than any other was William Pitt. The difference between Pitt and Burke was nearly as great as that between Burke and Fox. Burke would be content with nothing short of a crusade against France, and war to the death with her rulers. "I cannot persuade myself," he said, "that this war bears any the least resemblance to any that has ever existed in the world. I cannot persuade myself that any examples or any reasonings drawn from other wars and other politics are at all applicable to it" (*Corr.* iv. 219). Pitt, on the other hand, as Lord Russell truly says, treated Robespierre and Carnot as he would have treated any other French rulers, whose ambition was to be resisted, and whose interference in the affairs of other nations was to be checked. And he entered upon the matter in the spirit of a man of business, by sending ships to seize some islands belonging to France in the West Indies, so as to make certain of repayment of the expenses of the war.

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In the summer of 1794 Burke was struck to the ground by a blow to his deepest affection in life, and he never recovered from it. His whole soul was wrapped up in his only son, of whose abilities he had the most extravagant estimate and hope. All the evidence goes to show that Richard Burke was one of the most presumptuous and empty-headed of human beings. "He is the most impudent and opiniative fellow I ever knew," said Wolfe Tone. Gilbert Elliot, a very different man, gives the same account. "Burke," he says, describing a dinner party at Lord Fitzwilliam's in 1793, "has now got such a train after him as would sink anybody but himself: his son, who is quite *nauseated* by all mankind; his brother, who is liked better than his son, but is rather oppressive with animal spirits and brogue; and his cousin, William Burke, who is just returned unexpectedly from India, as much ruined as when he went years ago, and who is a fresh charge on any prospects of power Burke may ever have. Mrs Burke has in her train Miss French [Burke's niece], the most perfect *She Paddy* that ever was caught. Notwithstanding these disadvantages Burke is in himself a sort of power in the state. It is not too much to say that he is a sort of power in Europe, though totally without any of those means or the smallest share in them which give or maintain power in other men." Burke accepted the position of a power in Europe seriously. Though no man was ever more free from anything like the egoism of the intellectual coxcomb, yet he abounded in that active self-confidence and self-assertion which is natural in men who are conscious of great powers, and strenuous in promoting great causes. In the summer of 1791 he despatched his son to Coblenz to give advice to the royalist exiles, then under the direction of Calonne, and to report to him at Beaconsfield their disposition and prospects. Richard Burke was received with many compliments, but of course nothing came of his mission, and the only impression that remains with the reader of his prolix story is his tale of the two royal brothers, who afterwards became Louis XVIII. and Charles X., meeting after some parting, and embracing one another with many tears on board a boat in the middle of the Rhine, while some of the courtiers raised a cry of "Long live the king"—the king who had a few weeks before been carried back in triumph to his capital with Mayor Pétion in his coach. When we think of the pass to which things had come in Paris by this time, and of the unappeasable ferment that boiled round the court, there is a certain touch of the ludicrous in the notion of poor Richard Burke writing to Louis XVI. a letter of wise advice how to comport himself.

At the end of the same year, with the approval of his father he started for Ireland as the adviser of the Catholic Association. He made a wretched emissary, and there was no limit to his arrogance, noisiness and indiscretion. The Irish agitators were glad to give him two thousand guineas and to send him home. The mission is associated with a more important thing, his father's *Letters to Sir Hercules Langrishe*, advocating the admission of the Irish Catholics to the franchise. This short piece abounds richly in maxims of moral and political prudence. And Burke exhibited considerable courage in writing it; for many of its maxims seem to involve a contradiction, first, to the principles on which he withstood the movement in France, and second, to his attitude upon the subject of parliamentary reform. The contradiction is in fact only superficial. Burke was not the man to fall unawares into a trap of this kind. His defence of Catholic relief—and it had been the conviction of a lifetime—was very properly founded on propositions which were true of Ireland, and were true neither of France nor of the quality of parliamentary representation in

England. Yet Burke threw such breadth and generality over all he wrote that even these propositions, relative as they were, form a short manual of statesmanship.

At the close of the session of 1794 the impeachment of Hastings had come to an end, and Burke bade farewell to parliament. Richard Burke was elected in his father's place at Malton. The king was bent on making the champion of the old order of Europe a peer. His title was to be Lord Beaconsfield, and it was designed to annex to the title an income for three lives. The patent was being made ready, when all was arrested by the sudden death of the son who was to Burke more than life. The old man's grief was agonizing and inconsolable. "The storm has gone over me," he wrote in words which are well known, but which can hardly be repeated too often for any who have an ear for the cadences of noble and pathetic speech,—"The storm has gone over me, and I lie like one of those old oaks which the late hurricane has scattered about me. I am stripped of all my honours; I am torn up by the roots and lie prostrate on the earth.... I am alone. I have none to meet my enemies in the gate.... I live in an inverted order. They who ought to have succeeded me have gone before me. They who should have been to me as posterity are in the place of ancestors."

A pension of £2500 was all that Burke could now be persuaded to accept. The duke of Bedford and Lord Lauderdale made some remarks in parliament upon this paltry reward to a man who, in conducting a great trial on the public behalf, had worked harder for nearly ten years than any minister in any cabinet of the reign. But it was not yet safe to kick up heels in face of the dying lion. The vileness of such criticism was punished, as it deserved to be, in the *Letter to a Noble Lord* (1796), in which Burke showed the usual art of all his compositions in shaking aside the insignificances of a subject. He turned mere personal defence and retaliation into an occasion for a lofty enforcement of constitutional principles, and this, too, with a relevancy and pertinence of consummate skilfulness. There was to be one more great effort before the end.

In the spring of 1796 Pitt's constant anxiety for peace had become more earnest than ever. He had found out the instability of the coalition and the power of France. Like the thrifty steward he was, he saw with growing concern the waste of the national resources and the strain upon commerce, with a public debt swollen to what then seemed the desperate sum of £400,000,000. Burke at the notion of negotiation flamed out in the *Letters on a Regicide Peace*, in some respects the most splendid of all his compositions. They glow with passion, and yet with all their rapidity is such steadfastness, the fervour of imagination is so skilfully tempered by close and plausible reasoning, and the whole is wrought with such strength and fire, that we hardly know where else to look either in Burke's own writings or elsewhere for such an exhibition of the rhetorical resources of our language. We cannot wonder that the whole nation was stirred to the very depths, or that they strengthened the aversion of the king, of Windham and other important personages in the government against the plans of Pitt. The prudence of their drift must be settled by external considerations. Those who think that the French were likely to show a moderation and practical reasonableness in success, such as they had never shown in the hour of imminent ruin, will find Burke's judgment full of error and mischief. Those, on the contrary, who think that the nation which was on the very eve of surrendering itself to the Napoleonic absolutism was not in a hopeful humour for peace and the European order, will believe that Burke's protests were as perspicacious as they were powerful, and that anything which chilled the energy of the war was as fatal as he declared it to be.

When the third and most impressive of these astonishing productions came into the hands of the public, the writer was no more. Burke died on the 8th of July 1797. Fox, who with all his faults was never wanting in a fine and generous sensibility, proposed that there should be a public funeral, and that the body should lie among the illustrious dead in Westminster Abbey. Burke, however, had left strict injunctions that his burial should be private; and he was laid in the little church at Beaconsfield. It was the year of Campo Formio. So a black whirl and torment of rapine, violence and fraud was encircling the Western world, as a life went out which, notwithstanding some eccentricities and some aberrations, had made great tides in human destiny very luminous.

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(J. Mo.)

Authorities.—Of the *Collected Works*, there are two main editions—the quarto and the octavo. (1) Quarto, in eight volumes, begun in 1792, under the editorship of Dr F. Lawrence; vols. i.-iii. were published in 1792; vols. iv.-viii., edited by Dr Walter King, sometime bishop of Rochester, were completed in 1827. (2) Octavo in sixteen volumes. This was begun at Burke's death, also by Drs Lawrence and King; vols. i.-viii. were published in 1803 and reissued in 1808, when Dr Lawrence died; vols. ix.-xii. were published in 1813 and the remaining four vols. in 1827. A new edition of vols. i.-viii. was published in 1823 and the contents of vols. i.-xii. in 2 vols. octavo in 1834. An edition in nine volumes was published in Boston, Massachusetts, in 1839. This contains the whole of the English edition in sixteen volumes, with a reprint of the *Account of the European Settlements in America* which is not in the English edition.

Among the numerous editions published later may be mentioned that in *Bohn's British Classics*, published in 1853. This contains the fifth edition of Sir James Prior's life; also an edition in twelve volumes, octavo, published by J.C. Nimmo, 1898. There is an edition of the *Select Works* of Burke with introduction and notes by E.J. Payne in the Clarendon Press series, new edition, 3 vols., 1897. *The Correspondence of Edmund Burke*, edited by Earl Fitzwilliam and Sir R. Bourke, with appendix, detached papers and notes for speeches, was published in 4 vols., 1844. *The Speeches of Edmund Burke, in the House of Commons and Westminster Hall*, were published in 4 vols., 1816. Other editions of the speeches are those *On Irish Affairs*, collected and arranged by Matthew Arnold, with a preface (1881), *On American Taxation, On Conciliation with America*, together with the *Letter to the Sheriff of Bristol*, edited with introduction and notes by F.G. Selby (1895).

The standard life of Burke is that by Sir James Prior, *Memoir of the Life and Character of Edmund Burke with Specimens of his Poetry and Letters* (1824). The lives by C. MacCormick (1798) by R. Bisset (1798, 1800) are of little value. Other lives are those by the Rev. George Croly (2 vols., 1847), and by T. MacKnight (3 vols., 1898). Of critical estimates of Burke's life the *Edmund Burke* of John Morley, "English Men of Letters" series (1879), is an elaboration of the above article; see also his *Burke, a Historical Study* (1867); "Three Essays on Burke," by Sir James Fitzjames Stephen in *Horae Sabbaticae*, series iii. (1892); and *Peptographia Dublinensis, Memorial Discourses preached in the Chapel of Trinity College, Dublin*, 1895-1902; *Edmund Burke*, by G. Chadwick, bishop of Derry (1902).

BURKE, SIR JOHN BERNARD (1814-1892), British genealogist, was born in London, on the 5th of January 1814, and was educated in London and in France. His father, John Burke (1787-1848), was also a genealogist, and in 1826 issued a *Genealogical and Heraldic Dictionary of the Peerage and Baronetage of the United Kingdom*. This work, generally known as *Burke's Peerage*, has been issued annually since 1847. While practising as a barrister Bernard Burke assisted his father in his genealogical work, and in 1848 took control of his publications. In 1853 he was appointed Ulster king-at-arms; in 1854 he was knighted; and in 1855 he became keeper of the state papers in Ireland. After having devoted his life to genealogical studies he died in Dublin on the 12th of December 1892. In addition to editing *Burke's Peerage* from 1847 to his death, Burke brought out several editions of a companion volume, *Burke's Landed Gentry*, which was first published between 1833 and 1838. In 1866 and 1883 he published editions of his father's *Dictionary of the Peerages of England, Scotland and Ireland, extinct, dormant and in abeyance* (earlier editions, 1831, 1840, 1846); in 1855 and 1876 editions of his *Royal Families of England, Scotland and Wales* (1st edition, 1847-1851); and in 1878 and 1883 enlarged editions of his *Encyclopaedia of Heraldry, or General Armoury of England, Scotland and Ireland*. Burke's own works include *The Roll of Battle Abbey* (1848); *The Romance of the Aristocracy* (1855); *Vicissitudes of Families* (1883 and several earlier editions); and *The Rise of Great Families* (1882). He was succeeded as editor of *Burke's Peerage* and *Landed Gentry* by his fourth son, Ashworth Peter Burke.

BURKE, ROBERT O'HARA (1820-1861), Australian explorer, was born at St Cleram, Co. Galway, Ireland, in 1820. Descended from a branch of the family of Clanricarde, he was educated in Belgium, and at twenty years of age entered the Austrian army, in which he attained the rank of captain. In 1848 he left the Austrian service, and became a member of the Royal Irish Constabulary. Five years later he emigrated to Tasmania, and shortly afterwards crossed to Melbourne, where he became an inspector of police. When the Crimean War broke out he went to England in the hope of securing a commission in the army, but peace had meanwhile been signed, and he returned to Victoria and resumed his police duties. At the end of 1857 the Philosophical Institute of Victoria took up the question of the exploration of the interior of the Australian continent, and appointed a committee to inquire into and report upon the subject. In September 1858, when it became known that John McDouall Stuart had succeeded in penetrating as far as the centre of Australia, the sum of £1000 was anonymously offered for the promotion of an expedition to cross the continent from south to north, on condition that a further sum of £2000 should be subscribed within a twelvemonth. The amount having been raised within the time specified, the Victorian parliament supplemented it by a vote of £6000, and an expedition was organized under the leadership of Burke, with W.J. Wills as surveyor and astronomical observer. The story of this expedition, which left Melbourne on the 21st of August 1860, furnishes perhaps the most painful episode in Australian annals. Ten Europeans and three Sepoys accompanied the expedition, which was soon torn by internal dissensions. Near Menindie on the Darling, Landells, Burke's second in command, became insubordinate and resigned, his example being followed by the doctor—a German. On the 11th of November Burke, with Wills and five assistants, fifteen horses and sixteen camels, reached Cooper's Creek in Queensland, where a depot was formed near good grass and abundance of water. Here Burke proposed waiting the arrival of his third officer, Wright, whom he had sent back from Torowoto to Menindie to fetch some camels and supplies. Wright, however, delayed his departure until the 26th of January 1861. Meantime, weary of waiting, Burke, with Wills, King and Gray as companions, determined on the 16th of December to push on across the continent, leaving an assistant named Brahe to take care of the depot until Wright's arrival. On the 4th of February 1861 Burke and his party, worn down by famine, reached the estuary of the Flinders river, not far from the present site of Normantown on the Gulf of Carpentaria. On the 26th of February began their return journey. The party suffered greatly from famine and exposure, and but for the rainy season, thirst would have speedily ended their miseries. In vain they looked for the relief which Wright was to bring them. On the 16th of April Gray died, and the emaciated survivors halted a day to bury his body. That day's delay, as it turned out, cost Burke and Wills their lives; they arrived at Cooper's Creek to find the depot deserted. But a few hours before Brahe, unrelieved by Wright, and thinking that Burke had died or changed his plans, had taken his departure for the Darling. With such assistance as they could get from the natives, Burke, and his two companions struggled on, until death overtook Burke and Wills at the end of June. King sought the natives, who cared for him until his relief by a search party in September. No one can deny the heroism of the men whose lives were sacrificed in this ill-starred expedition. But it is admitted that the leaders were not bushmen and had had no experience in exploration. Disunion and disobedience to orders, from the highest to the lowest, brought about the worst results, and all that now remains to tell the story of the failure of this vast undertaking is a monument to the memory of the foolhardy heroes, from the chisel of Charles Summers, erected on a prominent site in Melbourne.

BURKE, WILLIAM (1792-1829), Irish criminal, was born in Ireland in 1792. After trying his hand at a variety of trades there, he went to Scotland about 1817 as a navvy, and in 1827 was living in a lodging-house in Edinburgh kept by William Hare, another Irish labourer. Towards the end of that year one of Hare's lodgers, an old army pensioner, died. This was the period of the body-snatchers or Resurrectionists, and Hare and Burke, aware that money could always be obtained for a corpse, sold the body to Dr Robert Knox, a leading Edinburgh anatomist, for £7, 10s. The price obtained and the simplicity of the transaction suggested to Hare an easy method of making a profitable livelihood, and Burke at once fell in with the plan. The two men inveigled obscure travellers to Hare's or some other lodging-house, made them drunk and then suffocated them, taking care to leave no marks of violence. The bodies were sold to Dr Knox for prices averaging from £8 to £14. At least fifteen victims had been disposed of in this way when the suspicions of the police were aroused, and Burke and Hare were arrested. The latter turned king's evidence, and Burke was found guilty and hanged at Edinburgh on the 28th of January 1829. Hare found it impossible, in view of the strong popular feeling, to remain in Scotland. He is believed to have died in England under an assumed name. From Burke's method of killing his victims has come the verb "to burke," meaning to suffocate, strangle or suppress secretly, or to kill with the object of selling the body for the purposes of dissection.

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See George Macgregor, *History of Burke and Hare and of the Resurrectionist Times* (Glasgow, 1884).

BURLAMAQUI, JEAN JACQUES (1694-1748), Swiss publicist, was born at Geneva on the 24th of June 1694. At the age of twenty-five he was designated honorary professor of ethics and the law of nature at the university of Geneva. Before taking up the appointment he travelled through France and England, and made the acquaintance of the most eminent writers of the period. On his return he began his lectures, and soon gained a wide reputation, from the simplicity of his style and the precision of his views. He continued

to lecture for fifteen years, when he was compelled on account of ill-health to resign. His fellow-citizens at once elected him a member of the council of state, and he gained as high a reputation for his practical sagacity as he had for his theoretical knowledge. He died at Geneva on the 3rd of April 1748. His works were *Principes du droit naturel* (1747), and *Principes du droit politique* (1751). These have passed through many editions, and were very extensively used as text-books. Burlamaqui's style is simple and clear, and his arrangement of the material good. His fundamental principle may be described as rational utilitarianism, and in many ways it resembles that of Cumberland.

BURLESQUE (Ital. *burlesco*, from *burla*, a joke, fun, playful trick), a form of the comic in art, consisting broadly in an imitation of a work of art with the object of exciting laughter, by distortion or exaggeration, by turning, for example, the highly rhetorical into bombast, the pathetic into the mock-sentimental, and especially by a ludicrous contrast between the subject and the style, making gods speak like common men and common men like gods. While parody (*q.v.*), also based on imitation, relies for its effect more on the close following of the style of its counterpart, burlesque depends on broader and coarser effects. Burlesque may be applied to any form of art, and unconsciously, no doubt, may be found even in architecture. In the graphic arts it takes the form better known as "caricature" (*q.v.*). Its particular sphere is, however, in literature, and especially in drama. The *Batrachomachia*, or Battle of the Frogs and Mice, is the earliest example in classical literature, being a travesty of the Homeric epic. There are many true burlesque parts in the comedies of Aristophanes, *e.g.* the appearance of Socrates in the *Clouds*. The Italian word first appears in the *Opere Burlesche* of Francesco Berni (1497-1535). In France during part of the reign of Louis XIV., the burlesque attained to great popularity; burlesque Aeneids, Iliads and Odysseys were composed, and even the most sacred subjects were not left untravestied. Of the numerous writers of these, P. Scarron is most prominent, and his *Virgile Travesti* (1648-1653) was followed by numerous imitators. In English literature Chaucer's *Rime of Sir Thopas* is a burlesque of the long-winded medieval romances. Among the best-known true burlesques in English dramatic literature may be mentioned the 2nd duke of Buckingham's *The Rehearsal*, a burlesque of the heroic drama; Gay's *Beggar's Opera*, of the Italian opera; and Sheridan's *The Critic*. In the later 19th century the name "burlesque" was given to a form of musical dramatic composition in which the true element of burlesque found little or no place. These musical burlesques, with which the Gaiety theatre, London, and the names of Edward Terry, Fred Leslie and Nellie Farren are particularly connected, developed from the earlier extravaganzas of J.R. Planché, written frequently round fairy tales. The Gaiety type of burlesque has since given place to the "musical comedy," and its only survival is to be found in the modern pantomime.

BURLINGAME, ANSON (1820-1870), American legislator and diplomat, was born in New Berlin, Chenango county, New York, on the 14th of November 1820. In 1823 his parents took him to Ohio, and about ten years afterwards to Michigan. In 1838-1841 he studied in one of the "branches" of the university of Michigan, and in 1846 graduated at the Harvard law school. He practised law in Boston, and won a wide reputation by his speeches for the Free Soil party in 1848. He was a member of the Massachusetts constitutional convention in 1853, of the state senate in 1853-1854, and of the national House of Representatives from 1855 to 1861, being elected for the first term as a "Know Nothing" and afterwards as a member of the new Republican party, which he helped to organize in Massachusetts. He was an effective debater in the House, and for his impassioned denunciation (June 21, 1856) of Preston S. Brooks (1819-1857), for his assault upon Senator Charles Sumner, was challenged by Brooks. Burlingame accepted the challenge and specified rifles as the weapons to be used; his second chose Navy Island, above the Niagara Falls, and in Canada, as the place for the meeting. Brooks, however, refused these conditions, saying that he could not reach the place designated "without running the gauntlet of mobs and assassins, prisons and penitentiaries, bailiffs and constables." To Burlingame's appointment as minister to Austria (March 22, 1861) the Austrian authorities objected because in Congress he had advocated the recognition of Sardinia as a first-class power and had championed Hungarian independence. President Lincoln thereupon appointed him (June 14, 1861) minister to China. This office he held until November 1867, when he resigned and was immediately appointed (November 26) envoy extraordinary and minister plenipotentiary to head a Chinese diplomatic mission to the United States and the principal European nations. The embassy, which included two Chinese ministers, an English and a French secretary, six students from the Tung-wan Kwang at Peking, and a considerable retinue, arrived in the United States in March 1868, and concluded at Washington (28th of July 1868) a series of articles, supplementary to the Reed Treaty of 1858, and later known as "The Burlingame Treaty." Ratifications of the treaty were not exchanged at Peking until November 23, 1869. The "Burlingame Treaty" recognizes China's right of eminent domain over all her territory, gives China the right to appoint at ports in the United States consuls, "who shall enjoy the same privileges and immunities as those enjoyed by the consuls of Great Britain and Russia"; provides that "citizens of the United States in China of every religious persuasion and Chinese subjects in the United States shall enjoy entire liberty of conscience and shall be exempt from all disability or persecution on account of their religious faith or worship in either country"; and grants certain privileges to citizens of either country residing in the other, the privilege of naturalization, however, being specifically withheld. After leaving the United States, the embassy visited several continental capitals, but made no definite treaties. Burlingame's speeches did much to awaken interest in, and a more intelligent appreciation of, China's attitude toward the outside world. He died suddenly at St Petersburg, on the 23rd of February 1870.

His son Edward Livermore Burlingame (b. 1848) was educated at Harvard and at Heidelberg, was a member of the editorial staff of the New York *Tribune* in 1871-1872 and of the *American Cyclopaedia* in 1872-1876, and in 1886 became the editor of *Scribner's Magazine*.

BURLINGTON, a city and the county-seat of Des Moines county, Iowa, U.S.A., on the Mississippi river, in the S.E. part of the state. Pop. (1890) 22,565; (1900) 23,201; (1905, state census) 25,318 (4492 foreign-born); (1910) 24,324. It is served by the Chicago, Burlington & Quincy (which has extensive construction and repair shops here), the Chicago, Rock Island & Pacific, and the Toledo, Peoria & Western (Pennsylvania system) railways; and has an extensive river commerce. The river is spanned here by the Chicago, Burlington & Quincy railway bridge. Many of the residences are on bluffs commanding beautiful views of river scenery; and good building material has been obtained from the Burlington limestone quarries. Crapo Park, of 100 acres, along the river, is one of the attractions of the city. Among the principal buildings are the county court house, the free public library, the Tama building, the German-American savings bank building and the post office. Burlington has three well-equipped hospitals. Among the city's manufactures are lumber, furniture, baskets, pearl buttons, cars, carriages and wagons, Corliss

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engines, waterworks pumps, metallic burial cases, desks, boxes, crackers, flour, pickles and beer. The factory product in 1905 was valued at $5,779,337, or 29.9% more than in 1900. The first white man to visit the site of Burlington seems to have been Lieutenant Zebulon M. Pike, who came in 1805 and recommended the erection of a fort. The American Fur Company established a post here in 1829 or earlier, but settlement really began in 1833, after the Black Hawk War, and the place had a population of 1200 in 1838. It was laid out as a town and named Flint Hills (a translation of the Indian name, *Shokokon*) in 1834; but the name was soon changed to Burlington, after the city of that name in Vermont. Burlington was incorporated as a town in 1837, and was chartered as a city in 1838 by the territory of Wisconsin, the city charter being amended by the territory of Iowa in 1839 and 1841. The territorial legislature of Wisconsin met here from 1836 to 1838 and that of Iowa from 1838 to 1840. In 1837 a newspaper, the *Wisconsin Territorial Gazette*, now the Burlington *Evening Gazette*, and in 1839 another, the Burlington *Hawk Eye*, were founded; the latter became widely known in the years immediately following 1872 from the humorous sketches contributed to it by Robert Jones Burdette (b. 1844), an associate editor, known as the "Burlington Hawk Eye Man," who in 1903 entered the Baptist ministry and became pastor of the Temple Baptist church in Los Angeles, California, and among whose publications are *Hawkeyetems* (1877), *Hawkeyes* (1879), and *Smiles Yoked with Sighs* (1900).

BURLINGTON, a city of Burlington county, New Jersey, U.S.A., on the E. bank of the Delaware river, 18 m. N.E. of Philadelphia. Pop. (1890) 7264; (1900) 7392, of whom 636 were foreign-born and 590 were of negro descent; (1905) 8038; (1910) 8336. It is served by the Pennsylvania railway, and by passenger and freight steamboat lines on the Delaware river, connecting with river and Atlantic coast ports. Burlington is a pleasant residential city with a number of interesting old mansions long antedating the War of Independence, some of them the summer homes of old Philadelphia families. The Burlington Society library, established in 1757 and still conducted under its original charter granted by George II., is one of the oldest public libraries in America. At Burlington are St Mary's Hall (1837; Protestant Episcopal), founded by Bishop G.W. Doane, one of the first schools for girls to be established in the country, Van Rensselaer Seminary and the New Jersey State Masonic home. In the old St Mary's church (Protestant Episcopal), which was built in 1703 and has been called St Anne's as well as St Mary's, Daniel Coxe (1674-1739), first provincial grand master of the lodge of Masons in America, was buried; a commemorative bronze tablet was erected in 1907. Burlington College, founded by Bishop Doane in 1864, was closed as a college in 1877, but continued as a church school until 1900; the buildings subsequently passed into the hands of an iron manufacturer. Burlington's principal industries are the manufacture of shoes and cast-iron water and gas pipes. Burlington was settled in 1677 by a colony of English Quakers. The settlement was first known as New Beverly, but was soon renamed after Bridlington (Burlington), the Yorkshire home of many of the settlers. In 1682 the assembly of West Jersey gave to Burlington "Matinicunk Island," above the town, "for the maintaining of a school for the education of youth"; revenues from a part of the island are still used for the support of the public schools, and the trust fund is one of the oldest for educational purposes in the United States. Burlington was incorporated as a town in 1693 (re-incorporated, 1733), and became the seat of government of West Jersey. On the union of East and West Jersey in 1702, it became one of the two seats of government of the new royal province, the meetings of the legislature generally alternating between Burlington and Perth Amboy, under both the colonial and the state government, until 1790. In 1777 the *New Jersey Gazette*, the first newspaper in New Jersey, was established here; it was published (here and later in Trenton) until 1786, and was an influential paper, especially during the War of Independence. Burlington was chartered as a city in 1784.

See Henry Armitt Brown, *The Settlement of Burlington* (Burlington, 1878); George M. Hills, *History of the Church in Burlington* (Trenton, 1885); and Mrs A.M. Gummère, *Friends in Burlington* (Philadelphia, 1884).

BURLINGTON, a city, port of entry and the county-seat of Chittenden county, Vermont, U.S.A., on the E. shore of Lake Champlain, in the N.W. part of the state, 90 m. S.E. of Montreal, and 300 m. N. of New York. It is the largest city in the state. Pop. (1880) 11,365; (1890) 14,590; (1900) 18,640, of whom 3726 were foreign-born; (1910, census) 20,468. It is served by the Central Vermont and the Rutland railways, and by lines of passenger and freight steamboats on Lake Champlain. The city is attractively situated on an arm of Lake Champlain, being built on a strip of land extending about 6 m. south from the mouth of the Winooski river along the lake shore and gradually rising from the water's edge to a height of 275 ft.; its situation and its cool and equable summer climate have given it a wide reputation as a summer resort, and it is a centre for yachting, canoeing and other aquatic sports. During the winter months it has ice-boat regattas. Burlington is the seat of the university of Vermont (1791; non-sectarian and co-educational), whose official title in 1865 became "The University of Vermont and State Agricultural College." The university is finely situated on a hill (280 ft. above the lake) commanding a charming view of the city, lake, the Adirondacks and the Green Mountains. It has departments of arts, sciences and medicine, and a library of 74,800 volumes and 32,936 pamphlets housed in the Billings Library, designed by H.H. Richardson. The university received the Federal grants under the Morrill acts of 1862 and 1890, and in connexion with it the Vermont agricultural experiment station is maintained. At Burlington are also the Mt St Mary's academy (1889, Roman Catholic), conducted by the Sisters of Mercy; and two business colleges. Among the principal buildings are the city hall, the Chittenden county court house, the Federal and the Y.M.C.A. buildings, the Masonic temple, the Roman Catholic cathedral and the Edmunds high school. Burlington's charitable institutions include the Mary Fletcher hospital, the Adams mission home, the Lousia Howard mission, the Providence orphan asylum, and homes for aged women, friendless women and destitute children. The Fletcher free public library (47,000 volumes in 1908) is housed in a Carnegie building. In the city are two sanitariums. The city has two parks (one, Ethan Allen Park, is on a bluff in the north-west part of the city, and commands a fine view) and four cemeteries; in Green Mount Cemetery, which overlooks the Winooski valley, is a monument over the grave of Ethan Allen, who lived in Burlington from 1778 until his death. Fort Ethan Allen, a United States military post, is about 3 m. east of the city, with which it is connected by an electric line. Burlington is the most important manufacturing centre in the state; among its manufactures are sashes, doors and blinds, boxes, furniture and wooden-ware, cotton and woollen goods, patent medicines, refrigerators, house furnishings, paper and machinery. In 1905 the city's factory products were valued at $6,355,754, three-tenths of which was the value of lumber and planing mill products, including sashes, doors and blinds. The Winooski river, which forms the boundary between Burlington and the township of Colchester and which enters Lake Champlain N.W. of the city, furnishes valuable water-power, but most of the manufactories are operated by steam. Quantities of marble were formerly taken from quarries in the vicinity. The city is a wholesale distributing centre for all northern Vermont and New Hampshire, and is one of the principal lumber markets in the east, most of the lumber

being imported from Canada. It is the port of entry for the Vermont customs district, whose exports and imports were valued respectively in 1907 at $8,333,024 and $5,721,034. A charter for a town to be founded here was granted by the province of New Hampshire in 1763, but no settlement was made until 1774. Burlington was chartered as a city in 1865.

BURMA, a province of British India, including the former kingdom of independent Burma, as well as British Burma, acquired by the British Indian government in the two wars of 1826 and 1852. It is divided into Upper and Lower Burma, the former being the territory annexed on 1st January 1886. The province lies to the east of the Bay of Bengal, and covers a range of country extending from the Pakchan river in 9° 55′ north latitude to the Naga and Chingpaw, or Kachin hills, lying roughly between the 27th and 28th degrees of north latitude; and from the Bay of Bengal on the west to the Mekong river, the boundary of the dependent Shan States on the east, that is to say, roughly, between the 92nd and 100th degrees of east longitude. The extreme length from north to south is almost 1200 m., and the broadest part, which is in about latitude 21° north, is 575 m. from east to west. On the N. it is bounded by the dependent state of Manipur, by the Mishmi hills, and by portions of Chinese territory; on the E. by the Chinese Shan States, portions of the province of Yunnan, the French province of Indo-China, and the Siamese Shan, or Lao States and Siam; on the S. by the Siamese Malay States and the Bay of Bengal; and on the W. by the Bay of Bengal and Chittagong. The coast-line from Taknaf, the mouth of the Naaf, in the Akyab district on the north, to the estuary of the Pakchan at Maliwun on the south, is about 1200 m. The total area of the province is estimated at 238,738 sq.m., of which Burma proper occupies 168,573 sq.m., the Chin hills 10,250 sq.m., and the Shan States, which comprise the whole of the eastern portion of the province, some 59,915 sq.m.

Natural Divisions.—The province falls into three natural divisions: Arakan with the Chin hills, the Irrawaddy basin, and the old province of Tenasserim, together with the portion of the Shan and Karen-ni states in the basin of the Salween, and part of Kengtung in the western basin of the Mekong. Of these Arakan is a strip of country lying on the seaward slopes of the range of hills known as the Arakan Yomas. It stretches from Cape Negrais on the south to the Naaf estuary, which divides it from the Chittagong division of Eastern Bengal and Assam on the north, and includes the districts of Sandoway, Kyaukpyu, Akyab and northern Arakan, an area of some 18,540 sq.m. The northern part of this tract is barren hilly country, but in the west and south are rich alluvial plains containing some of the most fertile lands of the province. Northwards lie the Chin and some part of the Kachin hills. To the east of the Arakan division, and separated from it by the Arakan Yornas, lies the main body of Burma in the basin of the Irrawaddy. This tract falls into four subdivisions. First, there is the highland tract including the hilly country at the sources of the Chindwin and the upper waters of the Irrawaddy, the Upper Chindwin, Katha, Bhamo, Myitkyina and Ruby Mines districts, with the Kachin hills and a great part of the Northern Shan states. In the Shan States there are a few open plateaus, fertile and well populated, and Maymyo in the Mandalay district, the hill-station to which in the hot weather the government of Burma migrates, stands in the Pyin-u-lwin plateau, some 3500 ft. above the sea. But the greater part of this country is a mass of rugged hills cut deep with narrow gorges, within which even the biggest rivers are confined. The second tract is that known as the dry zone of Burma, and includes the whole of the lowlands lying between the Arakan Yomas and the western fringe of the Southern Shan States. It stretches along both sides of the Irrawaddy from the north of Mandalay to Thayetmyo, and embraces the Lower Chindwin, Shwebo, Sagaing, Mandalay, Kyauksè, Meiktila, Yamèthin, Myingyan, Magwe, Pakôkku and Minbu districts. This tract consists mostly of undulating lowlands, but it is broken towards the south by the Pegu Yomas, a considerable range of hills which divides the two remaining tracts of the Irrawaddy basin. On the west, between the Pegu and the Arakan Yomas, stretches the Irrawaddy delta, a vast expanse of level plain 12,000 sq.m. in area falling in a gradual unbroken slope from its apex not far south of Prome down to the sea. This delta, which includes the districts of Bassein, Myaungmya, Thôngwa, Henzada, Hanthawaddy, Tharrawaddy, Pegu and Rangoon town, consists almost entirely of a rich alluvial deposit, and the whole area, which between Cape Negrais and Elephant Point is 137 m. wide, is fertile in the highest degree. To the east lies a tract of country which, though geographically a part of the Irrawaddy basin, is cut off from it by the Yomas, and forms a separate system draining into the Sittang river. The northern portion of this tract, which on the east touches the basin of the Salween river, is hilly; the remainder towards the confluence of the Salween, Gyaing and Attaran rivers consists of broad fertile plains. The whole is comprised in the districts of Toungoo and Thaton, part of the Karen-ni hills, with the Salween hill tract and the northern parts of Amherst, which form the northern portion of the Tenasserim administrative division. The third natural division of Burma is the old province of Tenasserim, which, constituted in 1826 with Moulmein as its capital, formed the nucleus from which the British supremacy throughout Burma has grown. It is a narrow strip of country lying between the Bay of Bengal and the high range of hills which form the eastern boundary of the province towards Siam. It comprises the districts of Mergui and Tavoy and a part of Amherst, and includes also the Mergui Archipelago. The surface of this part of the country is mountainous and much intersected with streams. Northward from this lies the major portion of the Southern Shan States and Karen-ni and a narrowing strip along the Salween of the Northern Shan States.

Mountains.—Burma proper is encircled on three sides by a wall of mountain ranges. The Arakan Yomas starting from Cape Negrais extend northwards more or less parallel with the coast till they join the Chin and Naga hills. They then form part of a system of ranges which curve north of the sources of the Chindwin river, and with the Kumon range and the hills of the Jade and Amber mines, make up a highland tract separated from the great Northern Shan plateau by the gorges of the Irrawaddy river. On the east the Kachin, Shan and Karen hills, extending from the valley of the Irrawaddy into China far beyond the Salween gorge, form a continuous barrier and boundary, and tail off into a narrow range which forms the eastern watershed of the Salween and separates Tenasserim from Siam. The highest peak of the Arakan Yomas, Liklang, rises nearly 10,000 ft. above the sea, and in the eastern Kachin hills, which run northwards from the state of Möng Mit to join the high range dividing the basins of the Irrawaddy and the Salween, are two peaks, Sabu and Worang, which rise to a height of 11,200 ft. above the sea. The Kumon range running down from the Hkamti country east of Assam to near Mogaung ends in a peak known as Shwedaunggyi, which reaches some 5750 ft. There are several peaks in the Ruby Mines district which rise beyond 7000 ft. and Loi Ling in the Northern Shan States reaches 9000 ft. Compared with these ranges the Pegu Yomas assume the proportions of mere hills. Popa, a detached peak in the Myingyan district, belongs to this system and rises to a height of nearly 5000 ft., but it is interesting mainly as an extinct volcano, a landmark and an object of superstitious folklore, throughout the whole of Central Burma. Mud volcanoes occur at Minbu, but they are not in any sense mountains, resembling rather the hot springs

which are found in many parts of Burma. They are merely craters raised above the level of the surrounding country by the gradual accretion of the soft oily mud, which overflows at frequent intervals whenever a discharge of gas occurs. Spurs of the Chin hills run down the whole length of the Lower Chindwin district, almost to Sagaing, and one hill, Powindaung, is particularly noted on account of its innumerable cave temples, which are said to hold no fewer than 446,444 images of Buddha. Huge caves, of which the most noted are the Farm Caves, occur in the hills near Moulmein, and they too are full of relics of their ancient use as temples, though now they are chiefly visited in connexion with the bats, whose flight viewed from a distance, as they issue from the caves, resembles a cloud of smoke.

Rivers.—Of the rivers of Burma the Irrawaddy is the most important. It rises possibly beyond the confines of Burma in the unexplored regions, where India, Tibet and China meet, and seems to be formed by the junction of a number of considerable streams of no great length. Two rivers, the Mali and the N'mai, meeting about latitude 25° 45′ some 150 m. north of Bhamo, contribute chiefly to its volume, and during the dry weather it is navigable for steamers up to their confluence. Up to Bhamo, a distance of 900 m. from the sea, it is navigable throughout the year, and its chief tributary in Burma, the Chindwin, is also navigable for steamers for 300 m. from its junction with the Irrawaddy at Pakôkku. The Chindwin, called in its upper reaches the Tanai, rises in the hills south-west of Thama, and flows due north till it enters the south-east corner of the Hukawng valley, where it turns north-west and continues in that direction cutting the valley into two almost equal parts until it reaches its north-west range, when it turns almost due south and takes the name of the Chindwin. It is a swift clear river, fed in its upper reaches by numerous mountain streams. The Mogaung river, rising in the watershed which divides the Irrawaddy and the Chindwin drainages, flows south and south-east for 180 m. before it joins the Irrawaddy, and is navigable for steamers as far as Kamaing for about four months in the year. South of Thayetmyo, where arms of the Arakan Yomas approach the river and almost meet that spur of the Pegu Yomas which formed till 1886 the
[v.04 p.0839]
northern boundary of British Burma, the valley of the Irrawaddy opens out again, and at Yegin Mingyi near Myanaung the influence of the tide is first felt, and the delta may be said to begin. The so-called rivers of the delta, the Ngawun, Pyamalaw, Panmawaddy, Pyinzalu and Pantanaw, are simply the larger mouths of the Irrawaddy, and the whole country towards the sea is a close network of creeks where there are few or no roads and boats take the place of carts for every purpose. There is, however, one true river of some size, the Hlaing, which rises near Prome, flows southwards and meets the Pegu river and the Pazundaung creek near Rangoon, and thus forms the estuary which is known as the Rangoon river and constitutes the harbour of Rangoon. East of the Rangoon river and still within the deltaic area, though cut off from the main delta by the southern end of the Pegu Yomas, lies the mouth of the Sittang. This river, rising in the Sham-Karen hills, flows first due north and then southward through the Kyauksè, Yamèthin and Toungoo districts, its line being followed by the Mandalay-Rangoon railway as far south as Nyaunglèbin in the Pegu district. At Toungoo it is narrow, but below Shwegyin it widens, and at Sittang it is half a mile broad. It flows into the Gulf of Martaban, and near its mouth its course is constantly changing owing to erosion and corresponding accretions. The second river in the province in point of size is the Salween, a huge river, believed from the volume of its waters to rise in the Tibetan mountains to the north of Lhasa. It is in all probability actually longer than the Irrawaddy, but it is not to be compared to that river in importance. It is, in fact, walled in on either side, with banks varying in British territory from 3000 to 6000 ft. high and at present unnavigable owing to serious rapids in Lower Burma and at one or two places in the Shan States, but quite open to traffic for considerable reaches in its middle course. The Gyaing and the Attaran rivers meet the Salween at its mouth, and the three rivers form the harbour of Moulmein, the second seaport of Burma.

Lakes.—The largest lake in the province is Indawgyi in the Myitkyina district. It has an area of nearly 100 sq. m. and is surrounded on three sides by ranges of hills, but is open to the north where it has an outlet in the Indaw river. In the highlands of the Shan hills there are the Inle lakes near Yawnghwe, and in the Katha district also there is another Indaw which covers some 60 sq. m. Other lakes are the Paunglin lake in Minbu district, the Inma lake in Prome, the Tu and Duya in Henzada, the Shahkègyi and the Inyègyi in Bassein, the sacred lake at Ye in Tenasserim, and the Nagamauk, Panzemyaung and Walonbyan in Arakan. The Meiktila lake covers an area of some 5 sq. m., but it is to some extent at least an artificial reservoir. In the heart of the delta numerous large lakes or marshes abounding in fish are formed by the overflow of the Irrawaddy river during the rainy season, but these either assume very diminutive proportions or disappear altogether in the dry season.

Climate.—The climate of the delta is cooler and more temperate than in Upper Burma, and this is shown in the fairer complexion and stouter physique of the people of the lower province as compared with the inhabitants of the drier and hotter upper districts as far as Bhamo, where there is a great infusion of other types of the Tibeto-Burman family. North of the apex of the delta and the boundary between the deltaic and inland tracts, the rainfall gradually lessens as far as Minbu, where what was formerly called the rainless zone commences and extends as far as Katha. The rainfall in the coast districts varies from about 200 in. in the Arakan and Tenasserim divisions to an average of 90 in Rangoon and the adjoining portion of the Irrawaddy delta. In the extreme north of Upper Burma the rainfall is rather less than in the country adjoining Rangoon, and in the dry zone the annual average falls as low as 20 and 30 in.

The temperature varies almost as much as the rainfall. It is highest in the central zone, the mean of the maximum readings in such districts as Magwe, Myingyan, Kyauksè, Mandalay and Shwebo in the month of May being close on 100° F., while in the littoral and sub-montane districts it is nearly ten degrees less. The mean of the minimum readings in December in the central zone districts is a few degrees under 60° F. and in the littoral districts a few degrees over that figure. In the hilly district of Mogôk (Ruby Mines) the December mean minimum is 36.8° and the mean maximum 79°. The climate of the Chin and Kachin hills and also of the Shan States is temperate. In the shade and off the ground the thermometer rarely rises above 80° F. or falls below 25° F. In the hot season and in the sun as much as 150° F. is registered, and on the grass in the cold weather ten degrees of frost are not uncommon. Snow is seldom seen either in the Chin or Shan hills, but there are snow-clad ranges in the extreme north of the Kachin country. In the narrow valleys of the Shan hills, and especially in the Salween valley, the shade maximum reaches 100° F. regularly for several weeks in April. The rainfall in the hills varies very considerably, but seems to range from about 60 in. in the broader valleys to about 300 in. on the higher forest-clad ranges.

Geology.—Geologically, British Burma consists of two divisions, an eastern and a western. The dividing line runs from the mouth of the Sittang river along the railway to Mandalay, and thence continues northward, with the same general direction but curving slightly towards the east. West of this line the

rocks are chiefly Tertiary and Quaternary; east of it they are mostly Palaeozoic or gneissic. In the western mountain ranges the beds are thrown into a series of folds which form a gentle curve running from south to north with its convexity facing westward. There is an axial zone of Cretaceous and Lower Eocene, and this is flanked on each side by the Upper Eocene and the Miocene, while the valley of the Irrawaddy is occupied chiefly by the Pliocene. Along the southern part of the Arakan coast the sea spreads over the western Miocene zone. The Cretaceous beds have not yet been separated from the overlying Eocene, and the identification of the system rests on the discovery of a single Cenomanian ammonite. The Eocene beds are marine and contain nummulites. The Miocene beds are also marine and are characterized by an abundant molluscan fauna. The Pliocene, on the other hand, is of freshwater origin, and contains silicified wood and numerous remains of Mammalia. Flint chips, which appear to have been fashioned by hand, are said to have been found in the Miocene beds, but to prove the existence of man at so early a period would require stronger evidence than has yet been brought forward.

The older rocks of eastern Burma are very imperfectly known. Gneiss and granite occur; Ordovician fossils have been found in the Upper Shan States, and Carboniferous fossils in Tenasserim and near Moulmein. Volcanic rocks are not common in any part of Burma, but about 50 m. north-north-east of Yenangyaung the extinct volcano of Popa rises to a height of 3000 ft. above the surrounding Pliocene plain. Intrusions of a serpentine-like rock break through the Miocene strata north of Bhamo, and similar intrusions occur in the western ranges. Whether the mud "volcanoes" of the Irrawaddy valley have any connexion with volcanic activity may be doubted. The petroleum of Burma occurs in the Miocene beds, one of the best-known fields being that of Yenangyaung. Coal is found in the Tertiary deposits in the valley of the Irrawaddy and in Tenasserim. Tin is abundant in Tenasserim, and lead and silver have been worked extensively in the Shan States. The famous ruby mines of Upper Burma are in metamorphic rock, while the jadeite of the Bhamo neighbourhood is associated with the Tertiary intrusions of serpentine-like rock already noticed.[1]

Population.—The total population of Burma in 1901 was 10,490,624 as against 7,722,053 in 1891; but a considerable portion of this large increase was due to the inclusion of the Shan States and the Chin hills in the census area. Even in Burma proper, however, there was an increase during the decade of 1,530,822, or 19.8%. The density of population per square mile is 44 as compared with 167 for the whole of India and 552 for the Bengal Delta. England and Wales have a population more than twelve times as dense as that of Burma, so there is still room for expansion. The chief races of Burma are Burmese (6,508,682), Arakanese (405,143), Karens (717,859), Shans (787,087), Chins (179,292), Kachins (64,405) and Talaings (321,898); but these totals do not include the Shan States and Chin hills. The Burmese in person have the Mongoloid characteristics common to the Indo-Chinese races, the Tibetans and tribes of the Eastern Himalaya. They may be generally described as of a stout, active, well-proportioned form; of a brown but never of an intensely dark complexion, with black, coarse, lank and abundant hair, and a little more beard than is possessed by the Siamese. Owing to their gay and lively disposition the Burmese have been called "the Irish of the East," and like the Irish they are somewhat inclined to laziness. Since the advent of the British power, the immigration of Hindus with a lower standard of comfort and of Chinamen with a keener business instinct has threatened the economic independence of the Burmese in their own country. As compared with the Hindu, the Burmese wear silk instead of cotton, and eat rice instead of the cheaper grains; they are of an altogether freer and less servile, but also of a less practical character. The Burmese women have a keener business instinct than the men, and serve in some degree to redress the balance. The Burmese children are adored by their parents, and are said to be the happiest and merriest children in the world.

Language and Literature.—The Burmese are supposed by modern philologists to have come, as joint members of a vast Indo-Chinese immigration swarm, from western China to the head waters of the Irrawaddy and then separated, some to people Tibet and Assam, the others to press southwards into the plains of Burma. The indigenous tongues of Burma are divided into the following groups:— [v.04 p.0840]

A. Indo-Chinese family	(1) Tibet-Burman sub-family	(*a*) The Burmese group.
		(*b*) The Kachin group.
		(*c*) The Kuki-Chin group.
	(2) Siamese-Chinese sub-family	(*d*) The Tai group.
		(*e*) The Karen group.
	(3) Môn-Annam sub-family	(*f*) The Upper Middle Mekong or Wa Palaung group.
		(*g*) The North Cambodian group.
B. Malay family		(*h*) The Selung language.

Burmese, which was spoken by 7,006,495 people in the province in 1901, is a monosyllabic language, with, according to some authorities, three different tones; so that any given syllable may have three entirely different meanings only distinguishable by the intonation when spoken, or by accents or diacritical marks when written. There are, however, very many weighty authorities who deny the existence of tones in the language. The Burmese alphabet is borrowed from the Aryan Sanskrit through the Pāli of Upper India. The language is written from left to right in what appears to be an unbroken line. Thus Burma possesses two kinds of literature, Pāli and Burmese. The Pāli is by far the more ancient, including as it does the Buddhist scriptures that originally found their way to Burma from Ceylon and southern India. The Burmese literature is for the most part metrical, and consists of religious romances, chronological histories and songs. The *Maha Yazawin* or "Royal Chronicle," forms the great historical work of Burma. This is an authorized history, in which everything unflattering to the Burmese monarchs was rigidly suppressed. After the Second Burmese War no record was ever made in the *Yazawin* that Pegu had been torn away from Burma by the British. The folk songs are the truest and most interesting national literature. The Burmese are fond of stage-plays in which great licence of language is permitted, and great liberty to "gag" is left to the wit or intelligence of the actors.

Government.—The province as a division of the Indian empire is administered by a lieutenant-governor, first appointed 1st May 1897, with a legislative council of nine members, five of whom are officials. There are, besides, a chief secretary, revenue secretary, secretary and two under-secretaries, a public works department secretary with two assistants. The revenue administration of the province is superintended by a financial commissioner, assisted by two secretaries, and a director of land records and agriculture, with a land records departmental staff. There is a chief court for the province with a chief justice and three

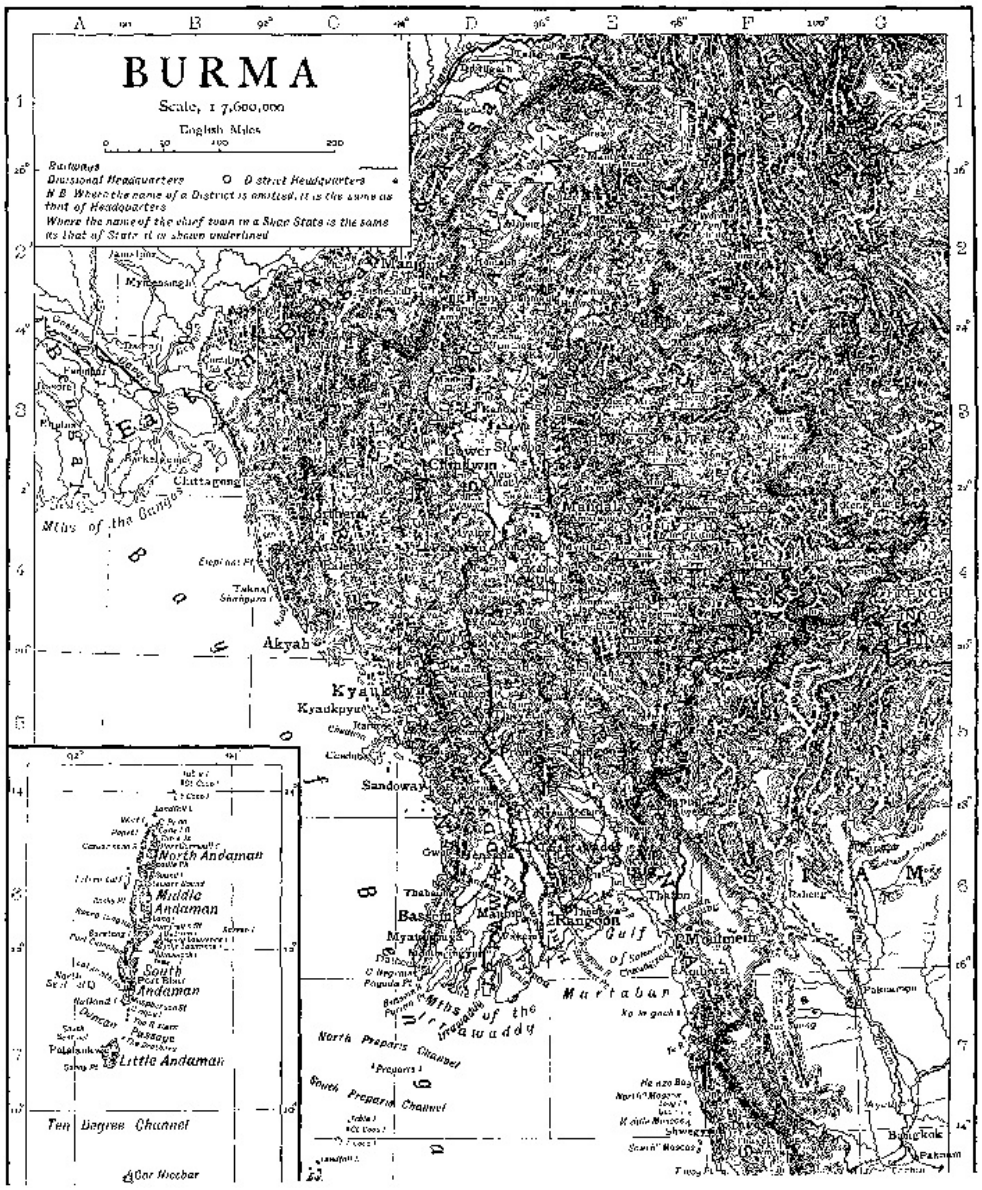
justices, established in May 1900. Other purely judicial officers are the judicial commissioner for Upper Burma, and the civil judges of Mandalay and Moulmein. There are four commissioners of revenue and circuit, and nineteen deputy commissioners in Lower Burma, and four commissioners and seventeen deputy commissioners in Upper Burma. There are two superintendents of the Shan States, one for the northern and one for the southern Shan States, and an assistant superintendent in the latter; a superintendent of the Arakan hill tracts and of the Chin hills, and a Chinese political adviser taken from the Chinese consular service. The police are under the control of an inspector-general, with deputy inspector-general for civil and military police, and for supply and clothing. The education department is under a director of public instruction, and there are three circles—eastern, western and Upper Burma, each under an inspector of schools.

The Burma forests are divided into three circles each under a conservator, with twenty-one deputy conservators. There are also a deputy postmaster-general, chief superintendent and four superintendents of telegraphs, a chief collector of customs, three collectors and four port officers, and an inspector-general of jails. At the principal towns benches of honorary magistrates, exercising powers of various degrees, have been constituted. There are forty-one municipal towns, fourteen of which are in Upper Burma. The commissioners of division are *ex officio* sessions judges in their several divisions, and also have civil powers, and powers as revenue officers. They are responsible to the lieutenant-governor, each in his own division, for the working of every department of the public service, except the military department, and the branches of the administration directly under the control of the supreme government. The deputy commissioners perform the functions of district magistrates, district judges, collectors and registrars, besides the miscellaneous duties which fall to the principal district officer as representative of government. Subordinate to the deputy commissioners are assistant commissioners, extra-assistant commissioners and myoôks, who are invested with various magisterial, civil and revenue powers, and hold charge of the townships, as the units of regular civil and revenue jurisdiction are called, and the sub-divisions of districts, into which most of these townships are grouped. Among the salaried staff of officials, the townships officers are the ultimate representatives of government who come into most direct contact with the people. Finally, there are the village headmen, assisted in Upper Burma by elders, variously designated according to old custom. Similarly in the towns, there are headmen of wards and elders of blocks. In Upper Burma these headmen have always been revenue collectors. The system under which in towns headmen of wards and elders of blocks are appointed is of comparatively recent origin, and is modelled on the village system.

The Shan States.

The Shan States were declared to be a part of British India by notification in 1886. The Shan States Act of 1888 vests the civil, criminal and revenue administration in the chief of the state, subject to the restrictions specified in the *sanad* or patent granted to him. The law to be administered in each state is the customary law of the state, so far as it is in accordance with the justice, equity and good conscience, and not opposed to the spirit of the law in the rest of British India. The superintendents exercise general control over the administration of criminal justice, and have power to call for cases, and to exercise wide revisionary powers. Criminal jurisdiction in cases in which either the complainant or the defendant is a European, or American, or a government servant, or a British subject not a native of a Shan State, is withdrawn from the chiefs and vested in the superintendents and assistant superintendents. Neither the superintendents nor the assistant superintendents have power to try civil suits, whether the parties are Shans or not. In the Myelat division of the southern Shan States, however, the criminal law is practically the same as the in force in Upper Burma, and the ngwegunhmus, or petty chiefs, have been appointed magistrates of the second class. The chiefs of the Shan States are of three classes:—(1) sawbwas; (2) myosas; (3) ngwegunhmus. The last are found only in the *Myelat*, or border country between the southern Shan States and Burma. There are fifteen sawbwas, sixteen myosas and thirteen ngwegunhmus in the Shan States proper. Two sawbwas are under the supervision of the commissioner of the Mandalay division, and two under the commissioner of the Sagaing division. The states vary enormously in size, from the 12,000 sq. m. of the Trans-Salween State of Kêng Tung, to the 3.95 sq. m. of Nam Hkôm in the Myelat. The latter contained only 41 houses with 210 inhabitants in 1897 and has since been merged in the adjoining state. There are five states, all sawbwaships, under the supervision of the superintendent of the northern Shan States, besides an indeterminate number of Wa States and communities of other races beyond the Salween river. The superintendent of the southern Shan States supervises thirty-nine, of which ten are sawbwaships. The headquarters of the northern Shan States are at Lashio, of the southern Shan States at Taung-gyi.

The states included in eastern and western Karen-ni are not part of British India, and are not subject to any of the laws in force in the Shan States, but they are under the supervision of the superintendent of the southern Shan States.



The northern portion of the Karen hills is at present dealt with on the principle of political as distinguished from administrative control. The tribes are not interfered with as long as they keep the peace. What is specifically known as the Kachin hills, the country taken under administration in the Bhamo and Myitkyina districts, is divided into forty tracts. Beyond these tracts there are many Kachins in Katha, Möng-Mit, and the northern Shan States, but though they are often the preponderating, they are not the exclusive population. The country within the forty tracts may be considered the Kachin hills proper, and it lies between 23° 30′ and 26° 30′ N. lat. and 96° and 98° E. long. Within this area the petty chiefs have appointment orders, the people are disarmed, and the rate of tribute per household is fixed in each case. [v.04 p.0841] Government is regulated by the Kachin hills regulation. Since 1894 the country has been practically undisturbed, and large numbers of Kachins are enlisted, and ready to enlist in the military police, and seem likely to form as good troops as the Gurkhas of Nepal.

The Chin hills were not declared an integral part of Burma until 1895, but they now form a scheduled district. The chiefs, however, are allowed to administer their own affairs, as far as may be, in accordance with their own customs, subject to the supervision of the superintendent of the Chin hills.

Religion.—Buddhists make up more than 88.6%; Mussulmans 3.28; spirit-worshippers 3.85; Hindus 2.76, and Christians 1.42 of the total population of the province. The large nominal proportion of Buddhists is deceptive. The Burmese are really as devoted to demonolatry as the hill-tribes who are labelled plain spirit-worshippers. The actual figures of the various religions, according to the census of 1901, are as follows:—

Buddhists	9,184,121
Spirit-worshippers	399,390
Hindus	285,484
Mussulmans	339,446
Christians	147,525
Sikhs	6,596
Jews	685
Parsees	245
Others	28

The chief religious principle of the Burmese is to acquire merit for their next incarnation by good works done in this life. The bestowal of alms, offerings of rice to priests, the founding of a monastery, erection of

pagodas, with which the country is crowded, the building of a bridge or rest-house for the convenience of travellers are all works of religious merit, prompted, not by love of one's fellow-creatures, but simply and solely for one's own future advantage.

An analysis shows that not quite two in every thousand Burmese profess Christianity, and there are about the same number of Mahommedans among them. It is admitted by the missionaries themselves that Christianity has progressed very slowly among the Burmese in comparison with the rapid progress made amongst the Karens. It is amongst the Sgaw Karens that the greatest progress in Christianity has been made, and the number of spirit-worshippers among them is very much smaller. The number of Burmese Christians is considerably increased by the inclusion among them of the Christian descendants of the Portuguese settlers of Syriam deported to the old Burmese Tabayin, a village now included in the Ye-u subdivision of Shwebo. These Christians returned themselves as Burmese. The forms of Christianity which make most converts in Burma are the Baptist and Roman Catholic faiths. Of recent years many conversions to Christianity have been made by the American Baptist missionaries amongst the Lahu or Muhsö hill tribesmen.

Education.—Compared with other Indian provinces, and even with some of the countries of Europe, Burma takes a very high place in the returns of those able to both read and write. Taking the sexes apart, though women fall far behind men in the matter of education, still women are better educated in Burma than in the rest of India. The average number of each sex in Burma per thousand is:—literates, male 378; female, 45; illiterates, male, 622; female, 955. The number of literates per thousand in Bengal is:—male, 104; female, 5. The proportion was greatly reduced in the 1901 census by the inclusion of the Shan States and the Chin hills, which mostly consist of illiterates.

The fact that in Upper Burma the proportion of literates is nearly as high as, and the proportion of those under instruction even higher than, that of the corresponding classes in Lower Burma, is a clear proof that in primary education, at least, the credit for the superiority of the Burman over the native of India is due to indigenous schools. In almost every village in the province there is a monastery, where the most regular occupation of one or more of the resident *pongyis*, or Buddhist monks, is the instruction free of charge of the children of the village. The standard of instruction, however, is very low, consisting only of reading and writing, though this is gradually being improved in very many monasteries. The absence of all prejudice in favour of the seclusion of women also is one of the main reasons why in this province the proportion who can read and write is higher than in any other part of India, Cochin alone excepted. It was not till 1890 that the education department took action in Upper Burma. It was then ascertained that there were 684 public schools with 14,133 pupils, and 1664 private schools with 8685 pupils. It is worthy of remark that of these schools 29 were Mahommedan, and that there were 176 schools for girls in which upwards of 2000 pupils were taught. There are three circles—Eastern, Central and Upper Burma. For the special supervision and encouragement of indigenous primary education in monastic and in lay schools, each circle of inspection is divided into sub-circles corresponding with one or more of the civil districts, and each sub-circle is placed under a deputy-inspector or a sub-inspector of schools. There are nine standards of instruction, and the classes in schools correspond with these standards. In Upper Burma all educational grants are paid from imperial funds; there is no cess as in Lower Burma. Grants-in-aid are given according to results. There is only one college, at Rangoon, which is affiliated to the Calcutta University. There are missionary schools amongst the Chins, Kachins and Shans, and a school for the sons of Shan chiefs at Taung-gyi in the southern Shan States. A *Patamabyan* examination for marks in the Pāli language was first instituted in 1896 and is held annually.

Finance.—The gross revenue of Lower Burma from all sources in 1871-1872 was Rs.1,36,34,520, of which Rs.1,21,70,530 was from imperial taxation, Rs.3,73,200 from provincial services, and Rs.10,90,790 from local funds. The land revenue of the province was Rs.34,45,230. In Burma the cultivators themselves continue to hold the land from government, and the extent of their holdings averages about five acres. The land tax is supplemented by a poll tax on the male population from 18 to 60 years of age, with the exception of immigrants during the first five years of their residence, religious teachers, schoolmasters, government servants and those unable to obtain their own livelihood. In 1890-1891 the revenue of Lower Burma has risen to Rs.2,08,38,872 from imperial taxation, Rs.1,55,51,897 for provincial services, and Rs.12,14,596 from incorporated local funds. The expenditure on the administration of Lower Burma in 1870-1871 was Rs.49,70,020. In 1890-1891 it was Rs.1,58,48,041. In Upper Burma the chief source of revenue is the *thathameda*, a tithe or income tax which was instituted by King Mindon, and was adopted by the British very much as they found it. For the purpose of the assessment every district and town is classified according to its general wealth and prosperity. As a rule the basis of calculation was 100 rupees from every ten houses, with a 10% deduction for those exempted by custom. When the total amount payable by the village was thus determined, the village itself settled the amount to be paid by each individual householder. This was done by *thamadis*, assessors, usually appointed by the villagers themselves. Other important sources of revenue are the rents from state lands, forests, and miscellaneous items such as fishery, revenue and irrigation taxes. In 1886-1887, the year after the annexation, the amount collected in Upper Burma from all sources was twenty-two lakhs of rupees. In the following year it had risen to fifty lakhs. Much of Upper Burma, however, remained disturbed until 1890. The figures for 1890-1891, therefore, show the first really regular collection. The amount then collected was Rs.87,47,020.

The total revenue of Burma in the year ending March 31, 1900 was Rs.7,04,36,240 and in 1905, Rs.9,65,62,298. The total expenditure in the same years respectively was Rs.4,30,81,000 and Rs.5,66,60,047. The principal items of revenue in the budget are the land revenue, railways, customs, forests and excise.

Defence.—Burma is garrisoned by a division of the Indian army, consisting of two brigades, under a lieutenant-general. Of the native regiments seven battalions are Burma regiments specially raised for permanent service in Burma by transformation from military police. These regiments, consisting of Gurkhas, Sikhs and Pathans, are distributed throughout the Shan States and the northern part of Burma. In addition to these there are about 13,500 civil police and 15,000 military police. The military police are in reality a regular military force with only two European officers in command of each battalion; and they are recruited entirely from among the warlike races of northern India. A small battalion of Karens enlisted as sappers and miners proved a failure and had to be disbanded. Experiments have also been made with the Kachin hillmen and with the Shans; but the Burmese character is so averse to discipline and control in

petty matters that it is impossible to get really suitable men to enlist even in the civil police. The volunteer forces consist of the Rangoon Port Defence Volunteers, comprising artillery, naval, and engineer corps, the Moulmein artillery, the Moulmein, Rangoon, Railway and Upper Burma rifles.

Minerals and Mining.—In its three chief mineral products, earth-oil, coal and gold, Burma offers a fair field for enterprise and nothing more. Without yielding fortunes for speculators, like South Africa or Australia, it returns a fair percentage upon genuine hard work. Coal is found in the Thayetmyo, Upper Chindwin and Shwebo districts, and in the Shan States; it also occurs in Mergui, but the deposits which have been so far discovered have been either of inferior quality or too far from their market to be worked to advantage. The tin mines in Lower Burma are worked by natives, but a company at one time worked mines in the Maliwun township of Mergui by European methods. The chief mines and minerals are in Upper Burma. The jade mines of Upper Burma are now practically the only source of supply of that mineral, which is in great demand over all China. The mines are situated beyond Kamaing, north of Mogaung in the Myitkyina district. The miners are all Kachins, and the right to collect the jade duty of 33⅓ is farmed out by government to a lessee, who has hitherto always been a Chinaman. The amount obtained has varied considerably. In 1887-1888 the rent was Rs.50,000. This dwindled to Rs.36,000 in 1892-1893, but the system was then adopted of letting for a term of three years and a higher rent was obtained. The value varies enormously according to colour, which should be a particular shade of dark green. Semi-transparency, brilliancy and hardness are, however, also essentials. The old river mines produced the best quality. The quarry mines on the top of the hill near Tawmaw produce enormous quantities, but the quality is not so good.

The most important ruby-bearing area is the Mogôk stone tract, in the hills about 60 m. east of the Irrawaddy and 90 m. north-north-west of Mandalay. The right to mine for rubies by European methods and to levy royalties from persons working by native methods was leased to the Burma Ruby Mines Company, Limited, in 1889, and the lease was renewed in 1896 for 14 years at a rent of Rs.3,15,000 a year plus a share of the profits. The rent was reduced permanently in 1898 to Rs.2,00,000 a year, but the share of the profits taken by government was increased from 20 to 30%. There are other ruby mines at Nanyaseik in the Myitkyina district and at Sagyin in the Mandalay district, where the mining is by native methods under licence-fees of Rs.5 and Rs.10 a month. They are, however, only moderately successful. Gold is found in most of the rivers in Upper Burma, but the gold-washing industry is for the most part spasmodic in the intervals of agriculture. There is a gold mine at Kyaukpazat in the Mawnaing circle of the Kathra district, where the quartz is crushed by machinery and treated by chemical processes. Work was begun in 1895, and the yield of gold in that year was 274 oz., which increased to 893 oz. in 1896-1897. This, however, proved to be merely a pocket, and the mine is now shut down. Dredging for gold, however, seems likely to prove very profitable and gold dust is found in practically every river in the hills.

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The principal seats of the petroleum industry are Yenangyaung in the Magwe, and Yenangyat in the Pakôkku districts. The wells have been worked for a little over a century by the natives of the country. The Burma Oil Company since 1889 has worked by drilled wells on the American or cable system, and the amount produced is yearly becoming more and more important.

Amber is extracted by Kachins in the Hukawng valley beyond the administrative border, but the quality of the fossil resin is not very good. The amount exported varies considerably. Tourmaline or rubellite is found on the borders of the Ruby Mines district and in the Shan State of Möng Löng. Steatite is extracted from the Arakan hill quarries. Salt is manufactured at various places in Upper Burma, notably in the lower Chindwin, Sagaing, Shwebo, Myingyan and Yamethin districts, as well as at Mawhkio in the Shan State of Thibaw. Iron is found in many parts of the hills, and is worked by inhabitants of the country. A good deal is extracted and manufactured into native implements at Pang Lông in the Lēgya (Laihka) Shan State. Lead is extracted by a Chinese lessee from the mines at Bawzaing (Maw-sōn) in the Myelat, southern Shan States. The ore is rich in silver as well as in lead.

Agriculture.—The cultivation of the land is by far the most important industry in Burma. Only 9.4% of the people were classed as urban in the census of 1901, and a considerable proportion of this number were natives of India and not Burmese. Nearly two-thirds of the total population are directly or indirectly engaged in agriculture and kindred occupations. Throughout most of the villages in the rural tracts men, women and children all take part in the agricultural operations, although in riverine villages whole families often support themselves from the sale of petty commodities and eatables. The food of the people consists as a rule of boiled rice with salted fresh or dried fish, salt, sessamum-oil, chillies, onions, turmeric, boiled vegetables, and occasionally meat of some sort from elephant flesh down to smaller animals, fowls and almost everything except snakes, by way of condiment.

The staple crop of the province in both Upper and Lower Burma is rice. In Lower Burma it is overwhelmingly the largest crop; in Upper Burma it is grown wherever practicable. Throughout the whole of the moister parts of the province the agricultural season is the wet period of the south-west monsoon, lasting from the middle of May until November. In some parts of Lower Burma and in the dry districts of Upper Burma a hot season crop is also grown with the assistance of irrigation during the spring months. Oxen are used for ploughing the higher lands with light soil, and the heavier and stronger buffaloes for ploughing wet tracts and marshy lands. As rice has to be transplanted as well as sown and irrigated, it needs a considerable amount of labour expended on it; and the Burman has the reputation of being a somewhat indolent cultivator. The Karens and Shans who settle in the plains expend much more care in ploughing and weeding their crops. Other crops which are grown in the province, especially in Upper Burma, comprise maize, tilseed, sugar-cane, cotton, tobacco, wheat, millet, other food grains including pulse, condiments and spices, tea, barley, sago, linseed and other oil-seeds, various fibres, indigo and other dye crops, besides orchards and garden produce. At the time of the British annexation of Burma there were some old irrigation systems in the Kyauksè and Minbu districts, which had been allowed to fall into disrepair, and these have now been renewed and extended. In addition to this the Mandalay Canal, 40 m. in length, with fourteen distributaries was opened in 1902; the Shwebo canal, 27 m. long, was opened in 1906, and a beginning had been made of two branches 29 and 20 m. in length, and of the Môn canal, begun in 1904, 53 m. in length. In all upwards of 300,000 acres are subject to irrigation under these schemes. On the whole the people of Burma are prosperous and contented. Taxes and land revenue are light; markets for the disposal of produce are constant and prices good; while fresh land is still available in most districts. Compared with the congested districts in the other provinces of India, with the exception of Assam, the lot of the Burman is decidedly enviable.

Forests.—-The forests of Burma are the finest in British India and one of the chief assets of the wealth of the country; it is from Burma that the world draws its main supply of teak for shipbuilding, and indeed it was the demand for teak that largely led to the annexation of Burma. At the close of the First Burmese War in 1826 Tenasserim was annexed because it was supposed to contain large supplies of this valuable timber; and it was trouble with a British forest company that directly led to the Third Burmese War of 1885. Since the introduction of iron ships teak has supplanted oak, because it contains an essential oil which preserves iron and steel, instead of corroding them like the tannic acid contained in oak. The forests of Burma, therefore, are now strictly preserved by the government, and there is a regular forest department for the conservation and cutting of timber, the planting of young trees for future generations, the prevention of forest fires, and for generally supervising their treatment by the natives. In the reserves the trees of commercial value can only be cut under a licence returning a revenue to the state, while unreserved trees can be cut by the natives for home consumption. There are naturally very many trees in these forests besides the teak. In Lower Burma alone the enumeration of the trees made by Sulpiz Kurz in his *Forest Flora of British Burma* (1877) includes some 1500 species, and the unknown species of Upper Burma and the Shan States would probably increase this total very considerably. In addition to teak, which provides the bulk of the revenue, the most valuable woods are *sha* or cutch, india rubber, *pyingado*, or ironwood for railway sleepers, and *padauk*. Outside these reserves enormous tracts of forest and jungle still remain for clearance and cultivation, reservation being mostly confined to forest land unsuitable for crops. In 1870-1871 the state reserved forests covered only 133 sq.m., in all the Rangoon division. The total receipts from the forests then amounted to Rs.7,72,400. In 1889-1890 the total area of reserved forests in Lower Burma was 5574 sq.m., and the gross revenue was Rs.31,34,720, and the expenditure was Rs.13,31,930. The work of the forest department did not begin in Upper Burma till 1891. At the end of 1892 the reserved forests in Upper Burma amounted to 1059 sq.m. On 30th June 1896 the reserved area amounted to 5438 sq.m. At the close of 1899 the area of the reserved forests in the whole province amounted to 15,669 sq.m., and in 1903-1904 to 20,038 sq.m. with a revenue of Rs.85,19,404 and expenditure amounting to Rs.35,00,311. In 1905-1906 there were 20,545 sq.m. of reserved forest, and it is probable that when the work of reservation is complete there will be 25,000 sq.m. of preserves or 12% of the total area.

Fisheries.—Fisheries and fish-curing exist both along the sea-coast of Burma and in inland tracts, and afforded employment to 126,651 persons in 1907. The chief seat of the industry is in the Thongwa and Bassein districts, where the income from the leased fisheries on individual streams sometimes amounts to between £6000 and £7000 a year. Net fisheries, worked by licence-holders in the principal rivers and along the sea-shore, are not nearly so profitable as the closed fisheries—called *In*—which are from time to time sold by auction for fixed periods of years. Salted fish forms, along with boiled rice, one of the chief articles of food among the Burmese; and as the price of salted fish is gradually rising along with the prosperity and purchasing power of the population, this industry is on a very sound basis. There are in addition some pearling grounds in the Mergui Archipelago, which have a very recent history; they were practically unknown before 1890; in the early 'nineties they were worked by Australian adventurers, most of whom have since departed; and now they are leased in blocks to a syndicate of Chinamen, who grant sub-leases to individual adventurers at the rate of £25 a pump for the pearling year. The chief harvest is of mother of pearl, which suffices to pay the working expenses; and there is over and above the chance of finding a pearl of price. Some pearls worth £1000 and upwards have recently been discovered.

Manufactures and Art.—The staple industry of Burma is agriculture, but many cultivators are also artisans in the by-season. In addition to rice-growing and the felling and extraction of timber, and the fisheries, the chief occupations are rice-husking, silk-weaving and dyeing. The introduction of cheap cottons and silk fabrics has dealt a blow to hand-weaving, while aniline dyes are driving out the native vegetable product; but both industries still linger in the rural tracts. The best silk-weavers are to be found at Amarapura. There large numbers of people follow this occupation as their sole means of livelihood, whereas silk and cotton weaving throughout the province generally is carried on by girls and women while unoccupied by other domestic duties. The Burmese are fond of bright colours, and pink and yellow harmonize well with their dark olive complexion, but even here the influence of western civilization is being felt, and in the towns the tendency now is towards maroon, brown, olive and dark green for the women's skirts. The total number of persons engaged in the production of textile fabrics in Burma according to the census of 1901 was 419,007. The chief dye-product of Burma is cutch, a brown dye obtained from the wood of the *sha* tree. Cutch-boiling forms the chief means of livelihood of a large number of the poorer classes in the Prome and Thayetmyo districts of Lower Burma, and a subsidiary means of subsistence elsewhere. Cheroot making and smoking is universal among both sexes. The chief arts of Burma are wood-carving and silver work. The floral wood-carving is remarkable for its freedom and spontaneity. The carving is done in teak wood when it is meant for fixtures, but teak has a coarse grain, and otherwise *yamane* clogwood, said to be a species of gmelina, is preferred. The tools employed are chisel, gouge and mallet. The design is traced on the wood with charcoal, gouged out in the rough, and finished with sharp fine tools, using the mallet for every stroke. The great bulk of the silver work is in the form of bowls of different sizes, in shape something like the lower half of a barrel, only more convex, of betel boxes, cups and small boxes for lime. Both in the wood-carving and silver work the Burmese character displays itself, giving boldness, breadth and freedom of design, but a general want of careful finish. Unfortunately the national art is losing its distinctive type through contact with western civilization.

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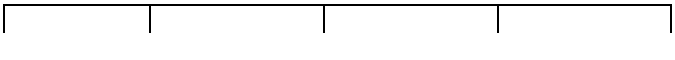
Commerce.—The chief articles of export from Burma are rice and timber. In 1805 the quantity of rice exported in the foreign and coastal trade amounted to 1,419,173 tons valued at Rs.9,77,66,132, and in 1905 the figures were 2,187,764 tons, value Rs.15,67,28,288. England takes by far the greatest share of Burma's rice, though large quantities are also consumed in Germany, while France, Italy, Belgium and Holland also consume a considerable amount. The regular course of trade is apt to be deflected by famines in India or Japan. In 1900 over one million tons of rice were shipped to India during the famine there. The rice-mills, almost all situated at the various seaports, secure the harvest from the cultivator through middlemen. The value of teak exported in 1895 was Rs.1,34,64,303, and in 1905, Rs.1,31,03,401. Subordinate products for exports include cutch dye, caoutchouc or india-rubber, cotton, petroleum and jade. By far the largest of the imports are cotton, silk and woollen piece-goods, while subordinate imports include hardware, gunny bags, sugar, tobacco and liquors.

The following table shows the progressive value of the trade of Burma since 1871-1872:—



Year.	Imports.	Exports.	Total.
	Rs.	Rs.	Rs.
1871-1872	3,15,79,860	3,78,02,170	6,93,82,030
1881-1882	6,38,49,840	8,05,71,410	14,44,21,250
1801-1892	10,50,06,247	12,67,21,878	23,17,28,125
1901-1902	12,78,46,636	18,74,47,200	31,52,93,836
1904-1905	17,06,20,796	23,94,69,114	41,00,89,910

Internal Communications.—In 1871-1872 there were 814 m. of road in Lower Burma, but the chief means of internal communication was by water. Steamers plied on the Irrawaddy as far as Thayetmyo. The vessels of the Irrawaddy Flotilla Company now ply to Bassein and to all points on the Irrawaddy as far north as Bhamo, and in the dry weather to Myitkyina, and also on the Chindwin as far north as Kindat, and to Homalin during the rains. The Arakan Flotilla Company has also helped to open up the Arakan division. The length of roads has not greatly increased in Lower Burma, but there has been a great deal of road construction in Upper Burma. At the end of the year 1904-1905 there were in the whole province 7486 m. of road, 1516 m. of which were metalled and 3170 unmetalled, with 2799 m. of other tracks. But the chief advance in communications has been in railway construction. The first railway from Rangoon to Prome, 161 m., was opened in 1877, and that from Rangoon to Toungoo, 166 m., was opened in 1884. Since the annexation of Upper Burma this has been extended to Mandalay, and the Mu Valley railway has been constructed from Sagaing to Myitkyina, a distance of 752 m. from Rangoon. The Mandalay-Lashio railway has been completed, and trains run from Mandalay to Lashio, a distance of 178 m. The Sagaing-Mônywa-Alôn branch and the Meiktila-Myingyan branch were opened to traffic during 1900. In 1902 a railway from Henzada to Bassein was formed and a connecting link with the Prome line from Henzada to Letpadan was opened in 1903. Railways were also constructed from Pegu to Martaban, 121 m. in length, and from Henzada to Kyang-in, 66 m. in length; and construction was contemplated of a railway from Thazi towards Taung-gyi, the headquarters of the southern Shan States. The total length of lines open in 1904-1905 was 1340 m., but railway communication in Burma is still very incomplete. Five of the eight commissionerships and Lashio, the capital of the northern Shan States, have communication with each other by railway, but Taung-gyi and the southern Shan States can still only be reached by a hill-road through difficult country for cart traffic, and the headquarters of three commissionerships, Moulmein, Akyab and Minbu, have no railway communication with Rangoon. Arakan is in the worst position of all, for it is connected with Burma by neither railway nor river, nor even by a metalled road, and the only way to reach Akyab from Rangoon is once a week by sea.

Law.—The British government has administered the law in Burma on principles identical with those which have been adopted elsewhere in the British dominions in India. That portion of the law which is usually described as Anglo-Indian law (see INDIAN LAW) is generally applicable to Burma, though there are certain districts inhabited by tribes in a backward state of civilization which are excepted from its operation. Acts of the British parliament relating to India generally would be applicable to Burma, whether passed before or after its annexation, these acts being considered applicable to all the dominions of the crown in India. As regards the acts of the governor-general in council passed for India generally—they, too, were from the first applicable to Lower Burma; and they have all been declared applicable to Upper Burma also by the Burma Laws Act of 1898. That portion of the English law which has been introduced into India without legislation, and all the rules of law resting upon the authority of the courts, are made applicable to Burma by the same act. But consistently with the practice which has always prevailed in India, there is a large field of law in Burma which the British government has not attempted to disturb. It is expressly directed by the act of 1898 above referred to, that in regard to succession, inheritance, marriage, caste or any religious usage or institution, the law to be administered in Burma is (*a*) the Buddhist law in cases where the parties are Buddhists, (*b*) the Mahommedan law in cases where the parties are Mahommedans, (*c*) the Hindu law in cases where the parties are Hindus, except so far as the same may have been modified by the legislature. The reservation thus made in favour of the native laws is precisely analogous to the similar reservation made in India (see INDIAN LAW, where the Hindu law and the Mahommedan Law are described). The Buddhist law is contained in certain sacred books called *Dhammathats*. The laws themselves are derived from one of the collections which Hindus attribute to Manu, but in some respects they now widely differ from the ancient Hindu law so far as it is known to us. There is no certainty as to the date or method of their introduction. The whole of the law administered now in Burma rests ultimately upon statutory authority; and all the Indian acts relating to Burma, whether of the governor-general or the lieutenant-governor of Burma in council, will be found in the Burma Code (Calcutta, 1899), and in the supplements to that volume which are published from time to time at Rangoon. There is no complete translation of the *Dhammathats*, but a good many of them have been translated. An account of these translations will be found in *The Principles of Buddhist Law* by Chan Toon (Rangoon, 1894), which is the first attempt to present those principles in something approaching to a systematic form.

History.—It is probable that Burma is the *Chryse Regio* of Ptolemy, a name parallel in meaning to *Sonaparanta*, the classic Pāli title assigned to the country round the capital in Burmese documents. The royal history traces the lineage of the kings to the ancient Buddhist monarchs of India. This no doubt is fabulous, but it is hard to say how early communication with Gangetic India began. From the 11th to the 13th century the old Burman empire was at the height of its power, and to this period belong the splendid remains of architecture at Pagan. The city and the dynasty were destroyed by a Chinese (or rather Mongol) invasion (1284 A.D.) in the reign of Kublai Khan. After that the empire fell to a low ebb, and Central Burma was often subject to Shan dynasties. In the early part of the 16th century the Burmese princes of Toungoo, in the north-east of Pegu, began to rise to power, and established a dynasty which at one time held possession of Pegu, Ava and Arakan. They made their capital at Pegu, and to this dynasty belong the gorgeous descriptions of some of the travellers of the 16th century. Their wars exhausted the country, and before the end of the century it was in the greatest decay. A new dynasty arose in Ava, which subdued Pegu, and maintained their supremacy throughout the 17th and during the first forty years of the 18th century. The Peguans or Talaings then revolted, and having taken the capital Ava, and made the king prisoner, reduced the whole country to submission. Alompra, left by the conqueror in charge of the village of Môtshobo, planned the deliverance of his country. He attacked the Peguans at first with small detachments; but when his forces increased, he suddenly advanced, and took possession of the capital in the autumn of 1753.

In 1754 the Peguans sent an armament of war-boats against Ava, but they were totally defeated by Alompra; while in the districts of Prome, Donubyu, &c., the Burmans revolted, and expelled all the Pegu garrisons in their towns. In 1754 Prome was besieged by the king of Pegu, who was again defeated by Alompra, and the war was transferred from the upper provinces to the mouths of the navigable rivers, and the numerous creeks and canals which intersect the lower country. In 1755 the yuva raja, the king of Pegu's brother, was equally unsuccessful, after which the Peguans were driven from Bassein and the adjacent country, and were forced to withdraw to the fortress of Syriam, distant 12 m. from Rangoon. Here they enjoyed a brief repose, Alompra being called away to quell an insurrection of his own subjects, and to repel an invasion of the Siamese; but returning victorious, he laid siege to the fortress of Syriam and took it by surprise. In these wars the French sided with the Peguans, the English with the Burmans. Dupleix, the governor of Pondicherry, had sent two ships to the aid of the former; but the master of the first was decoyed up the river by Alompra, where he was massacred along with his whole crew. The other escaped to Pondicherry. Alompra was now master of all the navigable rivers; and the Peguans, shut out from foreign aid, were finally subdued. In 1757 the conqueror laid siege to the city of Pegu, which capitulated, on condition that their own king should govern the country, but that he should do homage for his kingdom, and should also surrender his daughter to the victorious monarch. Alompra never contemplated the fulfilment of the condition; and having obtained possession of the town, abandoned it to the fury of his soldiers. In the following year the Peguans vainly endeavoured to throw off the yoke. Alompra afterwards reduced the town and district of Tavoy, and finally undertook the conquest of the Siamese. His army advanced to Mergui and Tenasserim, both of which towns were taken; and he was besieging the capital of Siam when he was taken ill. He immediately ordered his army to retreat, in hopes of reaching his capital alive; but he expired on the way, in 1760, in the fiftieth year of his age, after he had reigned eight years. In the previous year he had massacred the English of the establishment of Negrais, whom he suspected of assisting the Peguans. He was succeeded by his eldest son Noungdaugyi, whose reign was disturbed by the rebellion of his brother Sin-byu-shin, and afterwards by one of his father's generals. He died in little more than three years, leaving one son in his infancy; and on his decease the throne was seized by his brother Sin-byu-shin. The new king was intent, like his predecessors, on the conquest of the adjacent states, and accordingly made war in 1765 on the Manipur kingdom, and also on the Siamese, with partial success. In the following year he defeated the Siamese, and, after a long blockade, obtained possession of their capital. But while the Burmans were extending their conquests in this quarter, they were invaded by a Chinese army of 50,000 men from the province of Yunnan. This army was hemmed in by the skill of the Burmans; and, being reduced by the want of provisions, it was afterwards attacked and totally destroyed, with the exception of 2500 men, who were sent in fetters to work in the Burmese capital at their several trades. In the meantime the Siamese revolted, and while the Burman army was marching against them, the Peguan soldiers who had been incorporated in it rose against their companions, and commencing an indiscriminate massacre, pursued the Burman army to the gates of Rangoon, which they besieged, but were unable to capture. In 1774 Sin-byu-shin was engaged in reducing the marauding tribes. He took the district and fort of Martaban from the revolted Peguans; and in the following year he sailed down the Irrawaddy with an army of 50,000 men, and, arriving at Rangoon, put to death the aged monarch of Pegu, along with many of his nobles, who had shared with him in the offence of rebellion. He died in 1776, after a reign of twelve years, during which he had extended the Burmese dominions on every side. He was succeeded by his son, a youth of eighteen, called Singumin (Chenguza of Symes), who proved himself a bloodthirsty despot, and was put to death by his uncle, Bodawpaya or Mentaragyi, in 1781, who ascended the vacant throne. In 1783 the new king effected the conquest of Arakan. In the same year he removed his residence from Ava, which, with brief interruptions, had been the capital for four centuries, to the new city of Amarapura, "the City of the Immortals."

The Siamese who had revolted in 1771 were never afterwards subdued by the Burmans; but the latter retained their dominion over the sea-coast as far as Mergui. In the year 1785 they attacked the island of Junkseylon with a fleet of boats and an army, but were ultimately driven back with loss; and a second attempt by the Burman monarch, who in 1786 invaded Siam with an army of 30,000 men, was attended with no better success. In 1793 peace was concluded between these two powers, the Siamese yielding to the Burmans the entire possession of the coast of Tenasserim on the Indian Ocean, and the two important seaports of Mergui and Tavoy.

In 1795 the Burmese were involved in a dispute with the British in India, in consequence of their troops, to the amount of 5000 men, entering the district of Chittagong in pursuit of three robbers who had fled from justice across the frontier. Explanations being made and terms of accommodation offered by General Erskine, the commanding officer, the Burmese commander retired from the British territories, when the fugitives were restored, and all differences for the time amicably arranged.

But it was evident that the gradual extension of the British and Burmese territories would in time bring the two powers into close contact along a more extended line of frontier, and in all probability lead to a war between them. It happened, accordingly, that the Burmese, carrying their arms into Assam and Manipur, penetrated to the British border near Sylhet, on the north-east frontier of Bengal, beyond which were the possessions of the chiefs of Cachar, under the protection of the British government. The Burmese leaders, arrested in their career of conquest, were impatient to measure their strength with their new neighbours. It appears from the evidence of Europeans who resided in Ava, that they were entirely unacquainted with the discipline and resources of the Europeans. They imagined that, like other nations, they would fall before their superior tactics and valour; and their cupidity was inflamed by the prospect of marching to Calcutta and plundering the country. At length their chiefs ventured on the open violation of the British territories. They attacked a party of sepoys within the frontier, and seized and carried off British subjects, while at all points their troops, moving in large bodies, assumed the most menacing positions. In the south encroachments were made upon the British frontier of Chittagong. The island of Shahpura, at the mouth of the Naaf river, had been occupied by a small guard of British troops. These were attacked on the 23rd of September 1823 by the Burmese, and driven from their post with the loss of several lives; and to the repeated demands of the British for redress no answer was returned. Other outrages ensued; and at length, on March 5th, 1824, war was declared by the British government. The military operations, which will be found described under Burmese Wars, ended in the treaty of Yandaboo on the 24th of February 1826, which conceded the British terms and enabled their army to be withdrawn.

For some years the relations of peace continued undisturbed. Probably the feeling of amity on the part of the Burmese government was not very strong; but so long as the prince by whom the treaty was concluded

continued in power, no attempt was made to depart from its main stipulations. That monarch, Ba-ggi-daw, however, was obliged in 1837 to yield the throne to a usurper who appeared in the person of his brother, Tharrawaddi (Tharawadi). The latter, at an early period, manifested not only that hatred of British connexion which was almost universal at the Burmese court, but also the extremest contempt. For several years it had become apparent that the period was approaching when war between the British and the Burmese governments would again become inevitable. The British resident, Major Burney, who had been appointed in 1830, finding his presence at Ava agreeable neither to the king nor to himself, removed in 1837 to Rangoon, and shortly afterwards retired from the country. Ultimately it became necessary to forego even the pretence of maintaining relations of friendship, and the British functionary at that time, Captain Macleod, was withdrawn in 1840 altogether from a country where his continuance would have been but a mockery. The state of sullen dislike which followed was after a while succeeded by more active evidences of hostility. Acts of violence were committed on British ships and British seamen. Remonstrance was consequently made by the British government, and its envoys were supported by a small naval force. The officers on whom devolved the duty of representing the wrongs of their fellow-countrymen and demanding redress, proceeded to Rangoon, the governor of which place had been a chief actor in the outrages complained of; but so far were they from meeting with any signs of regret, that they were treated with indignity and contempt, and compelled to retire without accomplishing anything beyond blockading the ports. A series of negotiations followed; nothing was demanded of the Burmese beyond a very moderate compensation for the injuries inflicted on the masters of two British vessels, an apology for the insults offered by the governor of Rangoon to the representatives of the British government, and the re-establishment of at least the appearance of friendly relations by the reception of a British agent by the Burmese government. But the obduracy of King Pagan, who had succeeded his father in 1846, led to the refusal alike of atonement for past wrongs, of any expression of regret for the display of gratuitous insolence, and of any indication of a desire to maintain friendship for the future. Another Burmese war was the result, the first shot being fired in January 1852. As in the former, though success was varying, the British finally triumphed, and the chief towns in the lower part of the Burmese kingdom fell to them in succession. The city of Pegu, the capital of that portion which, after having been captured, had again passed into the hands of the enemy, was recaptured and retained, and the whole province of Pegu was, by proclamation of the governor-general, Lord Dalhousie, declared to be annexed to the British dominions on the 20th of December 1852. No treaty was obtained or insisted upon,—the British government being content with the tacit acquiescence of the king of Burma without such documents; but its resolution was declared, that any active demonstration of hostility by him would be followed by retribution.

About the same time a revolution broke out which resulted in King Pagan's dethronement. His tyrannical and barbarous conduct had made him obnoxious at home as well as abroad, and indeed many of his actions recall the worst passages of the history of the later Roman emperors. The Mindôn prince, who had become apprehensive for his own safety, made him prisoner in February 1853, and was himself crowned king of Burma towards the end of the year. The new monarch, known as King Mindôn, showed himself sufficiently arrogant in his dealings with the European powers, but was wise enough to keep free from any approach towards hostility. The loss of Pegu was long a matter of bitter regret, and he absolutely refused to acknowledge it by a formal treaty. In the beginning of 1855 he sent a mission of compliment to Lord Dalhousie, the governor-general; and in the summer of the same year Major (afterwards Sir Arthur) Phayre, *de facto* governor of the new province of Pegu, was appointed envoy to the Burmese court. He was accompanied by Captain (afterwards Sir Henry) Yule as secretary, and Mr Oldham as geologist, and his mission added largely to our knowledge of the state of the country; but in its main object of obtaining a treaty it was unsuccessful. It was not till 1862 that the king at length yielded, and his relations with Britain were placed on a definite diplomatic basis.

In that year the province of British Burma, the present Lower Burma, was formed, with Sir Arthur Phayre as chief commissioner. In 1867 a treaty was concluded at Mandalay providing for the free intercourse of trade and the establishment of regular diplomatic relations. King Mindôn died in 1878, and was succeeded by his son King Thibaw. Early in 1879 he excited much horror by executing a number of the members of the Burmese royal family, and relations became much strained. The British resident was withdrawn in October 1879. The government of the country rapidly became bad. Control over many of the outlying districts was lost, and the elements of disorder on the British frontier were a standing menace to the peace of the country. The Burmese court, in contravention of the express terms of the treaty of 1869, created monopolies to the detriment of the trade of both England and Burma; and while the Indian government was unrepresented at Mandalay, representatives of Italy and France were welcomed, and two separate embassies were sent to Europe for the purpose of contracting new and, if possible, close alliances with sundry European powers. Matters were brought to a crisis towards the close of 1885, when the Burmese government imposed a fine of £230,000 on the Bombay-Burma Trading Corporation, and refused to comply with a suggestion of the Indian government that the cause of complaint should be investigated by an impartial arbitrator. An ultimatum was therefore despatched on the 22nd of October 1885. On the 9th of November a reply was received in Rangoon amounting to an unconditional refusal. The king on the 7th of November issued a proclamation calling upon his subjects to drive the British into the sea. On the 14th of November 1885 the British field force crossed the frontier, and advanced to Mandalay without incurring any serious resistance (see Burmese Wars). It reached Ava on the 26th of November, and an envoy from the king signified his submission. On the 28th of November the British occupied Mandalay, and next day King Thibaw was sent down the river to Rangoon, whence he was afterwards transferred to Ratnagiri on the Bombay coast. Upper Burma was formally annexed on the 1st of January 1886, and the work of restoring the country to order and introducing settled government commenced. This was a more serious task than the overthrow of the Burmese government, and occupied four years. This was in part due to the character of the country, which was characterized as one vast military obstacle, and in part to the disorganization which had been steadily growing during the six years of King Thibaw's reign. By the close of 1889 all the larger bands of marauders were broken up, and since 1890 the country has enjoyed greater freedom from violent crime than the province formerly known as British Burma. By the Upper Burma Village Regulations and the Lower Burma Village Act, the villagers themselves were made responsible for maintaining order in every village, and the system has worked with the greatest success. During the decade 1891-1901 the population increased by 19.8% and cultivation by 53%. With good harvests and good markets the standard of living in Burma has much improved. Large areas of cultivable waste have been brought under cultivation, and the general result has been a contented people. The boundary with Siam was demarcated in 1893, and that with China was completed in 1900.

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(J. G. SC.)

[1] See also, for geology, W. Theobald, "On the Geology of Pegu," *Mem. Geol. Surv. India*, vol. x. pt. ii. (1874); F. Noetling, "The Development and Subdivision of the Tertiary System in Burma," *Rec. Geol. Sun. India*, vol. xxviii. (1895), pp. 59-86, pl. ii.; F. Noetling, "The Occurrence of Petroleum in Burma, and its Technical Exploitation," *Mem. Geol. Surv. India*, vol. xxvii. pt. ii. (1898).

BURMANN, PIETER (1668-1741), Dutch classical scholar, known as "the Elder," to distinguish him from his nephew, was born at Utrecht. At the age of thirteen he entered the university where he studied under Graevius and Gronovius. He devoted himself particularly to the study of the classical languages, and became unusually proficient in Latin composition. As he was intended for the legal profession, he spent some years in attendance on the law classes. For about a year he studied at Leiden, paying special attention to philosophy and Greek. On his return to Utrecht he took the degree of doctor of laws (March 1688), and after travelling through Switzerland and part of Germany, settled down to the practice of law, without, however, abandoning his classical studies. In December 1691 he was appointed receiver of the tithes which were originally paid to the bishop of Utrecht, and five years later was nominated to the professorship of eloquence and history. To this chair was soon added that of Greek and politics. In 1714 he paid a short visit to Paris and ransacked the libraries. In the following year he was appointed successor to the celebrated Perizonius, who had held the chair of history, Greek language and eloquence at Leiden. He was subsequently appointed professor of history for the United Provinces and chief librarian. His numerous editorial and critical works spread his fame as a scholar throughout Europe, and engaged him in many of the stormy disputes which were then so common among men of letters. Burmann was rather a compiler than a critic; his commentaries show immense learning and accuracy, but are wanting in taste and judgment. He died on the 31st of March 1741.

Burmann edited the following classical authors:—Phaedrus (1698); Horace (1699); Valerius Flaccus (1702); Petronius Arbiter (1709); Velleius Paterculus (1719); Quintilian (1720); Justin (1722); Ovid (1727); *Poetae Latini minores* (1731); Suetonius (1736); Lucan (1740). He also published an edition of Buchanan's works, continued Graevius's great work, *Thesaurus Antiquitatum et Historiarum Italiae*, and wrote a treatise *De Vectigalibus populi Romani* (1694) and a short manual of Roman antiquities, *Antiquitatum Romanarum Brevis Descriptio* (1711). His *Sylloge epistolarum a viris illustribus scriptarum* (1725) is of importance for the history of learned men. The list of his works occupies five pages in Saxe's *Onomasticon*. His poems and orations were published after his death. There is an account of his life in the *Gentleman's Magazine* for April (1742) by Dr Samuel Johnson.

BURMANN, PIETER (1714-1778), called by himself "the Younger" (Secundus), Dutch philologist, nephew of the above, was born at Amsterdam on the 13th of October 1714. He was brought up by his uncle in Leiden, and afterwards studied law and philology under C.A. Duker and Arnold von Drakenborch at Utrecht. In 1735 he was appointed professor of eloquence and history at Franeker, with which the chair of poetry was combined in 1741. In the following year he left Franeker for Amsterdam to become professor of history and philology at the Athenaeum. He was subsequently professor of poetry (1744), general librarian (1752), and inspector of the gymnasium (1753). In 1777 he retired, and died on the 24th of June 1778 at Sandhorst, near Amsterdam. He resembled his more famous uncle in the manner and direction of his studies, and in his violent disposition, which involved him in quarrels with contemporaries, notably Saxe and Klotz. He was a man of extensive learning, and had a great talent for Latin poetry. His most valuable works are: *Anthologia Veterum Latinorum Epigrammatum et Poematum* (1759-1773); *Aristophanis Comoediae Novem* (1760); *Rhetorica ad Herennium* (1761). He completed the editions of Virgil (1746) and Claudian (1760), which had been left unfinished by his uncle, and commenced an edition of Propertius, one of his best works, which was only half printed at the time of his death. It was completed by L. van Santen and published in 1780.

BURMESE WARS. Three wars were fought between Burma and the British during the 19th century (see BURMA: *History*), which resulted in the gradual extinction of Burmese independence.

First Burmese War, 1823-26.—On the 23rd of September 1823 an armed party of Burmese attacked a British guard on Shapura, an island close to the Chittagong side, killing and wounding six of the guard. Two Burmese armies, one from Manipur and another from Assam, also entered Cachar, which was under British protection, in January 1824. War with Burma was formally declared on the 5th of March 1824. On the 17th of May a Burmese force invaded Chittagong and drove a mixed sepoy and police detachment from its position at Ramu, but did not follow up its success. The British rulers in India, however, had resolved to carry the war into the enemy's country; an armament, under Commodore Charles Grant and Sir Archibald Campbell, entered the Rangoon river, and anchored off the town on the 10th of May 1824. After a feeble resistance the place, then little more than a large stockaded village, was surrendered, and the troops were landed. The place was entirely deserted by its inhabitants, the provisions were carried off or destroyed, and the invading force took possession of a complete solitude. On the 28th of May Sir A. Campbell ordered

an attack on some of the nearest posts, which were all carried after a steadily weakening defence. Another attack was made on the 10th of June on the stockades at the village of Kemmendine. Some of these were battered by artillery from the war vessels in the river, and the shot and shells had such effect on the Burmese that they evacuated them, after a very unequal resistance. It soon, however, became apparent that the expedition had been undertaken with very imperfect knowledge of the country, and without adequate provision. The devastation of the country, which was part of the defensive system of the Burmese, was carried out with unrelenting rigour, and the invaders were soon reduced to great difficulties. The health of the men declined, and their ranks were fearfully thinned. The monarch of Ava sent large reinforcements to his dispirited and beaten army; and early in June an attack was commenced on the British line, but proved unsuccessful. On the 8th the British assaulted. The enemy were beaten at all points; and their strongest stockaded works, battered to pieces by a powerful artillery, were in general abandoned. With the exception of an attack by the prince of Tharrawaddy in the end of August, the enemy allowed the British to remain unmolested during the months of July and August. This interval was employed by Sir A. Campbell in subduing the Burmese provinces of Tavoy and Mergui, and the whole coast of Tenasserim. This was an important conquest, as the country was salubrious and afforded convalescent stations to the sick, who were now so numerous in the British army that there were scarcely 3000 soldiers fit for duty. An expedition was about this time sent against the old Portuguese fort and factory of Syriam, at the mouth of the Pegu river, which was taken; and in October the province of Martaban was reduced under the authority of the British.

The rainy season terminated about the end of October; and the court of Ava, alarmed by the discomfiture of its armies, recalled the veteran legions which were employed in Arakan, under their renowned leader Maha Bandula. Bandula hastened by forced marches to the defence of his country; and by the end of November an army of 60,000 men had surrounded the British position at Rangoon and Kemmendine, for the defence of which Sir Archibald Campbell had only 5000 efficient troops. The enemy in great force made repeated attacks on Kemmendine without success, and on the 7th of December Bandula was defeated in a counter attack made by Sir A. Campbell. The fugitives retired to a strong position on the river, which they again entrenched; and here they were attacked by the British on the 15th, and driven in complete confusion from the field.

[v.04 p.0847] Sir Archibald Campbell now resolved to advance on Prome, about 100 m. higher up the Irrawaddy river. He moved with his force on the 13th of February 1825 in two divisions, one proceeding by land, and the other, under General Willoughby Cotton, destined for the reduction of Danubyu, being embarked on the flotilla. Taking the command of the land force, he continued his advance till the 11th of March, when intelligence reached him of the failure of the attack upon Danubyu. He instantly commenced a retrograde march; on the 27th he effected a junction with General Cotton's force, and on the 2nd of April entered the entrenchments at Danubyu without resistance, Bandula having been killed by the explosion of a bomb. The English general entered Prome on the 25th, and remained there during the rainy season. On the 17th of September an armistice was concluded for one month. In the course of the summer General Joseph Morrison had conquered the province of Arakan; in the north the Burmese were expelled from Assam; and the British had made some progress in Cachar, though their advance was finally impeded by the thick forests and jungle.

The armistice having expired on the 3rd of November, the army of Ava, amounting to 60,000 men, advanced in three divisions against the British position at Prome, which was defended by 3000 Europeans and 2000 native troops. But the British still triumphed, and after several actions, in which the Burmese were the assailants and were partially successful, Sir A. Campbell, on the 1st of December, attacked the different divisions of their army, and successively drove them from all their positions, and dispersed them in every direction. The Burmese retired on Malun, along the course of the Irrawaddy, where they occupied, with 10,000 or 12,000 men, a series of strongly fortified heights and a formidable stockade. On the 26th they sent a flag of truce to the British camp; and negotiations having commenced, peace was proposed to them on the following conditions:—(1) The cession of Arakan, together with the provinces of Mergui, Tavoy and Ye; (2) the renunciation by the Burmese sovereign of all claims upon Assam and the contiguous petty states; (3) the Company to be paid a crore of rupees as an indemnification for the expenses of the war; (4) residents from each court to be allowed, with an escort of fifty men; while it was also stipulated that British ships should no longer be obliged to unship their rudders and land their guns as formerly in the Burmese ports. This treaty was agreed to and signed, but the ratification of the king was still wanting; and it was soon apparent that the Burmese had no intention to sign it, but were preparing to renew the contest. On the 19th of January, accordingly, Sir A. Campbell attacked and carried the enemy's position at Malun. Another offer of peace was here made by the Burmese, but it was found to be insincere; and the fugitive army made at the ancient city of Pagan a final stand in defence of the capital. They were attacked and overthrown on the 9th of February 1826; and the invading force being now within four days' march of Ava, Dr Price, an American missionary, who with other Europeans had been thrown into prison when the war commenced, was sent to the British camp with the treaty (known as the treaty of Yandaboo) ratified, the prisoners of war released, and an instalment of 25 lakhs of rupees. The war was thus brought to a successful termination, and the British army evacuated the country.

Second Burmese War, 1852.—On the 15th of March 1852 Lord Dalhousie sent an ultimatum to King Pagan, announcing that hostile operations would be commenced if all his demands were not agreed to by the ist of April. Meanwhile a force consisting of 8100 troops had been despatched to Rangoon under the command of General H.T. Godwin, C.B., while Commodore Lambert commanded the naval contingent. No reply being given to this letter, the first blow of the Second Burmese War was struck by the British on the 5th of April 1852, when Martaban was taken. Rangoon town was occupied on the 12th, and the Shwe Dagôn pagoda on the 14th, after heavy fighting, when the Burmese army retired northwards. Bassein was seized on the 19th of May, and Pegu was taken on the 3rd of June, after some sharp fighting round the Shwe-maw-daw pagoda. During the rainy season the approval of the East India Company's court of directors and of the British government was obtained to the annexation of the lower portion of the Irrawaddy Valley, including Prome. Lord Dalhousie visited Rangoon in July and August, and discussed the whole situation with the civil, military and naval authorities. In consequence General Godwin occupied Prome on the 9th of October after but slight resistance. Early in December Lord Dalhousie informed King Pagan that the province of Pegu would henceforth form part of the British dominions, and that if his troops resisted the measure his whole kingdom would be destroyed. The proclamation of annexation was issued on the 20th of January 1853, and thus the Second Burmese War was brought to an end without any treaty

being signed.

Third Burmese War, 1885-86.—The imposition of an impossible fine on the Bombay-Burma Trading Company, coupled with the threat of confiscation of all their rights and property in case of non-payment, led to the British ultimatum of the 22nd of October 1885; and by the 9th of November a practical refusal of the terms having been received at Rangoon, the occupation of Mandalay and the dethronement of King Thibaw were determined upon. At this time, beyond the fact that the country was one of dense jungle, and therefore most unfavourable for military operations, little was known of the interior of Upper Burma; but British steamers had for years been running on the great river highway of the Irrawaddy, from Rangoon to Mandalay, and it was obvious that the quickest and most satisfactory method of carrying out the British campaign was an advance by water direct on the capital. Fortunately a large number of light-draught river steamers and barges (or "flats"), belonging to the Irrawaddy Flotilla Company, were available at Rangoon, and the local knowledge of the company's officers of the difficult river navigation was at the disposal of the government. Major-General, afterwards Sir, H.N.D. Prendergast, V.C., K.C.B., R.E., was placed in command of the expedition. As was only to be expected in an enterprise of this description, the navy as well as the army was called in requisition; and as usual the services rendered by the seamen and guns were most important. The total effective of the force was 9034 fighting men, 2810 native followers and 67 guns, and for river service, 24 machine guns. The river fleet which conveyed the troops and stores was composed of a total of no less than 55 steamers, barges, launches, &c.

Thayetmyo was the British post on the river nearest to the frontier, and here, by 14th November, five days after Thibaw's answer had been received, practically the whole expedition was assembled. On the same day General Prendergast received instructions to commence operations. The Burmese king and his country were taken completely by surprise by the unexampled rapidity of the advance. There had been no time for them to collect and organize the stubborn resistance of which the river and its defences were capable. They had not even been able to block the river by sinking steamers, &c., across it, for, on the very day of the receipt of orders to advance, the armed steamers, the "Irrawaddy" and "Kathleen," engaged the nearest Burmese batteries, and brought out from under their guns the king's steamer and some barges which were lying in readiness for this very purpose. On the 16th the batteries themselves on both banks were taken by a land attack, the enemy being evidently unprepared and making no resistance. On the 17th of November, however, at Minhla, on the right bank of the river, the Burmans in considerable force held successively a barricade, a pagoda and the redoubt of Minhla. The attack was pressed home by a brigade of native infantry on shore, covered by a bombardment from the river, and the enemy were defeated with a loss of 170 killed and 276 prisoners, besides many more drowned in the attempt to escape by the river. The advance was continued next day and the following days, the naval brigade and heavy artillery leading and silencing in succession the enemy's river defences at Nyaungu, Pakôkku and Myingyan. On the 26th of November, when the flotilla was approaching the ancient capital of Ava, envoys from King Thibaw met
[v.04 p.0848]
General Prendergast with offers of surrender; and on the 27th, when the ships were lying off that city and ready to commence hostilities, the order of the king to his troops to lay down their arms was received. There were three strong forts here, full at that moment with thousands of armed Burmans, and though a large number of these filed past and laid down their arms by the king's command, still many more were allowed to disperse with their weapons; and these, in the time that followed, broke up into dacoit or guerrilla bands, which became the scourge of the country and prolonged the war for years. Meanwhile, however, the surrender of the king of Burma was complete; and on the 28th of November, in less than a fortnight from the declaration of war, Mandalay had fallen, and the king himself was a prisoner, while every strong fort and town on the river, and all the king's ordnance (1861 pieces), and thousands of rifles, muskets and arms had been taken. Much valuable and curious "loot" and property was found in the palace and city of Mandalay, which, when sold, realized about 9 lakhs of rupees (£60,000).

From Mandalay, General Prendergast seized Bhamo on the 28th of December. This was a very important move, as it forestalled the Chinese, who were preparing to claim the place. But unfortunately, although the king was dethroned and deported, and the capital and the whole of the river in the hands of the British, the bands of armed soldiery, unaccustomed to conditions other than those of anarchy, rapine and murder, took advantage of the impenetrable cover of their jungles to continue a desultory armed resistance. Reinforcements had to be poured into the country, and it was in this phase of the campaign, lasting several years, that the most difficult and most arduous work fell to the lot of the troops. It was in this jungle warfare that the losses from battle, sickness and privation steadily mounted up; and the troops, both British and native, proved once again their fortitude and courage.

Various expeditions followed one another in rapid succession, penetrating to the remotest corners of the land, and bringing peace and protection to the inhabitants, who, it must be mentioned, suffered at least as much from the dacoits as did the troops. The final, and now completely successful, pacification of the country, under the direction of Sir Frederick (afterwards Earl) Roberts, was only brought about by an extensive system of small protective posts scattered all over the country, and small lightly equipped columns moving out to disperse the enemy whenever a gathering came to a head, or a pretended prince or king appeared.

No account of the Third Burmese War would be complete without a reference to the first, and perhaps for this reason most notable, land advance into the enemy's country. This was carried out in November 1885 from Toungoo, the British frontier post in the east of the country, by a small column of all arms under Colonel W.P. Dicken, 3rd Madras Light Infantry, the first objective being Ningyan. The operations were completely successful, in spite of a good deal of scattered resistance, and the force afterwards moved forward to Yamethin and Hlaingdet. As inland operations developed, the want of mounted troops was badly felt, and several regiments of cavalry were brought over from India, while mounted infantry was raised locally. It was found that without these most useful arms it was generally impossible to follow up and punish the active enemy.

BURN, RICHARD (1700-1785), English legal writer, was born at Winton, Westmorland, in 1709. Educated at Queen's College, Oxford, he entered the Church, and in 1736 became vicar of Orton in Westmorland. He was a justice of the peace for the counties of Westmorland and Cumberland, and devoted himself to the study of law. He was appointed chancellor of the diocese of Carlisle in 1765, an office which he held till his death at Orton on the 12th of November 1785. Burn's *Justice of the Peace and Parish Officer*, first published in 1755, was for many years the standard authority on the law relating to justices of the peace. It has passed through innumerable editions. His *Ecclesiastical Law* (1760), a work of much

research, was the foundation upon which were built many modern commentaries on ecclesiastical law. The best edition is that by R. Phillimore (4 vols., 1842). Burn also wrote *Digest of the Militia Laws* (1760), and *A New Law Dictionary* (2 vols., 1792).

BURNABY, FREDERICK GUSTAVUS (1842-1885), English traveller and soldier, was born on the 3rd of March 1842, at Bedford, the son of a clergyman. Educated at Harrow and in Germany, he entered the Royal Horse Guards in 1859. Finding no chance for active service, his spirit of adventure sought outlets in balloon-ascents and in travels through Spain and Russia. In the summer of 1874 he accompanied the Carlist forces as correspondent of *The Times*, but before the end of the war he was transferred to Africa to report on Gordon's expedition to the Sudan. This took Burnaby as far as Khartum. Returning to England in March 1875, he matured his plans for a journey on horseback to Khiva through Russian Asia, which had just been closed to travellers. His accomplishment of this task, in the winter of 1875-1876, described in his book *A Ride to Khiva*, brought him immediate fame. His next leave of absence was spent in another adventurous journey on horseback, through Asia Minor, from Scutari to Erzerum, with the object of observing the Russian frontier, an account of which he afterwards published. In the Russo-Turkish War of 1877, Burnaby (who soon afterwards became lieut.-colonel) acted as travelling agent to the Stafford House (Red Cross) Committee, but had to return to England before the campaign was over. At this point began his active interest in politics, and in 1880 he unsuccessfully contested a seat at Birmingham in the Tory-Democrat interest. In 1882 he crossed the Channel in a balloon. Having been disappointed in his hope of seeing active service in the Egyptian campaign of 1882, he participated in the Suakin campaign of 1884 without official leave, and was wounded at El Teb when acting as an intelligence officer under General Valentine Baker. This did not deter him from a similar course when a fresh expedition started up the Nile. He was given a post by Lord Wolseley, and met his death in the hand-to-hand fighting of the battle of Abu Klea (17th January 1885).

BURNAND, SIR FRANCIS COWLEY (1836-), English humorist, was born in London on the 29th of November 1836. His father was a London stockbroker, of French-Swiss origin; his mother Emma Cowley, a direct descendant of Hannah Cowley (1743-1809), the English poet and dramatist. He was educated at Eton and Cambridge, and originally studied first for the Anglican, then for the Roman Catholic Church; but eventually took to the law and was called to the bar. From his earliest days, however, the stage had attracted him—he founded the Amateur Dramatic Club at Cambridge,—and finally he abandoned the church and the law, first for the stage and subsequently for dramatic authorship. His first great dramatic success was made with the burlesque *Black-Eyed Susan*, and he wrote a large number of other burlesques, comedies and farces. One of his early burlesques came under the favourable notice of Mark Lemon, then editor of *Punch*, and Burnand, who was already writing for the comic paper *Fun*, became in 1862 a regular contributor to *Punch*. In 1880 he was appointed editor of *Punch*, and only retired from that position in 1906. In 1902 he was knighted. His literary reputation as a humorist depends, apart from his long association with *Punch*, on his well-known book *Happy Thoughts*, originally published in *Punch* in 1863-1864 and frequently reprinted.

See *Recollections and Reminiscences*, by Sir F.C. Burnand (London, 1904).

BURNE-JONES, SIR EDWARD BURNE, Bart. (1833-1898), English painter and designer, was born on the 28th of August 1833 at Birmingham. His father was a Welsh descent, and the idealism of his nature and art has been attributed to this Celtic strain. An only son, he was educated at King Edward's school, Birmingham, and destined for the Church. He retained through life an interest in classical studies, but it was the mythology of the classics which fascinated him. He went into residence as a scholar at Exeter College, Oxford, in January 1853. On the same day William Morris entered the same college, having also the intention of taking orders. The two were thrown together, and grew close friends. Their similar tastes
[v.04 p.0849] and enthusiasms were mutually stimulated. Burne-Jones resumed his early love of drawing and designing. With Morris he read *Modern Painters* and the *Morte d'Arthur*. He studied the Italian pictures in the University galleries, and Dürer's engravings; but his keenest enthusiasm was kindled by the sight of two works by a living man, Rossetti. One of these was a woodcut in Allingham's poems, "The Maids of Elfinmere"; the other was the water-colour "Dante drawing an Angel," then belonging to Mr Coombe, of the Clarendon Press, and now in the University collection. Having found his true vocation, Burne-Jones, like his friend Morris, determined to relinquish his thoughts of the Church and to become an artist. Rossetti, although not yet seen by him, was his chosen master; and early in 1856 he had the happiness, in London, of meeting him. At Easter he left college without taking a degree. This was his own decision, not due (as often stated) to Rossetti's persuasion; but on settling in London, where Morris soon joined him at 17 Red Lion Square, he began to work under Rossetti's friendly instruction and encouraging guidance.

As Burne-Jones once said, he "found himself at five-and-twenty what he ought to have been at fifteen." He had had no regular training as a draughtsman, and lacked the confidence of science. But his extraordinary faculty of invention as a designer was already ripening; his mind, rich in knowledge of classical story and medieval romance, teemed with pictorial subjects; and he set himself to complete his equipment by resolute labour, witnessed by innumerable drawings. The works of this first period are all more or less tinged by the influence of Rossetti; but they are already differentiated from the elder master's style by their more facile though less intensely felt elaboration of imaginative detail. Many are pen-and-ink drawings on vellum, exquisitely finished, of which the "Waxen Image" is one of the earliest and best examples; it is dated 1856. Although subject, medium and manner derive from Rossetti's inspiration, it is not the hand of a pupil merely, but of a potential master. This was recognized by Rossetti himself, who before long avowed that he had nothing more to teach him. Burne-Jones's first sketch in oils dates from this same year, 1856; and during 1857 he made for Bradfield College the first of what was to be an immense series of cartoons for stained glass. In 1858 he decorated a cabinet with the "Prioress's Tale" from Chaucer, his first direct illustration of the work of a poet whom he especially loved and who inspired him with endless subjects. Thus early, therefore, we see the artist busy in all the various fields in which he was to labour.

In the autumn of 1857 Burne-Jones joined in Rossetti's ill-fated scheme to decorate theh walls of the Oxford Union. None of the painters had mastered the technique of fresco, and their pictures had begun to peel from the walls before they were completed. In 1859 Burne-Jones made his first journey to Italy. He saw Florence, Pisa, Siena, Venice and other places, and appears to have found the gentle and romantic Sienese more attractive than any other school. Rossetti's influence still persisted; and its impress is visible, more strongly perhaps than ever before, in the two water-colours "Sidonia von Bork" and "Clara von Bork,"

painted in 1860. These little masterpieces have a directness of execution rare with the artist. In powerful characterization, combined with a decorative motive, they rival Rossetti at his best. In June of this year Burne-Jones was married to Miss Georgiana Macdonald, two of whose sisters were the wives of Sir E. Poynter and Mr J.L. Kipling, and they settled in Bloomsbury. Five years later he moved to Kensington Square, and shortly afterwards to the Grange, Fulham, an old house with a garden, where he resided till his death. In 1862 the artist and his wife accompanied Ruskin to Italy, visiting Milan and Venice.

In 1864 he was elected an associate of the Society of Painters in Water-Colours, and exhibited, among other works, "The Merciful Knight," the first picture which fully revealed his ripened personality as an artist. The next six years saw a series of fine water-colours at the same gallery; but in 1870, owing to a misunderstanding, Burne-Jones resigned his membership of the society. He was re-elected in 1886. During the next seven years, 1870-1877, only two works of the painter's were exhibited. These were two water-colours, shown at the Dudley Gallery in 1873, one of them being the beautiful "Love among the Ruins," destroyed twenty years later by a cleaner who supposed it to be an oil painting, but afterwards reproduced in oils by the painter. This silent period was, however, one of unremitting production. Hitherto Burne-Jones had worked almost entirely in water-colours. He now began a number of large pictures in oils, working at them in turn, and having always several on hand. The "Briar Rose" series, "Laus Veneris," the "Golden Stairs," the "Pygmalion" series, and "The Mirror of Venus" are among the works planned and completed, or carried far towards completion, during these years. At last, in May 1877, the day of recognition came, with the opening of the first exhibition of the Grosvenor Gallery, when the "Days of Creation," the "Beguiling of Merlin," and the "Mirror of Venus" were all shown. Burne-Jones followed up the signal success of these pictures with "Laus Veneris," the "Chant d'Amour," "Pan and Psyche," and other works, exhibited in 1878. Most of these pictures are painted in gay and brilliant colours. A change is noticeable next year, 1879, in the "Annunciation" and in the four pictures called "Pygmalion and the Image"; the former of these, one of the simplest and most perfect of the artist's works, is subdued and sober; in the latter a scheme of soft and delicate tints was attempted, not with entire success. A similar temperance of colours marks the "Golden Stairs," first exhibited in 1880. In 1884, following the almost sombre "Wheel of Fortune" of the preceding year, appeared "King Cophetua and the Beggar Maid," in which Burne-Jones once more indulged his love of gorgeous colour, refined by the period of self-restraint. This masterpiece is now in the National collection. He next turned to two important sets of pictures, "The Briar Rose" and "The Story of Perseus," though these were not completed for some years to come. In 1886, having been elected A.R.A. the previous year, he exhibited (for the only time) at the Royal Academy "The Depths of the Sea," a mermaid carrying down with her a youth whom she has unconsciously drowned in the impetuosity of her love. This picture adds to the habitual haunting charm a tragic irony of conception and a felicity of execution which give it a place apart among Burne-Jones's works. He resigned his Associateship in 1893. One of the "Perseus" series was exhibited in 1887, two more in 1888, with "The Brazen Tower," inspired by the same legend. In 1890 the four pictures of "The Briar Rose" were exhibited by themselves, and won the widest admiration. The huge tempera picture, "The Star of Bethlehem," painted for the corporation of Birmingham, was exhibited in 1891. A long illness for some time checked the painter's activity, which, when resumed, was much occupied with decorative schemes. An exhibition of his work was held at the New Gallery in the winter of 1892-1893. To this period belong several of his comparatively few portraits. In 1894 Burne-Jones was made a baronet. Ill-health again interrupted the progress of his works, chief among which was the vast "Arthur in Avalon." In 1898 he had an attack of influenza, and had apparently recovered, when he was again taken suddenly ill, and died on the 17th of June. In the following winter a second exhibition of his works was held at the New Gallery, and an exhibition of his drawings (including some of the charmingly humorous sketches made for children) at the Burlington Fine Arts Club.

His son and successor in the baronetcy, Sir Philip Burne-Jones (b. 1861), also became well known as an artist. The only daughter, Margaret, married Mr J.W. Mackail.

Burne-Jones's influence has been exercised far less in painting than in the wide field of decorative design. Here it has been enormous. His first designs for stained glass, 1857-1861, were made for Messrs Powell, but after 1861 he worked exclusively for Morris & Co. Windows executed from his cartoons are to be found all over England; others exist in churches abroad. For the American Church in Rome he designed a [v.04 p.0850] number of mosaics. Reliefs in metal, tiles, gesso-work, decorations for pianos and organs, and cartoons for tapestry represent his manifold activity. In all works, however, which were only designed and not carried out by him, a decided loss of delicacy is to be noted. The colouring of the tapestries (of which the "Adoration of the Magi" at Exeter College is the best-known) is more brilliant than successful. The range and fertility of Burne-Jones as a decorative inventor can be perhaps most conveniently studied in the sketch-book, 1885-1895, which he bequeathed to the British Museum. The artist's influence on book-illustration must also be recorded. In early years he made a few drawings on wood for Dalziel's Bible and for *Good Words*; but his later work for the Kelmscott Press, founded by Morris in 1891, is that by which he is best remembered. Besides several illustrations to other Kelmscott books, he made eighty-seven designs for the *Chaucer* of 1897.

Burne-Jones's aim in art is best given in some of his own words, written to a friend: "I mean by a picture a beautiful, romantic dream of something that never was, never will be—in a light better than any light that ever shone—in a land no one can define or remember, only desire—and the forms divinely beautiful—and then I wake up, with the waking of Brynhild." No artist was ever more true to his aim. Ideals resolutely pursued are apt to provoke the resentment of the world, and Burne-Jones encountered, endured and conquered an extraordinary amount of, angry criticism. In so far as this was directed against the lack of realism in his pictures, it was beside the point. The earth, the sky, the rocks, the trees, the men and women of Burne-Jones are not those of this world; but they are themselves a world, consistent with itself, and having therefore its own reality. Charged with the beauty and with the strangeness of dreams, it has nothing of a dream's incoherence. Yet it is a dreamer always whose nature penetrates these works, a nature out of sympathy with struggle and strenuous action. Burne-Jones's men and women are dreamers too. It was this which, more than anything else, estranged him from the age into which he was born. But he had an inbred "revolt from fact" which would have estranged him from the actualities of any age. That criticism seems to be more justified which has found in him a lack of such victorious energy and mastery over his materials as would have enabled him to carry out his conceptions in their original intensity. Representing the same kind of tendency as distinguished his French contemporary, Puvis de Chavannes, he was far less in the main current of art, and his position suffers accordingly. Often compared with Botticelli, he had nothing of the fire and vehemence of the Florentine. Yet, if aloof from strenuous action,

Burne-Jones was singularly strenuous in production. His industry was inexhaustible, and needed to be, if it was to keep pace with the constant pressure of his ideas. Invention, a very rare excellence, was his pre-eminent gift. Whatever faults his paintings may have, they have always the fundamental virtue of design; they are always pictures. His fame might rest on his purely decorative work. But his designs were informed with a mind of romantic temper, apt in the discovery of beautiful subjects, and impassioned with a delight in pure and variegated colour. These splendid gifts were directed in a critical and fortunate moment by the genius of Rossetti. Hence a career which shows little waste or misdirection of power, and, granted the aim proposed, a rare level of real success.

AUTHORITIES.—In 1904 was published *Memorials of Edward Burne-Jones*, by his widow, two volumes of extreme interest and charm. *The Work of Burne-Jones*, a collection of ninety-one photogravures, appeared in 1900.

See also *Catalogue to Burlington Club Exhibition of Drawings by Burne-Jones*, with Introduction by Cosmo Monkhouse (1899); *Sir E. Burne-Jones: a Record and a Review*, by Malcolm Belt (1898); *Sir E. Burne-Jones, his Life and Work*, by Julia Cartwright (Mrs Ady) (1894); *The Life of William Morris*, by J.W. Mackail (1899).

(L. B.)

BURNELL, ARTHUR COKE (1840-1882), English Sanskrit scholar, was born at St Briavels, Gloucestershire, in 1840. His father was an official of the East India Company, and in 1860 he himself went out to Madras as a member of the Indian civil service. Here he utilized every available opportunity to acquire or copy Sanskrit manuscripts. In 1870 he presented his collection of 350 MSS. to the India library. In 1874 he published a *Handbook of South Indian Palaeography*, characterized by Max Müller as "indispensable to every student of Indian literature," and in 1880 issued for the Madras government his greatest work, the *Classified Index to the Sanskrit MSS. in the Palace at Tanjore*. He was also the author of a large number of translations from, and commentaries on, various other Sanskrit manuscripts, being particularly successful in grouping and elucidating the essential principles of Hindu law. In addition to his exhaustive acquaintance with Sanskrit, and the southern India vernaculars, he had some knowledge of Tibetan, Arabic, Kawi, Javanese and Coptic. Burnell originated with Sir Henry Yule the well-known dictionary of Anglo-Indian words and phrases, *Hobson-Jobson*. His constitution, never strong, broke down prematurely through the combined influence of overwork and the Madras climate, and he died at West Stratton, Hampshire, on the 12th of October 1882. A further collection of Sanskrit manuscripts was purchased from his heirs by the India library after his death.

BURNELL, ROBERT (d. 1292), English bishop and chancellor, was born at Acton Burnell in Shropshire, and began his public life probably as a clerk in the royal chancery. He was soon in the service of Edward, the eldest son of King Henry III., and was constantly in attendance on the prince, whose complete confidence he appears to have enjoyed. Having received some ecclesiastical preferments, he acted as one of the regents of the kingdom from the death of Henry III. in November 1272 until August 1274, when the new king, Edward I., returned from Palestine and made him his chancellor. In 1275 Burnell was elected bishop of Bath and Wells, and three years later Edward repeated the attempt which he had made in 1270 to secure the archbishopric of Canterbury for his favourite. The bishop's second failure to obtain this dignity was due, doubtless, to his irregular and unclerical manner of life, a fact which also accounts, in part at least, for the hostility which existed between his victorious rival, Archbishop Peckham, and himself. As the chief adviser of Edward I. during the earlier part of his reign, and moreover as a trained and able lawyer, the bishop took a prominent part in the legislative acts of the "English Justinian," whose activity in this direction coincides practically with Burnell's tenure of the office of chancellor. The bishop also influenced the king's policy with regard to France, Scotland and Wales; was frequently employed on business of the highest moment; and was the royal mouthpiece on several important occasions. In 1283 a council, or, as it is sometimes called, a parliament, met in his house at Acton Burnell, and he was responsible for the settlement of the court of chancery in London. In spite of his numerous engagements, Burnell found time to aggrandize his bishopric, to provide liberally for his nephews and other kinsmen, and to pursue his cherished but futile aim of founding a great family. Licentious and avaricious, he amassed great wealth; and when he died on the 25th of October 1292 he left numerous estates in Shropshire, Worcestershire, Somerset, Kent, Surrey and elsewhere. He was, however, genial and kind-hearted, a great lawyer and a faithful minister.

See R.W. Eyton, *Antiquities of Shropshire* (London, 1854-1860); and E. Foss, *The Judges of England*, vol. iii. (London, 1848-1864).

BURNES, SIR ALEXANDER (1805-1841), British traveller and explorer, was born at Montrose, Scotland, in 1805. While serving in India, in the army of the East India Company, which he had joined in his seventeenth year, he made himself acquainted with Hindustani and Persian, and thus obtained an appointment as interpreter at Surat in 1822. Transferred to Cutch in 1826 as assistant to the political agent, he turned his attention more particularly to the history and geography of north-western India and the adjacent countries, at that time very imperfectly known. His proposal in 1829 to undertake a journey of exploration through the valley of the Indus was not carried out owing to political apprehensions; but in 1831 he was sent to Lahore with a present of horses from King William IV. to Maharaja Ranjit Singh and took advantage of the opportunity for extensive investigations. In the following years his travels were extended through Afghanistan across the Hindu Kush to Bokhara and Persia. The narrative which he published on his visit to England in 1834 added immensely to contemporary knowledge of the countries traversed, and was one of the most popular books of the time. The first edition brought the author the sum of £800, and his services were recognized not only by the Royal Geographical Society of London, but also by that of Paris. Soon after his return to India in 1835 he was appointed to the court of Sind to secure a treaty for the navigation of the Indus; and in 1836 he undertook a political mission to Dost Mahommed at Kabul. He advised Lord Auckland to support Dost Mahommed on the throne of Kabul, but the viceroy preferred to follow the opinion of Sir William Macnaghten and reinstated Shah Shuja, thus leading up to the disasters of the first Afghan War. On the restoration of Shah Shuja in 1839, he became regular political agent at Kabul, and remained there till his assassination in 1841 (on the 2nd of November), during the heat of an insurrection. The calmness with which he continued at his post, long after the imminence of his danger was apparent, gives an heroic colouring to the close of an honourable and devoted life. It came to light in 1861 that some of Burnes' despatches from Kabul in 1839 had been altered, so as to convey

opinions opposite to his, but Lord Palmerston refused after such a lapse of time to grant the inquiry demanded in the House of Commons. A narrative of his later labours was published in 1842 under the title of *Cabool*.

See Sir J.W. Kaye, *Lives of Indian Officers* (1889).

BURNET, GILBERT (1643-1715), English bishop and historian, was born in Edinburgh on the 18th of September 1643, of an ancient and distinguished Scottish house. He was the youngest son of Robert Burnet (1592-1661), who at the Restoration became a lord of session with the title of Lord Crimond. Robert Burnet had refused to sign the Scottish Covenant, although the document was drawn up by his brother-in-law, Archibald Johnstone, Lord Warristoun. He therefore found it necessary to retire from his profession, and twice went into exile. He disapproved of the rising of the Scots, but was none the less a severe critic of the government of Charles I. and of the action of the Scottish bishops. This moderate attitude he impressed on his son Gilbert, whose early education he directed. The boy entered Marischal College at the age of nine, and five years later graduated M.A. He then spent a year in the study of feudal and civil law before he resolved to devote himself to theology. He became a probationer for the Scottish ministry in 1661 just before episcopal government was re-established in Scotland. His decision to accept episcopal orders led to difficulties with his family, especially with his mother, who held rigid Presbyterian views. From this time dates his friendship with Robert Leighton (1611-1684), who greatly influenced his religious opinions. Leighton had, during a stay in the Spanish Netherlands, assimilated something of the ascetic and pietistic spirit of Jansenism, and was devoted to the interests of peace in the church. Burnet wisely refused to accept a benefice in the disturbed state of church affairs, but he wrote an audacious letter to Archbishop Sharp asking him to take measures to restore peace. Sharp sent for Burnet, and dismissed his advice without apparent resentment. He had already made valuable acquaintances in Edinburgh, and he now visited London, Oxford and Cambridge, and, after a short visit to Edinburgh in 1663, when he sought to secure a reprieve for his uncle Warristoun, he proceeded to travel in France and Holland. At Cambridge he was strongly influenced by the philosophical views of Ralph Cudworth and Henry More, who proposed an unusual degree of toleration within the boundaries of the church and the limitations imposed by its liturgy and episcopal government; and his intercourse in Holland with foreign divines of different Protestant sects further encouraged his tendency to latitudinarianism.

When he returned to England in 1664 he established intimate relations with Sir Robert Moray and with John Maitland, earl and afterwards first duke of Lauderdale, both of whom at that time advocated a tolerant policy towards the Scottish covenanters. Burnet became a member of the Royal Society, of which Moray was the first president. On his father's death he had been offered a living by a relative, Sir Alexander Burnet, and in 1663 the living of Saltoun, East Lothian, had been kept open for him by one of his father's friends. He was not formally inducted at Saltoun until June 1665, although he had served there since October 1664. For the next five years he devoted himself to his parish, where he won the respect of all parties. In 1666 he alienated the Scottish bishops by a bold memorial (printed in vol. ii. of the *Miscellanies* of the Scottish Historical Society), in which he pointed out that they were departing from the custom of the primitive church by their excessive pretensions, and yet his attitude was far too moderate to please the Presbyterians. In 1669 he resigned his parish to become professor of divinity in the university of Glasgow, and in the same year he published an exposition of his ecclesiastical views in his *Modest and Free Conference between a Conformist and a Nonconformist* (by "a lover of peace"). He was Leighton's right hand in the efforts at a compromise between the episcopal and the presbyterian principle. Meanwhile he had begun to differ from Lauderdale, whose policy after the failure of the scheme of "Accommodation" moved in the direction of absolutism and repression, and during Lauderdale's visit to Scotland in 1672 the divergence rapidly developed into opposition. He warily refused the offer of a Scottish bishopric, and published in 1673 his four "conferences," entitled *Vindication of the Authority, Constitution and Laws of the Church and State of Scotland*, in which he insisted on the duty of passive obedience. It was partly through the influence of Anne (d. 1716), duchess of Hamilton in her own right, that he had been appointed at Glasgow, and he made common cause with the Hamiltons against Lauderdale. The duchess had made over to him the papers of her father and uncle, from which he compiled the *Memoirs of the Lives and Actions of James and William, dukes of Hamilton and Castleherald. In which an Account is given of the Rise and Progress of the Civil Wars of Scotland ... together with many letters ... written by King Charles I.* (London, 1677; Univ. Press, Oxford, 1852), a book which was published as the second volume of a *History of the Church of Scotland*, Spottiswoode's *History* forming the first. This work established his reputation as an historian. Meanwhile he had clandestinely married in 1671 a cousin of Lauderdale, Lady Margaret Kennedy, daughter of John Kennedy, 6th earl of Cassilis, a lady who had already taken an active part in affairs in Scotland, and was eighteen years older than Burnet. The marriage was kept secret for three years, and Burnet renounced all claim to his wife's fortune.

Lauderdale's ascendancy in Scotland and the failure of the attempts at compromise in Scottish church affairs eventually led Burnet to settle in England. He was favourably received by Charles II. in 1673, when he went up to London to arrange for the publication of the Hamilton *Memoirs*, and he was treated with confidence by the duke of York. On his return to Scotland Lauderdale refused to receive him, and denounced him to Charles II. as one of the chief centres of Scottish discontent. Burnet found it wiser to retire to England on the plea of fulfilling his duties as royal chaplain. Once in London he resigned his professorship (September 1674) at Glasgow; but, although James remained his friend, Charles struck him off the roll of court chaplains in 1674, and it was in opposition to court influence that he was made chaplain to the Rolls Chapel by the master, Sir Harbottle Grimston, and appointed lecturer at St Clement's. He was summoned in April 1675 before a committee of the House of Commons to give evidence against Lauderdale, and disclosed, without reluctance according to his enemies, confidences which had passed between him and the minister. He himself confesses in his autobiography that "it was a great error in me to appear in this matter," and his conduct cost him the patronage of the duke of York. In ecclesiastical matters he threw in his lot with Thomas Tillotson and John Tenison, and at the time of the Revolution had written some eighteen polemics against encroachments of the Roman Catholic Church. At the suggestion of Sir William Jones, the attorney-general, he began his *History of the Reformation in England*, based on original documents. In the necessary research he received some pecuniary help from Robert Boyle, but he was hindered in the preparation of the first part (1679) through being refused access to the Cotton library, possibly by the influence of Lauderdale. For this volume he received the thanks of parliament, and the second and third volumes appeared in 1681 and 1715. In this work he undertook to refute the statements of Nicholas Sanders, whose *De Origine et progressu schismatis Anglicani libri tres*

(Cologne, 1585) was still, in the French translation of Maucroix, the commonly accepted account of the English reformation. Burnet's contradictions of Sanders must not, however, be accepted without independent investigation. At the time of the Popish Plot in 1678 he displayed some moderation, refusing to believe the charges made against the duke of York, though he chose this time to publish some anti-Roman pamphlets. He tried, at some risk to himself, to save the life of one of the victims, William Staly, and visited William Howard, Viscount Stafford, in the Tower. To the Exclusion Bill he opposed a suggestion of compromise, and it is said that Charles offered him the bishopric of Chichester, "if he would come entirely into his interests." Burnet's reconciliation with the court was short-lived. In January 1680 he addressed to the king a long letter on the subject of his sins; he was known to have received the dangerous confidence of Wilmot, earl of Rochester, in his last illness; and he was even suspected, unjustly, in 1683, of having composed the paper drawn up on the eve of death by William Russell, Lord Russell, whom he attended to the scaffold. On the 5th of November 1684 he preached, at the express wish of his patron Grimston, and against his own desire, the usual anti-Catholic sermon. He was consequently deprived of his appointments by order of the court, and on the accession of James II. retired to Paris. He had already begun the writing of his memoirs, which were to develop into the *History of His Own Time*.

Burnet now travelled in Italy, Germany and Switzerland, finally settling in Holland at the Hague, where he won from the princess of Orange a confidence which proved enduring. He rendered a signal service to William by inducing the princess to offer to leave the whole political power in her husband's hands in the event of their succession to the English crown. A prosecution against him for high treason was now set on foot both in England and in Scotland, and he took the precaution of naturalizing himself as a Dutch subject. Lady Margaret Burnet was dying when he left England, and n Holland he married a Dutch heiress of Scottish descent, Mary Scott. He returned to England with William and Mary, and drew up the English text of their declaration. His earlier views on the doctrine of non-resistance had been sensibly modified by what he saw in France after the revocation of the edict of Nantes and by the course of affairs at home, and in 1688 he published an *Inquiry into the Measures of Submission to the Supreme Authority* in defence of the revolution. He was consecrated to the see of Salisbury on the 31st of March 1689 by a commission of bishops to whom Archbishop Sancroft had delegated his authority, declining personally to perform the office. In his pastoral letter to his clergy urging them to take the oath of allegiance, Burnet grounded the claim of William and Mary on the right of conquest, a view which gave such offence that the pamphlet was burnt by the common hangman three years later. As bishop he proved an excellent administrator, and gave the closest attention to his pastoral duties. He discouraged plurality of livings, and consequent non-residence, established a school of divinity as Salisbury, and spent much time himself in preparing candidates for confirmation, and in the examination of those who wished to enter the priesthood. Four discourses delivered to the clergy of his diocese were printed in 1694. During Queen Mary's lifetime ecclesiastical patronage passed through her hands, but after her death William III. appointed an ecclesiastical commission on which Burnet was a prominent member, for the disposal of vacant benefices. In 1696 and 1697 he presented memorials to the king suggesting that the first-fruits and tenths raised by the clergy should be devoted to the augmentation of the poorer livings, and though his suggestions were not immediately accepted, they were carried into effect under Queen Anne by the provision known as Queen Anne's Bounty. His second wife died of smallpox in 1698, and in 1700 Burnet married again, his third wife being Elizabeth (1661-1709), widow of Robert Berkeley and daughter of Sir Richard Blake, a rich and charitable woman, known by her *Method of Devotion*, posthumously published in 1710. In 1699 he was appointed tutor to the royal duke of Gloucester, son of the Princess Anne, an appointment which he accepted somewhat against his will. His influence at court had declined after the death of Queen Mary; William resented his often officious advice, placed little confidence in his discretion, and soon after his accession is even said to have described him as *ein rechter Tartuffe*. Burnet made a weighty speech against the bill (1702-1703) directed against the practice of occasional conformity, and was a consistent exponent of Broad Church principles. He devoted five years' labour to his *Exposition of the Thirty-nine Articles* (1699; ed. J.R. Page, 1837), which was severely criticized by the High Church clergy. But his hopes for a comprehensive scheme which might include nonconformists in the English Church were necessarily destroyed on the accession of Queen Anne. He died on the 17th of March 1715, and was buried in the parish of St James's, Clerkenwell.

Burnet directed in his will that his most important work, the *History of His Own Time*, should appear six years after his death. It was published (2 vols., 1724-1734) by his sons, Gilbert and Thomas, and then not without omissions. It was attacked in 1724 by John Cockburn in *A Specimen of some free and impartial Remarks*. Burnet's book naturally aroused much opposition, and there were persistent rumours that the MS. had been unduly tampered with. He has been freely charged with gross misrepresentation, an accusation to which he laid himself open, for instance, in the account of the birth of James, the Old Pretender. His later intimacy with the Marlboroughs made him very lenient where the duke was concerned. The greatest value of his work naturally lies in his account of transactions of which he had personal knowledge, notably in his relation of the church history of Scotland, of the Popish Plot, of the proceedings at the Hague previous to the expedition of William and Mary, and of the personal relations between the joint sovereigns.

Of his children by his second wife, William (d. 1729) became a colonial governor in America; Gilbert (d. 1726) became prebendary of Salisbury in 1715, and chaplain to George I. in 1718; and Sir Thomas (1694-1753), his literary executor and biographer, became in 1741 judge in the court of common pleas.

Bibliography.—The chief authorities for Bishop Burnet's life are the autobiography "Rough Draft of my own Life" (ed. H.C. Foxcroft, Oxford, 1902, in the *Supplement to Burnet's History*), the Life by Sir Thomas Burnet in the *History of His Own Time* (Oxford, 1823, vol. vi.), and the *History* itself. A rather severe but detailed and useful criticism is given in L. v. Ranke's *History of England* (Eng. ed., Oxford, 1875), vol. vi. pp. 45-101. Burnet's letters to his friend, George Savile, marquess of Halifax, were published by the Royal Historical Society (*Camden Miscellany*, vol. xi.). The *History of His Own Time* (2 vols. fol., 1724-1734) ran through many editions before it was reprinted at the Clarendon Press (6 vols., 1823, and supplementary volume, 1833) with the suppressed passages of the first volume and notes by the earls of Dartmouth and Hardwicke, with the remarks of Swift. This edition, under the direction of M.J. Routh, was enlarged in a second Oxford edition of 1833. A new edition, based on this, but making use of the Bodleian MS., which differs very considerably from the printed version, was edited by Osmund Airy (Oxford, 1897, &c.). In 1902 (Clarendon Press, Oxford) Miss H.C. Foxcroft edited *A Supplement to Burnet's History of His Own Time*, to which is prefixed an account of the relation between the different versions of the History—the Bodleian

MS., the fragmentary Harleian MS. in the British Museum and Sir Thomas Burnet's edition; the book contains the remaining fragments of Burnet's original memoirs, his autobiography, his letters to Admiral Herbert and his private meditations. The chief differences between Burnet's original draft as represented by the Bodleian MS. and the printed history consist in a more lenient view generally of individuals, a modification of the censure levelled at the Anglican clergy, changes obviously dictated by a general variation in his point of view, and a more cautious account of personal matters such as his early relations with Lauderdale. He also cut out much minor detail, and information relating to himself and to members of his family. His *History of the Reformation of the Church of England* was edited (Clarendon Press, Oxford, 7 vols., 1865) by N. Pocock.

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Besides the works mentioned above may be noticed: *Some Passages of the Life and Death of John, Earl of Rochester* (Lond., 1680; facsimile reprint, with introduction by Lord Ronald Gower, 1875); *The Life and Death of Sir Matthew Hale, Kt., sometime Lord Chief-Justice of his Majesties Court of Kings Bench* (Lond., 1682), which is included in C. Wordsworth's *Ecclesiastical Biography* (vol. vi., 1818); *The History of the Rights of Princes in disposing of Ecclesiastical Benefices and Church Lands* (Lond., 1682, 8vo); *The Life of William Bedell, D.D., Bishop of Kilmore in Ireland* (1685), containing the correspondence between Bedell and James Waddesdon of the Holy Inquisition on the subject of the Roman obedience; *Reflections on Mr Varillas's "History of the Revolutions that have happened in Europe in matters of Religion," and more particularly on his Ninth Book, that relates to England* (Amst., 1686), appended to the account of his travels entitled *Some Letters*, which was originally published at Rotterdam (1686); *A Discourse of the Pastoral Care* (1692, 14th ed., 1821); *An Essay on the Memory of the late Queen* (1695); *A Collection of various Tracts and Discourses written in the Years 1677 to 1704* (3 vols., 1704); and *A Collection of Speeches, Prefaces, Letters, with a Description of Geneva and Holland* (1713). Of his shorter religious and polemical works a catalogue is given in vol. vi. of the Clarendon Press edition of his *History*, and in Lowndes's *Bibliographer's Manual*. The following translations deserve to be mentioned:—*Utopia, written in Latin by Sir Thomas More, Chancellor of England: translated into English* (1685); *A Relation of the Death of the Primitive Persecutors, written originally in Latin, by L.C.F. Lactantius: Englished by Gilbert Burnet, D.D., to which he hath made a large preface concerning Persecution* (Amst., 1687).

See also *A Life of Gilbert Burnet, Bishop of Salisbury* (1907), by T.E.S. Clarke and H.C. Foxcroft, with an introduction by C.H. Firth, which contains a chronological list of Burnet's published works. Of Burnet's personal character there are well-known descriptions in chapter vii. of Macaulay's *History of England*, and in W.E.H. Lecky's *History of England in the Eighteenth Century*, vol. i. pp. 80 seq.

BURNET, THOMAS (1635-1715), English divine, was born at Croft in Yorkshire about the year 1635. He was educated at Northallerton, and at Clare Hall, Cambridge. In 1657 he was made fellow of Christ's, and in 1667 senior proctor of the university. By the interest of James, duke of Ormonde, he was chosen master of the Charterhouse in 1685, and took the degree of D.D. As master he made a noble stand against the illegal attempts to admit Andrew Popham as a pensioner of the house, strenuously opposing an order of the 26th of December 1686, addressed by James II. to the governors dispensing with the statutes for the occasion.

Burnet published his famous *Telluris Theoria Sacra*, or *Sacred Theory of the Earth*,[1] at London in 1681. This work, containing a fanciful theory of the earth's structure,[2] attracted much attention, and he was afterwards encouraged to issue an English translation, which was printed in folio, 1684-1689. Addison commended the author in a Latin ode, but his theory was attacked by John Keill, William Whiston and Erasmus Warren, to all of whom he returned answers. His reputation obtained for him an introduction at court by Archbishop Tillotson, whom he succeeded as clerk of the closet to King William. But he suddenly marred his prospects by the publication, in 1692, of a work entitled *Archaeologiae Philosophicae: sive Doctrina antiqua de Rerum Originibus*, in which he treated the Mosaic account of the fall of man as an allegory. This excited a great clamour against him; and the king was obliged to remove him from his office at court. Of this book an English translation was published in 1729. Burnet published several other minor works before his death, which took place at the Charterhouse on the 27th September 1715. Two posthumous works appeared several years after his death—*De Fide et Officiis Christianorum* (1723), and *De Statu Mortuorum et Resurgentium Tractatus* (1723); in which he maintained the doctrine of a middle state, the millennium, and the limited duration of future punishment. A *Life of Dr Burnet*, by Heathcote, appeared in 1759.

[1] "Which," says Samuel Johnson, "the critick ought to read for its elegance, the philosopher for its arguments, and the saint for its piety" (*Lives of English Poets*, vol. i. p. 303).

[2] Burnet held that at the deluge the earth was crushed like an egg, the internal waters rushing out, and the fragments of shell becoming the mountains.

BURNET, known botanically as *Poterium*, a member of the rose family. The plants are perennial herbs with pinnate leaves and small flowers arranged in dense long-stalked heads. Great burnet (*Poterium officinale*) is found in damp meadows; salad burnet (*P. Sanguisorba*) is a smaller plant with much smaller flower-heads growing in dry pastures.

BURNETT, FRANCES ELIZA HODGSON (1849-), Anglo-American novelist, whose maiden name was Hodgson, was born in Manchester, England, on the 24th of November 1849; she went to America with her parents, who settled in Knoxville, Tennessee, in 1865. Miss Hodgson soon began to write stories for magazines. In 1873 she married Dr L.M. Burnett of Washington, whom she afterwards (1898) divorced. Her reputation as a novelist was made by her remarkable tale of Lancashire life, *That Lass o' Lowrie's* (1877), and a number of other volumes followed, of which the best were *Through one Administration* (1883) and *A Lady of Quality* (1896). In 1886 she attained a new popularity by her charming story of *Little Lord Fauntleroy*, and this led to other stories of child-life. *Little Lord Fauntleroy* was dramatized (see COPYRIGHT for the legal questions involved) and had a great success on the stage; and other dramas by her were also produced. In 1900 she married a second time, her husband being Mr Stephen Townesend, a surgeon, who (as Will Dennis) had taken to the stage and had collaborated with her in some of her plays.

BURNEY, CHARLES (1726-1814), English musical historian, was born at Shrewsbury on the 12th of April 1726. He received his earlier education at the free school of that city, and was afterwards sent to the public school at Chester. His first music master was Edmund Baker, organist of Chester cathedral, and a

pupil of Dr John Blow. Returning to Shrewsbury when about fifteen years old, he continued his musical studies for three years under his half-brother, James Burney, organist of St Mary's church, and was then sent to London as a pupil of the celebrated Dr Arne, with whom he remained three years. Burney wrote some music for Thomson's *Alfred*, which was produced at Drury Lane theatre on the 30th of March 1745. In 1749 he was appointed organist of St Dionis-Backchurch, Fenchurch Street, with a salary of £30 a year; and he was also engaged to take the harpsichord in the "New Concerts" then recently established at the King's Arms, Cornhill. In that year he married Miss Esther Sleepe, who died in 1761; in 1769 he married Mrs Stephen Allen of Lynn. Being threatened with a pulmonary affection he went in 1751 to Lynn in Norfolk, where he was elected organist, with an annual salary of £100, and there he resided for the next nine years. During that time he began to entertain the idea of writing a general history of music. His *Ode for St Cecilia's Day* was performed at Ranelagh Gardens in 1759; and in 1760 he returned to London in good health and with a young family; the eldest child, a girl of eight years of age, surprised the public by her attainments as a harpsichord player. The concertos for the harpsichord which Burney published soon after his return to London were regarded with much admiration. In 1766 he produced, at Drury Lane, a free English version and adaptation of J.J. Rousseau's operetta *Le Devin du village*, under the title of *The Cunning Man*. The university of Oxford conferred upon him, on the 23rd of June 1769, the degrees of Bachelor and Doctor of Music, on which occasion he presided at the performance of his exercise for these degrees. This consisted of an anthem, with an overture, solos, recitatives and choruses, accompanied by instruments, besides a vocal anthem in eight parts, which was not performed. In 1769 he published *An Essay towards a History of Comets*.

Amidst his various professional avocations, Burney never lost sight of his favorite object—his *History of Music*—and therefore resolved to travel abroad for the purpose of collecting materials that could not be found in Great Britain. Accordingly, he left London in June 1770, furnished with numerous letters of introduction, and proceeded to Paris, and thence to Geneva, Turin, Milan, Padua, Venice, Bologna, Florence, Rome and Naples. The results of his observations he published in *The Present State of Music in*
[v.04 p.0854] *France and Italy* (1771). Dr Johnson thought so well of this work that, alluding to his own *Journey to the Western Islands of Scotland*, he said, "I had that clever dog Burney's Musical Tour in my eye." In July 1772 Burney again visited the continent, to collect further materials, and, after his return to London, published his tour under the title of *The Present State of Music in Germany, the Netherlands and United Provinces* (1773). In 1773 he was chosen a fellow of the Royal Society. In 1776 appeared the first volume (in 4to) of his long-projected *History of Music*. In 1782 Burney published his second volume; and in 1789 the third and fourth. Though severely criticized by Forkel in Germany and by the Spanish ex-Jesuit, Requeno, who, in his Italian work *Saggi sul Ristabilimento dell' Arte Armonica de' Greci e Romani Cantori* (Parma, 1798), attacks Burney's account of the ancient Greek music, and calls him *lo scompigliato Burney*, the *History of Music* was generally recognized as possessing great merit. The least satisfactory volume is the fourth, the treatment of Handel and Bach being quite inadequate. Burney's first tour was translated into German by Ebeling, and printed at Hamburg in 1772; and his second tour, translated into German by Bode, was published at Hamburg in 1773. A Dutch translation of his second tour, with notes by J.W. Lustig, organist at Groningen, was published there in 1786. The Dissertation on the Music of the Ancients, in the first volume of Burney's *History*, was translated into German by J.J. Eschenburg, and printed at Leipzig, 1781. Burney derived much aid from the first two volumes of Padre Martini's very learned *Storia della Musica* (Bologna, 1757-1770). One cannot but admire his persevering industry, and his sacrifices of time, money and personal comfort, in collecting and preparing materials for his *History*, and few will be disposed to condemn severely errors and oversights in a work of such extent and difficulty.

In 1774 he had written *A Plan for a Music School*. In 1779 he wrote for the Royal Society an account of the infant Crotch, whose remarkable musical talent excited so much attention at that time. In 1784 he published, with an Italian title-page, the music annually performed in the pope's chapel at Rome during Passion Week. In 1785 he published, for the benefit of the Musical Fund, an account of the first commemoration of Handel in Westminster Abbey in the preceding year, with an excellent life of Handel. In 1796 he published *Memoirs and Letters of Metastasio*. Towards the close of his life Burney was paid £1000 for contributing to Rees's *Cyclopaedia* all the musical articles not belonging to the department of natural philosophy and mathematics. In 1783, through the treasury influence of his friend Edmund Burke, he was appointed organist to the chapel of Chelsea Hospital, and he moved his residence from St Martin's Street, Leicester Square, to live in the hospital for the remainder of his life. He was made a member of the Institute of France, and nominated a correspondent in the class of the fine arts, in the year 1810. From 1806 until his death he enjoyed a pension of £300 granted by Fox. He died at Chelsea College on the 12th of April 1814, and was interred in the burying-ground of the college. A tablet was erected to his memory in Westminster Abbey.

Burney's portrait was painted by Reynolds, and his bust was cut by Nollekens in 1805. He had a wide circle of acquaintance among the distinguished artists and literary men of his day. At one time he thought of writing a life of his friend Dr Samuel Johnson, but he retired before the crowd of biographers who rushed into that field. His character in private as well as in public life appears to have been very amiable and exemplary. Dr Burney's eldest son, James, was a distinguished officer in the royal navy, who died a rear-admiral in 1821; his second son was the Rev. Charles Burney, D.D. (1757-1817), a well-known classical scholar, whose splendid collection of rare books, and MSS. was ultimately bought by the nation for the British Museum; and his second daughter was Frances (Madame D'Arblay, *q.v.*).

The *Diary and Letters* of Madame D'Arblay contain many minute and interesting particulars of her father's public and private life, and of his friends and contemporaries. A life of Burney by Madame D'Arblay appeared in 1832.

Besides the operatic music above mentioned, Burney's known compositions consist of:—(1) *Six Sonatas for the harpsichord*; (2) *Two Sonatas for the harp or piano, with accompaniments for violin and violoncello*; (3) *Sonatas for two violins and a bass: two sets*; (4) *Six Lessons for the harpsichord*; (5) *Six Duets for two German flutes*; (6) *Three Concertos for the harpsichord*; (7) *Six concert pieces with an introduction and fugue for the organ*; (8) *Six Concertos for the violin, &c., in eight parts*; (9) *Two Sonatas for pianoforte, violin and violoncello*; (10) *A Cantata, &c.*; (11) *Anthems, &c.*; (12) *XII. Canzonetti a due voci in Canone, poesia dell' Abate Metastasio*.

BURNHAM BEECHES, a wooded tract of 375 acres in Buckinghamshire, England, acquired in 1879 by the Corporation of the city of London, and preserved for public use. This tract, the remnant of an ancient

forest, the more beautiful because of the undulating character of the land, lies west of the road between Slough and Beaconsfield, and 2 m. north of Burnham Beeches station on the Great Western railway. The poet Thomas Gray, who stayed frequently at Stoke Poges in the vicinity, is enthusiastic concerning the beauty of the Beeches ina letter to Horace Walpole in 1737. Near the township of Burnham are slight Early English remains of an abbey founded in 1265. Burnham is an urban district with a population (1901) of 3245.

BURNHAM-ON-CROUCH, an urban district in the southeastern parliamentary division of Essex, England, 43 m. E. by N. from London on a branch of the Great Eastern railway. Pop. (1901) 2919. The church of St Mary is principally late Perpendicular, a good example; it has Decorated portions and a Norman font. There are extensive oyster beds in the Crouch estuary. Burnham lies 6 m. from the North Sea; below it the Crouch is joined on the south side by the Roch, which branches into numerous creeks, and, together with the main estuary, forms Foulness, Wallasea, Potton and other low, flat islands, embanked and protected from incursions of the sea. Burnham is in some repute as a watering-place, and is a favourite yachting station. There is considerable trade in corn and coal, and boat-building is carried on.

BURNING TO DEATH. As a legal punishment for various crimes burning alive was formerly very widespread. It was common among the Romans, being given in the XII. Tables as the special penalty for arson. Under the Gothic codes adulterers were so punished, and throughout the middle ages it was the civil penalty for certain heinous crimes, *e.g.* poisoning, heresy, witchcraft, arson, bestiality and sodomy, and so continued in some cases, nominally at least, till the beginning of the 19th century. In England, under the common law, women condemned for high treason or petty treason (murder of husband, murder of master or mistress, certain offences against the coin, &c.) were burned, this being considered more "decent" than hanging and exposure on a gibbet. In practice the convict was strangled before being burnt. The last woman burnt in England suffered in 1789, the punishment being abolished in 1790.

Burning was not included among the penalties for heresy under the Roman imperial codes; but the burning of heretics by orthodox mobs had long been sanctioned by custom before the edicts of the emperor Frederick II. (1222, 1223) made it the civil-law punishment for heresy. His example was followed in France by Louis IX. in the Establishments of 1270. In England, where the civil law was never recognized, the common law took no cognizance of ecclesiastical offences, and the church courts had no power to condemn to death. There were, indeed, in the 12th and 13th centuries isolated instances of the burning of heretics. William of Newburgh describes the burning of certain foreign sectaries in 1169, and early in the 13th century a deacon was burnt by order of the council of Oxford (Foxe ii. 374; cf. Bracton, *de Corona*, ii. 300), but by what legal sanction is not obvious. The right of the crown to issue writs *de haeretico comburendo*, claimed for it by later jurists, was based on that issued by Henry IV. in 1400 for the burning of William Sawtre; but Sir James Stephen (*Hist. Crim. Law*) points out that this was issued "with the assent of the lords temporal," which seems to prove that the crown had no right under the common law to issue such writs. The burning of heretics was actually made legal in England by the statute *de haeretico comburendo* (1400), passed ten days after the issue of the above writ. This was repealed in
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1533, but the Six Articles Act of 1539 revived burning as a penalty for denying transubstantiation. Under Queen Mary the acts of Henry IV. and Henry V. were revived; they were finally abolished in 1558 on the accession of Elizabeth. Edward VI., Elizabeth and James I., however, burned heretics (illegally as it would appear) under their supposed right of issuing writs for this purpose. The last heretics burnt in England were two Arians, Bartholomew Legate at Smithfield, and Edward Wightman at Lichfield, both in 1610. As for witches, countless numbers were burned in most European countries, though not in England, where they were hanged. In Scotland in Charles II.'s day the law still was that witches were to be "worried at the stake and then burnt"; and a witch was burnt at Dornoch so late as 1708.

BURNLEY, a market town and municipal, county and parliamentary borough of Lancashire, England, at the junction of the rivers Brun and Calder, 213 m. N.N.W. of London and 29 m. N. of Manchester, on the Lancashire & Yorkshire railway and the Leeds & Liverpool Canal. Pop. (1891) 87,016; (1901) 97,043. The church of St Peter dates from the 14th century, but is largely modernized; among a series of memorials of the Towneley family is one to Charles Towneley (d. 1805), who collected the series of antique marbles, terra-cottas, bronzes, coins and gems which are named after him and preserved in the British Museum. In 1902 Towneley Hall and Park were acquired by the corporation, the mansion being adapted to use as a museum and art gallery, and in 1903 a summer exhibition was held here. There are a large number of modern churches and chapels, a handsome town-hall, market hall, museum and art gallery, school of science, municipal technical school, various benevolent institutions, and pleasant public parks and recreation grounds. The principal industries are cotton-weaving, worsted-making, iron-founding, coal-mining, quarrying, brick-burning and the making of sanitary wares. It has been suggested that Burnley may coincide with Brunanburh, the battlefield on which the Saxons conquered the Dano-Celtic force in 937. During the cotton famine consequent upon the American war of 1861-65 it suffered severely, and the operatives were employed on relief works embracing an extensive system of improvements. The parliamentary borough (1867), which returns one member, falls within the Clitheroe division of the county. The county borough was created in 1888. The town was incorporated in 1861. The corporation consists of a mayor, 12 aldermen and 36 councillors. By act of parliament in 1890 Burnley was created a suffragan bishopric of the diocese of Manchester. Area of the municipal borough, 4005 acres.

BURNOUF, EUGÈNE (1801-1852), French orientalist, was born in Paris on the 8th of April 1801. His father, Prof. Jean Louis Burnouf (1775-1844), was a classical scholar of high reputation, and the author, among other works, of an excellent translation of Tacitus (6 vols., 1827-1833). Eugene Burnouf published in 1826 an *Essai sur le Pâli ...*, written in collaboration with Christian Lassen; and in the following year *Observations grammaticales sur quelques passages de l'essai sur le Pâli*. The next great work he undertook was the deciphering of the Zend manuscripts brought to France by Anquetil du Perron. By his labours a knowledge of the Zend language was first brought into the scientific world of Europe. He caused the *Vendidad Sade*, part of one of the books bearing the name of Zoroaster, to be lithographed with the utmost care from the Zend MS. in the Bibliothèque Nationale, and published it in folio parts, 1829-1843. From 1833 to 1835 he published his *Commentaire sur le Yaçna, l'un des livres liturgiques des Parses*; he also published the Sanskrit text and French translation of the *Bhâgavata Purâna ou histoire poétique de Krichna* in three folio volumes (1840-1847). His last works were *Introduction à l'histoire du Bouddhisme indien* (1844), and a translation of *Le lotus de la bonne loi* (1852). Burnouf died on the 28th of May 1852. He had been for twenty years a member of the Académie des Inscriptions and professor of Sanskrit in the

Collège de France.

See a notice of Burnouf's works by Barthélemy Saint-Hilaire, prefixed to the second edition (1876) of the *Introd. à l'histoire du Bouddhisme indien*; also Naudet, "Notice historique sur M.M. Burnouf, père et fils," in *Mem. de l'Acad. des Inscriptions*, xx. A list of his valuable contributions to the *Journal asiatique*, and of his MS. writings, is given in the appendix to the *Choix de lettres d'Eugène Burnouf* (1891).

BURNOUS (from the Arab. *burnus*), a long cloak of coarse woollen stuff with a hood, usually white in colour, worn by the Arabs and Berbers throughout North Africa.

BURNS, SIR GEORGE, Bart. (1795-1890), English shipowner, was born in Glasgow on the 10th of December 1795, the son of the Rev. John Burns. In partnership with a brother, James, he began as a Glasgow general merchant about 1818, and in 1824 in conjunction with a Liverpool partner, Hugh Matthie, started a line of small sailing ships which ran between Glasgow and Liverpool. As business increased the vessels were also sailed to Belfast, and steamers afterwards replaced the sailing ships. In 1830 a partnership was entered into with the McIvers of Liverpool, in which George Burns devoted himself specially to the management of the ships. In 1838 with Samuel Cunard, Robert Napier and other capitalists, the partners (McIver and Burns) started the "Cunard" Atlantic line of steamships. They secured the British government's contract for the carrying of the mails to North America. The sailings were begun with four steamers of about 1000 tons each, which made the passage in 15 days at some 8½ knots per hour. George Burns retired from the Glasgow management of the line in 1860. He was made a baronet in 1889, but died on the 2nd of June 1890 at Castle Wemyss, where he had spent the latter years of his life.

John Burns (1829-1901), his eldest son, who succeeded him in the baronetcy, and became head of the Cunard Company, was created a peer, under the title of Baron Inverclyde, in 1897; he was the first to suggest to the government the use of merchant vessels for war purposes. George Arbuthnot Burns (1861-1905) succeeded his father in the peerage, as 2nd baron Inverclyde, and became chairman of the Cunard Company in 1902. He conducted the negotiations which resulted in the refusal of the Cunard Company to enter the shipping combination, the International Mercantile Marine Company, formed by Messrs J.P. Morgan & Co., and took a leading part in the application of turbine engines to ocean liners.

BURNS, JOHN (1858-), English politician, was born at Vauxhall, London, in October 1858, the second son of Alexander Burns, an engineer, of Ayrshire extraction. He attended a national school in Battersea until he was ten years old, when he was sent to work in Price's candle factory. He worked for a short time as a page-boy, then in some engine works, and at fourteen was apprenticed for seven years to a Millbank engineer. He continued his education at the night-schools, and read extensively, especially the works of Robert Owen, J.S. Mill, Paine and Cobbett. He ascribed his conversion to the principles of socialism to his sense of the insufficiency of the arguments advanced against it by J.S. Mill, but he had learnt socialistic doctrine from a French fellow-workman, Victor Delahaye, who had witnessed the Commune. After working at his trade in various parts of England, and on board ship, he went for a year to the West African coast at the mouth of the Niger as a foreman engineer. His earnings from this undertaking were expended on a six months' tour in France, Germany and Austria for the study of political and economic conditions. He had early begun the practice of outdoor speaking, and his exceptional physical strength and strong voice were invaluable qualifications for a popular agitator. In 1878 he was arrested and locked up for the night for addressing an open-air demonstration on Clapham Common. Two years later he married Charlotte Gale, the daughter of a Battersea shipwright. He was again arrested in 1886 for his share in the West End riots when the windows of the Carlton and other London clubs were broken, but cleared himself at the Old Bailey of the charge of inciting the mob to violence. In November of the next year, however, he was again arrested for resisting the police in their attempt to break up the meeting in Trafalgar Square, and was condemned to six weeks' imprisonment. A speech delivered by him at the Industrial Remuneration Conference of 1884 had attracted considerable attention, and in that year he became a member of the [v.04 p.0856] Social Democratic Federation, which put him forward unsuccessfully in the next year as parliamentary candidate for West Nottingham. His connexion with the Social Democratic Federation was short-lived; but he was an active member of the executive of the Amalgamated Engineers' trade union, and was connected with the trades union congresses until 1895, when, through his influence, a resolution excluding all except wage labourers was passed. He was still working at his trade in Hoe's printing machine works when he became a Progressive member of the first London County Council, being supported by an allowance of £2 a week subscribed by his constituents, the Battersea working men. He introduced in 1892 a motion that all contracts for the County Council should be paid at trade union rates and carried out under trade union conditions, and devoted his efforts in general to a war against monopolies, except those of the state or the municipality. In the same year (1889) in which he became a member of the County Council, he acted with Mr Ben Tillett as the chief leader and organizer of the London dock strike. He entered the House of Commons as member for Battersea in 1892, and was re-elected in 1895, 1900 and 1906. In parliament he became well known as an independent Radical, and he was included in the Liberal cabinet by Sir Henry Campbell-Bannerman in December 1905 as president of the Local Government Board. During the next two years, though much out of favour with his former socialist allies, he earned golden opinions for his administrative policy, and for his refusal to adopt the visionary proposals put forward by the more extreme members of the Labour party for dealing with the "unemployed" question; and in 1908 he retained his office in Mr Asquith's cabinet.

BURNS, ROBERT (1759-1796), Scottish poet, was born on the 25th of January 1759 in a cottage about 2 m. from Ayr. He was the eldest son of a small farmer, William Burness, of Kincardineshire stock, who wrought hard, practised integrity, wished to bring up his children in the fear of God, but had to fight all his days against the winds and tides of adversity. "The poet," said Thomas Carlyle, "was fortunate in his father —a man of thoughtful intense character, as the best of our peasants are, valuing knowledge, possessing some and open-minded for more, of keen insight and devout heart, friendly and fearless: a fully unfolded man seldom found in any rank in society, and worth descending far in society to seek. ... Had he been ever so little richer, the whole might have issued otherwise. But poverty sunk the whole family even below the reach of our cheap school system, and Burns remained a hard-worked plough-boy."

Through a series of migrations from one unfortunate farm to another; from Alloway (where he was taught to read) to Mt. Oliphant, and then (1777) to Lochlea in Tarbolton (where he learnt the rudiments of geometry), the poet remained in the same condition of straitened circumstances. At the age of thirteen he thrashed the corn with his own hands, at fifteen he was the principal labourer. The family kept no servant,

and for several years butchers' meat was a thing unknown in the house. "This kind of life," he writes, "the cheerless gloom of a hermit and the unceasing toil of a galley-slave, brought me to my sixteenth year." His naturally robust frame was overtasked, and his nervous constitution received a fatal strain. His shoulders were bowed, he became liable to headaches, palpitations and fits of depressing melancholy. From these hard tasks and his fiery temperament, craving in vain for sympathy in a frigid air, grew the strong temptations on which Burns was largely wrecked,—the thirst for stimulants and the revolt against restraint which soon made headway and passed all bars. In the earlier portions of his career a buoyant humour bore him up; and amid thick-coming shapes of ill he bated no jot of heart or hope. He was cheered by vague stirrings of ambition, which he pathetically compares to the "blind groping of Homer's Cyclops round the walls of his cave." Sent to school at Kirkoswald, he became, for his scant leisure, a great reader —eating at meal-times with a spoon in one hand and a book in the other,—and carrying a few small volumes in his pocket to study in spare moments in the fields. "The collection of songs" he tells us, "was my *vade mecum*. I pored over them driving my cart or walking to labour, song by song, verse by verse, carefully noting the true, tender, sublime or fustian." He lingered over the ballads in his cold room by night; by day, whilst whistling at the plough, he invented new forms and was inspired by fresh ideas, "gathering round him the memories and the traditions of his country till they became a mantle and a crown." It was among the furrows of his father's fields that he was inspired with the perpetually quoted wish—

> "That I for poor auld Scotland's sake
> Some useful plan or book could make,
> Or sing a sang at least."

An equally striking illustration of the same feeling is to be found in his summer Sunday's ramble to the Leglen wood,—the fabled haunt of Wallace,—which the poet confesses to have visited "with as much devout enthusiasm as ever pilgrim did the shrine of Loretto." In another reference to the same period he refers to the intense susceptibility to the homeliest aspects of Nature which throughout characterized his genius. "Scarcely any object gave me more—I do not know if I should call it pleasure—but something which exalts and enraptures me—than to walk in the sheltered side of a wood or high plantation in a cloudy winter day and hear the stormy wind howling among the trees and raving over the plain. I listened to the birds, and frequently turned out of my path lest I should disturb their little songs or frighten them to another station." Auroral visions were gilding his horizon as he walked in glory, if not in joy, "behind his plough upon the mountain sides."; but the swarm of his many-coloured fancies was again made grey by the *atra cura* of unsuccessful toils.

Burns had written his first verses of note, "Behind yon hills where Stinchar (afterwards Lugar) flows," when in 1781 he went to Irvine to learn the trade of a flax-dresser. "It was," he says, "an unlucky affair. As we were giving a welcome carousal to the New Year, the shop took fire and burned to ashes; and I was left, like a true poet, without a sixpence." His own heart, too, had unfortunately taken fire. He was poring over mathematics till, in his own phraseology,—still affected in its prose by the classical pedantries caught from Pope by Ramsay,—"the sun entered Virgo, when a charming *fillette*, who lived next door, overset my trigonometry, and set me off at a tangent from the scene of my studies." We need not detail the story, nor the incessant repetitions of it, which marked and sometimes marred his career. The poet was jilted, went through the usual despairs, and resorted to the not unusual sources of consolation. He had found that he was "no enemy to social life," and his mates had discovered that he was the best of boon companions in the lyric feasts, where his eloquence shed a lustre over wild ways of life, and where he was beginning to be distinguished as a champion of the New Lights and a satirist of the Calvinism whose waters he found like those of Marah.

In Robert's 25th year his father died, full of sorrows and apprehensions for the gifted son who wrote for his tomb in Alloway kirkyard, the fine epitaph ending with the characteristic line—

> "For even his failings leaned to virtue's side."

For some time longer the poet, with his brother Gilbert, lingered at Lochlea, reading agricultural books, miscalculating crops, attending markets, and in a mood of reformation resolving, "in spite of the world, the flesh and the devil, to be a wise man." Affairs, however, went no better with the family; and in 1784 they migrated to Mossgiel, where he lived and wrought, during four years, for a return scarce equal to the wage of the commonest labourer in our day. Meanwhile he had become intimate with his future wife, Jean Armour; but the father, a master mason, discountenanced the match, and the girl being disposed to "sigh as a lover," as a daughter to obey, Burns, in 1786, gave up his suit, resolved to seek refuge in exile, and having accepted a situation as book-keeper to a slave estate in Jamaica, had taken his passage in a ship for the West Indies. His old associations seemed to be breaking up, men and fortune scowled, and "hungry ruin had him in the wind," when he wrote the lines ending—

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> "Adieu, my native banks of Ayr,"

and addressed to the most famous of the loves, in which he was as prolific as Catullus or Tibullus, the proposal—

> "Will ye go to the Indies, my Mary."

He was withheld from his project and, happily or unhappily, the current of his life was turned by the success of his first volume, which was published at Kilmarnock in June 1786. It contained some of his most justly celebrated poems, the results of his scanty leisure at Lochlea and Mossgiel; among others "The Twa Dogs,"—a graphic idealization of Aesop,—"The Author's Prayer," the "Address to the Deil," "The Vision" and "The Dream," "Halloween," "The Cottar's Saturday Night," the lines "To a Mouse" and "To a Daisy," "Scotch Drink," "Man was made to Mourn," the "Epistle to Davie," and some of his most popular songs. This epitome of a genius so marvellous and so varied took his audience by storm. "The country murmured of him from sea to sea." "With his poems," says Robert Heron, "old and young, grave and gay, learned and ignorant, were alike transported. I was at that time resident in Galloway, and I can well remember how even plough-boys and maid-servants would have gladly bestowed the wages they earned the most hardly, and which they wanted to purchase necessary clothing, if they might but procure the works of Burns." This first edition only brought the author £20 direct return, but it introduced him to the *literati* of Edinburgh,

whither he was invited, and where he was welcomed, feasted, admired and patronized. He appeared as a portent among the scholars of the northern capital and its university, and manifested, according to Mr Lockhart, "in the whole strain of his bearing, his belief that in the society of the most eminent men of his nation he was where he was entitled to be, hardly deigning to flatter them by exhibiting a symptom of being flattered."

Sir Walter Scott bears a similar testimony to the dignified simplicity and almost exaggerated independence of the poet, during this *annus mirabilis* of his success. "As for Burns, *Virgilium vidi tantum*, I was a lad of fifteen when he came to Edinburgh, but had sense enough to be interested in his poetry, and would have given the world to know him. I saw him one day with several gentlemen of literary reputation, among whom I remember the celebrated Dugald Stewart. Of course we youngsters sat silent, looked, and listened.... I remember ... his shedding tears over a print representing a soldier lying dead in the snow, his dog sitting in misery on one side, on the other his widow with a child in her arms. His person was robust, his manners rustic, not clownish. ... His countenance was more massive than it looks in any of the portraits. There was a strong expression of shrewdness in his lineaments; the eye alone indicated the poetic character and temperament. It was large and of a dark cast, and literally glowed when he spoke with feeling or interest. I never saw such another eye in a human head. His conversation expressed perfect self-confidence, without the least intrusive forwardness. I thought his acquaintance with English poetry was rather limited; and having twenty times the abilities of Allan Ramsay and of Fergusson he talked of them with too much humility as his models. He was much caressed in Edinburgh, but the efforts made for his relief were extremely trifling." *Laudatur et alget.* Burns went from those meetings, where he had been posing professors (no hard task), and turning the heads of duchesses, to share a bed in the garret of a writer's apprentice,—they paid together 3s. a week for the room. It was in the house of Mr Carfrae, Baxter's Close, Lawnmarket, "first scale stair on the left hand in going down, first door in the stair." During Burns's life it was reserved for William Pitt to recognize his place as a great poet; the more cautious critics of the North were satisfied to endorse him as a rustic prodigy, and brought upon themselves a share of his satire. Some of the friendships contracted during this period—as for Lord Glencairn and Mrs Dunlop—are among the most pleasing and permanent in literature; for genuine kindness was never wasted on one who, whatever his faults, has never been accused of ingratitude. But in the bard's city life there was an unnatural element. He stooped to beg for neither smiles nor favour, but the gnarled country oak is cut up into cabinets in artificial prose and verse. In the letters to Mr Graham, the prologue to Mr Wood, and the epistles to Clarinda, he is dancing minuets with hob-nailed shoes. When, in 1787, the second edition of the *Poems* came out, the proceeds of their sale realized for the author £400. On the strength of this sum he gave himself two long rambles, full of poetic material—one through the border towns into England as far as Newcastle, returning by Dumfries to Mauchline, and another a grand tour through the East Highlands, as far as Inverness, returning by Edinburgh, and so home to Ayrshire.

In 1788 Burns took a new farm at Ellisland on the Nith, settled there, married, lost his little money, and wrote, among other pieces, "Auld Lang Syne" and "Tam o' Shanter." In 1789 he obtained, through the good office of Mr Graham of Fintry, an appointment as excise-officer of the district, worth £50 per annum. In 1791 he removed to a similar post at Dumfries worth £70. In the course of the following year he was asked to contribute to George Thomson's *Select Collection of Original Scottish Airs with Symphonies and Accompaniments for the Pianoforte and Violin: the poetry by Robert Burns*. To this work he contributed about one hundred songs, the best of which are now ringing in the ear of every Scotsman from New Zealand to San Francisco. For these, original and adapted, he received a shawl for his wife, a picture by David Allan representing the "Cottar's Saturday Night," and £5! The poet wrote an indignant letter and never afterwards composed for money. Unfortunately the "Rock of Independence" to which he had proudly retired was but a castle of air, over which the meteors of French political enthusiasm cast a lurid gleam. In the last years of his life, exiled from polite society on account of his revolutionary opinions, he became sourer in temper and plunged more deeply into the dissipations of the lower ranks, among whom he found his only companionship and sole, though shallow, sympathy.

Burns began to feel himself prematurely old. Walking with a friend who proposed to him to join a county ball, he shook his head, saying "that's all over now," and adding a verse of Lady Grizel Baillie's ballad—

> "O were we young as we ance hae been,
> We sud hae been galloping down on yon green,
> And linking it ower the lily-white lea,
> But were na my heart light I wad dee."

His hand shook; his pulse and appetite failed; his spirits sunk into a uniform gloom. In April 1796 he wrote —"I fear it will be some time before I tune my lyre again. By Babel's streams I have sat and wept. I have only known existence by the pressure of sickness and counted time by the repercussions of pain. I close my eyes in misery and open them without hope. I look on the vernal day and say with poor Fergusson—

> "Say wherefore has an all-indulgent heaven
> Life to the comfortless and wretched given."

On the 4th of July he was seen to be dying. On the 12th he wrote to his cousin for the loan of £10 to save him from passing his last days in jail. On the 21st he was no more. On the 25th, when his last son came into the world, he was buried with local honours, the volunteers of the company to which he belonged firing three volleys over his grave.

It has been said that "Lowland Scotland as a distinct nationality came in with two warriors and went out with two bards. It came in with William Wallace and Robert Bruce and went out with Robert Burns and Walter Scott. The first two made the history, the last two told the story and sung the song." But what in the minstrel's lay was mainly a requiem was in the people's poet also a prophecy. The position of Burns in the progress of British literature may be shortly defined; he was a link between two eras, like Chaucer, the last of the old and the first of the new—the inheritor of the traditions and the music of the past, in some respects the herald of the future.

The volumes of our lyrist owe part of their popularity to the fact of their being an epitome of melodies, moods and memories that had belonged for centuries to the national life, the best inspirations of which have passed into them. But in gathering from his ancestors Burns has exalted their work by asserting a

new dignity for their simplest themes. He is the heir of Barbour, distilling the spirit of the old poet's epic into a battle chant, and of Dunbar, reproducing the various humours of a half-sceptical, half-religious philosophy of life. He is the pupil of Ramsay, but he leaves his master, to make a social protest and to lead a literary revolt. *The Gentle Shepherd*, still largely a court pastoral, in which "a man's a man" if born a gentleman, may be contrasted with "The Jolly Beggars"—the one is like a minuet of the ladies of Versailles on the sward of the Swiss village near the Trianon, the other like the march of the maenads with Theroigne de Mericourt. Ramsay adds to the rough tunes and words of the ballads the refinement of the wits who in the "Easy" and "Johnstone" clubs talked over their cups of Prior and Pope, Addison and Gay. Burns inspires them with a fervour that thrills the most wooden of his race. We may clench the contrast by a representative example. This is from Ramsay's version of perhaps the best-known of Scottish songs,—

"Methinks around us on each bough
A thousand Cupids play;
Whilst through the groves I walk with you,
Each object makes me gay.
Since your return—the sun and moon
With brighter beams do shine,
Streams murmur soft notes while they run
As they did lang syne."

Compare the verses in Burns—

"We twa hae run about the braes
And pu'd the gowans fine;
But we've wandered mony a weary foot
Sin auld lang syne.
We twa hae paidl'd in the burn,
Frae morning sun till dine:
But seas between us braid hae roar'd
Sin auld lang syne."

Burns as a poet of the inanimate world doubtless derived hints from Thomson of *The Seasons*, but in his power of tuning its manifestation to the moods of the mind he is more properly ranked as a forerunner of Wordsworth. He never follows the fashions of his century, except in his failures—in his efforts at set panegyric or fine letter-writing. His highest work knows nothing of "Damon" or "Musidora." He leaves the atmosphere of drawing-rooms for the ingle or the ale-house or the mountain breeze.

The affectations of his style are insignificant and rare. His prevailing characteristic is an absolute sincerity. A love for the lower forms of social life was his besetting sin; Nature was his healing power. Burns compares himself to an Aeolian harp, strung to every wind of heaven. His genius flows over all living and lifeless things with a sympathy that finds nothing mean or insignificant. An uprooted daisy becomes in his pages an enduring emblem of the fate of artless maid and simple bard. He disturbs a mouse's nest and finds in the "tim'rous beastie" a fellow-mortal doomed like himself to "thole the winter's sleety dribble," and draws his oft-repeated moral. He walks abroad and, in a verse that glints with the light of its own rising sun before the fierce sarcasm of "The Holy Fair," describes the melodies of a "simmer Sunday morn." He loiters by Afton Water and "murmurs by the running brook a music sweeter than its own." He stands by a roofless tower, where "the howlet mourns in her dewy bower," and "sets the wild echoes flying," and adds to a perfect picture of the scene his famous vision of "Libertie." In a single stanza he concentrates the sentiment of many Night Thoughts—

"The pale moon is setting beyond the white wave,
And Time is setting wi' me, O."

For other examples of the same graphic power we may refer to the course of his stream—

"Whiles ow'r a linn the burnie plays
As through the glen it wimpled," &c.,

or to "The Birks of Aberfeldy" or the "spate" in the dialogue of "The Brigs of Ayr." The poet is as much at home in the presence of this flood as by his "trottin' burn's meander." Familiar with all the seasons he represents the phases of a northern winter with a frequency characteristic of his clime and of his fortunes; her tempests became anthems in his verse, and the sounding woods "raise his thoughts to Him that walketh on the wings of the wind"; full of pity for the shelterless poor, the "ourie cattle," the "silly sheep," and the "helpless birds," he yet reflects that the bitter blast is not "so unkind as man's ingratitude." This constant tendency to ascend above the fair or wild features of outward things, or to penetrate beneath them, to make them symbols, to endow them with a voice to speak for humanity, distinguishes Burns as a descriptive poet from the rest of his countrymen. As a painter he is rivalled by Dunbar and James I., more rarely by Thomson and Ramsay. The "lilt" of Tannahill's finest verse is even more charming. But these writers rest in their art; their main care is for their own genius. The same is true in a minor degree of some of his great English successors. Keats has a palette of richer colours, but he seldom condescends to "human nature's daily food." Shelley floats in a thin air to stars and mountain tops, and vanishes from our gaze like his skylark. Byron, in the midst of his revolutionary fervour, never forgets that he himself belongs to the "caste of Vere de Vere." Wordsworth's placid affection and magnanimity stretch beyond mankind, and, as in "Hart-leap-well" and the "Cuckoo," extend to bird and beast; he moralizes grandly on the vicissitudes of common life, but he does not enter into, because by right of superior virtue he places himself above them. "From the Lyrical Ballads," it has been said, "it does not appear that men eat or drink, marry or are given in marriage." We revere the monitor who, consciously good and great, gives us the dry light of truth, but we love the bard, *nostrae deliciae*, who is all fire—fire from heaven and Ayrshire earth mingling in the outburst of passion and of power, which is his poetry and the inheritance of his race. He had certainly neither culture nor philosophy enough to have written the "Ode on the Recollections of Childhood," but to appreciate that ode requires an education. The sympathies of Burns, as broad as Wordsworth's, are more intense; in turning his pages we feel ourselves more decidedly in the presence of one who joys with those who rejoice and mourns with those who mourn. He is never shallow, ever plain,

and the expression of his feeling is so terse that it is always memorable. Of the people he speaks more directly for the people than any of our more considerable poets. Chaucer has a perfect hold of the homeliest phases of life, but he wants the lyric element, and the charm of his language has largely faded from untutored ears. Shakespeare, indeed, has at once a loftier vision and a wider grasp; for he sings of "Thebes and Pelops line," of Agincourt and Philippi, as of Falstaff, and Snug the joiner, and the "meanest flower that blows." But not even Shakespeare has put more thought into poetry which the most prosaic must appreciate than Burns has done. The latter moves in a narrower sphere and wants the strictly dramatic faculty, but its place is partly supplied by the vividness of his narrative. His realization of incident and character is manifested in the sketches in which the manners and prevailing fancies of his countrymen are immortalized in connexion with local scenery. Among those almost every variety of disposition finds its favourite. The quiet households of the kingdom have received a sort of apotheosis in the "Cottar's Saturday Night." It has been objected that the subject does not afford scope for the more daring forms of the author's genius; but had he written no other poem, this heartful rendering of a good week's close in a God-fearing home, sincerely devout, and yet relieved from all suspicion of sermonizing by its humorous touches, would have secured a permanent place in literature. It transcends Thomson and Beattie at their best, and will smell sweet like the actions of the just for generations to come.

Lovers of rustic festivity may hold that the poet's greatest performance is his narrative of "Halloween," which for easy vigour, fulness of rollicking life, blended truth and fancy, is unsurpassed in its kind. [v.04 p.0859] Campbell, Wilson, Hazlitt, Montgomery, Burns himself, and the majority of his critics, have recorded their preference for "Tam o' Shanter," where the weird superstitious element that has played so great a part in the imaginative work of this part of our island is brought more prominently forward. Few passages of description are finer than that of the roaring Doon and Alloway Kirk glimmering through the groaning trees; but the unique excellence of the piece consists in its variety, and a perfectly original combination of the terrible and the ludicrous. Like Goethe's *Walpurgis Nacht*, brought into closer contact with real life, it stretches from the drunken humours of Christopher Sly to a world of fantasies almost as brilliant as those of the *Midsummer Night's Dream*, half solemnized by the severer atmosphere of a sterner clime. The contrast between the lines "Kings may be blest," &c., and those which follow, beginning "But pleasures are like poppies spread," is typical of the perpetual antithesis of the author's thought and life, in which, at the back of every revelry, he sees the shadow of a warning hand, and reads on the wall the writing, *Omnia mutantur*. With equal or greater confidence other judges have pronounced Burns's masterpiece to be "The Jolly Beggars." Certainly no other single production so illustrates his power of exalting what is insignificant, glorifying what is mean, and elevating the lowest details by the force of his genius. "The form of the piece," says Carlyle, "is a mere cantata, the theme the half-drunken snatches of a joyous band of vagabonds, while the grey leaves are floating on the gusts of the wind in the autumn of the year. But the whole is compacted, refined and poured forth in one flood of liquid harmony. It is light, airy and soft of movement, yet sharp and precise in its details; every face is a portrait, and the whole a group in clear photography. The blanket of the night is drawn aside; in full ruddy gleaming light these rough tatterdemalions are seen at their boisterous revel wringing from Fate another hour of wassail and good cheer." Over the whole is flung a half-humorous, half-savage satire—aimed, like a two-edged sword, at the laws and the law-breakers, in the acme of which the graceless crew are raised above the level of ordinary gipsies, footpads and rogues, and are made to sit "on the hills like gods together, careless of mankind," and to launch their Titan thunders of rebellion against the world.

> "A fig for those by law protected;
> Liberty's a glorious feast;
> Courts for cowards were erected,
> Churches built to please the priest."

A similar mixture of drollery and defiance appears in the justly celebrated "Address to the Deil," which, mainly whimsical, is relieved by touches oan in the conception of such a being straying in lonely places and loitering among trees, or in the familiarity with which the poet lectures so awful a personage,"—we may add, than in the inimitable outbreak at the close—

> "O would you tak a thought an' men'."

Carlyle, in reference to this passage, cannot resist the suggestion of a parallel from Sterne. "He is the father of curses and lies, said Dr Slop, and is cursed and damned already. I am sorry for it, quoth my Uncle Toby."

Burns fared ill at the hands of those who were not sorry for it, and who repeated with glib complacency every terrible belief of the system in which they had been trained. The most scathing of his *Satires*, under which head fall many of his minor and frequent passages in his major pieces, are directed against the false pride of birth, and what he conceived to be the false pretences of religion. The apologue of "Death and Dr Hornbook," "The Ordination," the song "No churchman am I for to rail and to write," the "Address to the Unco Guid," "Holy Willie," and above all "The Holy Fair," with its savage caricature of an ignorant ranter of the time called Moodie, and others of like stamp, not unnaturally provoked offence. As regards the poet's attitude towards some phases of Calvinism prevalent during his life, it has to be remarked that from the days of Dunbar there has been a degree of antagonism between Scottish verse and the more rigid forms of Scottish theology.

It must be admitted that in protesting against hypocrisy he has occasionally been led beyond the limits prescribed by good taste. He is at times abusive of those who differ from him. This, with other offences against decorum, which here and there disfigure his pages, can only be condoned by an appeal to the general tone of his writing, which is reverential. Burns had a firm faith in a Supreme Being, not as a vague mysterious Power; but as the Arbiter of human life. Amid the vicissitudes of his career he responds to the cottar's summons, "Let us worship God."

> "An atheist's laugh's a poor exchange
> For Deity offended"

is the moral of all his verse, which treats seriously of religious matters. His prayers in rhyme give him a high place among secular Psalmists.

Like Chaucer, Burns was a great moralist, though a rough one. In the moments of his most intense revolt against conventional prejudice and sanctimonious affectation, he is faithful to the great laws which underlie change, loyal in his veneration for the cardinal virtues—Truth, Justice and Charity,—and consistent in the warnings, to which his experience gives an unhappy force, against transgressions of Temperance. In the "Epistle to a Young Friend," the shrewdest advice is blended with exhortations appealing to the highest motive, that which transcends the calculation of consequences, and bids us walk in the straight path from the feeling of personal honour, and "for the glorious privilege of being independent." Burns, like Dante, "loved well because he hated, hated wickedness that hinders loving," and this feeling, as in the lines—"Dweller in yon dungeon dark," sometimes breaks bounds; but his calmer moods are better represented by the well-known passages in the "Epistle to Davie," in which he preaches acquiescence in our lot, and a cheerful acceptance of our duties in the sphere where we are placed. This *philosophie douce*, never better sung by Horace, is the prevailing refrain of our author's *Songs*. On these there are few words to add to the acclaim of a century. They have passed into the air we breathe; they are so real that they seem things rather than words, or, nearer still, living beings. They have taken all hearts, because they are the breath of his own; not polished cadences, but utterances as direct as laughter or tears. Since Sappho loved and sang, there has been no such national lyrist as Burns. Fine ballads, mostly anonymous, existed in Scotland previous to his time; and shortly before a few authors had produced a few songs equal to some of his best. Such are Alexander Ross's "Wooed and Married," Lowe's "Mary's Dream," "Auld Robin Gray," "The Land o' the Leal" and the two versions of "The Flowers o' the Forest." From these and many of the older pieces in Ramsay's collection, Burns admits to have derived copious suggestions and impulses. He fed on the past literature of his country as Chaucer on the old fields of English thought, and —

> "Still the elements o' sang,
> In formless jumble, right and wrang,
> Went floating in his brain."

But he gave more than he received; he brought forth an hundredfold; he summed up the stray material of the past, and added so much of his own that one of the most conspicuous features of his lyrical genius is its variety in new paths. Between the first of war songs, composed in a storm on a moor, and the pathos of "Mary in Heaven," he has made every chord in our northern life to vibrate. The distance from "Duncan Gray" to "Auld Lang Syne" is nearly as great as that from Falstaff to Ariel. There is the vehemence of battle, the wail of woe, the march of veterans "red-wat-shod," the smiles of meeting, the tears of parting friends, the gurgle of brown burns, the roar of the wind through pines, the rustle of barley rigs, the thunder on the hill—all Scotland is in his verse. Let who will make her laws, Burns has made the songs, which her emigrants recall "by the long wash of Australasian seas," in which maidens are wooed, by which mothers lull their infants, which return "through open casements unto dying ears"—they are the links, the watchwords, the masonic symbols of the Scots race.

[v.04 p.0860] (J. N.)

The greater part of Burns's verse was posthumously published, and, as he himself took no care to collect the scattered pieces of occasional verse, different editors have from time to time printed, as his, verses that must be regarded as spurious. *Poems chiefly in the Scottish Dialect*, by Robert Burns (Kilmarnock, 1786), was followed by an enlarged edition printed in Edinburgh in the next year. Other editions of this book were printed—in London (1787), an enlarged edition at Edinburgh (2 vols., 1793) and a reprint of this in 1794. Of a 1790 edition mentioned by Robert Chambers no traces can be found. Poems by Burns appeared originally in *The Caledonian Mercury, The Edinburgh Evening Courant, The Edinburgh Herald, The Edinburgh Advertiser*; the London papers, *Stuart's Star and Evening Advertiser* (subsequently known as *The Morning Star*), *The Morning Chronicle*; and in the *Edinburgh Magazine* and *The Scots Magazine*. Many poems, most of which had first appeared elsewhere, were printed in a series of penny chap-books, *Poetry Original and Select* (Brash and Reid, Glasgow), and some appeared separately as broadsides. A series of tracts issued by Stewart and Meikle (Glasgow, 1796-1799) includes some Burns's numbers, *The Jolly Beggars, Holy Willie's Prayer* and other poems making their first appearance in this way. The seven numbers of this publication were reissued in January 1800 as *The Poetical Miscellany*. This was followed by Thomas Stewart's *Poems ascribed to Robert Burns* (Glasgow, 1801). Burns's songs appeared chiefly in James Johnson's *Scots Musical Museum* (6 vols., 1787-1803), which he appears after the first volume to have virtually edited, though the two last volumes were published only after his death; and in George Thomson's *Select Collection of Original Scottish Airs* (6 vols., 1793-1841). Only five of the songs done for Thomson appeared during the poet's lifetime, and Thomson's text cannot be regarded with confidence. The Hastie MSS. in the British Museum (Addit. MS. 22,307) include 162 songs, many of them in Burns's handwriting; and the Dalhousie MS., at Brechin Castle, contains Burns's correspondence with Thomson. For a full account of the songs see James C. Dick, *The Songs of Robert Burns now first printed with the Melodies for which they were written* (2 vols., 1903).

The items in Mr W. Craibe Angus's *Printed Works of Robert Burns* (1899) number nine hundred and thirty. Only the more important collected editions can be here noticed. Dr Currie was the anonymous editor of the *Works of Robert Burns; with an Account of his Life, and a Criticism on his Writings ...* (Liverpool, 1800). This was undertaken for the benefit of Burns's family at the desire of his friends, Alexander Cunningham and John Syme. A second and amended edition appeared in 1801, and was followed by others, but Currie's text is neither accurate nor complete. Additional matter appeared in *Reliques of Robert Burns* ... by R.H. Cromek (London, 1808). In *The Works of Robert Burns, With his Life by Allan Cunningham* (8 vols., London, 1834) there are many additions and much biographical material. *The Works of Robert Burns*, edited by James Hogg and William Motherwell (5 vols., 1834-1836, Glasgow and Edinburgh), contains a life of the poet by Hogg, and some useful notes by Motherwell attempting to trace the sources of Burns's songs. *The Correspondence between Burns and Clarinda* was edited by W.C. M^{c}Lehose (Edinburgh, 1843). An improved text of the poems was provided in the second "Aldine Edition" of the *Poetical Works* (3 vols., 1839), for which Sir H. Nicolas, the editor, made use of many original MSS. In the *Life and Works of Robert Burns*, edited by Robert Chambers (Edinburgh, 4 vols., 1851-1852; library edition, 1856-1857; new edition, revised by William Wallace, 1896), the poet's works are given in chronological order, interwoven with letters and biography. The text was bowdlerized by Chambers, but the book contained much new and valuable information. Other well-known editions are those of George Gilfillan (2 vols., 1864); of Alexander Smith (Golden Treasury Series, London, 2 vols., 1865); of P. Hately Waddell (Glasgow, 1867); one

published by Messrs Blackie & Son, with Dr Currie's memoir and an essay by Prof. Wilson (1843-1844); of W. Scott Douglas (the Kilmarnock edition, 1876, and the "library" edition, 1877-1879), and of Andrew Lang, assisted by W.A. Craigie (London, 1896). The complete correspondence between Burns and Mrs Dunlop was printed in 1898.

A critical edition of the *Poetry of Robert Burns*, which may be regarded as definitive, and is provided with full notes and variant readings, was prepared by W.E. Henley and T.F. Henderson (4 vols., Edinburgh, 1896-1897; reprinted, 1901), and is generally known as the "Centenary Burns." In vol. iii. the extent of Burns's indebtedness to Scottish folk-song and his methods of adaptation are minutely discussed; vol. iv. contains an essay on "Robert Burns. Life, Genius, Achievement," by W.E. Henley.

The chief original authority for Burns's life is his own letters. The principal "lives" are to be found in the editions just mentioned. His biography has also been written by J. Gibson Lockhart (*Life of Burns*, Edinburgh, 1828); for the "English Men of Letters" series in 1879 by Prof. J. Campbell Shairp; and by Sir Leslie Stephen in the *Dictionary of National Biography* (vol. viii., 1886). Among the more important essays on Burns are those by Thomas Carlyle (*Edinburgh Review*, December 1828); by John Nichol, the writer of the above article (W. Scott Douglas's edition of Burns); by R.L. Stevenson (*Familiar Studies of Men and Books*); by Auguste Angellier (*Robert Burns. La vie et les œuvres*, 2 vols., Paris, 1893); by Lord Rosebery (*Robert Burns: Two Addresses in Edinburgh*, 1896); by J. Logie Robertson (in *In Scottish Fields*, Edin., 1890, and *Furth in Field*, Edin., 1894); and T.F. Henderson (*Robert Burns*, 1904). There is a selected bibliography in chronological order in W.A. Craigie's *Primer of Burns* (1896).

BURNS AND SCALDS. A burn is the effect of dry heat applied to some part of the human body, a scald being the result of moist heat. Clinically there is no distinction between the two, and their classification and treatment are identical. In Dupuytren's classification, now most generally accepted, burns are divided into six classes according to the severest part of the lesion. Burns of the first degree are characterized by severe pain, redness of the skin, a certain amount of swelling that soon passes, and later exfoliation of the skin. Burns of the second degree show vesicles (small blisters) scattered over the inflamed area, and containing a clear, yellowish fluid. Beneath the vesicle the highly sensitive papillae of the skin are exposed. Burns of this degree leave no scar, but often produce a permanent discoloration. In burns of the third degree, there is a partial destruction of the true skin, leaving sloughs of a yellowish or black colour. The pain is at first intense, but passes off on about the second day to return again at the end of a week, when the sloughs separate, exposing the sensitive nerve filaments of the underlying skin. This results in a slightly depressed cicatrix, which happily, however, shows but slight tendency to contraction. Burns of the fourth degree, which follow the prolonged application of any form of intense heat, involve the total destruction of the true skin. The pain is much less severe than in the preceding class, since the nerve endings have been totally destroyed. The results, however, are far more serious, and the healing process takes place only very slowly on account of the destruction of the skin glands. As a result, deep puckered scars are formed, which show great tendency to contract, and where these are situated on face, neck or joints the resulting deformity and loss of function may be extremely serious. In burns of the fifth degree the underlying muscles are more or less destroyed, and in those of the sixth the bones are also charred. Examples of the last two classes are mainly provided by epileptics who fall into a fire during a fit.

The clinical history of a severe burn can be divided into three periods. The first period lasts from 36 to 48 hours, during which time the patient lies in a condition of profound shock, and consequently feels little or no pain. If death results from shock, coma first supervenes, which deepens steadily until the end comes. The second period begins when the effects of shock pass, and continues until the slough separates, this usually taking from seven to fourteen days. Considerable fever is present, and the tendency to every kind of complication is very great. Bronchitis, pneumonia, pleurisy, meningitis, intestinal catarrh, and even ulceration of the duodenum, have all been recorded. Hence both nursing and medical attendance must be very close during this time. It is probable that these complications are all the result of septic infection and absorption, and since the modern antiseptic treatment of burns they have become much less common. The third period is prolonged until recovery takes place. Death may result from septic absorption, or from the wound becoming infected with some organism, as tetanus, erysipelas, &c. The prognosis depends chiefly on the extent of skin involved, death almost invariably resulting when one-third of the total area of the body is affected, however superficially. Of secondary but still grave importance is the position of the burn, that over a serous cavity making the future more doubtful than one on a limb. Also it must be remembered that children very easily succumb to shock.

In treating a patient the condition of shock must be attended to first, since from it arises the primary danger. The sufferer must be wrapped immediately in hot blankets, and brandy given by the mouth or in an enema, while ether can be injected hypodermically. If the pulse is very bad a saline infusion must be administered. The clothes can then be removed and the burnt surfaces thoroughly cleansed with a very mild antiseptic, a weak solution of lysol acting very well. If there are blisters these must be opened and the contained effusion allowed to escape. Some surgeons leave them at this stage, but others prefer to remove the raised epithelium. When thoroughly cleansed, the wound is irrigated with sterilized saline solution and a dressing subsequently applied. For the more superficial lesions by far the best results are obtained from the application of gauze soaked in picric acid solution and lightly wrung out, being covered with a large antiseptic wool pad and kept in position by a bandage. Picric acid 1½ drams, absolute alcohol 3 oz., and distilled water 40 oz., make a good lotion. All being well, this need only be changed about twice a week. The various kinds of oil once so greatly advocated in treating burns are now largely abandoned since they have no antiseptic properties. The deeper burns can only be attended to by a surgeon, whose aim will be first to bring septic absorption to a minimum, and later to hasten the healing process. Skin grafting has great value after extensive burns, not because it hastens healing, which it probably does not do, but because it has a marked influence in lessening cicatricial contraction. When a limb is hopelessly charred, amputation is the only course.

[v.04 p.0861]

BURNSIDE, AMBROSE EVERETT (1824-1881), American soldier, was born at Liberty, Indiana, on the 23rd of May 1824, of Scottish pedigree, his American ancestors settling first in South Carolina, and next in the north-west wilderness, where his parents lived in a rude log cabin. He was appointed to the United States military academy through casual favour, and graduated in 1847, when war with Mexico was nearly over. In 1853 he resigned his commission, and from 1853 to 1858 was engaged in the manufacture of firearms at Bristol, R.I. In 1856 he invented a breech-loading rifle. He was employed by the Illinois Central railroad until the Civil War broke out. Then he took command of a Rhode Island regiment of three months

militia, on the summons of Governor Sprague, took part in the relief of the national capital, and commanded a brigade in the first battle of Bull Run. On the 6th of August 1861 he was commissioned brigadier-general of volunteers, and placed in charge of the expeditionary force which sailed in January 1862 under sealed orders for the North Carolina coast. The victories of Roanoke Island, Newbern and Fort Macon (February—April) were the chief incidents of a campaign which was favourably contrasted by the people with the work of the main army on the Atlantic coast. He was promoted major-general U.S.V. soon afterwards, and early in July, with his North Carolina troops (IX. army corps), he was transferred to the Virginian theatre of war. Part of his forces fought in the last battles of Pope's campaign in Virginia, and Burnside himself was engaged in the battles of South Mountain and Antietam. At the latter he was in command of McClellan's left wing, but the want of vigour in his attack was unfavourably criticized. His patriotic spirit, modesty and amiable manners, made him highly popular, and upon McClellan's final removal (Nov. 7) from the Army of the Potomac, President Lincoln chose him as successor. The choice was unfortunate. Much as he was liked, no one had ever looked upon him as the equal of McClellan, and it was only with the greatest reluctance that he himself accepted the responsibility, which he had on two previous occasions declined. He sustained a crushing defeat at the battle of Fredericksburg (13 Dec. 1862), and (Jan. 27) gave way to Gen. Hooker, after a tenure of less than three months. Transferred to Cincinnati in March 1863, he caused the arrest and court-martial of Clement L. Vallandigham, lately an opposition member of Congress, for an alleged disloyal speech, and later in the year his measures for the suppression of press criticism aroused much opposition; he helped to crush Morgan's Ohio raid in July; then, moving to relieve the loyalists in East Tennessee, in September entered Knoxville, to which the Confederate general James Longstreet unsuccessfully laid siege. In 1864 Burnside led his old IX. corps under Grant in the Wilderness and Petersburg campaigns. After bearing his part well in the many bloody battles of that time, he was overtaken once more by disaster. The failure of the "Burnside mine" at Petersburg brought about his resignation. A year later he left the service, and in 1866 he became governor of Rhode Island, serving for three terms (1866-1869). From 1875 till his death he was a Republican member of the United States Congress. He was present with the German headquarters at the siege of Paris in 1870-71. He died at Bristol, Rhode Island, on the 13th of September 1881.

See B.P. Poore, *Life and Public Services of Ambrose E. Burnside* (Providence, 1882); A. Woodbury, *Major-General Burnside and the Ninth Army Corps* (Providence, 1867).

BURNTISLAND, a royal, municipal and police burgh of Fife, Scotland, on the shore of the Firth of Forth, 5¾ m. S.W. of Kirkcaldy by the North British railway. Pop. (1891) 4993; (1901) 4846. It is protected from the north wind by the Binn (632 ft.), and in consequence of its excellent situation, its links and sandy beach, it enjoys considerable repute as a summer resort. The chief industries are distilling, fisheries, shipbuilding and shipping, especially the export of coal and iron. Until the opening of the Forth bridge, its commodious harbour was the northern station of the ferry across the firth from Granton, 5 m. south. The parish church, dating from 1594, is a plain structure, with a squat tower rising in two tiers from the centre of the roof. The public buildings include two hospitals, a town-hall, music hall, library and reading room and science institute. On the rocks forming the western end of the harbour stands Rossend Castle, where the amorous French poet Chastelard repeated the insult to Queen Mary which led to his execution. In 1667 it was ineffectually bombarded by the Dutch. The burgh was originally called Parva Kinghorn and later Wester Kinghorn. The origin and meaning of the present name of the town have always been a matter of conjecture. There seems reason to believe that it refers to the time when the site, or a portion of it, formed an island, as sea-sand is the subsoil even of the oldest quarters. Another derivation is from Gaelic words meaning "the island beyond the bend." With Dysart, Kinghorn and Kirkcaldy, it unites in returning one member to parliament.

BURR, AARON (1756-1836), American political leader, was born at Newark, New Jersey, on the 6th of February 1756. His father, the Rev. Aaron Burr (1715-1757), was the second president (1748-1757) of the College of New Jersey, now Princeton University; his mother was the daughter of Jonathan Edwards, the well-known Calvinist theologian. The son graduated from the College of New Jersey in 1772, and two years later began the study of law in the celebrated law school conducted by his brother-in-law, Tappan Reeve, at Litchfield, Connecticut. Soon after the outbreak of the War of Independence, in 1775, he joined Washington's army in Cambridge, Mass. He accompanied Arnold's expedition into Canada in 1775, and on arriving before Quebec he disguised himself as a Catholic priest and made a dangerous journey of 120 m. through the British lines to notify Montgomery, at Montreal, of Arnold's arrival. He served for a time on the staffs of Washington and Putnam in 1776-77, and by his vigilance in the retreat from Long Island he saved an entire brigade from capture. On becoming lieutenant-colonel in July 1777, he assumed the command of a regiment, and during the winter at Valley Forge guarded the "Gulf," a pass commanding the approach to the camp, and necessarily the first point that would be attacked. In the engagement at Monmouth, on the 28th of June 1778, he commanded one of the brigades in Lord Stirling's division. In January 1779 Burr was assigned to the command of the "lines" of Westchester county, a region between the British post at Kingsbridge and that of the Americans about 15 m. to the north. In this district there was much turbulence and plundering by the lawless elements of both Whigs and Tories and by bands of ill-disciplined soldiers from both armies. Burr established a thorough patrol system, rigorously enforced martial law, and quickly restored order.

He resigned from the army in March 1779, on account of ill-health, renewed the study of law, was admitted to the bar at Albany in 1782, and began to practise in New York city after its evacuation by the British in the following year. In 1782 he married Theodosia Prevost (d. 1794), the widow of a British army officer who had died in the West Indies during the War of Independence. They had one child, a daughter, Theodosia, born in 1783, who became widely known for her beauty and accomplishments, married Joseph Alston of South Carolina in 1801, and was lost at sea in 1813. Burr was a member of the state assembly (1784-1785), attorney-general of the state (1789-1791), United States senator (1791-1797), and again a member of the assembly (1798-1799 and 1800-1801). As national parties became clearly defined, he associated himself with the Democratic-Republicans. Although he was not the founder of Tammany Hall, he began the construction of the political machine upon which the power of that organization is based. In the election of 1800 he was placed on the Democratic-Republican presidential ticket with Thomas Jefferson, and each received the same number of electoral votes. It was well understood that the party intended that Jefferson should be president and Burr vice-president, but owing to a defect (later remedied) in the Constitution the responsibility for the final choice was thrown upon the House of Representatives. The attempts of a powerful faction among the Federalists to secure the election of Burr failed, partly

because of the opposition of Alexander Hamilton and partly, it would seem, because Burr himself would make no efforts to obtain votes in his own favour. On Jefferson's election, Burr of course became vice-president. His fair and judicial manner as president of the Senate, recognized even by his bitterest enemies, helped to foster traditions in regard to that position quite different from those which have become associated with the speakership of the House of Representatives.

Hamilton had opposed Burr's aspirations for the vice-presidency in 1792, and had exerted influence through Washington to prevent his appointment as brigadier-general in 1798, at the time of the threatened war between the United States and France. It was also in a measure his efforts which led to Burr's lack of success in the New York gubernatorial campaign of 1804; moreover the two had long been rivals at the bar. Smarting under defeat and angered by Hamilton's criticisms, Burr sent the challenge which resulted in the famous duel at Weehawken, N.J., on the 11th of July 1804, and the death of Hamilton (*q.v.*) on the following day. After the expiration of his term as vice-president (March 4, 1805), broken in fortune and virtually an exile from New York, where, as in New Jersey, he had been indicted for murder after the duel with Hamilton, Burr visited the South-west and became involved in the so-called conspiracy which has so puzzled the students of that period. The traditional view that he planned a separation of the West from the Union is now discredited. Apart from the question of political morality he could not, as a shrewd politician, have failed to see that the people of that section were too loyal to sanction such a scheme. The objects of his treasonable correspondence with Merry and Yrujo, the British and Spanish ministers at Washington, were, it would seem, to secure money and to conceal his real designs, which were probably to overthrow Spanish power in the Southwest, and perhaps to found an imperial dynasty in Mexico. He was arrested in 1807 on the charge of treason, was brought to trial before the United States circuit court at Richmond, Virginia, Chief-Justice Marshall presiding, and he was acquitted, in spite of the fact that the political influence of the national administration was thrown against him. Immediately afterward he was tried on a charge of misdemeanour, and on a technicality was again acquitted. He lived abroad from 1808 to 1812, passing most of his time in England, Scotland, Denmark, Sweden and France; trying to secure aid in the prosecution of his filibustering schemes but meeting with numerous rebuffs, being ordered out of England and Napoleon refusing to receive him. In 1812 he returned to New York and spent the remainder of his life in the practice of law. Burr was unscrupulous, insincere and notoriously immoral, but he was pleasing in his manners, generous to a fault, and was intensely devoted to his wife and daughter. In 1833 he married Eliza B. Jumel (1769-1865), a rich New York widow; the two soon separated, however, owing to Burr's having lost much of her fortune in speculation. He died at Port Richmond, Staten Island, New York, on the 14th of September 1836.

The standard biography is James Parton's *The Life and Times of Aaron Burr* (first edition, 1857; enlarged edition, 2 vols., Boston and New York, 1898). W.F. McCaleb's *The Aaron Burr Conspiracy* (New York, 1903) is a scholarly defence of the West and incidentally of Burr against the charge of treason, and is the best account of the subject; see also I. Jenkinson, *Aaron Burr* (Richmond, Ind., 1902). For the traditional view of Burr's conspiracy, see Henry Adams's *History of the United States*, vol. iii. (New York, 1890).

BURRIANA, a seaport of eastern Spain, in the province of Castellón de la Plana; on the estuary of the river Séco, which flows into the Mediterranean Sea. Pop. (1900) 12,962. The harbour of Burriana on the open sea is annually visited by about three hundred small coasting-vessels. Its exports consist chiefly of oranges grown in the surrounding fertile plain, which is irrigated with water from the river Mijares, on the north, and also produces large quantities of grain, oil, wine and melons. Burriana is connected by a light railway with the neighbouring towns of Onda (6595), Almazóra (7070), Villarreal (16,068) and Castellón de la Plana (29,904). Its nearest station on the Barcelona-Valencia coast railway is Villarreal.

BURRITT, ELIHU (1810-1879), American philanthropist, known as "the learned blacksmith," was born in New Britain, Conn., on the 8th of December 1810. His father (a farmer and shoemaker), and his grandfather, both of the same name, had served in the Revolutionary army. An elder brother, Elijah, who afterwards published *The Geography of the Heavens* and other text-books, went out into the world while Elihu was still a boy, and after editing a paper in Georgia came back to New Britain and started a school. Elihu, however, had to pick up what knowledge he could get from books at home, where his father's long illness, ending in death, made his services necessary. At sixteen he was apprenticed to a blacksmith, and he made this his trade both there and at Worcester, Mass., where he removed in 1837. He had a passion for reading; from the village library he borrowed book after book, which he studied at his forge or in his spare hours; and he managed to find time for attending his brother's school for a while, and even for pursuing his search for culture among the advantages to be found at New Haven. He mastered Latin, Greek, French, Spanish, Italian and German, and by the age of thirty could read nearly fifty languages. His extraordinary aptitude gradually made him famous. He took to lecturing, and then to an ardent crusade on behalf of universal peace and human brotherhood, which made him travel persistently to various parts of the United States and Europe. In 1848 he organized the Brussels congress of Friends of Peace, which was followed by annual congresses in Paris, Frankfort, London, Manchester and Edinburgh. He wrote and published voluminously, leaflets, pamphlets and volumes, and started the *Christian Citizen* at Worcester to advocate his humanitarian views. Cheap trans-oceanic postage was an ideal for which he agitated wherever he went. His vigorous philanthropy keeps the name of Elihu Burritt green in the history of the peace movement, apart from the fame of his learning. His countrymen, at universities such as Yale and elsewhere, delighted to do him honour; and he was U.S. consul at Birmingham from 1865 to 1870. He returned to America and died at New Britain on the 9th of March 1879.

See *Life*, by Charles Northend, in the memorial volume (1879); and an article by Ellen Strong Bartlett in the *New England Magazine* (June, 1897).

BURROUGHS, GEORGE (c. 1650-1692), American congregational pastor, graduated at Harvard in 1670, and became the minister of Salem Village (now Danvers) in 1680, a charge which he held till 1683. He lived at Falmouth (now Portland, Maine) until the Indians destroyed it in 1690, when he removed to Wells. In May 1692 during the witchcraft delusion, on the accusation of some personal enemies in his former congregation who had sued him for debt, Burroughs was arrested and charged, among other offences, with "extraordinary Lifting and such feats of strength as could not be done without Diabolicall Assistance." Though the jury found no witch-marks on his body he was convicted and executed on Gallows Hill, Salem, on the 19th of August, the only minister who suffered this extreme fate.

[v.04 p.0863] **BURROUGHS, JOHN** (1837-), American poet and writer on natural history, was born in Roxbury,

Delaware county, New York, on the 3rd of April 1837. In his earlier years he engaged in various pursuits, teaching, journalism, farming and fruit-raising, and for nine years was a clerk in the treasury department at Washington. After publishing in 1867 a volume of *Notes on Walt Whitman as poet and person* (a subject to which he returned in 1896 with his *Whitman: a Study*), he began in 1871, with *Wake-Robin*, a series of books on birds, flowers and rural scenes which has made him the successor of Thoreau as a popular essayist en the plants and animals environing human life. His later writings showed a more philosophic mood and a greater disposition towards literary or meditative allusion than their predecessors, but the general theme and method remained the same. His chief books, in addition to *Wake-Robin*, are *Birds and Poets* (1877), *Locusts and Wild Honey* (1879), *Signs and Seasons* (1886), and *Ways of Nature* (1905); these are in prose, but he wrote much also in verse, a volume of poems, *Bird and Bough*, being published in 1906. *Winter Sunshine* (1875) and *Fresh Fields* (1884) are sketches of travel in England and France.

A biographical sketch of Burroughs is prefixed to his *Year in the Fields* (new ed., 1901). A complete uniform edition of his works was issued in 1895, &c. (Riverside edition, Cambridge, Mass.).

BURSAR (Med. Lat. *bursarius*), literally a keeper of the *bursa* or purse. The word is now chiefly used of the official, usually one of the fellows, who administers the finances of a college at a university, or of the treasurer of a school or other institution. The term is also applied to the holder of "a bursary," an exhibition at Scottish schools or universities, and also in England a scholarship or exhibition enabling a pupil of an elementary school to continue his education at a secondary school. The term "burse" (Lat. *bursa*, Gr. βόρσα, bag of skin) is particularly used of the embroidered purse which is one of the insignia of office of the lord high chancellor of England, and of the pouch which in the Roman Church contains the "corporal" in the service of the Mass. The "bursa" is a square case opening at one side only and covered and lined with silk or linen; one side should be of the colour of the vestments of the day.

BURSCHENSCHAFT, an association of students at the German universities. It was formed as a result of the German national sentiment awakened by the War of Liberation, its object being to foster patriotism and Christian conduct, as opposed to the particularism and low moral standard of the old *Landsmannschaften*. It originated at Jena, under the patronage of the grand-duke of Saxe-Weimar, and rapidly spread, the *Allgemeine deutsche Burschenschaft* being established in 1818. The loud political idealism of the *Burschen* excited the fears of the reactionary powers, which culminated after the murder of Kotzebue (*q.v.*) by Karl Sand in 1819, a crime inspired by a secret society among the *Burschen* known as the Blacks (*Schwarzen*). The repressive policy embodied in the Carlsbad Decrees (*q.v.*) was therefore directed mainly against the *Burschenschaft*, which none the less survived to take part in the revolutions of 1830. After the *émeute* at Frankfort in 1833, the association was again suppressed, but it lived on until, in 1848, all laws against it were abrogated. The *Burschenschaften* are now purely social and non-political societies. The *Reformburschenschaften*, formed since 1883 on the principle of excluding duelling, are united in the *Allgemeiner deutscher Burschenbund*.

BURSIAN, CONRAD (1830-1883), German philologist and archaeologist, was born at Mutzschen in Saxony, on the 14th of November 1830. On the removal of his parents to Leipzig, he received his early education at the Thomas school, and entered the university in 1847. Here he studied under Moritz Haupt and Otto Jahn until 1851, spent six months in Berlin (chiefly to attend Böckh's lectures), and completed his university studies at Leipzig (1852). The next three years were devoted to travelling in Belgium, France, Italy and Greece. In 1856 he became a *Privat-docent*, and in 1858 extraordinary professor at Leipzig; in 1861 professor of philology and archaeology at Tübingen; in 1864 professor of classical antiquities at Zurich; in 1869 at Jena, where he was also director of the archaeological museum; in 1874 at Munich, where he remained until his death on the 21st of September 1883. His most important works are: *Geographie von Griechenland* (1862-1872); *Beiträge zur Geschichte der klassischen Studien im Mittelalter* (1873); *Geschichte der klassischen Philologie in Deutschland* (1883); editions of Julius Firmicus Maternus' *De Errore Profanarum Religionum* (1856) and of Seneca's *Suasoriae* (1857). The article on Greek Art in Ersch and Gruber's Encyclopaedia is by him. Probably the work in connexion with which he is best known is the *Jahresbericht über die Fortschritte der klassischen Altertumswissenschaft* (1873, &c.), of which he was the founder and editor; from 1879 a *Biographisches Jahrbuch für Altertumskunde* was published by way of supplement, an obituary notice of Bursian, with a complete list of his writings, being in the volume for 1884.

BURSLEM, a market town of Staffordshire, England, in the Potteries district, 150 m. N.W. from London, on the North Staffordshire railway and the Grand Trunk Canal. Pop. (1891) 31,999; (1901) 38,766. In the 17th century the town was already famous for its manufacture of pottery. Here Josiah Wedgwood was born in 1730, his family having practised the manufacture in this locality for several generations, while he himself began work independently at the Ivy House pottery in 1759. He is commemorated by the Wedgwood Institute, founded in 1863. It comprises a school of art, free library, museum, picture-gallery and the free school founded in 1794. The exterior is richly and peculiarly ornamented, to show the progress of fictile art. The neighbouring towns of Stoke, Hanley and Longton are connected with Burslem by tramways. Burslem is mentioned in Domesday. Previously to 1885 it formed part of the parliamentary borough of Stoke, but it is now included in that of Hanley. It was included in the municipal borough of Stoke-on-Trent under an act of 1908.

BURTON, SIR FREDERICK WILLIAM (1816-1900), British painter and art connoisseur, the third son of Samuel Burton of Mungret, Co. Limerick, was born in Ireland in 1816. He was educated in Dublin, where his artistic studies were carried on with marked success under the direction of Mr Brocas, an able teacher, who foretold for the lad a distinguished career. That this estimate was not exaggerated was proved by Burton's immediate success in his profession. He was elected an associate of the Royal Hibernian Academy at the age of twenty-one and an academician two years later; and in 1842 he began to exhibit at the Royal Academy. A visit to Germany and Bavaria in 1851 was the first of a long series of wanderings in various parts of Europe, which gave him a profound and intimate knowledge of the works of the Old Masters, and prepared him admirably for the duties that he undertook in 1874 when he was appointed director of the British National Gallery in succession to Sir W. Boxall, R.A. During the twenty years that he held this post he was responsible for many important purchases, among them Leonardo da Vinci's "Virgin of the Rocks," Raphael's "Ansidei Madonna," Holbein's "Ambassadors," Van Dyck's equestrian portrait of Charles I., and the "Admiral Pulido Pareja," by Velasquez; and he added largely to the noted series of Early Italian pictures in the gallery. The number of acquisitions made to the collection during his period of office amounts to not fewer than 500. His own painting, most of which was in water-colour, had more attraction

for experts than for the general public. He was elected an associate of the Royal Society of Painters in Water-Colours in 1855, and a full member in the following year. He resigned in 1870, and was re-elected as an honorary member in 1886. A knighthood was conferred on him in 1884, and the degree of LL.D. of Dublin in 1889. In his youth he had strong sympathy with the "Young Ireland Party," and was a close associate with some of its members. He died in Kensington on the 16th of March 1900.

BURTON, JOHN HILL (1809-1881), Scottish historical writer, the son of an officer in the army, was born at Aberdeen on the 22nd of August 1809. After studying at the university of his native city, he removed to
[v.04 p.0864] Edinburgh, where he qualified for the Scottish bar and practised as an advocate; but his progress was slow, and he eked out his narrow means by miscellaneous literary work. His *Manual of the Law of Scotland* (1839) brought him into notice; he joined Sir John Bowring in editing the works of Jeremy Bentham, and for a short time was editor of the *Scotsman*, which he committed to the cause of free trade. In 1846 he achieved high reputation by his *Life of David Hume*, based upon extensive and unused MS. material. In 1847 he wrote his biographies of Simon, Lord Lovat, and of Duncan Forbes, and in 1849 prepared for Chambers's Series manuals of political and social economy and of emigration. In the same year he lost his wife, whom he had married in 1844, and never again mixed freely with society, though in 1855 he married again. He devoted himself mainly to literature, contributing largely to the *Scotsman* and *Blackwood*, writing *Narratives from Criminal Trials in Scotland* (1852), *Treatise on the Law of Bankruptcy in Scotland* (1853), and publishing in the latter year the first volume of his *History of Scotland*, which was completed in 1870. A new and improved edition of the work appeared in 1873. Some of the more important of his contributions to *Blackwood* were embodied in two delightful volumes, *The Book Hunter* (1862) and *The Scot Abroad* (1864). He had in 1854 been appointed secretary to the prison board, an office which gave him entire pecuniary independence, and the duties of which he discharged most assiduously, notwithstanding his literary pursuits and the pressure of another important task assigned to him after the completion of his history, the editorship of the *National Scottish Registers*. Two volumes were published under his supervision. His last work, *The History of the Reign of Queen Anne* (1880), is very inferior to his *History of Scotland*. He died on the 10th of August 1881. Burton was pre-eminently a jurist and economist, and may be said to have been guided by accident into the path which led him to celebrity. It was his great good fortune to find abundant unused material for his *Life of Hume*, and to be the first to introduce the principles of historical research into the history of Scotland. All previous attempts had been far below the modern standard in these particulars, and Burton's history will always be memorable as marking an epoch. His chief defects as a historian are want of imagination and an undignified familiarity of style, which, however, at least preserves his history from the dulness by which lack of imagination is usually accompanied. His dryness is associated with a fund of dry humour exceedingly effective in its proper place, as in *The Book Hunter*. As a man he was loyal, affectionate, philanthropic and entirely estimable.

A memoir of Hill Burton by his wife was prefaced to an edition of *The Book Hunter*, which like his other works was published at Edinburgh (1882).

(R. G.)

BURTON, SIR RICHARD FRANCIS (1821-1890), British consul, explorer and Orientalist, was born at Barham House, Hertfordshire, on the 19th of March 1821. He came of the Westmorland Burtons of Shap, but his grandfather, the Rev. Edward Burton, settled in Ireland as rector of Tuam, and his father, Lieutenant-Colonel Joseph Netterville Burton, of the 36th Regiment, was an Irishman by birth and character. His mother was descended from the MacGregors, and he was proud of a remote drop of Bourbon blood piously believed to be derived from a morganatic union of the Grand Monarque. There were even those, including some of the Romany themselves, who saw gipsy written in his peculiar eyes as in his character, wild and resentful, essentially vagabond, intolerant of convention and restraint. His irregular education strengthened the inherited bias. A childhood spent in France and Italy, under scarcely any control, fostered the love of untrammelled wandering and a marvellous fluency in continental vernaculars. Such an education so little prepared him for academic proprieties, that when he entered Trinity College, Oxford, in October 1840, a criticism of his military moustache by a fellow-undergraduate was resented by a challenge to a duel, and Burton in various ways distinguished himself by such eccentric behaviour that rustication inevitably ensued. Nor was he much more in his element as a subaltern in the 18th Regiment of Bombay Native Infantry, which he joined at Baroda in October 1842. Discipline of any sort he abhorred, and the one recommendation of the East India Company's service in his eyes was that it offered opportunities for studying Oriental life and languages. He had begun Arabic without a master at Oxford, and worked in London at Hindustani under Forbes before he went out; in India he laboured indefatigably at the vernaculars, and his reward was an astonishingly rapid proficiency in Gujarati, Marathi, Hindustani, as well as Persian and Arabic. His appointment as an assistant in the Sind survey enabled him to mix with the people, and he frequently passed as a native in the bazaars and deceived his own *munshi*, to say nothing of his colonel and messmates. His wanderings in Sind were the apprenticeship for the pilgrimage to Mecca, and his seven years in India laid the foundations of his unparalleled familiarity with Eastern life and customs, especially among the lower classes. Besides government reports and contributions to the Asiatic Society, his Indian period produced four books, published after his return home: *Scinde, or the Unhappy Valley* (1851), *Sindh and the Races that Inhabit the Valley of the Indus* (1851), *Goa and the Blue Mountains* (1851), and *Falconry in the Valley of the Indus* (1852). None of these achieved popularity, but the account of Sind is remarkably vivid and faithful.

The pilgrimage to Mecca in 1853 made Burton famous. He had planned it whilst mixing disguised among the Muslims of Sind, and had laboriously prepared for the ordeal by study and practice. No doubt the primary motive was the love of adventure, which was his strongest passion; but along with the wanderer's restlessness marched the zest of exploration, and whilst wandering was in any case a necessity of his existence, he preferred to roam in untrodden ways where mere adventure might be dignified by geographical service. There was a "huge white blot" on the maps of central Arabia where no European had ever been, and Burton's scheme, approved by the Royal Geographical Society, was to extend his pilgrimage to this "empty abode," and remove a discreditable blank from the map. War among the tribes curtailed the design, and his journey went no farther than Medina and Mecca. The exploit of accompanying the Muslim hajj to the holy cities was not unique, nor so dangerous as has been imagined. Several Europeans have accomplished it before and since Burton's visit without serious mishap. Passing himself off as an Indian Pathan covered any peculiarities or defects of speech. The pilgrimage, however, demands an intimate proficiency in a complicated ritual, and a familiarity with the minutiae of Eastern

manners and etiquette; and in the case of a stumble, presence of mind and cool courage may be called into request. There are legends that Burton had to defend his life by taking others'; but he carried no arms, and confessed, rather shamefastly, that he had never killed anybody at any time. The actual journey was less remarkable than the book in which it was recorded, *The Pilgrimage to Al-Medinah and Meccah* (1855). Its vivid descriptions, pungent style, and intensely personal "note" distinguish it from books of its class; its insight into Semitic modes of thought and its picture of Arab manners give it the value of an historical document; its grim humour, keen observation and reckless insobriety of opinion, expressed in peculiar, uncouth but vigorous language make it a curiosity of literature.

Burton's next journey was more hazardous than the pilgrimage, but created no parallel sensation. In 1854 the Indian government accepted his proposal to explore the interior of the Somali country, which formed a subject of official anxiety in its relation to the Red Sea trade. He was assisted by Capt. J.H. Speke and two other young officers, but accomplished the most difficult part of the enterprise alone. This was the journey to Harrar, the Somali capital, which no white man had entered. Burton vanished into the desert, and was not heard of for four months. When he reappeared he had not only been to Harrar, but had talked with the king, stayed ten days there in deadly peril, and ridden back across the desert, almost without food and water, running the gauntlet of the Somali spears all the way. Undeterred by this experience he set out again, but was checked by a skirmish with the tribes, in which one of his young officers was killed, Captain Speke was wounded in eleven places, and Burton himself had a javelin thrust through his jaws. His *First Footsteps in East Africa* (1856), describing these adventures, is one of his most exciting and most characteristic books, full of learning, observation and humour.

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After serving on the staff of Beatson's Bashi-bazouks at the Dardanelles, but never getting to the front in the Crimea, Burton returned to Africa in 1856. The foreign office, moved by the Royal Geographical Society, commissioned him to search for the sources of the Nile, and, again accompanied by Speke, he explored the lake regions of equatorial Africa. They discovered Lake Tanganyika in February 1858, and Speke, pushing on during Burton's illness and acting on indications supplied by him, lighted upon Victoria Nyanza. The separate discovery led to a bitter dispute, but Burton's expedition, with its discovery of the two lakes, was the incentive to the later explorations of Speke and Grant, Baker, Livingstone and Stanley; and his report in volume xxxiii. of the *Proceedings of the Royal Geographical Society*, and his *Lake Regions of Equatorial Africa* (1860), are the true parents of the multitudinous literature of "darkest Africa." Burton was the first Englishman to enter Mecca, the first to explore Somaliland, the first to discover the great lakes of Central Africa. His East African pioneering coincides with areas which have since become peculiarly interesting to the British Empire; and three years later he was exploring on the opposite side of Africa, at Dahomey, Benin and the Gold Coast, regions which have also entered among the imperial "questions" of the day. Before middle age Burton had compressed into his life, as Lord Derby said, "more of study, more of hardship, and more of successful enterprise and adventure, than would have sufficed to fill up the existence of half a dozen ordinary men." *The City of the Saints* (1861) was the fruit of a flying visit to the United States in 1860.

Since 1849 his connexion with the Indian army had been practically severed; in 1861 he definitely entered the service of the foreign office as consul at Fernando Po, whence he was shifted successively to Santos in Brazil (1865), Damascus (1869), and Trieste (1871), holding the last post till his death on the 20th of October 1890. Each of these posts produced its corresponding books: Fernando Po led to the publishing of *Wanderings in West Africa* (1863), *Abeokuta and the Cameroons* (1863), *A Mission to Gelele, king of Dahomé* (1864), and *Wit and Wisdom from West Africa* (1865). The *Highlands of the Brazil* (1869) was the result of four years' residence and travelling; and *Letters from the Battlefields of Paraguay* (1870) relate to a journey across South America to Peru. Damascus suggested *Unexplored Syria* (1872), and might have led to much better work, since no consulate in either hemisphere was more congenial to Burton's taste and linguistic studies; but he mismanaged his opportunities, got into trouble with the foreign office, and was removed to Trieste, where his Oriental prepossessions and prejudices could do no harm, but where, unfortunately, his Oriental learning was thrown away. He did not, however, abandon his Eastern studies or his Eastern travels. Various fresh journeys or revisitings of familiar scenes are recorded in his later books, such as *Zanzibar* (1872), *Ultima Thule* (1875), *Etruscan Bologna* (1876), *Sind Revisited* (1877), *The Land of Midian* (1879) and *To the Gold Coast for Gold* (1883). None of these had more than a passing interest. Burton had not the charm of style or imagination which gives immortality to a book of travel. He wrote too fast, and took too little pains about the form. His blunt, disconnected sentences and ill-constructed chapters were full of information and learning, and contained not a few thrusts for the benefit of government or other people, but they were not "readable." There was something ponderous about his very humour, and his criticism was personal and savage. By far the most celebrated of all his books is the translation of the "Arabian Nights" (*The Thousand Nights and a Night*, 16 vols., privately printed, 1885-1888), which occupied the greater part of his leisure at Trieste. As a monument of his Arabic learning and his encyclopaedic knowledge of Eastern life this translation was his greatest achievement. It is open to criticism in many ways; it is not so exact in scholarship, nor so faithful to its avowed text, as might be expected from his reputation; but it reveals a profound acquaintance with the vocabulary and customs of the Muslims, with their classical idiom as well as their vulgarest "Billingsgate," with their philosophy and modes of thought as well as their most secret and most disgusting habits. Burton's "anthropological notes," embracing a wide field of pornography, apart from questions of taste, abound in valuable observations based upon long study of the manners and the writings of the Arabs. The translation itself is often marked by extraordinary resource and felicity in the exact reproduction of the sense of the original; Burton's vocabulary was marvellously extensive, and he had a genius for hitting upon the right word; but his fancy for archaic words and phrases, his habit of coining words, and the harsh and rugged style he affected, detract from the literary quality of the work without in any degree enhancing its fidelity. With grave defects, but sometimes brilliant merits, the translation holds a mirror to its author. He was, as has been well said, an Elizabethan born out of time; in the days of Drake his very faults might have counted to his credit. Of his other works, *Vikram and the Vampire, Hindu Tales* (1870), and a history of his favourite arm, *The Book of the Sword*, vol. i. (1884), unfinished, may be mentioned. His translation of *The Lusiads of Camoens* (1880) was followed (1881) by a sketch of the poet's life. Burton had a fellow-feeling for the poet adventurer, and his translation is an extraordinarily happy reproduction of its original. A manuscript translation of the "Scented Garden," from the Arabic, was burnt by his widow, acting in what she believed to be the interests of her husband's reputation. Burton married Isabel Arundell in 1861, and owed much to her courage, sympathy and passionate devotion. Her romantic and exaggerated biography of her husband, with all its faults, is one of the most pathetic monuments which the unselfish love of a woman has ever

raised to the memory of her hero. Another monument is the Arab tent of stone and marble which she built for his tomb at Mortlake.

Besides Lady Burton's *Life of Sir Richard F. Burton* (2 vols., 1893, 2nd edition, condensed, edited, with a preface, by W.H. Wilkins, 1898), there are *A Sketch of the Career of R.F. Burton*, by A.B. Richards, Andrew Wilson, and St Clair Baddeley (1886); *The True Life of Captain Sir Richard F. Burton*, by his niece, G.M. Stisted (1896); and a brief sketch by the present writer prefixed to Bohn's edition of the *Pilgrimage to Al-Medinah and Meccah* (1898), from which some sentences have here been by permission reproduced. In 1906 appeared the *Life of Sir Richard Burton*, by Thomas Wright of Olney, in two volumes, an industrious and rather critical work, interesting in particular for the doubts it casts on Burton's originality as an Arabic translator, and emphasizing his indebtedness to Payne's translation (1881) of the *Arabian Nights*.

(S. L.-P.)

BURTON, ROBERT (1577-1640), English writer, author of *The Anatomy of Melancholy*, son of a country gentleman, Ralph Burton, was born at Lindley in Leicestershire on the 8th of February 1576-7. He was educated at the free school of Sutton Coldfield and at Nuneaton grammar school; became in 1593 a commoner of Brasenose College, and in 1599 was elected student at Christ Church, where he continued to reside for the rest of his life. The dean and chapter of Christ Church appointed him, in November 1616, vicar of St Thomas in the west suburbs, and about 1630 his patron, Lord Berkeley, presented him to the rectory of Segrave in Leicestershire. He held the two livings "with much ado to his dying day" (says Antony à Wood, the Oxford historian, somewhat mysteriously); and he was buried in the north aisle of Christ Church cathedral, where his elder brother William Burton, author of a *History of Leicestershire*, raised to his memory a monument, with his bust in colour. The epitaph that he had written for himself was carved beneath the bust: *Paucis notus, paucioribus ignotus, hic jacet Democritus Junior, cui vitam dedit et mortem Melancholia*. Some years before his death he had predicted, by the calculation of his nativity, that the approach of his climacteric year (sixty-three) would prove fatal; and the prediction came true, for he died on the 25th of January 1639-40 (some gossips surmising that he had "sent up his soul to heaven
[v.04 p.0866] through a noose about his neck" to avoid the chagrin of seeing his calculations falsified). His portrait in Brasenose College shows the face of a scholar, shrewd, contemplative, humorous.

A Latin comedy, *Philosophaster*, originally written by Robert Burton in 1606 and acted at Christ Church in 1617, was long supposed to be lost; but in 1862 it was printed for the Roxburghe Club from a manuscript belonging to the Rev. W.E. Buckley, who edited it with elaborate care and appended a collection of the academical exercises that Burton had contributed to various Oxford miscellanies ("Natalia," "Parentalia," &c.). *Philosophaster* is a vivacious exposure of charlatanism. Desiderius, duke of Osuna, invites learned men from all parts of Europe to repair to the university which he has re-established; and a crowd of shifty adventurers avail themselves of the invitation. There are points of resemblance to *Philosophaster* in Ben Jonson's *Alchemist* and Tomkis's *Albumazar*, but in the prologue Burton is careful to state that his was the earlier play. (Another manuscript of *Philosophaster*, a presentation copy to William Burton from the author, has since been found in the library of Lord Mostyn.)

In 1621 was issued at Oxford the first edition, a quarto, of *The Anatomy of Melancholy ... by Democritus Junior*. Later editions, in folio, were published in 1624, 1628, 1632, 1638, 1651, 1652, 1660, 1676. Burton was for ever engaged in revising his treatise. In the third edition (where first appeared the engraved emblematical title-page by C. Le Blond) he declared that he would make no further alterations. But the fourth edition again bore marks of revision; the fifth differed from the fourth; and the sixth edition was posthumously printed from a copy containing his latest corrections.

Not the least interesting part of the *Anatomy* is the long preface, "Democritus to the Reader," in which Burton sets out his reasons for writing the treatise and for assuming the name of Democritus Junior. He had been elected a student of "the most flourishing college of Europe" and he designed to show his gratitude by writing something that should be worthy of that noble society. He had read much; he was neither rich nor poor; living in studious seclusion, he had been a critically observant spectator of the world's affairs. The philosopher Democritus, who was by nature very melancholy, "averse from company in his latter days and much given to solitariness," spent his closing years in the suburbs of Abdera. There Hippocrates once found him studying in his garden, the subject of his study being the causes and cure of "this *atra bilis* or melancholy." Burton would not compare himself with so famous a philosopher, but he aimed at carrying out the design which Democritus had planned and Hippocrates had commended. It is stated that he actually set himself to reproduce the old philosopher's reputed eccentricities of conduct. When he was attacked by a fit of melancholy he would go to the bridge foot at Oxford and shake his sides with laughter to hear the bargemen swearing at one another, just as Democritus used to walk down to the haven at Abdera and pick matter for mirth out of the humours of waterside life.

Burton anticipates the objections of captious critics. He allows that he has "collected this cento out of divers authors" and has borrowed from innumerable books, but he claims that "the composition and method is ours only, and shows a scholar." It had been his original intention to write in Latin, but no publisher would take the risk of issuing in Latin so voluminous a treatise. He humorously apologizes for faults of style on the ground that he had to work single-handed (unlike Origen who was allowed by Ambrosius six or seven amanuenses) and digest his notes as best he might. If any object to his choice of subject, urging that he would be better employed in writing on divinity, his defence is that far too many commentaries, expositions, sermons, &c., are already in existence. Besides, divinity and medicine are closely allied; and, melancholy being both a spiritual and bodily infirmity, the divine and the physician must unite to cure it.

The preface is followed by a tabular synopsis of the First Partition with its several Sections, Members and Subsections. After various preliminary digressions Burton sets himself to define what Melancholy is and what are its species and kinds. Then he discusses the Causes, supernatural and natural, of the disorder, and afterwards proceeds to set down the Symptoms (which cannot be briefly summarized, "for the Tower of Babel never yielded such confusion of tongues as the Chaos of Melancholy doth of Symptoms"). The Second Partition is devoted to the Cure of Melancholy. As it is of great importance that we should live in good air, a chapter deals with "Air Rectified. With a Digression of the Air." Burton never travelled, but the study of cosmography had been his constant delight; and over sea and land, north, east, west, south—in this enchanting chapter—he sends his vagrant fancy flying. In the disquisition on "Exercise rectified of body and mind" he dwells gleefully on the pleasures of country life, and on the content that scholars find in

the pursuit of their favourite studies. Love-Melancholy is the subject of the first Three Sections of the Third Partition, and many are the merry tales with which these pages are seasoned. The Fourth (and concluding) Section treats, in graver mood, of Religious Melancholy; and to the "Cure of Despair" he devotes his deepest meditations.

The Anatomy, widely read in the 17th century, for a time lapsed into obscurity, though even "the wits of Queen Anne's reign and the beginning of George I. were not a little beholden to Robert Burton" (Archbishop Herring). Dr Johnson deeply admired the work; and Sterne laid it heavily under contribution. But the noble and impassioned devotion of Charles Lamb has been the most powerful help towards keeping alive the memory of the "fantastic great old man." Burton's odd turns and quirks of expression, his whimsical and affectate fancies, his kindly sarcasm, his far-fetched conceits, his deep-lying pathos, descended by inheritance of genius to Lamb. The enthusiasm of Burton's admirers will not be chilled by the disparagement of unsympathetic critics (Macaulay and Hallam among them) who have consulted his pages in vain; but through good and evil report he will remain, their well-loved companion to the end.

The best of the modern editions of Burton was published in 1896, 3 vols. 8vo (Bell and Sons), under the editorship of A.R. Shilleto, who identified a large number of the classical quotations and many passages from post-classical authors. Prof. Bensley, of the university of Adelaide, has since contributed to the ninth and tenth series of *Notes and Queries* many valuable notes on the *Anatomy*. Dr Aldis Wright has long been engaged on the preparation of a definitive edition.

(A. H. B.)

BURTON, WILLIAM EVANS (1804-1860), English actor and playwright, born in London in September 1804, was the son of William George Burton (1774-1825), a printer and author of *Research into the religions of the Eastern nations as illustrative of the scriptures* (1805). He was educated for the Church, but, having entered his father's business, his success as an amateur actor led him to go upon the stage. After several years in the provinces, he made his first London appearance in 1831. In 1834 he went to America, where he appeared in Philadelphia as Dr Ollapod in *The Poor Gentleman*. He took a prominent place, both as actor and manager, in New York, Philadelphia and Baltimore, the theatre which he leased in New York being renamed Burton's theatre. He had much popular success as Captain Cuttle in John Brougham's dramatization of *Dombey and Son*, and in other low comedy parts in plays from Dickens's novels. Burton was the author of a large number of plays, one of which, *Ellen Wareham* (1833), was produced simultaneously at five London theatres. In Philadelphia he established the *Gentleman's Magazine*, of which Edgar Allan Poe was for some time the editor. He was himself the editor of the *Cambridge Quarterly* and the *Souvenir*, and the author of several books, including a *Cyclopaedia of Wit and Humour* (1857). He collected a library of over 100,000 volumes, especially rich in Shakespeariana, which was dispersed after his death at New York City on the 9th of February 1860.

BURTON-UPON-TRENT, a market town and municipal and county borough in the Burton parliamentary division of Staffordshire and the Southern parliamentary division of Derbyshire, England; lying mainly upon the left bank of the Trent, in Staffordshire. Pop. (1891) 46,047; (1901) 50,386. It is 127 m north-west from London by the London & North-Western and the Midland railways, and is also served by the Great Northern and North Staffordshire railways. The Trent is navigable from a point near the town downward. The neighbouring country is pleasant enough, particularly along the river, but the town itself is purely industrial, and contains no pre-eminent buildings. The church of St Mary and St Modwen is classic in style, of the 18th century, but embodies some remains of an ancient Gothic building. Of a Benedictine abbey dedicated to the same saints there remain a gatehouse and lodge, and a fine doorway. The former abbot's house at Seyney Park is a half-timbered building of the 15th century. The free grammar school was founded in 1525. A fine bridge over the Trent, and the municipal buildings, were provided by Lord Burton. There are pleasant recreation grounds on the Derbyshire side of the river.

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Burton is the seat of an enormous brewing trade, representing nearly one-tenth of the total amount of this trade in the United Kingdom. It is divided between some twenty firms. The premises of Bass's brewery extend over 500 acres, while Allsopp's stand next; upwards of 5000 hands are employed in all, and many miles of railways owned by the firms cross the streets in all directions on the level, and connect with the lines of the railway companies. The superiority which is claimed for Burton ales is attributed to the use of well-water impregnated with sulphate of lime derived from the gypseous deposits of the district. Burton is governed by a mayor, 8 aldermen and 24 councillors. Area, 4202 acres.

Burton-upon-Trent (Burhton) is first mentioned towards the close of the 9th century, when St Modwen, an Irish virgin, is said to have established a convent on the Isle of Andressey opposite Burton. In 1002 Wulfric, earl of Mercia, founded here a Benedictine abbey, and by charter of 1004 granted to it the town with other large endowments. Burton was evidently a mesne borough under the abbot, who held the court of the manor and received the profits of the borough according to the charter of Henry I. granting sac and soc and other privileges and right in the town. Later charters were given by Henry II., by John in 1204 (who also granted an annual fair of three days' duration, 29th of October, at the feast of St Modwen, and a weekly market on Thursday), by Henry III. in 1227, by Henry VII. in 1488 (Henry VII. granted a fair at the feast of St Luke, 18th of October), and by Henry VIII. in 1509. At the dissolution Henry VIII. founded on the site of the abbey a collegiate church dissolved before 1545, when its lands, with all the privileges formerly vested in the abbot, were conferred on Sir William Paget, ancestor of the marquess of Anglesey, now holder of the manor. In 1878 it was incorporated under a mayor, 8 aldermen, 24 councillors. Burton was the scene of several engagements in the Civil War, when its large trade in clothing and alabaster was practically ruined. Although the abbey ale was mentioned as early as 1295, the brewing industry is comparatively of recent development, having begun about 1708. Forty years later it had a market at St Petersburg and the Baltic ports, and in 1796 there were nine brewing firms in the town.

See William Molyneux, *History of Burton-on-Trent* (1869); *Victoria County History, Staffordshire*.

BURU (*Buro*, Dutch *Boeroe* or *Boeloe*), an island of the Dutch East Indies, one of the Molucca Islands belonging to the residency of Amboyna, between 3° 4′ and 3° 50′ S. and 125° 58′ and 127° 15′ E. Its extreme measurements are 87 m. by 50 m., and its area is 3400 sq. m. Its surface is for the most part mountainous, though the seaboard district is frequently alluvial and marshy from the deposits of the numerous rivers. Of these the largest, the Kajeli, discharging eastward, is in part navigable. The greatest elevations occur in the west, where the mountain Tomahu reaches 8530 ft. In the middle of the western

part of the island lies the large lake of Wakolo, at an altitude of 2200 ft., with a circumference of 37 m. and a depth of about 100 ft. It has been considered a crater lake; but this is not the case. It is situated at the junction of the sandstone and slate, where the water, having worn away the former, has accumulated on the latter. The lake has no affluents and only one outlet, the Wai Nibe to the north. The chief geological formations of Buru are crystalline slate near the north coast, and more to the south Mesozoic sandstone and chalk, deposits of rare occurrence in the archipelago. By far the larger part of the country is covered with natural forest and prairie land, but such portions as have been brought into cultivation are highly fertile. Coffee, rice and a variety of fruits, such as the lemon, orange, banana, pine-apple and coco-nut are readily grown, as well as sago, red-pepper, tobacco and cotton. The only important exports, however, are cajeput oil, a sudorific distilled from the leaves of the *Melaleuca Cajuputi* or white-wood tree; and timber. The native flora is rich, and teak, ebony and canari trees are especially abundant; the fauna, which is similarly varied, includes the babirusa, which occurs in this island only of the Moluccas. The population is about 15,000. The villages on the sea-coast are inhabited by a Malayan population, and the northern and western portions of the island are occupied by a light-coloured Malay folk akin to the natives of the eastern Celebes. In the interior is found a peculiar race which is held by some to be Papuan. They are described, however, as singularly un-Papuan in physique, being only 5 ft. 2 in. in average height, of a yellow-brown colour, of feeble build, and without the characteristic frizzly hair and prominent nose of the true Papuan. They are completely pagan, live in scattered hamlets, and have come very little in contact with any civilization. Among the maritime population a small number of Chinese, Arabs and other races are also found. The island is divided by the Dutch into two districts. The chief settlement is Kajeli on the east coast. A number of Mahommedan natives here are descended from tribes compelled in 1657 to gather together from the different parts of the island, while all the clove-trees were exterminated in an attempt by the Dutch to centralize the clove trade. Before the arrival of the Dutch the islanders were under the dominion of the sultan of Ternate; and it was their rebellion against him that gave the Europeans the opportunity of effecting their subjugation.

BURUJIRD, a province of Persia, bounded W. by Luristan, N. by Nehavend and Malayir, E. by Irak and S. by Isfahan. It is divided into the following administrative divisions:—(1) town of Burujird with villages in immediate neighbourhood; (2) Silakhor (upper and lower); (3) Japalak (with Sarlek and Burbarud); (4) nomad Bakhtiari. It has a population of about 250,000 or 300,000, and pays a yearly revenue of about £16,000. It is very fertile and produces much wheat, barley, rice and opium. With improved means of transport, which would allow the growers to export, the produce of cereals could easily be trebled. The province is sometimes joined with that of Luristan.

The town Burujird, the capital of the province, is situated in the fertile Silakhor plain on the river Tahīj, a tributary of the Dizful river (Ab i Diz), 70 m. by road from Hamadan and 212 m. from Isfahan, in 33° 55′ N. and 48° 55′ E., and at an elevation of 5315 ft. Pop. about 25,000. It manufactures various cotton stuffs (coarse prints, carpet covers) and felts (principally hats and caps for Lurs and Bakhtiaris). It has post and telegraph offices.

BURY, JOHN BAGNELL (1861-), British historian, was born on the 16th of October 1861, and was educated at Trinity College, Dublin, where he was elected to a fellowship in 1885. A fine Greek scholar, he edited Pindar's *Nemean* and *Isthmian Odes*; but he devoted himself chiefly to the study of history, and was chosen professor of modern history at Dublin in 1893, becoming regius professor of Greek in 1898. He resigned both positions in 1902, when he was elected regius professor of modern history in the university of Cambridge. His historical work was mainly concerned with the later Roman empire, and his edition of Gibbon's *Decline and Fall*, with a masterly introduction and valuable notes (1896-1900), is the standard text of this history. He also wrote a *History of Greece to the Death of Alexander the Great* (1900); *History of the Later Roman Empire, 395-800* (1889); *History of the Roman Empire 27 B.C.-180 A.D.* (1893); *Life of St Patrick and his Place in History* (1905), &c. He was elected a fellow of King's College, Cambridge, and received honorary degrees from the universities of Oxford, Edinburgh, Glasgow, Aberdeen and Durham.

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BURY, a market-town and municipal, county and parliamentary borough of Lancashire, England, on the river Irwell, 195 m. N.W. by W. from London, and 10½ N. by W. from Manchester, on the Lancashire & Yorkshire railway and the Manchester & Bolton canal. Pop. (1891) 57,212; (1901) 58,029. The church of St Mary is of early foundation, but was rebuilt in 1876. Besides numerous other places of worship, there are a handsome town hall, athenaeum and museum, art gallery and public library, various assembly rooms, and several recreation grounds. Kay's free grammar school was founded in 1726; there are also municipal technical schools. The cotton manufacture is the principal industry; there are also calico printing, dyeing and bleaching works, machinery and iron works, woollen manufactures, and coal mines and quarries in the vicinity. Sir Robert Peel was born at Chamber Hall in the neighbourhood, and his father did much for the prosperity of the town by the establishment of extensive print-works. A monument to the statesman stands in the market-place. The parliamentary borough returns one member (since 1832). The county borough was created in 1888. The corporation consists of a mayor, 10 aldermen and 30 councillors. Area, 5836 acres.

Bury, of which the name is derived from the Anglo-Saxon *burhg*, *birig* or *byrig* (town, castle or fortified place), was the site of a Saxon station, and an old English castle stood in Castle Croft close to the town. It was a member of the Honour of Clitheroe and a fee of the royal manor of Tottington, which soon after the Conquest was held by the Lacys. The local family of Bury held lands here during the 13th century, and at least for a short time the manor itself, but before 1347 it passed by marriage to the Pilkingtons of Pilkington, with whom it remained till 1485, when on the attainder of Sir Thomas Pilkington it was granted to the first earl of Derby, whose descendants have since held it. Under a grant made by Edward IV. to Sir Thomas Pilkington, fairs are still held on March 5, May 3, and September 18, and a market was formerly held under the same grant on Thursday, which has, however, been long replaced by a customary market on Saturday. The woollen trade was established here through the agency of Flemish immigrants in Edward III.'s reign, and in Elizabeth's time this industry was of such importance that an aulneger was appointed to measure and stamp the woollen cloth. But although the woollen manufacture is still carried on, the cotton trade has been gradually superseding it since the early part of the 18th century. The family of the Kays, the inventors, belonged to this place, and Robert Peel's print-works were established here in 1770. The cognate trades of bleaching, dyeing and machine-making have been long carried on. A court-leet and view of frank pledge used to be held half-yearly at Easter and Michaelmas, and a court-baron in May. Until 1846 three constables were chosen annually at the court-leet to govern the place, but in that year the

inhabitants obtained authority from parliament to appoint twenty-seven commissioners to undertake the local government. A charter of incorporation was granted in 1876. The well-known Bury Cooperative Society was established in 1856. There was a church here at the time of the Domesday Survey, and the earliest mention of a rector is found in the year 1331-1332. One-half of the town is glebe belonging to the rectory.

BURY ST EDMUNDS, a market town and municipal and parliamentary borough of Suffolk, England, on the Lark, an affluent of the Great Ouse; 87 m. N.E. by N. from London by the Great Eastern railway. Pop. (1901) 16,255. It is pleasantly situated on a gentle eminence, in a fertile and richly cultivated district. The tower or church-gate, one of the finest specimens of early Norman architecture in England, and the western gate, a beautiful structure of rich Decorated work, together with ruined walls of considerable extent, are all that remains of the great abbey. St Mary's church, with a beautifully carved roof, was erected in the earlier part of the 15th century, and contains the tomb of Mary Tudor, queen of Louis XII. of France. St James's church is also a fine Perpendicular building, with a modern chancel, and without a tower. All these splendid structures, fronting one of the main streets in succession, form, even without the abbey church, a remarkable memorial of the wealth of the foundation. Behind them lie picturesque gardens which contain the ruins, the plan of which is difficult to trace, though the outlines of some portions, as the chapter-house, have been made clear by excavation. There is a handsome Roman Catholic church of St Edmund. The so-called Moyses Hall (perhaps a Jew's House, of which there is a parallel example at Lincoln) retains transitional Norman work. The free grammar school, founded by Edward VI., has two scholarships at Cambridge, and six exhibitions to each university, and occupies modern buildings. The Church Schools Company has a school. There are large agricultural implement works, and the agricultural trade is important, cattle and corn markets being held. In the vicinity is Ickworth, the seat of the marquess of Bristol, a great mansion of the end of the 18th century. The parliamentary borough, which returns one member, is coextensive with the municipal borough. The town is governed by a mayor, 6 aldermen and 18 councillors. Area, 2947 acres.

Bury St Edmunds (Beodricesworth, St Edmund's Bury), supposed by some to have been the Villa Faustina of the Romans, was one of the royal towns of the Saxons. Sigebert, king of the East Angles, founded a monastery here about 633, which in 903 became the burial place of King Edmund, who was slain by the Danes about 870, and owed most of its early celebrity to the reputed miracles performed at the shrine of the martyr king. By 925 the fame of St Edmund had spread far and wide, and the name of the town was changed to St Edmund's Bury. Sweyn, in 1020, having destroyed the older monastery and ejected the secular priests, built a Benedictine abbey on its site. In 942 or 945 King Edmund had granted to the abbot and convent jurisdiction over the whole town, free from all secular services, and Canute in 1020 freed it from episcopal control. Edward the Confessor made the abbot lord of the franchise. By various grants from the abbots, the town gradually attained the rank of a borough. Henry III. in 1235 granted to the abbot two annual fairs, one in December (which still survives), the other the great St Matthew's fair, which was abolished by the Fairs Act of 1871. Another fair was granted by Henry IV. in 1405. Elizabeth in 1562 confirmed the charters which former kings had granted to the abbots, and James I. in 1606 granted a charter of incorporation with an annual fair in Easter week and a market. Further charters were granted by him in 1608 and 1614, and by Charles II. in 1668 and 1684. The reversion of the fairs and two markets on Wednesday and Saturday were granted by James I. in fee farm to the corporation. Parliaments were held here in 1272, 1296 and 1446, but the borough was not represented until 1608, when James I. conferred the privilege of sending two members. The Redistribution Act 1885 reduced the representation to one. There was formerly a large woollen trade.

See Richard Yates, *Hist. and Antiqs. of the Abbey of St Edmund's Bury* (2nd ed., 1843); H.R. Barker, *History of Bury St Edmunds*.

BUSBECQ, OGIER GHISLAIN DE [Augerius Gislenius] (1522-1592), Flemish writer and traveller, was born at Comines, and educated at the university of Louvain and elsewhere. Having served the emperor Charles V. and his son, Philip II. of Spain, he entered the service of the emperor Ferdinand I., who sent him as ambassador to the sultan Suleiman I. the Magnificent. He returned to Vienna in 1562 to become tutor to the sons of Maximilian II., afterwards emperor, subsequently taking the position of master of the household of Elizabeth, widow of Charles IX., king of France, and daughter of Maximilian. Busbecq was an excellent scholar, a graceful writer and a clever diplomatist. He collected valuable manuscripts, rare coins and curious inscriptions, and introduced various plants into Germany. He died at the castle of Maillot near Rouen on the 28th of October 1592. Busbecq wrote *Itinera Constantinopolitanum et Amasianum* (Antwerp, 1581), a work showing considerable insight into Turkish politics. This was published in Paris in 1589 as *A.G. Busbequii legationis Turcicae epistolae iv.*, and has been translated into several languages. He was a frequent visitor to France, and wrote *Epistolae ad Rudolphum II. Imperatorem e Gallia scriptae* (Louvain, 1630), an interesting account of affairs at the French court. His works were published at Leiden in 1633 and at Basel in 1740. An English translation of the *Itinera* was published in 1744.

[v.04 p.0869]

See C.T. Forster and F.H.B. Daniel, *Life and Letters of Ogier Ghiselin de Busbecq* (London, 1881); Viertel, *Busbecks Erlebnisse in der Turkei* (Gottingen, 1902).

BUSBY, RICHARD (1606-1695), English clergyman, and head master of Westminster school, was born at Lutton in Lincolnshire in 1606. He was educated at the school which he afterwards superintended for so long a period, and first signalized himself by gaining a king's scholarship. From Westminster Busby proceeded to Christ Church, Oxford, where he graduated in 1628. In his thirty-third year he had already become renowned for the obstinate zeal with which he supported the falling dynasty of the Stuarts, and was rewarded for his services with the prebend and rectory of Cudworth, with the chapel of Knowle annexed, in Somersetshire. Next year he became head master of Westminster, where his reputation as a teacher soon became great. He himself once boasted that sixteen of the bishops who then occupied the bench had been birched with his "little rod". No school in England has on the whole produced so many eminent men as Westminster did under the régime of Busby. Among the more illustrious of his pupils may be mentioned South, Dryden, Locke, Prior and Bishop Atterbury. He wrote and edited many works for the use of his scholars. His original treatises (the best of which are his Greek and Latin grammars), as well as those which he edited, have, however, long since fallen into disuse. Busby died in 1695, in his ninetieth year, and was buried in Westminster Abbey, where his effigy is still to be seen.

BUSBY, the English name for a military head-dress of fur. Possibly the original sense of a "busby wig"

came from association with Dr Busby of Westminster; but it is also derived from "buzz", in the phrase "buzz wig". In its first Hungarian form the military busby was a cylindrical fur cap, having a "bag" of coloured cloth hanging from the top; the end of this bag was attached to the right shoulder as a defence against sword-cuts. In Great Britain "busbies" are of two kinds: (*a*) the hussar busby, cylindrical in shape, with a bag; this is worn by hussars and the Royal Horse Artillery; (*b*) the rifle busby, a folding cap of astrachan, in shape somewhat resembling a "Glengarry" but taller. Both have straight plumes in the front of the headdress. The word "busby" is also used colloquially to denote the tall bear-and-raccoon-skin "caps" worn by foot-guards and fusiliers, and the full dress feather bonnet of Highland infantry. Cylindrical busbies were formerly worn by the artillery engineers and rifles, but these are now obsolete in the regular army, though still worn by some territorial and colonial troops of these arms.

BUSCH, JULIUS HERMANN MORITZ (1821-1899), German publicist, was born at Dresden on the 13th of February 1821. He entered the university of Leipzig in 1841 as a student of theology, but graduated as doctor philosophiae, and from 1847 devoted himself entirely to journalism and literature. In 1851 he went to America, but soon returned disillusioned to Germany, and published an account of his travels. During the next years he travelled extensively in the East and wrote books on Egypt, Greece and Palestine. From 1856 he was employed at Leipzig on the *Grenzboten*, one of the most influential German periodicals, which, under the editorship of Gustav Freytag, had become the organ of the Nationalist party. In 1864 he became closely connected with the Augustenburg party in Schleswig-Holstein, but after 1866 he transferred his services to the Prussian government, and was employed in a semi-official capacity in the newly conquered province of Hanover. From 1870 onwards he was one of Bismarck's press agents, and was at the chancellor's side in this capacity during the whole of the campaign of 1870-71. In 1878 he published the first of his works on Bismarck—a book entitled *Bismarck und seine Leute, während des Krieges mit Frankreich*, in which, under the form of extracts from his diary, he gave an account of the chancellor's life during the war. The vividness of the descriptions and the cleverness with which the conversations were reported ensured a success, and the work was translated into several languages. This was followed in 1885 by another book, *Unser Reichskanzler*, chiefly dealing with the work in the foreign office in Berlin. Immediately after Bismarck's death Busch published the chancellor's famous petition to the emperor William II. dated the 18th of March 1890, requesting to be relieved of office. This was followed by a pamphlet *Bismarck und sein Werk*; and in 1898 in London and in English, by the famous memoirs entitled *Bismarck: some Secret Pages of his History* (German by Grunow, under title *Tagebuchblätter*), in which were reprinted the whole of the earlier works, but which contains in addition a considerable amount of new matter, passages from the earlier works which had been omitted because of the attacks they contained on people in high position, records of later conversations, and some important letters and documents which had been entrusted to him by Bismarck. Many passages were of such a nature that it could not be safely published in Germany; but in 1899 a far better and more complete German edition was published at Leipzig in three volumes and consisting of three sections. Busch died at Leipzig on the 16th of November 1899.

See Ernst Goetz, in *Biog. Jahrbuch* (1900).

BUSCH, WILHELM (1832-1908), German caricaturist, was born at Wiedensahl in Hanover. After studying at the academies of Düsseldorf, Antwerp and Munich, he joined in 1859 the staff of *Fliegende Blätter*, the leading German comic paper, and was, together with Oberländer, the founder of modern German caricature. His humorous drawings and caricatures are remarkable for the extreme simplicity and expressiveness of his pen-and-ink line, which record with a few rapid scrawls the most complicated contortions of the body and the most transitory movement. His humorous illustrated poems, such as *Max und Moritz, Der heilige Antonius von Padua, Die Fromme Helene, Hans Huckebein* and *Die Erlebnisse Knopps des Junggesellen*, play, in the German nursery, the same part that Edward Lear's nonsense verses do in England. The types created by him have become household words in his country. He invented the series of comic sketches illustrating a story in scenes without words, which have inspired Caran d'Ache and other leading caricaturists.

BÜSCHING, ANTON FRIEDRICH (1724-1793), German theologian and geographer, was born at Stadthagen in Schaumburg-Lippe, on the 27th of September 1724. In 1748 he was appointed tutor in the family of the count de Lynars, who was then going as ambassador to St Petersburg. On this journey he resolved to devote his life to the improvement of geographical science. Leaving the count's family, he went to reside at Copenhagen, and devoted himself entirely to this new pursuit. In 1752 he published his *Description of the Counties of Schleswig and Holstein*. In 1754 he removed to Göttingen, where in 1757 he was appointed professor of philosophy; but in 1761 he accepted an invitation to the German congregation at St Petersburg. There he organized a school which, under him, soon became one of the most flourishing in the north of Europe, but a disagreement with Marshal Münich led him, in spite of the empress's offers of high advancement, to return to central Europe in 1765. He first went to live at Altona; but next year he was called to superintend the famous "Greyfriars Gymnasium" (*Gymnasium zum Grauen Kloster*), which had been formed at Berlin by Frederick the Great. He died of dropsy on the 28th of May 1793, having by writing and example given a new impulse to education throughout Prussia. While at Göttingen he married the poetess, Christiana Dilthey.

Büsching's works (on geography, history, education and religion) amount to more than a hundred. The first class comprehends those upon which his fame chiefly rests; for although he did not possess the genius of D'Anville, he may be regarded as the creator of modern Statistical Geography. His *magnum opus* is the *Erdebeschreibung*, in seven parts, of which the first four, comprehending Europe, were published in 1754-1761, and have been translated into several languages (*e.g.* into English with a preface by Murdoch, in six volumes, London, 1762). In 1768 the fifth part was published, being the first volume upon Asia, containing Asiatic Turkey and Arabia. It displays an immense extent of research, and is generally considered as his masterpiece. Büsching was also the editor of a valuable collection entitled *Magazin für d. neue Historie und Geographie* (23 vols. 4to, 1767-1793); also of *Wochentl. Nachrichten von neuen Landkarten* (Berlin, 1773-1787). His works on education enjoyed great repute. In biography he wrote a number of articles for the above-mentioned *Magazin*, and a valuable collection of *Beiträge zur Lebensgeschichte merkwürdiger Personen* (6 vols., 1783-1789), including an elaborate life of Frederick the Great.

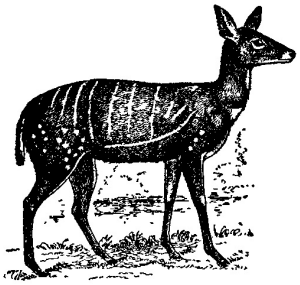
[v.04 p.0870]

BUSENBAUM (or Busembaum), **HERMANN** (1600-1668), Jesuit theologian, was born at Nottelen in Westphalia. He attained fame as a master of casuistry, and out of his lectures to students at Cologne grew his celebrated book *Medulla theologiae moralis, facili ac perspicua methodo resolvens casus conscientiae*

(1645). The manual obtained a wide popularity and passed through over two hundred editions before 1776. Pierre Lacroix added considerably to its bulk, and editions in two folio volumes appeared in both Germany (1710-1714) and France (1729). In these sections on murder and especially on regicide were much amplified, and in connexion with Damien's attempt on the life of Louis XV. the book was severely handled by the parlement of Paris. At Toulouse in 1757, though the offending sections were repudiated by the heads of the Jesuit colleges, the *Medulla* was publicly burned, and the episode undoubtedly led the way to the duc de Choiseul's attack on the society. Busenbaum also wrote a book on the ascetic life, *Lilium inter spinas*. He became rector of the Jesuit college at Hildesheim and then at Münster, where he died on the 31st of January 1668, being at the time father-confessor to Bishop Bernard of Galen.

BUSH. (1) (A word common to many European languages, meaning "a wood", cf. the Ger. *Busch*, Fr. *bois*, Ital. *bosco* and the med. Lat. *boscus*), a shrub or group of shrubs, especially of those plants whose branches grow low and thick. Collectively "the bush" is used in British colonies, particularly in Australasia and South Africa, for the tract of country covered with brushwood not yet cleared for cultivation. From the custom of hanging a bush as a sign outside a tavern comes the proverb "Good wine needs no bush." (2) (From a Teutonic word meaning "a box", cf. the Ger. *Rad-büchse*, a wheel box, and the termination of "blunderbuss" and "arquebus"; the derivation from the Fr. *bouche*, a mouth, is not correct), a lining frequently inserted in the bearings of machinery. When a shaft and the bearing in which it rotates are made of the same metal, the two surfaces are in certain cases apt to "seize" and abrade each other. To prevent this, bushes of some dissimilar metal are employed; thus a shaft of mild steel or wrought iron may be made to run in hard cast steel, cast iron, bronze or Babbitt metal. The last, having a low melting point, may be cast about the shaft for which it is to form a bearing.

BUSHBUCK (*Boschbok*,) the South African name of a medium-sized red antelope (*q.v.*), marked with white lines and spots, belonging to a local race of a widely spread species, *Tragelaphus scriptus*. The males alone have rather small, spirally twisted horns. There are several allied species, sometimes known as harnessed antelopes, which are of a larger size. Some of these such as the situtunga (*T. spekei*) have the hoofs elongated for walking on swampy ground, and hence have been separated as *Limnotragus*.



Female Bushbuck.

BUSHEL (from the O. Fr. *boissiel*, cf. med. L. *bustellus, busellus*, a little box), a dry measure of capacity, containing 8 gallons or 4 pecks. It has been in use for measuring corn, potatoes, &c., from a very early date; the value varying locally and with the article measured. The "imperial bushel", legally established in Great Britain in 1826, contains 2218.192 cub.in., or 80 lb of distilled water, determined at 62° F., with the barometer at 30 in. Previously, the standard bushel used was known as the "Winchester bushel", so named from the standard being kept in the town hall at Winchester; it contained 2150.42 cub. in. This standard is the basis of the bushel used in the United States and Canada; but other "bushels" for use in connexion with certain commodities have been legalized in different states.

BUSHIDO (Japanese for "military-knight-ways"), the unwritten code of laws governing the lives of the nobles of Japan, equivalent to the European chivalry. Its maxims have been orally handed down, together with a vast accumulation of traditional etiquette, the result of centuries of feudalism. Its inception is associated with the uprise of feudal institutions under Yoritomo, the first of the Shoguns, late in the 12th century, but bushido in an undeveloped form existed before then. The samurai or nobles of Japan entertained the highest respect for truth. "A *bushi* has no second word" was one of their mottoes. And their sense of honour was so high as to dictate suicide where it was offended.

See Inazo Nitobe, *Bushido: The Soul of Japan* (1905); also JAPAN: *Army*.

BUSHIRE, or BANDER BUSHIRE, a town of Persia, on the northern shore of the Persian Gulf, in 28° 59′ N., 50° 49′ E. The name is pronounced Boosheer, and not Bew-shire, or Bus-hire; modern Persians write it Bushehr and, yet more incorrectly, Abushehr, and translate it as "father of the city," but it is most probably a contraction of Bokht-ardashir, the name given to the place by the first Sassanian monarch in the 3rd century. In a similar way Riv-ardashir, a few miles south of Bushire, has become Rishire (Reesheer). In the first half of the 18th century, when Bushire was an unimportant fishing village, it was selected by Nadir Shah as the southern port of Persia and dockyard of the navy which he aspired to create in the Persian Gulf, and the British commercial factory of the East India Company, established at Gombrun, the modern Bander Abbasi, was transferred to it in 1759. At the beginning of the 19th century it had a population of 6000 to 8000, and it is now the most important port in the Persian Gulf, with a population of about 25,000. It used to be under the government of Fars, but is (since about 1892) the seat of the governor of the Persian Gulf ports, who is responsible to the central government, and has under his jurisdiction the principal ports of the Gulf and their dependencies. The town, which is of a triangular form, occupies the northern extremity of a peninsula 11 m. long and 4 broad, and is encircled by the sea on all sides except the south. It is fortified on the land side by a wall with 12 round towers. The houses being mostly built of a white conglomerate stone of shells and coral which forms the peninsula, gives the city when viewed from a distance a clean and handsome appearance, but on closer inspection the streets are found to be very narrow, irregular, ill-paved and filthy. Almost the only decent buildings are the governor's palace, the British residency and the houses of some well-to-do merchants. The sea immediately east of the town has a considerable depth, but its navigation is impeded by sand-banks and a bar north and west of the town, which can be passed only by vessels drawing not more than 9 ft. of water, except at spring tides, when there is a rise of from 8 to 10 ft. Vessels drawing more than 9 ft. must anchor in the roads miles away to the west. The climate is very hot in the summer months and unhealthy. The water is very bad, and that fit for drinking requires to be brought from wells distant 1½ to 3 m. from the city wall.

Bushire carries on a considerable trade, particularly with India, Java and Arabia. Its principal imports are cotton and woollen goods, yarn, metals, sugar, coffee, tea, spices, cashmere shawls, &c., and its principal exports opium, wool, carpets, horses, grain, dyes and gums, tobacco, rosewater, &c. The importance of Bushire has much increased since about 1862. It is now not only the headquarters of the English naval squadron in the Persian Gulf, and the land terminus of the Indo-European telegraph, but it also forms the chief station in the Gulf of the British Indian Steam Navigation Company, which runs its vessels weekly between Bombay and Basra. Consulates of Great Britain, Germany, France, Russia and Turkey and several

European mercantile houses are established at Bushire, and notwithstanding the drawbacks of bad roads to the interior, insufficient and precarious means of transport, and want of security, the annual value of the Bushire trade since 1890 averaged about £1,500,000 (one-third being for exports, two-thirds for imports), and over two-thirds of this was British. Of the 278,000 tons of shipping which entered the port in 1905, 244,000 were British.

During the war with Persia (1856-57) Bushire surrendered to a British force and remained in British occupation for some months. At Rishire, some miles south of Bushire and near the summer quarters of the British resident and the British telegraph buildings, there are extensive ruins among which bricks with cuneiform inscriptions have been found, showing that the place was a very old Elamite settlement.

(A. H.-S.)

BUSHMEN, or Bosjesmans, a people of South Africa, so named by the British and Dutch colonists of the Cape. They often call themselves *Saan* [Sing. *Sá*], but this appears to be the Hottentot name. If they have a national name it is *Khuai*, probably "small man," the title of one group. This *Khuai* has, however, been translated as the Bushman word for *tablier égyptien* (see below), adopted as the racial name because that malformation is one of their physical characteristics. The Kaffirs call them Abatwa, the Bechuana Masarwa (Maseroa). There is little reason to doubt that they constitute the aboriginal element of the population of South Africa, and indications of their former presence have been found as far north at least as the Nyasa and Tanganyika basins. "It would seem," writes Sir H.H. Johnston (*British Central Africa*, p. 52), "as if the earliest known race of man inhabiting what is now British Central Africa was akin to the Bushman-Hottentot type of negro. Rounded stones with a hole through the centre, similar to those which are used by the Bushmen in the south for weighting their digging-sticks (the *graaf stock* of the Boers), have been found at the south end of Lake Tanganyika." The dirty yellow colour of the Bushmen, their slightly slanting eyes and prominent cheek-bones had induced early anthropologists to dwell on their resemblance to the Mongolian races. This similarity has been now recognized as quite superficial. More recently a connexion has been traced between the Bushmen and the Pygmy peoples inhabiting the forests of Central Africa. Though the matter cannot be regarded as definitely settled, the latest researches rather tend to discredit this view. In fact it would appear that the two peoples have little in common save diminutive proportions and a nomadic and predatory form of existence. Owing to the discovery of steatopygous figurines in Egyptian graves, a theory has been advanced that the Egyptians of the early dynasties were of the same primitive pygmy negroid stock as the Bushmen. But this is highly speculative. The physical characteristics of Egyptian skulls have nothing of the Bushman in them. Of the primitive pygmy negroid stock the Hottentots (*q.v.*), once considered the parent family, are now regarded as an offshoot of mixed Bantu-Bushman blood from the main Bushman race.

It seems probable that the Bushmen must be regarded as having extended considerably to the north of the area occupied by them within the memory of white men. Evidence has been produced of the presence of a belated Hottentot or Hottentot-Bushman group as far north as the district between Kilimanjaro and Victoria Nyanza. They were probably driven south by the Bantu tribes, who eventually outflanked them and confined them to the less fertile tracts of country. Before the arrival of Europeans in South Africa the Bushman race appears to have been, what it so essentially is to-day, a nomadic race living in widely scattered groups. The area in which the Bushmen are now found sporadically may be defined as extending from the inner ranges of the mountains of Cape Colony, through the central Kalahari desert to near Lake Ngami, and thence north-westward to the districts about the Ovambo river north of Damaraland. In short, they have been driven by European and Kaffir encroachments into the most barren regions of South Africa. A few remain in the more inaccessible parts of the Drakensberg range about the sources of the Vaal. Only in one or two districts are they found in large numbers, chiefly in Great Bushman Land towards the Orange river. A regularly planned and wholesale destruction of the Bushmen on the borders of Cape Colony in the earlier years of European occupation reduced their numbers to a great extent; but this cruel hunting of the Bushmen has ceased. In retaliation the Bushmen were long the scourge of the farms on the outer borders of the colony, making raids on the cattle and driving them off in large numbers. On the western side of the deserts they are generally at enmity with the Koranna Hottentots, but on the eastern border of the Kalahari they have to some extent fraternized with the earliest Bechuana migrants. Their language, which exists in several dialects, has in common with Hottentot, but to a greater degree, the peculiar sounds known as "clicks." The Hottentot language is more agglutinative, the Bushman more monosyllabic; the former recognizes a gender in names, the latter does not; the Hottentots form the plural by a suffix, the Bushmen by repetition of the name; the former count up to twenty, the latter can only number two, all above that being "many." F.C.Selous records that Koranna Hottentots were able to converse fluently with the Bushmen of Bechuanaland.

The most striking feature of the Bushman's physique is shortness of stature. Gustav Fritsch in 1863-1866 found the average height of six grown men to be 4 ft. 9 in. Earlier, but less trustworthy, measurements make them still shorter. Among 150 measured by Sir John Barrow during the first British occupation of Cape Colony the tallest man was 4 ft. 9 in., the tallest woman 4 ft. 4 in. The Bushmen living in Bechuanaland measured by Selous in the last quarter of the 19th century were, however, found to be of nearly average height. Few persons were below 5 ft.; 5 ft. 4 in. was common, and individuals of even 6 ft. were not unknown. No great difference in height appears to exist between men and women. Fritsch's average from five Bushman women was one-sixth of an inch more than for the men. The Bushmen, as already stated, are of a dirty yellow colour, and of generally unattractive countenance. The skull is long and low, the cheek-bones large and prominent. The eyes are deeply set and crafty in expression. The nose is small and depressed, the mouth wide with moderately everted lips, and the jaws project. The teeth are not like badly cut ivory, as in Bantu, but regular and of a mother-of-pearl appearance. In general build the Bushman is slim and lean almost to emaciation. Even the children show little of the round outlines of youth. The amount of fat under the skin in both sexes is remarkably small; hence the skin is as dry as leather and falls into strong folds around the stomach and at the joints. The fetor of the skin, so characteristic of the negro, is not found in the Bushman. The hair is weak in growth, in age it becomes grey, but baldness is rare. Bushmen have little body-hair and that of a weak stubbly nature, and none of the fine down usual on most skins. On the face there is usually only a scanty moustache. A hollowed back and protruding stomach are frequent characteristics of their figure, but many of them are well proportioned, all being active and capable of enduring great privations and fatigue. Considerable steatopygy often exists among the women, who share with the Hottentot women the extraordinary prolongation of the nymphae which is often called "the Hottentot apron" or *tablier*. Northward the

Bushmen appear to improve both in general condition and in stature, probably owing to a tinge of Bantu blood. The Bushman's clothing is scanty: a triangular piece of skin, passed between the legs and fastened round the waist with a string, is often all that is worn. Many men, however, and nearly all the women, wear the *kaross*, a kind of pelisse of skins sewn together, which is used at night as a wrap. The bodies of both sexes are smeared with a native ointment, *buchu*, which, aided by accretions of dust and dirt, soon forms a coating like a rind. Men and women often wear sandals of hide or plaited bast. They are fond of ornament, and decorate the arms, neck and legs with beads, iron or copper rings, teeth, hoofs, horns and shells, while they stick feathers or hares' tails in the hair. The women sometimes stain their faces with red
[v.04 p.0872] pigment. They carry tobacco in goats' horns or in the shell of a land tortoise, while boxes of ointment or amulets are hung round neck or waist. A jackal's tail mounted on a stick serves the double purpose of fan and handkerchief. For dwellings in the plains they have low huts formed of reed mats, or occupy a hole in the earth; in the mountain districts they make a shelter among the rocks by hanging mats on the windward side. Of household utensils they have none, except ostrich eggs, in which they carry water, and occasionally rough pots. For cooking his food the Bushman needs nothing but fire, which he obtains by rubbing hard and soft wood together.

Bushmen do not possess cattle, and have no domestic animals except a few half-wild dogs, nor have they the smallest rudiments of agriculture. Living by hunting, they are thoroughly acquainted with the habits and movements of every kind of wild animal, following the antelope herds in their migrations. Their weapon is a bow made of a stout bough bent into a sharp curve. It is strung with twisted sinew. The arrow, which is neatly made of a reed, the thickness of a finger, is bound with thread to prevent splitting, and notched at the end for the string. At the point is a head of bone, or stone with a quill barb; iron arrow-blades obtained from the Bantu are also found. The arrow is usually 2 to 3 ft. long. The distance at which the Bushman can be sure of hitting is not great, about twenty paces. The arrows are always coated with a gummy poisonous compound which kills even the largest animal in a few hours. The preparation is something of a mystery, but its main ingredients appear to be the milky juice of the *Amaryllis toxicaria*, which is abundant in South Africa, or of the *Euphorbia arborescens*, generally mixed with the venom of snakes or of a large black spider of the genus *Mygale*; or the entrails of a very deadly caterpillar, called N'gwa or 'Kaa, are used alone. One authority states that the Bushmen of the western Kalahari use the juice of a chrysalis which they scrape out of the ground. From their use of these poisons the Bushmen are held in great dread by the neighbouring races. They carry, too, a club some 20 in. long with a knob as big as a man's fist. Assegais and knives are rare. No Bushman tribe south of Lake Ngami is said to carry spears. A rude implement, called by the Boers *graaf stock* or digging stick, consisting of a sharpened spike of hard wood over which a stone, ground to a circular form and perforated, is passed and secured by a wedge, forms part of the Bushman equipment. This is used by the women for uprooting the succulent tuberous roots of the several species of creeping plants of the desert, and in digging pitfalls. These perforated stones have a special interest in indicating the former extension of the Bushmen, since they are found, as has been said, far beyond the area now occupied by them. The Bushmen are famous as hunters, and actually run down many kinds of game. Living a life of periodical starvation, they spend days at a time in search of food, upon which when found they feed so gluttonously that it is said five of them will eat a whole zebra in a few hours. They eat practically anything. The meat is but half cooked, and game is often not completely drawn. The Bushman eats raw such insects as lice and ants, the eggs of the latter being regarded as a great delicacy. In hard times they eat lizards, snakes, frogs, worms and caterpillars. Honey they relish, and for vegetables devour bulbs and roots. Like the Hottentot, the Bushman is a great smoker.

The disposition of the Bushman has been much maligned; the cruelty which has been attributed to him is the natural result of equal brutalities practiced upon him by the other natives and the early European settlers. He is a passionate lover of freedom, and, like many other primitive people, lives only for the moment. Unlike the Hottentot he has never willingly become a slave, and will fight to the last for his personal liberty. He has been described as the "anarchist of South Africa." Still, when he becomes a servant, he is usually trustworthy. His courage is remarkable, and Fritsch was told by residents who were well qualified to speak that supported by a dozen Bushmen they would not be afraid of a hundred Kaffirs. The terror inspired by the Bushmen has indeed had an effect in the deforestation of parts of Cape Colony, for the colonists, to guard against stealthy attacks, cut down all the bush far round their holdings. Mission-work among the Bushmen has been singularly unsuccessful. But in spite of his savage nature, the Bushman is intelligent. He is quick-witted, and has the gift of imitating extraordinarily well the cries of bird and beast. He is musical, too, and makes a rough instrument out of a gourd and one or more strings. He is fond of dancing; besides the ordinary dances are the special dances at certain stages of the moon, &c. One of the most interesting facts about the Bushman is his possession of a remarkable delight in graphic illustration; the rocks of the mountains of Cape Colony and of the Drakensberg and the walls of caves anciently inhabited by them have many examples of Bushman drawings of men, women, children and animals characteristically sketched. Their designs are partly painted on rock, with four colours, white, black, red and yellow ochre, partly engraved in soft sandstone, partly chiselled in hard stone. Rings, crosses and other signs drawn in blue pigment on some of the rocks, and believed to be one or two centuries old, have given rise to the erroneous speculation that these may be remains of a hieroglyphic writing. A discovery of drawings of men and women with antelope heads was made in the recesses of the Drakensberg in 1873 (J.M. Orpen in *Cape Monthly Magazine*, July 1874). A few years later Selous discovered similar rock-paintings in Mashonaland and Manicaland.

Little is known of the family life of the Bushmen. Marriage is a matter merely of offer and acceptance ratified by a feast. Among some tribes the youth must prove himself an expert hunter. Nothing is known of the laws of inheritance. The avoidance of parents-in-law, so marked among Kaffirs, is found among Bushmen. Murder, adultery, rape and robbery are offences against their code of morals. As among other African tribes the social position of the women is low. They are beasts of burden, carrying the children and the family property on the journeys, and doing all the work at the halting-place. It is their duty also to keep the encampment supplied with water, no matter how far it has to be carried. The Bushman mother is devoted to her children, who, though suckled for a long time, yet are fed within the first few days after birth upon chewed roots and meat, and taught to chew tobacco at a very early age. The child's head is often protected from the sun by a plaited shade of ostrich feathers. There is practically no tribal organization. Individual families at times join together and appoint a chief, but the arrangement is never more than temporary. The Bushmen have no concrete idea of a God, but believe in evil spirits and supernatural interference with man's life. All Bushmen carry amulets, and there are indications of totemism in their refusal to eat certain foods. Thus one group will not eat goat's flesh, though the animal is

the commonest in their district. Others reverence antelopes or even the caterpillar N'gwa. The Bushman cuts off the joints of the fingers as a sign of mourning and sometimes, it seems, as an act of repentance. Traces of a belief in continued existence after death are seen in the cairns of stone thrown on the graves of chiefs. Evil spirits are supposed to hide beneath these sepulchral mounds, and the Bushman thinks that if he does not throw his stone on the mounds the spirits will twist his neck. The whole family deserts the place where any one has died, after raising a pile of stones. The corpse's head is anointed, then it is smoke-dried and laid in the grave at full length, stones or earth being piled on it. There is a Bushman belief that the sun will rise later if the dead are not buried with their faces to the east. Weapons and other Bushman treasures are buried with the dead, and the hut materials are burnt in the grave.

The Bushmen have many animal myths, and a rich store of beast legends. The most prominent of the animal mythological figures is that of the mantis, around which a great cycle of myths has been formed. He and his wife have many names. Their adopted daughter is the porcupine. In the family history an ichneumon, an elephant, a monkey and an eland all figure. The Bushmen have also solar and lunar myths, and observe and name the stars. Canopus alone has five names. Some of the constellations have figurative
[v.04 p.0873] names. Thus they call Orion's Belt "three she-tortoises hanging on a stick," and Castor and Pollux "the cow-elands." The planets, too, have their names and myths, and some idea of the astonishing wealth of this Bushman folklore and oral literature may be formed from the fact that the materials collected by Bleek and preserved in Sir George Grey's library at Cape Town form eighty-four stout MS. volumes of 3600 pages. They comprise myths, fables, legends and even poetry, with tales about the sun and moon, the stars, the crocodile and other animals; legends of peoples who dwelt in the land before the Bushmen arrived from the north; songs, charms, and even prayers, or at least incantations; histories, adventures of men and animals; tribal customs, traditions, superstitions and genealogies. A most curious feature in Bushman folklore is the occurrence of the speeches of various animals, into which the relater of the legend introduces particular "clicks," supposed to be characteristic of the animals in whose mouths they are placed.

See G.W. Stow, *The Native Races of South Africa* (London, 1905); Mark Hutchinson, "Bushman Drawings," in *Jour. Anthrop. Instit.*, 1882, p. 464; Sir H.H. Johnston, *Jour. Anthrop. Inst.*, 1883, p. 463; Dr H. Welcker, *Archiv f. Anthrop.* xvi.; G. Bertin, "The Bushmen and their Language," *Jour. R. Asial. Soc.* xviii. part i.; Gustav Fritsch, *Die Eingeborenen Südafrikas* (Breslau, 1872); W.H.I. Bleek, *Bushman Folklore* (1875); J.L.P. Erasmus, *The Wild Bushman*, MS. note (1899); F.C. Selous, *African Nature Notes and Reminiscences* (1908), chap. xx.; S. Passarge, *Die Buschmanner der Kalahari* (Berlin, 1907).

BUSHNELL, HORACE (1802-1876), American theologian, was born in the village of Bantam, township of Litchfield, Connecticut, on the 14th of April 1802. He graduated at Yale in 1827, was associate editor of the New York *Journal of Commerce* in 1828-1829, and in 1829 became a tutor at Yale. Here he at first took up the study of law, but in 1831 he entered the theological department of Yale College, and in 1833 was ordained pastor of the North Congregational church in Hartford, Conn., where he remained until 1859, when on account of long-continued ill-health he resigned his pastorate. Thereafter he had no settled charge, but, until his death at Hartford on the 17th of February 1876, he occasionally preached and was diligently employed as an author. While in California in 1856, for the restoration of his health, he took an active interest in the organization, at Oakland, of the college of California (chartered in 1855 and merged in the university of California in 1869), the presidency of which he declined. As a preacher, Dr Bushnell was a man of remarkable power. Not a dramatic orator, he was in high degree original, thoughtful and impressive in the pulpit. His theological position may be said to have been one of qualified revolt against the Calvinistic orthodoxy of his day. He criticized prevailing conceptions of the Trinity, the atonement, conversion, and the relations of the natural and the supernatural. Above all, he broke with the prevalent view which regarded theology as essentially intellectual in its appeal and demonstrable by processes of exact logical deduction. To his thinking its proper basis is to be found in the feelings and intuitions of man's spiritual nature. He had a vast influence upon theology in America, an influence not so much, possibly, in the direction of the modification of specific doctrines as in "the impulse and tendency and general spirit which he imparted to theological thought." Dr Munger's estimate may be accepted, with reservations, as the true one: "He was a theologian as Copernicus was an astronomer; he changed the point of view, and thus not only changed everything, but pointed the way toward unity in theological thought. He was not exact, but he put God and man and the world into a relation that thought can accept while it goes on to state it more fully with ever growing knowledge. Other thinkers were moving in the same direction; he led the movement in New England, and wrought out a great deliverance. It was a work of superb courage. Hardly a theologian in his denomination stood by him, and nearly all pronounced against him." Four of his books were of particular importance: *Christian Nurture* (1847), in which he virtually opposed revivalism and "effectively turned the current of Christian thought toward the young"; *Nature and the Supernatural* (1858), in which he discussed miracles and endeavoured to "lift the natural into the supernatural" by emphasizing the super-naturalness of man; *The Vicarious Sacrifice* (1866), in which he contended for what has come to be known as the "moral view" of the atonement in distinction from the "governmental" and the "penal" or "satisfaction" theories; and *God in Christ* (1849) (with an introductory "Dissertation on Language as related to Thought"), in which he expressed, it was charged, heretical views as to the Trinity, holding, among other things, that the Godhead is "instrumentally three—three simply as related to our finite apprehension, and the communication of God's incommunicable nature." Attempts, indeed, were made to bring him to trial, but they were unsuccessful, and in 1852 his church unanimously withdrew from the local "consociation," thus removing any possibility of further action against him. To his critics Bushnell formally replied by writing *Christ in Theology* (1851), in which he employs the important argument that spiritual facts can be expressed only in approximate and poetical language, and concludes that an adequate dogmatic theology cannot exist. That he did not deny the divinity of Christ he proved in *The Character of Jesus, forbidding his possible Classification with Men* (1861). He also published *Sermons for the New Life* (1858); *Christ and his Salvation* (1864); *Work and Play* (1864); *Moral Uses of Dark Things* (1868); *Women's Suffrage, the Reform against Nature* (1869); *Sermons on Living Subjects* (1872); and *Forgiveness and Law* (1874). Dr Bushnell was greatly interested in the civic interests of Hartford, and was the chief agent in procuring the establishment of the public park named in his honour by that city.

An edition of his works, in eleven volumes, appeared in 1876-1881; and a further volume, gathered from his unpublished papers, as *The Spirit in Man: Sermons and Selections*, in 1903. New editions of his *Nature and the Supernatural, Sermons for the New Life*, and *Work and Play*, were published the same year. A full

bibliography, by Henry Barrett Learned, is appended to his *Spirit in Man*. Consult Mrs M.B. Cheneys *Life and Letters of Horace Bushnell* (New York, 1880; new edition, 1903), and Dr Theodore T. Mungers *Horace Bushnell, Preacher and Theologian* (Boston, 1899); also a series of papers in the *Minutes of the General Association of Connecticut* (*Bushnell Centenary*) (Hartford, 1902).

(W. WR.)

BŪṢĪRĪ [Abū 'Abdallāh Muhammad ibn Sa'īd ul-Būṣīrī] (1211-1294), Arabian poet, lived in Egypt, where he wrote under the patronage of Ibn Hinna, the vizier. His poems seem to have been wholly on religious subjects. The most famous of these is the so-called "Poem of the Mantle." It is entirely in praise of Mahomet, who cured the poet of paralysis by appearing to him in a dream and wrapping him in a mantle. The poem has little literary value, being an imitation of Ka'b ibn Zuhair's poem in praise of Mahomet, but its history has been unique (cf. I. Goldziher in *Revue de l'histoire des religions*, vol. xxxi. pp. 304 ff.). Even in the poet's lifetime it was regarded as sacred. Up to the present time its verses are used as amulets; it is employed in the lamentations for the dead; it has been frequently edited and made the basis for other poems, and new poems have been made by interpolating four or six lines after each line of the original. It has been published with English translation by Faizullabhai (Bombay, 1893), with French translation by R. Basset (Paris, 1894), with German translation by C.A. Ralfs (Vienna, 1860), and in other languages elsewhere.

For long list of commentaries, &c., cf. C. Brockelmann's *Gesch. der Arab. Litteratur* (Weimar, 1898), vol. i. pp. 264-267.

(G. W. T.)

BUSIRIS, in a Greek legend preserved in a fragment of Pherecydes, an Egyptian king, son of Poseidon and Lyssianassa. After Egypt has been afflicted for nine years with famine, Phrasius, a seer of Cyprus, arrived in Egypt and announced that the cessation of the famine would not take place until a foreigner was yearly sacrificed to Zeus or Jupiter. Busiris commenced by sacrificing the prophet, and continued the custom by offering a foreigner on the altar of the god. It is here that Busiris enters into the circle of the myths and *parerga* of Heracles, who had arrived in Egypt from Libya, and was seized and bound ready to be killed and offered at the altar of Zeus in Memphis. Heracles burst the bonds which bound him, and, seizing his club, slew Busiris with his son Amphidamas and his herald Chalbes. This exploit is often represented on vase paintings from the 6th century B.C. and onwards, the Egyptian monarch and his companions being represented as negroes, and the legend is referred to by Herodotus and later writers. Although some of the Greek writers made Busiris an Egyptian king and a successor of Menes, about the sixtieth of the series, and the builder of Thebes, those better informed by the Egyptians rejected him altogether. Various esoterical explanations were given of the myth, and the name not found as a king was recognized as that of the tomb of Osiris. Busiris is here probably an earlier and less accurate Graecism than Osiris for the name of the Egyptian god Usiri, like Bubastis, Buto, for the goddesses Ubasti and Uto. Busiris, Bubastis, Buto, more strictly represent Pusiri, Pubasti, Puto, cities sacred to these divinities. All three were situated in the Delta, and would be amongst the first known to the Greeks. All shrines of Osiris were called *P-usiri*, but the principal city of the name was in the centre of the Delta, capital of the 9th (Busirite) nome of Lower Egypt; another one near Memphis (now Abusir) may have helped the formation of the legend in that quarter. The name Busiris in this legend may have been caught up merely at random by the early Greeks, or they may have vaguely connected their legend with the Egyptian myth of the slaying of Osiris (as king of Egypt) by his mighty brother Seth, who was in certain aspects a patron of foreigners. Phrasius, Chalbes and Epaphus (for the grandfather of Busiris) are all explicable as Graecized Egyptian names, but other names in the legend are purely Greek. The sacrifice of foreign prisoners before a god, a regular scene on temple walls, is perhaps only symbolical, at any rate for the later days of Egyptian history, but foreign intruders must often have suffered rude treatment at the hands of the Egyptians, in spite of the generally mild character of the latter.

[v.04 p.0874]

See H. v. Gartringen, in Pauly-Wissowa, *Realencyclopadie*, for the evidence from the side of classical archaeology.

(F. LL. G.)

BUSK, GEORGE (1807-1886), British surgeon, zoologist and palaeontologist, son of Robert Busk, merchant of St Petersburg, was born in that city on the 12th of August 1807. He studied surgery in London, at both St Thomas's and St Bartholomew's hospitals, and was an excellent operator. He was appointed assistant-surgeon to the Greenwich hospital in 1832, and served as naval surgeon first in the *Grampus*, and afterwards for many years in the *Dreadnought*; during this period he made important observations on cholera and on scurvy. In 1855 he retired from service and settled in London, where he devoted himself mainly to the study of zoology and palaeontology. As early as 1842 he had assisted in editing the *Microscopical Journal*; and later he edited the *Quarterly Journal of Microscopical Science* (1853-1868) and the *Natural History Review* (1861-1865). From 1856 to 1859 he was Hunterian professor of comparative anatomy and physiology in the Royal College of Surgeons, and he became president of the college in 1871. He was elected F.R.S. in 1850, and was an active member of the Linnean, Geological and other societies, and president of the Anthropological Institute (1873-1874); he received the Royal Society's Royal medal and the Geological Society's Wollaston and Lyell medals. Early in life he became the leading authority on the Polyzoa; and later the vertebrate remains from caverns and river-deposits occupied his attention. He was a patient and cautious investigator, full of knowledge, and unaffectedly simple in character. He died in London on the 10th of August 1886.

BUSKEN-HUET, CONRAD (1826-1886), Dutch literary critic, was born at the Hague on the 28th of December 1826. He was trained for the Church, and, after studying at Geneva and Lausanne, was appointed pastor of the Walloon chapel in Haarlem in 1851. In 1863 conscientious scruples obliged him to resign his charge, and Busken-Huet, after attempting journalism, went out to Java in 1868 as the editor of a newspaper. Before this time, however, he had begun his career as a polemical man of letters, although it was not until 1872 that he was made famous by the first series of his *Literary Fantasies*, a title under which he gradually gathered in successive volumes all that was most durable in his work as a critic. His one novel, *Lidewijde*, was written under strong French influences. Returning from the East Indies, Busken-Huet settled for the remainder of his life in Paris, where he died in April 1886. For the last quarter of a century he had been the acknowledged dictator in all questions of Dutch literary taste. Perfectly honest,

desirous to be sympathetic, widely read, and devoid of all sectarian obstinacy, Busken-Huet introduced into Holland the light and air of Europe. He made it his business to break down the narrow prejudices and the still narrower self-satisfaction of his countrymen, without endangering his influence by a mere effusion of paradox. He was a brilliant writer, who would have been admired in any language, but whose appearance in a literature so stiff and dead as that of Holland in the 'fifties was dazzling enough to produce a sort of awe and stupefaction. The posthumous correspondence of Busken-Huet has been published, and adds to our impression of the vitality and versatility of his mind.

(E. G.)

BUSKIN (a word of uncertain origin, existing in many European languages, as Fr. *brousequin*, Ital. *borzacchino*, Dutch *brozeken*, and Span, *borceguí*), a half-boot or high shoe strapped under the ankle, and protecting the shins; especially the thick-soled boot or *cothurnus* in the ancient Athenian tragedy, used to increase the stature of the actors, as opposed to the *soccus*, "sock," the light shoe of comedy. The term is thus often used figuratively of a tragic style.

BUSLAEV, FEDOR IVANOVICH (1818-1898), Russian author and philologist, was born on the 13th of April 1818 at Kerensk, where his father was secretary of the district tribunal. He was educated at Penza and Moscow University. At the end of his academical course, 1838, he accompanied the family of Count S.G. Strogonov on a tour through Italy, Germany and France, occupying himself principally with the study of classical antiquities. On his return he was appointed assistant professor of Russian literature at the university of Moscow. A study of Jacob Grimm's great dictionary had already directed the attention of the young professor to the historical development of the Russian language, and the fruit of his studies was the book *On the Teaching of the National Language* (Moscow, 1844 and 1867), which even now has its value. In 1848 he produced his work *On the Influence of Christianity on the Slavonic Language*, which, though subsequently superseded by Franz von Miklosich's *Christliche Terminologie*, is still one of the most striking dissertations on the development of the Slavonic languages. In this work Buslaev proves that long before the age of Cyril and Methodius the Slavonic languages had been subject to Christian influences. In 1855 he published *Palaeographical and Philological Materials for the History of the Slavonic Alphabets*, and in 1858 *Essay towards an Historical Grammar of the Russian Tongue*, which, despite some trivial defects, is still a standard work, abounding with rich material for students, carefully collected from an immense quantity of ancient records and monuments. In close connexion with this work in his *Historical Chrestomathy of the Church-Slavonic and Old Russian Tongues* (Moscow, 1861). Buslaev also interested himself in Russian popular poetry and old Russian art, and the result of his labours is enshrined in *Historical Sketches of Russian Popular Literature and Art* (St Petersburg, 1861), a very valuable collection of articles and monographs, in which the author shows himself a worthy and faithful disciple of Grimm. His *Popular Poetry* (St Petersburg, 1887) is a valuable supplement to the *Sketches*. In 1881 he was appointed professor of Russian literature at Moscow, and three years later published his *Annotated Apocalypse* with an atlas of 400 plates, illustrative of ancient Russian art.

See S.D. Sheremetev, *Memoir of F.I. Buslaev* (Moscow, 1899).

(R. N. B.)

BUSS, FRANCES MARY (1827-1894), English schoolmistress, was born in London in 1827, the daughter of the painter-etcher R.W. Buss, one of the original illustrators of *Pickwick*. She was educated at a school in Camden Town, and continued there as a teacher, but soon joined her mother in keeping a school in Kentish Town. In 1848 she was one of the original attendants at lectures at the new Queen's College for
[v.04 p.0875] Ladies. In 1830 her school was moved to Camden Street, and under its new name of the North London Collegiate School for Ladies it rapidly increased in numbers and reputation. In 1864 Miss Buss gave evidence before the Schools Inquiry Commission, and in its report her school was singled out for exceptional commendation. Indeed, under her influence, what was then pioneer work of the highest importance had been done to put the education of girls on a proper intellectual footing. Shortly afterwards the Brewers' Company and the Clothworkers' Company provided funds by which the existing North London Collegiate School was rehoused and a Camden School for Girls founded, and both were endowed under a new scheme, Miss Buss continuing to be principal of the former. She and Miss Beale of Cheltenham became famous as the chief leaders in this branch of the reformed educational movement; she played an active part in promoting the success of the Girls' Public Day School Company, encouraging the connexion of the girls' schools with the university standard by examinations, working for the establishment of women's colleges, and improving the training of teachers; and her energetic personality was a potent force among her pupils and colleagues. She died in London on the 24th of December 1894.

BUSSA, a town in the British protectorate of Northern Nigeria, on the west bank of the Niger, in 10° 9′ N., 4° 40′ E. It is situated just above the rapids which mark the limit of navigability of the Niger by steamer from the sea. Here in 1806 Mungo Park, in his second expedition to trace the course of the Niger, was attacked by the inhabitants, and drowned while endeavouring to escape. During 1894-1898 its possession was disputed by Great Britain and France, the last-named country acknowledging by the convention of June 1898 the British claim, which carried with it the control of the lower Niger. It is now the capital of northern Borgu (see NIGERIA, and BORGU).

BUSSACO (or BUSACO), **SERRA DE**, a mountain range on the frontiers of the Aveiro, Coimbra, and Vizeu districts of Portugal, formerly included in the province of Beira. The highest point in the range is the Ponta de Bussaco (1795 ft.), which commands a magnificent view over the Serra da Estrella, the Mondego valley and the Atlantic Ocean. Luso (pop. 1661), a village celebrated for its hot mineral springs, is the nearest railway station, on the Guarda-Figueira da Foz line, which skirts the northern slopes of the Serra. Towards the close of the 19th century the Serra de Bussaco became one of the regular halting-places for foreign, and especially for British, tourists, on the overland route between Lisbon and Oporto. Its hotel, built in the Manoellian style—a blend of Moorish and Gothic—encloses the buildings of a secularized Carmelite monastery, founded in 1268. The convent woods, now a royal domain, have long been famous for their cypress, plane, evergreen oak, cork and other forest trees, many of which have stood for centuries and attained an immense size. A bull of Pope Gregory XV. (1623), anathematizing trespassers and forbidding women to approach, is inscribed on a tablet at the main entrance; another bull, of Urban VIII. (1643), threatens with excommunication any person harming the trees. In 1873 a monument was erected, on the southern slopes of the Serra, to commemorate the battle of Bussaco, in which the French, under Marshal

Masséna, were defeated by the British and Portuguese, under Lord Wellington, on the 27th of September 1810.

BUSSY, ROGER DE RABUTIN, Comte de (1618-1693), commonly known as Bussy-Rabutin, French memoir-writer, was born on the 13th of April 1618 at Epiry, near Autun. He represented a family of distinction in Burgundy (see Sévigné, Madame de), and his father, Léonor de Rabutin, was lieutenant-general of the province of Nivernais. Roger was the third son, but by the death of his elder brothers became the representative of the family. He entered the army when he was only sixteen and fought through several campaigns, succeeding his father in the office of *mestre de camp*. He tells us himself that his two ambitions were to become "honnête homme" and to distinguish himself in arms, but the luck was against him. In 1641 he was sent to the Bastille by Richelieu for some months as a punishment for neglect of his duties in his pursuit of gallantry. In 1643 he married a cousin, Gabrielle de Toulongeon, and for a short time he left the army. But in 1645 he succeeded to his father's position in the Nivernais, and served under Condé in Catalonia. His wife died in 1646, and he became more notorious than ever by an attempt to abduct Madame de Miramion, a rich widow. This affair was with some difficulty settled by a considerable payment on Bussy's part, and he afterwards married Louise de Rouville. When Condé joined the party of the Fronde, Bussy joined him, but a fancied slight on the part of the prince finally decided him for the royal side. He fought with some distinction both in the civil war and on foreign service, and buying the commission of *mestre de camp* in 1655, he went to serve under Turenne in Flanders. He served there for several campaigns and distinguished himself at the battle of the Dunes and elsewhere; but he did not get on well with his general, and his quarrelsome disposition, his overweening vanity and his habit of composing libellous *chansons* made him eventually the enemy of most persons of position both in the army and at court. In the year 1659 he fell into disgrace for having taken part in an orgy at Roissy near Paris during Holy Week, which caused great scandal. Bussy was ordered to retire to his estates, and beguiled his enforced leisure by composing, for the amusement of his mistress, Madame de Montglas, his famous *Histoire amoureuse des Gaules*. This book, a series of sketches of the intrigues of the chief ladies of the court, witty enough, but still more ill-natured, circulated freely in manuscript, and had numerous spurious sequels. It was said that Bussy had not spared the reputation of Madame, and the king, angry at the report, was not appeased when Bussy sent him a copy of the book to disprove the scandal. He was sent to the Bastille on the 17th of April 1665, where he remained for more than a year, and he was only liberated on condition of retiring to his estates, where he lived in exile for seventeen years. Bussy felt the disgrace keenly, but still bitterer was the enforced close of his military career. In 1682 he was allowed to revisit the court, but the coldness of his reception there made his provincial exile seem preferable, and he returned to Burgundy, where he died on the 9th of April 1693.

The *Histoire amoureuse* is in its most striking passages adapted from Petronius, and, except in a few portraits, its attractions are chiefly those of the scandalous chronicle. But his *Mémoires*, published after his death, are extremely lively and characteristic, and have all the charm of a historical romance of the adventurous type. His voluminous correspondence yields in variety and interest to few collections of the kind, except that of Madame de Sévigné, who indeed is represented in it to a great extent, and whose letters first appeared in it. The literary and historical student, therefore, owes Bussy some thanks.

The best edition of the *Histoire amoureuse des Gaules* is that of Paul Boiteau in the Bibliothèque Elzévirienne (3 vols., Paris, 1856-1859). The *Mémoires* (2 vols., 1857) and *Correspondance* (6 vols., 1858-1859) were edited by Ludovic Lalanne. Bussy wrote other things, of which the most important, his *Genealogy of the Rabutin Family*, remained in MS. till 1867, while his *Considérations sur la guerre* was first published in Dresden in 1746. He also wrote, for the use of his children, a series of biographies, in which his own life serves a moral purpose.

BUSTARD (corrupted from the Lat. *Avis tarda*, though the application of the epithet[1] is not easily understood), the largest British land-fowl, and the *Otis tarda* of Linnaeus, which formerly frequented the champaign parts of Great Britain from East Lothian to Dorsetshire, but of which the native race is now extirpated. Its existence in the northern locality just named rests upon Sir Robert Sibbald's authority (*circa* 1684), and though Hector Boethius (1526) unmistakably described it as an inhabitant of the Merse, no later writer than the former has adduced any evidence in favour of its Scottish domicile. The last examples of the native race were probably two killed in 1838 near Swaffham, in Norfolk, a district in which for some years previously a few hen-birds of the species, the remnant of a plentiful stock, had maintained their existence, though no cock-bird had latterly been known to bear them company. In Suffolk, where the
[v.04 p.0876] neighbourhood of Icklingham formed its chief haunt, an end came to the race in 1832; on the wolds of Yorkshire about 1826, or perhaps a little later; and on those of Lincolnshire about the same time. Of Wiltshire, George Montagu, author of an *Ornithological Dictionary*, writing in 1813, says that none had been seen in their favourite haunts on Salisbury Plain for the last two or three years. In Dorsetshire there is no evidence of an indigenous example having occurred since that date, nor in Hampshire nor Sussex since the opening of the 19th century. From other English counties, as Cambridgeshire, Hertfordshire and Berkshire, it disappeared without note being taken of the event, and the direct cause or causes of its extermination can only be inferred from what, on testimony cited by Henry Stevenson (*Birds of Norfolk*, ii. pp. 1-42), is known to have led to the same result in Norfolk and Suffolk. In the latter the extension of plantations rendered the country unfitted for a bird whose shy nature could not brook the growth of covert that might shelter a foe, and in the former the introduction of improved agricultural implements, notably the corn-drill and the horse-hoe, led to the discovery and generally the destruction of every nest, for the bird's chosen breeding-place was in wide fields—"brecks," as they are locally called—of winter-corn. Since the extirpation of the native race the bustard is known to Great Britain only by occasional wanderers, straying most likely from the open country of Champagne or Saxony, and occurring in one part or another of the United Kingdom some two or three times every three or four years, and chiefly in midwinter.

An adult male will measure nearly 4 ft. from the tip of the bill to the end of the tail, and its wings have an expanse of 8 ft. or more,—its weight varying (possibly through age) from 22 to 32 lb. This last was that of one which was recorded by the younger Naumann, the best biographer of the bird (*Vögel Deutschlands*, vii. p. 12), who, however, stated in 1834 that he was assured of the former existence of examples which had attained the weight of 35 or 38 lb. The female is considerably smaller. Compared with most other birds frequenting open places, the bustard has disproportionately short legs, yet the bulk of its body renders it a conspicuous and stately object, and when on the wing, to which it readily takes, its flight is powerful and sustained. The bill is of moderate length, but, owing to the exceedingly flat head of the bird,

appears longer than it really is. The neck, especially of the male in the breeding-season, is thick, and the tail, in the same sex at that time of year, is generally carried in an upright position, being, however, in the paroxysms of courtship turned forwards, while the head and neck are simultaneously reverted along the back, the wings are lowered, and their shorter feathers erected. In this posture, which has been admirably portrayed by Joseph Wolf (*Zool. Sketches*, pl. 45), the bird presents a very strange appearance, for the tail, head and neck are almost buried amid the upstanding feathers before named, and the breast is protruded to a remarkable extent. The bustard is of a pale grey on the neck and white beneath, but the back is beautifully barred with russet and black, while in the male a band of deep tawny-brown—in some examples approaching a claret-colour—descends from either shoulder and forms a broad gorget on the breast. The secondaries and greater wing-coverts are white, contrasting vividly, as the bird flies, with the black primaries. Both sexes have the ear-coverts somewhat elongated—whence doubtless is derived the name *Otis* (Gr. ὠτίς)—and the male is adorned with a tuft of long, white, bristly plumes, springing from each side of the base of the mandible. The food of the bustard consists of almost any of the plants natural to the open country it loves, but in winter it will readily forage on those which are grown by man, and especially coleseed and similar green crops. To this vegetable diet much animal matter is added when occasion offers, and from an earthworm to a field-mouse little that lives and moves seems to come amiss to its appetite.

Though not many birds have had more written about them than the bustard, much is unsettled with regard to its economy. A moot point, which will most likely always remain undecided, is whether the British race was migratory or not, though that such is the habit of the species in most parts of the European continent is beyond dispute. Equally uncertain as yet is the question whether it is polygamous or not—the evidence being perhaps in favour of its having that nature. But one of the most singular properties of the bird is the presence in some of the fully-grown males of a pouch or gular sac, opening under the tongue. This extraordinary feature, first discovered by James Douglas, a Scottish physician, and made known by Eleazar Albin in 1740, though its existence was hinted by Sir Thomas Browne sixty years before, if not by the emperor Frederick II, has been found wanting in examples that, from the exhibition of all the outward marks of virility, were believed to be thoroughly mature; and as to its function and mode of development judgment had best be suspended, with the understanding that the old supposition of its serving as a receptacle whence the bird might supply itself or its companions with water in dry places must be deemed to be wholly untenable. The structure of this pouch—the existence of which in some examples has been well established—is, however, variable; and though there is reason to believe that in one form or another it is more or less common to several exotic species of the family *Otididae*, it would seem to be as inconstant in its occurrence as in its capacity. As might be expected, this remarkable feature has attracted a good deal of attention (*Journ. für Ornith.*, 1861, p. 153; *Ibis*, 1862, p. 107; 1865, p. 143; *Proc. Zool. Soc.*, 1865, p. 747; 1868, p. 741; 1869, p. 140; 1874, p. 471), and the later researches of A.H. Garrod show that in an example of the Australian bustard (*Otis australis*) examined by him there was, instead of a pouch or sac, simply a highly dilated oesophagus—the distension of which, at the bird's will, produced much the same appearance and effect as that of the undoubted sac found at times in the *O. tarda*.

The distribution of the bustards is confined to the Old World—the bird so called in the fur-countries of North America, and thus giving its name to a lake, river and cape, being the Canada goose (*Bernicla canadensis*). In the Palaearctic region we have the *O. tarda* already mentioned, extending from Spain to Mesopotamia at least, and from Scania to Morocco, as well as a smaller species, *O. tetrax*, which often occurs as a straggler in, but was never an inhabitant of, the British Islands. Two species, known indifferently by the name of houbara (derived from the Arabic), frequent the more southern portions of the region, and one of them, *O. macqueeni*, though having the more eastern range and reaching India, has several times occurred in north-western Europe, and once even in England. In the east of Siberia the place of *O. tarda* is taken by the nearly-allied, but apparently distinct, *O. dybovskii*, which would seem to occur also in northern China. Africa is the chief stronghold of the family, nearly a score of well-marked species being peculiar to that continent, all of which have been by later systematists separated from the genus *Otis*. India, too, has three peculiar species, the smaller of which are there known as floricans, and, like some of their African and one of their European cousins, are remarkable for the ornamental plumage they assume at the breeding-season. Neither in Madagascar nor in the Malay Archipelago is there any form of this family, but Australia possesses one large species already named. From Xenophon's days (*Anab.* i. 5) to our own the flesh of bustards has been esteemed as of the highest flavour. The bustard has long been protected by the game-laws in Great Britain, but, as will have been seen, to little purpose. A few attempts have been made to reinstate it as a denizen of this country, but none on any scale that would ensure success. Many of the older authors considered the bustards allied to the ostrich, a most mistaken view, their affinity pointing apparently towards the cranes in one direction and the plovers in another.

(A. N.)

[1] It may be open to doubt whether *tarda* is here an adjective. Several of the medieval naturalists used it as a substantive.

BUSTO ARSIZIO, a town of Lombardy, Italy, in the province of Milan, 21 m. N.W. by rail from the town of Milan. Pop. (1901) 19,673. It contains a fine domed church, S. Maria di Piazza, built in 1517 after the designs of Bramante: the picture over the high altar is one of Gaudenzio Ferrari's best works. The church of S. Giovanni Battista is a good baroque edifice of 1617; by it stands a fine 13th-century campanile. Busto Arsizio is an active manufacturing town, the cotton factories being especially important. It is a railway junction for Novara and Seregno.

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BUTADES, of Sicyon, wrongly called Dibutades, the first Greek modeller in clay. The story is that his daughter, smitten with love for a youth at Corinth where they lived, drew upon the wall the outline of his shadow, and that upon this outline her father modelled a face of the youth in clay, and baked the model along with the clay tiles which it was his trade to make. This model was preserved in Corinth till Mummius sacked that town. This incident led Butades to ornament the ends of roof-tiles with human faces, a practice which is attested by numerous existing examples. He is also said to have invented a mixture of clay and ruddle, or to have introduced the use of a special kind of red clay (Pliny, *Nat. Hist.* xxxv. 12[43]). The period at which he flourished is unknown, but has been put at about 600 B.C.

BUTCHER, one who slaughters animals, and dresses and prepares the carcass for purposes of food. The word also is applied to one who combines this trade with that of selling the meat, and to one who only sells

the meat. The O.Fr. *bochier* or *bouchier*, modern *boucher*, from which "butcher" is derived, meant originally a killer of goats and a seller of goats' flesh, from the O.Fr. *boc*, a he-goat; cf. Ital. *beccaio*, from *becco*, a goat.

BUTE, JOHN STUART, 3RD EARL OF (1713-1792), English prime minister, son of James, 2nd earl, and of Lady Jane Campbell, daughter of the 1st duke of Argyll, was born on the 25th of May 1713; he was educated at Eton and succeeded to the earldom (in the peerage of Scotland; created for his grandfather Sir James Stuart in 1703) on his father's death in 1723. He was elected a representative peer for Scotland in 1737 but not in the following parliaments, and appears not to have spoken in debate. In 1738 he was made a knight of the Thistle, and for several years lived in retirement in Bute, engaged in agricultural and botanical pursuits. From the quiet obscurity for which his talents and character entirely fitted him Bute was forced by a mere accident. He had resided in England since the rebellion of 1745, and in 1747, a downpour of rain having prevented the departure of Frederick, prince of Wales, from the Egham races, Bute was summoned to his tent to make up a whist party; he immediately gained the favour of the prince and princess, became the leading personage at their court, and in 1750 was appointed by Frederick a lord of his bedchamber. After the latter's death in 1751 his influence in the household increased. To his close intimacy with the princess a guilty character was commonly assigned by contemporary opinion, and their relations formed the subject of numerous popular lampoons, but the scandal was never founded on anything but conjecture and the malice of faction. With the young prince, the future king, Bute's intimacy was equally marked; he became his constant companion and confidant, and used his influence to inspire him with animosity against the Whigs and with the high notions of the sovereign's powers and duties found in Bolingbroke's *Patriot King* and Blackstone's *Commentaries*. In 1775 he took part in the negotiations between Leicester House and Pitt, directed against the duke of Newcastle, and in 1757 in the conferences between the two ministers which led to their taking office together. In 1756, by the special desire of the young prince, he was appointed groom of the stole at Leicester House, in spite of the king's pronounced aversion to him.

On the accession of George III. in 1760, Bute became at once a person of power and importance. He was appointed a privy councillor, groom of the stole and first gentleman of the bedchamber, and though merely an irresponsible confidant, without a seat in parliament or in the cabinet, he was in reality prime minister, and the only person trusted with the king's wishes and confidence. George III. and Bute immediately proceeded to accomplish their long-projected plans, the conclusion of the peace with France, the break-up of the Whig monopoly of power, and the supremacy of the monarchy over parliament and parties. Their policy was carried out with consummate skill and caution. Great care was shown not to alienate the Whig leaders in a body, which would have raised up under Pitt's leadership a formidable party of resistance, but advantage was taken of disagreements between the ministers concerning the war, of personal jealousies, and of the strong reluctance of the old statesmen who had served the crown for generations to identify themselves with active opposition to the king's wishes. They were all discarded singly, and isolated, after violent disagreements, from the rest of the ministers. On the 25th of March 1761 Bute succeeded Lord Holderness as secretary of state for the northern department, and Pitt resigned in October on the refusal of the government to declare war against Spain.

On the 3rd of November Bute appeared in his new capacity as prime minister in the House of Lords, where he had not been seen for twenty years. Though he had succeeded in disarming all organized opposition in parliament, the hostility displayed against him in the nation, arising from his Scottish nationality, his character as favourite, his peace policy and the resignation of the popular hero Pitt, was overwhelming. He was the object of numerous attacks and lampoons. He dared not show himself in the streets without the protection of prize-fighters, while the jack-boot (a pun upon his name) and the petticoat, by which the princess was represented, were continually being burnt by the mob or hanged upon the gallows. On the 9th of November, while proceeding to the Guildhall, he narrowly escaped falling into the hands of the populace, who smashed his coach, and he was treated with studied coldness at the banquet. In January 1762 Bute was compelled to declare war against Spain, though now without the advantages which the earlier decision urged by Pitt could have secured, and he supported the war, but with no zeal and no definite aim beyond the obtaining of a peace at any price and as soon as possible. In May he succeeded the duke of Newcastle as first lord of the treasury, and he was created K.G. after resigning the order of the Thistle. In his blind eagerness for peace he conducted on his own responsibility secret negotiations for peace with France through Viri, the Sardinian minister, and the preliminary treaty was signed on the 3rd of November at Fontainebleau. The king of Prussia had some reason to complain of the sudden desertion of his ally, but there is no evidence whatever to substantiate his accusation that Bute had endeavoured to divert the tsar later from his alliance with Prussia, or that he had treacherously in his negotiations with Vienna held out to that court hopes of territorial compensation in Silesia as the price of the abandonment of France; while the charge brought against Bute in 1765 of having taken bribes to conclude the peace, subsequently after investigation pronounced frivolous by parliament, may safely be ignored. A parliamentary majority was now secured for the minister's policy by bribery and threats, and with the aid of Henry Fox, who deserted his party to become leader of the Commons. The definitive peace of Paris was signed on the 10th of February 1763, and a wholesale proscription of the Whigs was begun, the most insignificant adherents of the fallen party, including widows, menial servants and schoolboys, incurring the minister's mean vengeance. Later, Bute roused further hostility by his cider tax, an ill-advised measure producing only £75,000 a year, imposing special burdens upon the farmers and landed interest in the cider counties, and extremely unpopular because extending the detested system of taxation by excise, regarded as an infringement of the popular liberties. At length, unable to contend any longer against the general and inveterate animosity displayed against him, fearing for the consequences to the monarchy, alarmed at the virulent attacks of the *North Briton*, and suffering from ill-health, Bute resigned office on the 8th of April. "Fifty pounds a year," he declared, "and bread and water were luxury compared with what I suffer." He had, however, before retiring achieved the objects for which he had been entrusted with power.

He still for a short time retained influence with the king, and intended to employ George Grenville (whom he recommended as his successor) as his agent; but the latter insisted on possessing the king's whole confidence, and on the failure of Bute in August 1763 to procure his dismissal and to substitute a ministry led by Pitt and the duke of Bedford, Grenville demanded and obtained Bute's withdrawal from the court. He resigned accordingly the office of privy purse, and took leave of George III. on the 28th of September. He still corresponded with the king, and returned again to London next year, but in May 1765, after the duke of Cumberland's failure to form an administration, Grenville exacted the promise from the king,

which appears to have been kept faithfully, that Bute should have no share and should give no advice whatever in public business, and obtained the dismissal of Bute's brother from his post of lord privy seal in Scotland. Bute continued to visit the princess of Wales, but on the king's arrival always retired by a back staircase.

The remainder of Bute's life has little public interest. He spoke against the government on the American question in February 1766, and in March against the repeal of the Stamp Act. In 1768 and 1774 he was again elected a representative peer for Scotland, but took no further part in politics, and in 1778 refused to have anything to do with the abortive attempt to effect an alliance between himself and Chatham. He travelled in Italy, complained of the malice of his opponents and of the ingratitude of the king, and determined "to retire from the world before it retires from me." He died on the 10th of March 1792 and was buried at Rothesay in Bute.

Though one of the worst of ministers, Bute was by no means the worst of men or the despicable and detestable person represented by the popular imagination. His abilities were inconsiderable, his character weak, and he was qualified neither for the ordinary administration, of public business nor for the higher sphere of statesmanship, and was entirely destitute of that experience which sometimes fills the place of natural aptitude. His short administration was one of the most disgraceful and incompetent in English history, originating in an accident, supported only by the will of the sovereign, by gross corruption and intimidation, the precursor of the disintegration of political life and of a whole series of national disasters. Yet Bute had good principles and intentions, was inspired by feelings of sincere affection and loyalty for his sovereign, and his character remains untarnished by the grosser accusations raised by faction. In the circle of his family and intimate friends, away from the great world in which he made so poor a figure, he was greatly esteemed. Samuel Johnson, Lord Mansfield, Lady Hervey, Bishop Warburton join in his praise. For the former, a strong opponent of his administration, he procured a pension of £300 a year. He was exceptionally well read, with a refined taste for books and art, and purchased the famous *Thomason Tracts* now in the British Museum. He was learned in the science of botany, and formed a magnificent collection and a botanic garden at Luton Hoo, where Robert Adam built for him a splendid residence. He engraved privately about 1785 at enormous expense *Botanical Tables containing the Different Familys of British Plants*, while *The Tabular Distribution of British Plants* (1787) is also attributed to him. Bute filled the offices of ranger of Richmond Forest, governor of the Charterhouse, chancellor of Marischal College, Aberdeen (1761), trustee of the British Museum (1765), president of the Society of Antiquaries of Scotland (1780) and commissioner of Chelsea hospital.

By his marriage with Mary, daughter of Edward Wortley Montagu of Wortley, Yorkshire, who in 1761 was created Baroness Mount Stuart of Wortley, and through whom he became possessed of the enormous Wortley property, he had, besides six daughters, five sons, the eldest of whom, John, Lord Cardiff (1744-1814), succeeded him as 4th earl and was created a marquess in 1796. John, Lord Mount Stuart (1767-1794), the son and heir of the 1st marquess, died before his father, and consequently in 1814 the Bute titles and estates came to his son John (1793-1848) as 2nd marquess. The latter was succeeded by his only son John Patrick (1847-1900), whose son John (b. 1881) inherited the title in 1900.

BUTE, the most important, though not the largest, of the islands constituting the county of the same name, in the Firth of Clyde, Scotland, about 18 m. S.W. of Greenock and 40 m., by water, from Glasgow. It is bounded on the N. and W. by the lovely Kyles of Bute, the narrow winding strait which separates it from Argyllshire, on the E. by the Firth of Clyde, and on the S. and S.W. by the Sound of Bute, about 6 m. wide, which divides it from Arran. Its area is about 49 sq. m., or 31,161 acres. It lies in a N.W. to S.E. direction, and its greatest length from Buttock Point on the Kyles to Garroch Head on the Firth of Clyde is 15½ m. Owing to indentations its width varies from 1⅓ m. to 4½ m. There are piers at Kilchattan, Craigmore, Port Bannatyne and Rothesay, but Rothesay is practically the harbour for the whole island. Here there is regular communication by railway steamers from Craigendoran, Prince's Pier (Greenock), Gourock and Wemyss Bay, and by frequent vessels from the Broomielaw Bridge in Glasgow and other points on the Clyde. Pop. (1891) 11,735; (1901) 12,162.

The principal hills are in the north, where the chief are Kames Hill (911 ft.) and Kilbride Hill (836 ft.). The streams are mostly burns, and there are six lochs. Loch Fad, about 1 m. S. of Rothesay, 2½ m. long by ⅓ m. wide, was the source of the power used in the Rothesay cotton-spinning mill, which was the first establishment of the kind erected in Scotland. In 1827 on its western shore Edmund Kean built a cottage afterwards occupied by Sheridan Knowles. It now belongs to the marquess of Bute. From Loch Ascog, fully 1 m. long, Rothesay derives its water supply. The other lakes are Loch Quien, Loch Greenan, Dhu Loch and Loch Bull. Glen More in the north and Glen Callum in the south are the only glens of any size. The climate is mild and healthful, fuchsias and other plants flowering even in winter, and neither snow nor frost being of long continuance, and less rain falling than in many parts of the western coast. Some two-thirds of the area, mostly in the centre and south, are arable, yielding excellent crops of potatoes for the Glasgow market, oats and turnips; the rest consists of hill pastures and plantations. The fisheries are of considerable value. There is no lack of sandstone, slate and whinstone. Some coal exists, but it is of inferior quality and doubtful quantity. At Kilchattan a superior clay for bricks and tiles is found, and grey granite susceptible of high polish.

The island is divided geologically into two areas by a fault running from Rothesay Bay in a south-south-west direction by Loch Fad to Scalpsie Bay, which, throughout its course, coincides with a well-marked depression. The tract lying to the north-west of this dislocation is composed of the metamorphic rocks of the Eastern Highlands. The Dunoon phyllites form a narrow belt about a mile and a half broad crossing the island between Kames Bay and Etterick Bay, while the area to the north is occupied by grits and schists which may be the western prolongations of the Beinn Bheula group. Near Rothesay and along the hill slopes west of Loch Fad there are parallel strips of grits and phyllites. That part of the island lying to the east of this dislocation consists chiefly of Upper Old Red Sandstone strata, dipping generally in a westerly or south-westerly direction. At the extreme south end, between Kilchattan and Garroch Head, these conglomerates and sandstones are overlaid by a thick cornstone or dolomitic limestone marking the upper limit of the formation, which is surmounted by the cement-stones and contemporaneous lavas of Lower Carboniferous age. The bedded volcanic rocks which form a series of ridges trending north-west comprise porphyritic basalts, andesite, and, near Port Luchdach, brownish trachyte. Near the base of the volcanic series intrusive igneous rocks of Carboniferous age appear in the form of sills and bosses, as, for instance, the oval mass of olivine-basalt on Suidhe Hill. Remnants of raised beaches are conspicuous in Bute. One of

the well-known localities for arctic shelly clays occurs at Kilchattan brick-works, where the dark red clay rests on tough boulder-clay and may be regarded as of late glacial age.

As to the origin of the name of Bute, there is some doubt. It has been held to come from *both* (Irish for "a cell"), in allusion to the cell which St Brendan erected in the island in the 6th century; others contend that it is derived from the British words *ey budh* (Gaelic, *ey bhiod*), "the island of corn" (*i.e.* food), in reference to its fertility, notable in contrast with the barrenness of the Western Isles and Highlands. Bute was probably first colonized by the vanguard of Scots who came over from Ireland, and at intervals the Norsemen also secured a footing for longer or shorter periods. In those days the Butemen were also called Brandanes, after the Saint. Attesting the antiquity of the island, "Druidical" monuments, barrows, cairns and cists are numerous, as well as the remains of ancient chapels. In virtue of a charter granted by James IV. in 1506, the numerous small proprietors took the title of "baron," which became hereditary in their families. Now the title is practically extinct, the lands conferring it having with very few exceptions passed
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by purchase into the possession of the marquess of Bute, the proprietor of nearly the whole island. His seat, Mount Stuart, about 4½ m. from Rothesay by the shore road, is finely situated on the eastern coast. Port Bannatyne (pop. 1165), 2 m. north by west of Rothesay, is a flourishing watering-place, named after Lord Bannatyne (1743-1833), a judge of the court of session, one of the founders of the Highland and Agricultural Society in 1784. Near to it is Kames Castle, where John Sterling, famous for Carlyle's biography, was born in 1806. Kilchattan, in the south-east of the island, is a favourite summer resort. Another object of interest is St Blane's Chapel, picturesquely situated about ½ m. from Dunagoil Bay. Off the western shore of Bute, ¾ m. from St Ninian's Point, lies the island of Inchmarnock, 2 m. in length and about ¾ m. in width.

See J. Wilson, *Account of Rothesay and Bute* (Rothesay, 1848); and J.K. Hewison, *History of Bute* (1894-1895).

BUTE, or Buteshire, an insular county in the S.W. of Scotland, consisting of the islands of Bute, from which the county takes its name, Inchmarnock, Great Cumbrae, Little Cumbrae, Arran, Holy Island and Pladda, all lying in the Firth of Clyde, between Ayrshire on the E. and Argyllshire on the W. and N. The area of the county is 140,307 acres, or rather more than 219 sq. m. Pop. (1891) 18,404; (1901) 18,787 (or 86 to the sq. m.). In 1901 the number of persons who spoke Gaelic alone was 20, of those speaking Gaelic and English 2764. Before the Reform Bill of 1832, Buteshire, alternately with Caithness-shire, sent one member to parliament—Rothesay at the same time sharing a representative with Ayr, Campbeltown, Inveraray and Irvine. Rothesay was then merged in the county, which since then has had a member to itself. Buteshire and Renfrewshire form one sheriffdom, with a sheriff-substitute resident in Rothesay who also sits periodically at Brodick and Millport. The circuit courts are held at Inveraray. The county is under school-board jurisdiction, and there is a secondary school at Rothesay. The county council subsidizes technical education in agriculture at Glasgow and Kilmarnock. The staple crops are oats and potatoes, and cattle, sheep and horses are reared. Seed-growing is an extensive industry, and the fisheries are considerable. The Rothesay fishery district includes all the creeks in Buteshire and a few in Argyll and Dumbarton shires, the Cumbraes being grouped with the Greenock district. The herring fishery begins in June, and white fishing is followed at one or other point all the year round. During the season many of the fishermen are employed on the Clyde yachts, Rothesay being a prominent yachting centre. The exports comprise agricultural produce and fish, trade being actively carried on between the county ports of Rothesay, Millport, Brodick and Lamlash and the mainland ports of Glasgow, Greenock, Gourock, Ardrossan and Wemyss Bay, with all of which there is regular steamer communication throughout the year.

BUTHROTUM. (1) An ancient seaport of Illyria, corresponding with the modern Butrinto (*q.v.*). (2) A town in Attica, mentioned by Pliny the Elder (*Nat. Hist.* iv. 37).

BUTLER, the name of a family famous in the history of Ireland. The great house of the Butlers, alone among the families of the conquerors, rivalled the Geraldines, their neighbours, kinsfolk and mortal foes. Theobald Walter, their ancestor, was not among the first of the invaders. He was the grandson of one Hervey Walter who, in the time of Henry I., held Witheton or Weeton in Amounderness, a small fee of the honour of Lancaster, the manor of Newton in Suffolk, and certain lands in Norfolk. In the great inquest of Lancaster lands that followed a writ of 1212, this Hervey, named as the father of Hervey Walter, is said to have given lands in his fee of Weeton to Orm, son of Magnus, with his daughter Alice in marriage. Hervey Walter, son of this Hervey, advanced his family by matching with Maude, daughter of Theobald de Valognes, lord of Parham, whose sister Bertha was wife of Ranulf de Glanville, the great justiciar, "the eye of the king." When Ranulf had founded the Austin Canons priory of Butley, Hervey Walter, his wife's brother-in-law, gave to the house lands in Wingfield for the soul's health of himself and his wife Maude, of Ranulf de Glanville and Bertha his wife, the charter, still preserved in the Harleian collection, being witnessed by Hervey's younger sons, Hubert Walter, Roger and Hamon. Another son, Bartholomew, witnessed a charter of his brother Hubert, 1190-1193. That these nephews of the justiciar profited early by their kinship is seen in Hubert Walter's foundation charter of the abbey of West Dereham, wherein he speaks of "dominus Ranulphus de Glanvilla et domina Bertha uxor eius, qui nos nutrierunt." Hubert, indeed, becoming one of his uncle's clerks, was so much in his confidence that Gervase of Canterbury speaks of the two as ruling the kingdom together. King Richard, whom he accompanied to the Holy Land, made him bishop of Salisbury and (1193) archbishop of Canterbury. "Wary of counsel, subtle of wit," he was the champion of Canterbury and of England, and the news of his death drew the cry from King John that "now, for the first time, am I king in truth."

Between these two great statesmen Theobald Walter, the eldest brother of the archbishop, rose and flourished. Theobald is found in the *Liber Niger* (*c.* 1166) as holding Amounderness by the service of one knight. In 1185 he went over sea to Waterford with John the king's son, the freight of the harness sent after him being charged in the Pipe Roll. Clad in that harness he led the men of Cork when Dermot MacCarthy, prince of Desmond, was put to the sword, John rewarding his services with lands in Limerick and with the important fief of Arklow in the vale of Avoca, where he made his Irish seat and founded an abbey. Returning to England he accompanied his uncle Randulf to France, both witnessing a charter delivered by the king at Chinon when near to death. Soon afterwards, Theobald Walter was given by John that hereditary office of butler to the lord of Ireland, which makes a surname for his descendants, styling himself *pincerna* when he attests John's charter to Dublin on the 15th of May 1192. J. Horace Round has pointed out that he also took a fresh seal, the inscription of which calls him Theobald Walter, Butler of

Ireland, and henceforward he is sometimes surnamed Butler (*le Botiller*). When John went abroad in 1192, Theobald was given the charge of Lancaster castle, but in 1194 he was forced to surrender to his brother Hubert, who summoned it in King Richard's name. Making his peace through Hubert's influence, he was sheriff of Lancashire for King Richard, who regranted to him all Amounderness. His fortunes turned with the king's death. The new sovereign, treating his surrender of the castle as treachery, took the shrievalty from him, disseised him of Amounderness and sold his cantreds of Limerick land to William de Braose. But the great archbishop soon found means to bring his brother back to favour, and on the 2nd of January 1201-2 Amounderness, by writ of the king, is to be restored to Theobald Walter, *dilecto et fideli nostra*, Within a year or two Theobald left England to end his days upon his Arklow fief, busying himself with religious foundations at Wotheney in Limerick, at Arklow and at Nenagh. At Wotheney he is said to have been buried shortly before the 12th of February 1205-6, when an entry in the Close Roll is concerned with his widow. This widow, Maude, daughter of Robert le Vavasor of Denton, was given up to her father, who, buying the right of marrying her at a price of 1200 marks and two palfreys, gave her to Fulk fitz-Warine. Theobald, the son and heir of Theobald and Maude, a child of six years old, was likewise taken into the keeping of his grandfather Robert, but letters from the king, dated the 2nd of March 1205-6, told Robert, "as he loved his body," to surrender the heir at once to Gilbert fitz-Reinfrid, the baron of Kendal.

Adding to its possessions by marriages the house advanced itself among the nobility of Ireland. On the 1st of September 1315, its chief, Edmund Walter *alias* Edmund the Butler, for services against the Scottish raiders and Ulster rebels, had a charter of the castle and manors of Carrick, Macgriffyn and Roscrea to hold to him and his heirs *sub nomine et honore comitis de Karryk*. This charter, however, while apparently creating an earldom, failed, as Mr Round has explained, to make his issue earls of Carrick. But James, the
[v.04 p.0880] son and heir of Edmund, having married in 1327 Eleanor de Bohun, daughter of Humfrey, earl of Hereford and Essex, high constable of England, by a daughter of Edward I., was created an Irish earl on the 2nd of November 1328, with the title of Ormonde.

From the early years of the 14th century the Ormonde earls, generation by generation, were called to the chief government of Ireland as lords-keeper, lords-lieutenant, deputies or lords-justices, and unlike their hereditary enemies the Geraldines they kept a tradition of loyalty to the English crown and to English custom. Their history is full of warring with the native Irish, and as the sun stood still upon Gibeon, even so, we are told, it rested over the red bog of Athy while James the White Earl was staying the wild O'Mores. More than one of the earls of Ormonde had the name of a scholar, while of the 6th earl, master of every European tongue and ambassador to many courts, Edward IV. is said to have declared that were good breeding and liberal qualities lost to the world they might be found again in John, earl of Ormonde. The earls were often absent from Ireland on errands of war or peace. James, the 5th earl, had the English earldom of Wiltshire given him in 1449 for his Lancastrian zeal. He fought at St Albans in 1455, casting his harness into a ditch as he fled the field, and he led a wing at Wakefield. His stall plate as a knight of the Garter is still in St George's chapel. Defeated with the earl of Pembroke at Mortimer's Cross and taken prisoner after Towton, his fate is uncertain, but rumour said that he was beheaded at Newcastle, and a letter addressed to John Paston about May 1461 sends tidings that "the Erle of Wylchir is hed is sette on London Brigge."

To his time belongs a document illustrating a curious tradition of the Butlers. His petition to parliament when he was conveying Buckinghamshire lands to the hospital of St Thomas of Acres in London, recites that he does so "in worship of that glorious martyr St Thomas, sometime archbishop of Canterbury, of whose blood the said earl of Wiltshire, his father and many of his ancestors are lineally descended." But the pedigrees in which genealogists have sought to make this descent definite will not bear investigation. The Wiltshire earldom died with him and the Irish earldom was for a time forfeited, his two brothers, John and Thomas, sharing his attainder. John was restored in blood by Edward IV.; and Thomas, the 7th earl, summoned to the English parliament in 1495 as Lord Rochford, a title taken from a Bohun manor in Essex, saw the statute of attainder annulled by Henry VII.'s first parliament. He died without male issue in 1515. Of his two daughters and co-heirs Anne was married to Sir James St. Leger, and Margaret to Sir William Boleyn of Blickling, by whom she was mother of Sir James and Sir Thomas Boleyn. The latter, the father of Anne Boleyn, was created earl of Wiltshire and Ormonde in 1529.

In Ireland the heir male of the Ormonde earls, Sir Piers Butler—"red Piers"—assumed the earldom of Ormonde in 1515 and seized upon the Irish estates. Being a good ally against the rebel Irish, the government temporized with his claim. He was an Irishman born, allied to the wild Irish chieftains by his mother, a daughter of the MacMorrogh Kavanagh; the earldom had been long in the male line; all Irish sentiment was against the feudal custom which would take it out of the family, and the two co-heirs were widows of English knights. In 1522, styled "Sir Piers Butler pretending himself to be earl of Ormonde," he was made chief governor of Ireland as lord deputy, and on the 23rd of February 1527/8, following an agreement with the co-heirs of the 7th earl, whereby the earldom of Ormonde was declared to be at the king's disposal, he was created earl of Ossory. But the Irish estates, declared forfeit to the crown in 1536 under the Act of Absentees, were granted to him as "earl of Ossory and Ormonde." Although the Boleyn earl of Ormonde and Wiltshire was still alive, there can be no doubt that Piers Butler had a patent of the Ormonde earldom about the 22nd of February 1537/8, from which date his successors must reckon their peerage. His son and heir, James the Lame, who had been created Viscount Thurles on the 2nd of January 1535/6, obtained an act of parliament in 1543/4 which, confirming the grant to his father of the earldom, gave him the old "pre-eminence" of the ancient earldom of 1328.

Earl James was poisoned at a supper in Ely House in 1546, and Thomas the Black Earl, his son and heir, was brought up at the English court, professing the reformed religion. His sympathies were with the Irish, although he stood staunchly for law and order, and for the great part of his life he was wrestling with rebellion. His lands having been harried by hit hereditary enemies the Desmond Geraldines, Elizabeth gave him his revenge by appointing him in 1580 military governor of Munster, with a commission to "banish and vanquish these cankered Desmonds," then in open rebellion. In three months, by his own account, he had put to the sword 46 captains, 800 notorious traitors and 4000 others, and, after four years' fighting, Gerald, earl of Desmond, a price on his head, was taken and killed. Dying in 1614 without lawful issue, Thomas was succeeded by his nephew Walter of Kilcash, who had fought beside him against the Burkes and O'Mores. But Sir Robert Preston, afterwards created earl of Desmond, claimed a great part of the Ormonde lands in right of his wife, the Black Earl's daughter and heir. In spite of the loyal services of Earl Walter, King James supported the claimant, and the earl, refusing to submit to a royal award, was thrown into gaol, where he lay for eight years in great poverty, his rents being cut off. Although liberated

in 1625 he was not acknowledged heir to his uncle's estates until 1630. His son, Viscount Thurles, being drowned on a passage to England, a grandson succeeded him.

This grandson, James Butler, is perhaps the most famous of the long line of Ormondes. By his marriage with his cousin Elizabeth Preston, the Ormonde titles were once more united with all the Ormonde estates. A loyal soldier and statesman, he commanded for the king in Ireland, where he was between the two fires of Catholic rebels and Protestant parliamentarians. In Ireland he stayed long enough to proclaim Charles II. in 1649, but defeated at Rathmines, his garrisons broken by Cromwell, he quitted the country at the end of 1650. At the Restoration he was appointed lord-lieutenant, his estates having been restored to him with the addition of the county palatine of Tipperary, taken by James I. from his grandfather. In 1632 he had been created a marquess. The English earldom of Brecknock was added in 1660 and an Irish dukedom of Ormonde in the following year. In 1682 he had a patent for an English dukedom with the same title. Buckingham's intrigues deprived him for seven years of his lord-lieutenancy, and a desperate attempt was made upon his life in 1670, when a company of ruffians dragged him from his coach in St James's Street and sought to hurry him to the gallows at Tyburn. His son's threat that, if harm befell his father he would pistol Buckingham, even if he were behind the king's chair, may have saved him from assassination. At the accession of James II. he was once more taken from active employment, and "Barzillai, crowned with honour and with years" died at his Dorsetshire house in 1688. He had seen his great-great-uncle the Black Earl, who was born in 1532, and a great-grandson was playing beside him a few hours before his death. His brave son Ossory, "the eldest hope with every grace adorned," died eight years before him, and he was succeeded by a grandson James, the second duke of Ormonde, who, a recognized leader of the London Jacobites, was attainted in 1715, his honours and estates being forfeited. The duke lived thirty years in exile, chiefly at Avignon, and died in the rebellion year of 1745 without surviving issue. His younger brother Charles, whom King William had created Lord Butler of Weston in the English peerage and earl of Arran in the Irish, was allowed to purchase the Ormonde estates. On the earl's death without issue in 1758 the estates were enjoyed by a sister, passing in 1760, by settlement of the earl of Arran, to John Butler of Kilcash, descendant of a younger brother of the first duke. John dying six years later was succeeded by Walter Butler, a first cousin, whose son John, heir-male of the line of Ormonde, became earl of Ormonde and Ossory and Viscount Thurles in 1791, the Irish parliament reversing the attainder of 1715. Walter, son and heir of the restored earl, was given an English peerage as Lord Butler of Llanthony (1801) and an Irish
[v.04 p.0881] marquessate of Ormonde (1816), titles that died with him. This Lord Ormonde in 1810 sold to the crown for the great sum of £216,000 his ancestral right to the prisage of wines in Ireland. For his brother and heir, created Lord Ormonde of Llahthony at the coronation of George IV., the Irish marquessate was revived in 1825 and descended in the direct line.

The earls of Carrick (Ireland 1748), Viscounts Ikerrin (Ireland 1629), claim descent from a brother of the first Ormonde earl, while the viscounts Mountgarret (Ireland 1550) spring from a younger son of Piers, the Red Earl of Ossory. The barony of Caher (Ireland 1543), created for Sir Thomas Butler of Chaier or Caher-down-Eske, a descendant in an illegitimate branch of the Butlers, fell into abeyance among heirs general on the death of the 2nd baron in 1560. It was again created, after the surrender of their rights by the heirs general, in 1583 for Sir Theobald Butler (d. 1596), and became extinct in 1858 on the death of Richard Butler, 13th baron and 2nd viscount Caher, and second earl of Glengall. Buttler von Clonebough, *genannt* Haimhausen, count of the Holy Roman Empire, descends from the 3rd earl of Ormonde, the imperial title having been revived in 1681 in memory of the services of a kinsman, Walter, Count Butler (d. 1634), the dragoon officer who carried out the murder of Wallenstein.

See Lancashire Inquests, 1205-1307; Lancashire and Cheshire Record Society, xlviii.; Chronicles of Matthew Paris, Roger of Hoveden, Giraldus Cambrensis, &c.; *Dictionary of National Biography*; G.E.C.'s *Complete Peerage*; Carte's Ormonde papers; Paston Letters; Rolls of parliament; fine rolls, liberate rolls, pipe rolls, &c.

(O. Ba.)

BUTLER, ALBAN (1710-1773), English Roman Catholic priest and hagiologist, was born in Northampton on the 24th of October 1710. He was educated at the English college, Douai, where on his ordination to the priesthood he held successively the chairs of philosophy and divinity. He laboured for some time as a missionary priest in Staffordshire, held several positions as tutor to young Roman Catholic noblemen, and was finally appointed president of the English seminary at St Omer, where he remained till his death on the 15th of May 1773. Butler's great work, *The Lives of the Saints*, the result of thirty years' study (4 vols., London, 1756-1759), has passed through many editions and translations (best edition, including valuable notes, Dublin, 12 vols. 1779-1780). It is a popular and compendious reproduction of the *Acta Sanctorum*, exhibiting great industry and research, and is in all respects the best work of its kind in English literature.

See *An Account of the Life of A.B. by C.B., i.e.* by his nephew Charles Butler (London, 1799); and Joseph Gillow's *Bibliographical Dictionary of English Catholics*, vol. i.

BUTLER, BENJAMIN FRANKLIN (1818-1893), American lawyer, soldier and politician, was born in Deerfield, New Hampshire, on the 5th of November 1818. He graduated at Waterville (now Colby) College in 1838, was admitted to the Massachusetts bar in 1840, began practice at Lowell, Massachusetts, and early attained distinction as a lawyer, particularly in criminal cases. Entering politics as a Democrat, he first attracted general attention by his violent campaign in Lowell in advocacy of the passage of a law establishing a ten-hour day for labourers; he was a member of the Massachusetts House of Representatives in 1853, and of the state senate in 1859, and was a delegate to the Democratic national conventions from 1848 to 1860. In that of 1860 at Charleston he advocated the nomination of Jefferson Davis and opposed Stephen A. Douglas, and in the ensuing campaign he supported Breckinridge.

After the Baltimore riot at the opening of the Civil War, Butler, as a brigadier-general in the state militia, was sent by Governor John A. Andrew, with a force of Massachusetts troops, to reopen communication between the Union states and the Federal capital. By his energetic and careful work Butler achieved his purpose without fighting, and he was soon afterwards made major-general, U.S.V. Whilst in command at Fortress Monroe, he declined to return to their owners fugitive slaves who had come within his lines, on the ground that, as labourers for fortifications, &c., they were contraband of war, thus originating the phrase "contraband" as applied to the negroes. In the conduct of tactical operations Butler was almost uniformly unsuccessful, and his first action at Big Bethel, Va., was a humiliating defeat for the National arms. Later in 1861 he commanded an expeditionary force, which, in conjunction with the navy, took Forts

Hatteras and Clark, N.C. In 1862 he commanded the force which occupied New Orleans. In the administration of that city he showed great firmness and severity. New Orleans was unusually healthy and orderly during the Butler régime. Many of his acts, however, gave great offence, particularly the seizure of $800,000 which had been deposited in the office of the Dutch consul, and an order, issued after some provocation, on May 15th, that if any woman should "insult or show contempt for any officer or soldier of the United States, she shall be regarded and shall be held liable to be treated as a woman of the town plying her avocation." This order provoked protests both in the North and the South, and also abroad, particularly in England and France, and it was doubtless the cause of his removal in December 1862. On the 1st of June he had executed one W.B. Mumford, who had torn down a United States flag placed by Farragut on the United States mint; and for this execution he was denounced (Dec. 1862) by President Davis as "a felon deserving capital punishment," who if captured should be reserved for execution. In the campaign of 1864 he was placed at the head of the Army of the James, which he commanded creditably in several battles. But his mismanagement of the expedition against Fort Fisher, N.C., led to his recall by General Grant in December.

He was a Republican representative in Congress from 1867 to 1879, except in 1875-1877. In Congress he was conspicuous as a Radical Republican in Reconstruction legislation, and was one of the managers selected by the House to conduct the impeachment, before the Senate, of President Johnson, opening the case and taking the most prominent part in it on his side; he exercised a marked influence over President Grant and was regarded as his spokesman in the House, and he was one of the foremost advocates of the payment in "greenbacks" of the government bonds. In 1871 he was a defeated candidate for governor of Massachusetts, and also in 1879 when he ran on the Democratic and Greenback tickets, but in 1882 he was elected by the Democrats who got no other state offices. In 1883 he was defeated on renomination. As presidential nominee of the Greenback and Anti-Monopolist parties, he polled 175,370 votes in 1884, when he had bitterly opposed the nomination by the Democratic party of Grover Cleveland, to defeat whom he tried to "throw" his own votes in Massachusetts and New York to the Republican candidate. His professional income as a lawyer was estimated at $100,000 per annum shortly before his death at Washington, D.C., on the 11th of January 1893. He was an able but erratic administrator and soldier, and a brilliant lawyer. As a politician he excited bitter opposition, and was charged, apparently with justice, with corruption and venality in conniving at and sharing the profits of illicit trade with the Confederates carried on by his brother at New Orleans and by his brother-in-law in the department of Virginia and North Carolina, while General Butler was in command.

See James Parton, *Butler in New Orleans* (New York, 1863), which, however, deals inadequately with the charges brought against Butler; and *The Autobiography and Personal Reminiscences of Major-General B.F. Butler: Butler's Book* (New York, 1893), to be used with caution as regards facts.

BUTLER, CHARLES (1750-1832), British lawyer and miscellaneous writer, was born in London on the 14th of August 1750. He was educated at Douai, and in 1775 entered at Lincoln's Inn. He had considerable practice as a conveyancer, and after the passing of the Roman Catholic Relief Act 1791 was called to the bar. In 1832 he took silk, and was made a bencher of Lincoln's Inn. He died on the 2nd of June in the same year. His literary activity was enormous, and the number of his published works comprises about fifty volumes. The most important of them are the *Reminiscences* (1821-1827); *Horae Biblicae* (1797), which has passed through several editions; *Horae Juridicae Subsecivae* (1804); *Book of the Roman Catholic Church* (1825), which was directed against Southey and excited some controversy; lives of Erasmus, Grotius, Bossuet, Fénelon. He also edited and completed the *Lives of the Saints* of his uncle, Alban Butler, Fearne's *Essay on Contingent Remainders* and Hargrave's edition of *Coke upon Littleton's Laws of England* (1775).

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A complete list of Butler's works is contained in Joseph Gillow's *Bibliographical Dictionary of English Catholics*, vol. i. pp. 357-364.

BUTLER, GEORGE (1774-1853), English schoolmaster and divine, was born in London and educated at Sidney Sussex College, Cambridge, where he afterwards became fellow, in the capacity first of mathematical lecturer, and afterwards of classical tutor. He was elected a public examiner of the university in 1804, and in the following year was one of the select preachers. As head master of Harrow (1805-1829) his all-round knowledge, his tact and his skill as an athlete rendered his administration successful and popular. On his retirement he settled down at Gayton, Northamptonshire, a living which had been presented to him by his college in 1814. In 1836 he became chancellor of the diocese of Peterborough, and in 1842 was appointed dean of Peterborough. His few publications include some notes of Harrow, entitled *Harrow, a Selection of Lists of the School between 1770 and 1828* (Peterborough, 1849).

His eldest son, George Butler (1819-1890), was principal of Liverpool College (1866-1882) and canon of Winchester. In 1852 he married Josephine Elizabeth, daughter of John Grey of Dilston. She died on the 30th of December 1906 (see her *Autobiography*, 1909). Mrs Josephine Butler, as she was commonly called afterwards, was a woman of intense moral and spiritual force, who devoted herself to rescue work, and specially to resisting the "state regulation of vice" whether by the C.D. Acts in India or by any system analogous to that of the continent in England.

His youngest son, the Rev. Dr Henry Montagu Butler, became one of the best-known scholars of his day. Born in 1833, and educated at Harrow and Trinity, Cambridge, he was senior classic in 1855 and was elected a fellow of his college. In 1859 he became head master of Harrow, as his father had been, and only resigned on being made dean of Gloucester in 1885. In 1886 he was elected master of Trinity, Cambridge. His publications include various volumes of sermons, but his reputation rests on his wide scholarship, his remarkable gifts as a public speaker, and his great practical influence both as a headmaster and at Cambridge. He married first (1861), Georgina Elliot, and secondly (1888) Agneta Frances Ramsay (who in 1887 was senior classic at Cambridge), and had five sons and two daughters.

BUTLER, JOSEPH (1692-1752), English divine and philosopher, bishop of Durham, was born at Wantage, in Berkshire, on the 18th of May 1692. His father, a linen-draper of that town, was a Presbyterian, and it was his wish that young Butler should be educated for the ministry in that church. The boy was placed under the care of the Rev. Philip Barton, master of the grammar school at Wantage, and remained there for some years. He was then sent to Samuel Jones's dissenting academy at Gloucester, and afterwards at Tewkesbury, where his most intimate friend was Thomas Seeker, who became archbishop of Canterbury.

While at this academy Butler became dissatisfied with the principles of Presbyterianism, and after much deliberation resolved to join the Church of England. About the same time he began to study with care Samuel Clarke's celebrated *Demonstration of the Being and Attributes of God*, which had been published as the Boyle Lectures a few years previously. With great modesty and secrecy Butler, then in his twenty-second year, wrote to the author propounding certain difficulties with regard to the proofs of the unity and omnipresence of the Divine Being. Clarke answered his unknown opponent with a gravity and care that showed his high opinion of the metaphysical acuteness displayed in the objections, and published the correspondence in later editions of the *Demonstration*. Butler acknowledged that Clarke's reply satisfied him on one of the points, and he subsequently gave his adhesion to the other. In one of his letters we already find the germ of his famous dictum that "probability is the guide of life."

In March 1715 he entered at Oriel College, Oxford, but for some time found it uncongenial and thought of migrating to Cambridge. But he made a close friend in one of the resident fellows, Edward Talbot, son of William Talbot, then bishop of Oxford, and afterwards of Salisbury and Durham. In 1718 he took his degree, was ordained deacon and priest, and on the recommendation of Talbot and Clarke was nominated preacher at the chapel of the Rolls, where he continued till 1726. It was here that he preached his famous *Fifteen Sermons* (1726), including the well-known discourses on human nature. In 1721 he had been given a prebend at Salisbury by Bishop Talbot, who on his translation to Durham gave Butler the living of Houghton-le-Skerne in that county, and in 1725 presented him to the wealthy rectory of Stanhope. In 1726 he resigned his preachership at the Rolls.

For ten years Butler remained in perfect seclusion at Stanhope. He was only remembered in the neighbourhood as a man much loved and respected, who used to ride a black pony very fast, and whose known benevolence was much practised upon by beggars. Archbishop Blackburne, when asked by Queen Caroline whether he was still alive, answered, "He is not dead, madam, but buried." In 1733 he was made chaplain to Lord Chancellor Talbot, elder brother of his dead friend Edward, and in 1736 prebendary of Rochester. In the same year he was appointed clerk of the closet to the queen, and had to take part in the metaphysical conversation parties which she loved to gather round her. He met Berkeley frequently, but in his writings does not refer to him. In 1736 also appeared his great work, *The Analogy of Religion*.

In 1737 Queen Caroline died; on her deathbed she recommended Butler to the favour of her husband. George seemed to think his obligation sufficiently discharged by appointing Butler in 1738 to the bishopric of Bristol, the poorest see in the kingdom. The severe but dignified letter to Walpole, in which Butler accepted the preferment, showed that the slight was felt and resented. Two years later, however, the bishop was presented to the rich deanery of St Paul's, and in 1746 was made clerk of the closet to the king. In 1747 the primacy was offered to Butler, who, it is said, declined it, on the ground that "it was too late for him to try to support a falling church." The story has not the best authority, and though the desponding tone of some of Butler's writings may give it colour, it is not in harmony with the rest of his life, for in 1750 he accepted the see of Durham, vacant by the death of Edward Chandler. His charge to the clergy of the diocese, the only charge of his known to us, is a weighty and valuable address on the importance of external forms in religion. This, together with the fact that over the altar of his private chapel at Bristol he had a cross of white marble, gave rise to an absurd rumour that the bishop had too great a leaning towards Romanism. At Durham he was very charitable, and expended large sums in building and decorating his church and residence. His private expenses were exceedingly small. Shortly after his translation his constitution began to break up, and he died on the 16th of June 1752, at Bath, whither he had removed for his health. He was buried in the cathedral of Bristol, and over his grave a monument was erected in 1834, with an epitaph by Southey. According to his express orders, all his MSS. were burned after his death. Bishop Butler was never married. His personal appearance has been sketched in a few lines by Hutchinson:—"He was of a most reverend aspect; his face thin and pale; but there was a divine placidness which inspired veneration, and expressed the most benevolent mind. His white hair hung gracefully on his shoulders, and his whole figure was patriarchal."

Butler was an earnest and deep-thinking Christian, melancholy by temperament, and grieved by what seemed to him the hopelessly irreligious condition of his age. In his view not only the religious life of the nation, but (what he regarded as synonymous) the church itself, was in an almost hopeless state of decay,
[v.04 p.0883] as we see from his first and only charge to the diocese of Durham and from many passages in the *Analogy*. And though there was a complete remedy just coming into notice, in the Evangelical revival, it was not of a kind that commended itself to Butler, whose type of mind was opposed to everything that savoured of enthusiasm. He even asked John Wesley, in 1739, to desist from preaching in his diocese of Bristol, and in a memorable interview with the great preacher remarked that any claim to the extraordinary gifts of the Holy Spirit was "a horrid thing, a very horrid thing, sir." Yet Butler was keenly interested in those very miners of Kingswood among whom Wesley preached, and left £500 towards building a church for them. It is a great mistake to suppose that because he took no great part in politics he had no interest in the practical questions of his time, or that he was so immersed in metaphysics as to live in the clouds. His intellect was profound and comprehensive, thoroughly qualified to grapple with the deepest problems of metaphysics, but by natural preference occupying itself mainly with the practical and moral. Man's conduct in life, not his theory of the universe, was what interested him. The *Analogy* was written to counteract the practical mischief which he considered wrought by deists and other freethinkers, and the *Sermons* lay a good deal of stress on everyday Christian duties. His style has frequently been blamed for its obscurity and difficulty, but this is due to two causes: his habit of compressing his arguments into narrow compass, and of always writing with the opposite side of the case in view, so that it has been said of the *Analogy* that it raises more doubts than it solves. One is also often tempted away from the main course of the argument by the care and precision with which Butler formulates small points of detail.

His great work, *The Analogy of Religion, Natural and Revealed, to the Course and Constitution of Nature*, cannot be adequately appreciated unless taken in connexion with the circumstances of the period at which it appeared. It was intended as a defence against the great tide of deistical speculation (see Deism), which in the apprehension of many good men seemed likely to sweep away the restraints of religion and make way for a general reign of licence. Butler did not enter the lists in the ordinary way. Most of the literature evoked by the controversy on either side was devoted to rebutting the attack of some individual opponent. Thus it was Bentley versus Collins, Sherlock versus Woolston, Law versus Tindal. The *Analogy*, on the contrary, did not directly refer to the deists at all, and yet it worked more havoc with their position than all the other books put together, and remains practically the one surviving landmark of the whole dispute. Its

central motive is to prove that all the objections raised against revealed or supernatural religion apply with equal force to the whole constitution of nature, and that the general analogy between the principles of divine government, as set forth by the biblical revelation, and those observable in the course of nature, leads us to the warrantable conclusion that there is one Author of both. Without altogether eschewing Samuel Clarke's *a priori* system, Butler relies mainly on the inductive method, not professing to give an absolute demonstration so much as a probable proof. And everything is brought into closest relation with "that which is the foundation of all our hopes and of all our fears; all our hopes and fears which are of any consideration; I mean a Future Life."

Butler is a typical instance of the English philosophical mind. He will admit no speculative theory of things. To him the universe is no realization of intelligence, which is to be deciphered by human thought; it is a constitution or system, made up of individual facts, through which we thread our way slowly and inductively. Complete knowledge is impossible; nay, what we call knowledge of any part of the system is inherently imperfect. "We cannot have a thorough knowledge of any part without knowing the whole." So far as experience goes, "to us probability is the very guide of life." Reason is certainly to be accepted; it is pur natural light, and the only faculty whereby we can judge of things. But it gives no completed system of knowledge and in matters of fact affords only probable conclusions. In this emphatic declaration, that knowledge of the course of nature is merely probable, Butler is at one with Hume, who was a most diligent student of the bishop's works. What can come nearer Hume's celebrated maxim—"Anything may be the cause of anything else," than Butler's conclusion, "so that any one thing whatever may, for aught we know to the contrary, be a necessary condition to any other"?

It is this strong grasp or the imperfect character of our knowledge of nature and of the grounds for its limitation that makes Butler so formidable an opponent to his deistical contemporaries. He will permit no anticipations of nature, no *a priori* construction of experience. "The constitution of nature is as it is," and no system of abstract principles can be allowed to take its place. He is willing with Hume to take the course of experience as the basis of his reasoning, seeing that it is common ground for himself and his antagonists. In one essential respect, however, he goes beyond Hume. The course of nature is for him an unmeaning expression unless it be referred to some author; and he therefore makes extensive use of the teleological method. This position is assumed throughout the treatise, and as against the deists with justice, for their whole argument rested upon the presupposition of the existence of God, the perfect Ruler of the world.

The premises, then, with which Butler starts are the existence of God, the known course of nature, and the necessary limitation of our knowledge. What does he wish to prove? It is not his intention *to prove God's perfect moral government over the world or the truth of religion*. His work is in no sense a philosophy of religion. His purpose is entirely defensive; he wishes to answer objections that have been brought against religion, and to examine certain difficulties that have been alleged as insuperable. And this is to be effected in the first place by showing that from the obscurities and inexplicabilities we meet with in nature we may reasonably expect to find similar difficulties in the scheme of religion. If difficulties be found in the course and constitution of nature, whose author is admitted to be God, surely the existence of similar difficulties in the plan of religion can be no valid objection against its truth and divine origin. That this is at least in great part Butler's object is plain from the slightest inspection of his work. It has seemed to many to be an unsatisfactory mode of arguing and but a poor defence of religion; and so much the author is willing to allow. But in the general course of his argument a somewhat wider issue appears. He seeks to show not only that the difficulties in the systems of natural and revealed religion have counterparts in nature, but also that the facts of nature, far from being adverse to the principles of religion, are a distinct ground for inferring their probable truth. He endeavours to show that the balance of probability is entirely in favour of the scheme of religion, that this probability is the natural conclusion from an inspection of nature, and that, as religion is a matter of practice, we are bound to adopt the course of action which is even probably the right one. If, we may imagine him saying, the precepts of religion are entirely analogous in their partial obscurity and apparent difficulty to the ordinary course of nature disclosed to us by experience, then it is credible that these precepts are true; not only can no objections be drawn against them from experience, but the balance of probability is in their favour. This mode of reasoning from what is known of nature to the probable truth of what is contained in religion is the celebrated method of analogy.

Although Butler's work is peculiarly one of those which ought not to be exhibited in outline, for its strength lies in the organic completeness with which the details are wrought into the whole argument, yet a summary of his results will throw more light on the method than any description can.

Keeping clearly in view his premises—the existence of God and the limited nature of knowledge—Butler begins by inquiring into the fundamental pre-requisite of all natural religion—the immortality of the soul. Evidently the stress of the whole question is here. Were man not immortal, religion would be of little value. Now, Butler does not attempt to prove the truth of the doctrine; that proof comes from another quarter. The only questions he asks are—Does experience forbid us to admit immortality as a possibility? Does experience furnish any probable reason for inferring that immortality is a fact? To the first of these a negative, to the second an affirmative answer is returned. All the analogies of our life here lead us to conclude that we shall continue to live after death; and neither from experience nor from the reason of the thing can any argument against the possibility of this be drawn. Immortality, then, is not unreasonable; it is probable. If, he continues, we are to live after death, it is of importance for us to consider on what our future state may depend; for we may be either happy or miserable. Now, whatever speculation may say as to God's purpose being necessarily universal benevolence, experience plainly shows us that our present happiness and misery depend upon our conduct, and are not distributed indiscriminately. Therefore no argument can be brought from experience against the possibility of our future happiness and misery likewise depending upon conduct. The whole analogy of nature is in favour of such a dispensation; it is therefore reasonable or probable. Further, we are not only under a government in which actions considered simply as such are rewarded and punished, but it is known from experience that virtue and vice are followed by their natural consequents—happiness and misery. And though the distribution of these rewards is not perfect, all hindrances are plainly temporary or accidental. It may therefore be concluded that the balance of probability is in favour of God's government in general being a moral scheme, where virtue and vice are respectively rewarded and punished. It need not be objected to the justice of this arrangement that men are sorely tempted, and may very easily be brought to neglect that on which their future welfare depends, for the very same holds good in nature. Experience shows man to be

in a state of trial so far as regards the present; it cannot, therefore, be unreasonable to suppose that we are in a similar state as regards the future. Finally, it can surely never be advanced as an argument against the truth of religion that there are many things in it which we do not comprehend, when experience exhibits to us such a copious stock of incomprehensibilities in the ordinary course and constitution of nature.

It cannot have escaped observation, that in the foregoing course of argument the conclusion is invariably from experience of the present order of things to the reasonableness or probability of some other system—of a future state. The inference in all cases passes beyond the field of experience; that it does so may be and has been advanced as a conclusive objection against it. See for example a passage in Hume, *Works* (ed. 1854), iv. 161-162, cf. p. 160, which says, in short, that no argument from experience can ever carry us beyond experience itself. However well grounded this reasoning may be, it altogether misses the point at which Butler aimed, and is indeed a misconception of the nature of analogical argument. Butler never attempts to *prove* that a future life regulated according to the requirements of ethical law is a reality; he only desires to show that the conception of such a life is not irreconcilable with what we know of the course of nature, and that consequently it is *not unreasonable* to suppose that there is such a life. Hume readily grants this much, though he hints at a formidable difficulty which the plan of the *Analogy* prevented Butler from facing, the proof of the existence of God. Butler seems willing to rest satisfied with his opponents' admission that the being of God is proved by reason, but it would be hard to discover how, upon his own conception of the nature and limits of reason, such a proof could ever be given. It has been said that it is no flaw in Butler's argument that he has left atheism as a possible mode of viewing the universe, because his work was not directed against the atheists. It is, however, in some degree a defect; for his defence of religion against the deists rests on a view of reason which would for ever preclude a demonstrative proof of God's existence.

If, however, his premises be granted, and the narrow issue kept in view, the argument may be admitted as perfectly satisfactory. From what we know of the present order of things, it is not unreasonable to suppose that there will be a future state of rewards and punishments, distributed according to ethical law. When the argument from analogy seems to go beyond this, a peculiar difficulty starts up. Let it be granted that our happiness and misery in this life depend upon our conduct—are, in fact, the rewards and punishments attached by God to certain modes of action, the natural conclusion from analogy would seem to be that our future happiness or the reverse will probably depend upon our actions in the future state. Butler, on the other hand, seeks to show that analogy leads us to believe that our future state will depend upon our present conduct. His argument, that the punishment of an imprudent act often follows after a long interval may be admitted, but does not advance a single step towards the conclusion that imprudent acts will be punished hereafter. So, too, with the attempt to show that from the analogy of the present life we may not unreasonably infer that virtue and vice will receive their respective rewards and punishments hereafter; it may be admitted that virtuous and vicious acts are naturally looked upon as objects of reward or punishment, and treated accordingly, but we may refuse to allow the argument to go further, and to infer a perfect distribution of justice dependent upon our conduct here. Butler could strengthen his argument only by bringing forward prominently the absolute requirements of the ethical consciousness, in which case he would have approximated to Kant's position with regard to this very problem. That he did not do so is, perhaps, due to his strong desire to use only such premises as his adversaries the deists were willing to allow.

As against the deists, however, he may be allowed to have made out his point, that the substantial doctrines of natural religion are not opposed to reason and experience, and may be looked upon as credible. The positive proof of them is to be found in revealed religion, which has disclosed to us not only these truths, but also a further scheme not discoverable by the natural light. Here, again, Butler joins issue with his opponents. Revealed religion had been declared to be nothing but a republication of the truths of natural religion (Matthew Tindal, *Christianity as Old as the Creation*), and all revelation had been objected to as impossible. To show that such objections are invalid, and that a revelation is at least not impossible, Butler makes use mainly of his doctrine of human ignorance. Revelation had been rejected because it lay altogether beyond the sphere of reason and could not therefore be grasped by human intelligence. But the same is true of nature; there are in the ordinary course of things inexplicabilities; indeed we may be said with truth to know nothing, for there is no medium between perfect and completed comprehension of the whole system of things, which we manifestly have not, and mere faith grounded on probability. Is it unreasonable to suppose that in a revealed system there should be the same superiority to our intelligence? If we cannot explain or foretell by reason what the exact course of events in nature will be, is it to be expected that we can do so with regard to the wider scheme of God's revealed providence? Is it not probable that there will be many things not explicable by us? From our experience of the course of nature it would appear that no argument can be brought against the possibility of a revelation. Further, though it is the province of reason to test this revealed system, and though it be granted that, should it contain anything immoral, it must be rejected, yet a careful examination of the particulars will show that there is no incomprehensibility or difficulty in them which has not a counterpart in nature. The whole scheme of revealed principles is, therefore, not unreasonable, and the analogy of nature and natural religion would lead us to infer its truth. If, finally, it be asked, how a system professing to be revealed can substantiate its claim, the answer is, by means of the historical evidences, such as miracles and fulfilment of prophecy.

It would be unfair to Butler's argument to demand from it answers to problems which had not in his time arisen, and to which, even if they had then existed, the plan of his work would not have extended. Yet it is at least important to ask how far, and in what sense, the *Analogy* can be regarded as a positive and valuable contribution to theology. What that work has done is to prove to the consistent deist that no objections can be drawn from reason or experience against natural or revealed religion, and, consequently, that the things objected to are not incredible and may be proved by external evidence. But the deism of the 17th century is a phase of thought that has no living reality now, and the whole aspect of the religious problem has been completely changed. To a generation that has been moulded by the philosophy of Kant and Hegel, by the historical criticism of modern theology, and by all that has been done in the field of comparative religion, the argument of the *Analogy* cannot but appear to lie quite outside the field of controversy. To Butler the Christian religion, and by that he meant the orthodox Church of England system, was a moral scheme revealed by a special act of the divine providence, the truth of which was to be judged by the ordinary canons of evidence. The whole stood or fell on historical grounds. A speculative

construction of religion was abhorrent to him, a thing of which he seems to have thought the human mind naturally incapable. The religious consciousness does not receive from him the slightest consideration. The *Analogy*, in fact, has and can have but little influence on the present state of theology; it was not a book for all time, but was limited to the problems of the period at which it appeared.

Throughout the whole of the *Analogy* it is manifest that the interest which lay closest to Butler's heart was the ethical. His whole cast of thinking was practical. The moral nature of man, his conduct in life, is that on account of which alone an inquiry into religion is of importance. The systematic account of this moral nature is to be found in the famous *Sermons preached at the Chapel of the Rolls*, especially in the first three. In these sermons Butler has made substantial contributions to ethical science, and it may be said with confidence, that in their own department nothing superior in value appeared during the long interval between Aristotle and Kant. To both of these great thinkers he has certain analogies. He resembles the first in his method of investigating the end which human nature is intended to realize; he reminds of the other by the consistency with which he upholds the absolute supremacy of moral law.

In his ethics, as in his theology, Butler had constantly in view a certain class of adversaries, consisting partly of the philosophic few, partly of the fashionably educated many, who all participated in one common mode of thinking. The keynote of this tendency had been struck by Hobbes, in whose philosophy man was regarded as a mere selfish sensitive machine, moved solely by pleasures and pains. Cudworth and Clarke had tried to place ethics on a nobler footing, but their speculations were too abstract for Butler and not sufficiently "applicable to the several particular relations and circumstances of life."

His inquiry is based on teleological principles. "Every work, both of nature and art, is a system; and as every particular thing both natural and artificial is for some use or purpose out of or beyond itself, one may add to what has been already brought into the idea of a system its conduciveness to this one or more ends." Ultimately this view of nature, as the sphere of the realization of final causes, rests on a theological basis; but Butler does not introduce prominently into his ethics the specifically theological groundwork, and may be thought willing to ground his principle on experience. The ethical question then is, as with Aristotle, what is the τέλος of man? The answer to this question is to be obtained by an analysis of the facts of human nature, whence, Butler thinks, "it will as fully appear that this our nature, *i.e.* constitution, is adapted to virtue, as from the idea of a watch it appears that its nature, *i.e.* constitution or system, is adapted to measure time." Such analysis had been already attempted by Hobbes, and the result he came to was that man naturally is adapted only for a life of selfishness,—his end is the procuring of pleasure and the avoidance of pain. A closer examination, however, shows that this at least is false. The truth of the counter propositions, that man is φύσει πολιτικός, that the full development of his being is impossible apart from society, becomes manifest on examination of the facts. For while self-love plays a most important part in the human economy, there is no less evidently a natural principle of benevolence. [v.04 p.0885] Moreover, among the particular passions, appetites and desires there are some whose tendency is as clearly towards the general good as that of others is towards the satisfaction of the self. Finally, that principle in man which reflects upon actions and the springs of actions, unmistakably sets the stamp of its approbation upon conduct that tends towards the general good. It is clear, therefore, that from this point of view the sum of practical morals might be given in Butler's own words—"that mankind is a community, that we all stand in a relation to each other, that there is a public end and interest of society, which each particular is obliged to promote." But deeper questions remain.

The threefold division into passions and affections, self-love and benevolence, and conscience, is Butler's celebrated analysis of human nature as found in his first sermon. But by regarding benevolence less as a definite desire for the general good as such than as kind affection for particular individuals, he practically eliminates it as a regulative principle and reduces the authorities in the polity of the soul to two—conscience and self-love.

But the idea of human nature is not completely expressed by saying that it consists of reason and the several passions. "Whoever thinks it worth while to consider this matter thoroughly should begin by stating to himself exactly the idea of a system, economy or constitution of any particular nature; and he will, I suppose, find that it is one or a whole, made up of several parts, but yet that the several parts, even considered as a whole, do not complete the idea, unless in the notion of a whole you include the relations and respects which these parts have to each other." This fruitful conception of man's ethical nature as an organic unity Butler owes directly to Shaftesbury and indirectly to Aristotle; it is the strength and clearness with which he has grasped it that gives peculiar value to his system.

The special relation among the parts of our nature to which Butler alludes is the subordination of the particular passions to the universal principle of reflection or conscience. This relation is the peculiarity, the *cross*, of man; and when it is said that virtue consists in following nature, we mean that it consists in pursuing the course of conduct dictated by this superior faculty. Man's function is not fulfilled by obeying the passions, or even cool self-love, but by obeying conscience. That conscience has a natural supremacy, that it is superior in kind, is evident from the part it plays in the moral constitution. We judge a man to have acted wrongly, *i.e.* unnaturally, when he allows the gratification of a passion to injure his happiness, *i.e.* when he acts in accordance with passion and against self-love. It would be impossible to pass this judgment if self-love were not regarded as superior in kind to the passions, and this superiority results from the fact that it is the peculiar province of self-love to take a view of the several passions and decide as to their relative importance. But there is in man a faculty which takes into consideration all the springs of action, including self-love, and passes judgment upon them, approving some and condemning others. From its very nature this faculty is supreme in authority, if not in power; it reflects upon all the other active powers, and pronounces absolutely upon their moral quality. Superintendency and authority are constituent parts of its very idea. We are under obligation to obey the law revealed in the judgments of this faculty, for it is the law of our nature. And to this a religious sanction may be added, for "consciousness of a rule or guide of action, in creatures capable of considering it as given them by their Maker, not only raises immediately a sense of duty, but also a sense of security in following it, and a sense of danger in deviating from it." Virtue then consists in following the true law of our nature, that is, conscience. Butler, however, is by no means very explicit in his analysis of the functions to be ascribed to conscience. He calls it the Principle of Reflection, the Reflex Principle of Approbation, and assigns to it as its province the motives or propensions to action. It takes a view of these, approves or disapproves, impels to or restrains from action. But at times he uses language that almost compels one to attribute to him the popular view of conscience as passing its judgments with unerring certainty on individual acts. Indeed his theory is

weakest exactly at the point where the real difficulty begins. We get from him no satisfactory answer to the inquiry, What course of action is approved by conscience? Every one, he seems to think, knows what virtue is, and a philosophy of ethics is complete if it can be shown that such a course of action harmonizes with human nature. When pressed still further, he points to justice, veracity and the common good as comprehensive ethical ends. His whole view of the moral government led him to look upon human nature and virtue as connected by a sort of pre-established harmony. His ethical principle has in it no possibility of development into a system of actual duties; it has no content. Even on the formal side it is a little difficult to see what part conscience plays. It seems merely to set the stamp of its approbation on certain courses of action to which we are led by the various passions and affections; it has in itself no originating power. How or why it approves of some and not of others is left unexplained. Butler's moral theory, like those of his English contemporaries and successors, is defective from not perceiving that the notion of duty can have real significance only when connected with the will or practical reason, and that only in reason which wills itself have we a principle capable of development into an ethical system. It has received very small consideration at the hands of German historians of ethics.

AUTHORITIES.—See T. Bartlett, *Memoirs of Butler* (1839). The standard edition of Butler's works is that in 2 vols. (Oxford, 1844). Editions of the *Analogy* are very numerous; that by Bishop William Fitzgerald (1849) contains a valuable Life and Notes. W. Whewell published an edition of the *Three Sermons*, with Introduction. Modern editions of the *Works* are those by W.E. Gladstone (2 vols. with a 3rd vol. of *Studies Subsidiary*, 1896), and J.H. Bernard, (2 vols. in the English Theological Library, 1900). For the history of the religious works contemporary with the *Analogy*, see Lechler, *Gesch. d. Engl. Deismus*; M. Pattison, in *Essays and Reviews*; W. Hunt, *Religious Thought in England*, vols., ii. and iii.; L. Stephen, *English Thought in the 18th Century*; J.H. Overton and F. Relton, *The English Church from the Accession of George I. to the End of the 18th Century*.

(R. AD.; A. J. G.)

BUTLER, NICHOLAS MURRAY (1862-), American educator, was born at Elizabeth, New Jersey, on the 2nd of April 1862. He graduated at Columbia College in 1882, was a graduate fellow in philosophy there from 1882 to 1884, when he took the degree of Ph.D., and then studied for a year in Paris and Berlin. He was an assistant in philosophy at Columbia in 1885-1886, tutor in 1886-1889, adjunct professor of philosophy, ethics and psychology in 1889-1890, becoming full professor in 1890, and dean of the faculty of philosophy in 1890-1902. From 1887 until 1891 he was the first president of the New York college for the training of teachers (later the Teachers' College of Columbia University), which he had personally planned and organized. In 1891 he founded and afterwards edited the *Educational Review*, an influential educational magazine. He soon came to be looked upon as one of the foremost authorities on educational matters in America, and in 1894 was elected president of the National Educational Association. He was also a member of the New Jersey state board of education from 1887 to 1895, and was president of the Paterson (N.J.) board of education in 1892-1893. In 1901 he succeeded Seth Low as president of Columbia University. Besides editing several series of books, including "The Great Educators" and "The Teachers' Professional Library," he published *The Meaning of Education* (1898), a collection of essays; and two series of addresses, *True and False Democracy* (1907), and *The American as he is* (1908).

BUTLER (or BOTELER), **SAMUEL** (1612-1680), English poet, author of *Hudibras*, son of Samuel Butler, a small farmer, was baptized at Strensham, Worcestershire, on the 8th of February 1612. He was educated at the King's school, Worcester, under Henry Bright, the record of whose zeal as a teacher is preserved by Fuller (*Worthies*, Worcestershire). After leaving school he served a Mr Jeffereys of Earl's Croome, Worcestershire, in the capacity of justice's clerk, and is supposed to have thus gained his knowledge of law and law terms. He also employed himself at Earl's Croome in general study, and particularly in painting, which he is said to have thought of adopting as a profession. It is probable, however, that art has not lost by his change of mind, for, according to one of his editors, in 1774 his pictures "served to stop windows and save the tax; indeed they were not fit for much else." He was then recommended to Elizabeth, countess of Kent. At her home at Wrest, Bedfordshire, he had access to a good library, and there too he met Selden, who sometimes employed him as his secretary. But his third sojourn, with Sir Samuel Luke at Cople Hoo, Bedfordshire, was not only apparently the longest, but also much the most important in its effects on his career and works. We are nowhere informed in what capacity Butler served Sir Samuel Luke, or how he came to reside in the house of a noted Puritan and Parliament man. In the family of this "valiant Mamaluke," who, whether he was or was not the original of Hudibras, was certainly a rigid Presbyterian, "a colonel in the army of the Parliament, scoutmaster-general for Bedfordshire and governor of Newport Pagnell," Butler must have had the most abundant opportunities of studying from the life those who were to be the victims of his satire; he is supposed to have taken some hints for his caricature from Sir Henry Rosewell of Ford Abbey, Devonshire. But we know nothing positive of him until the Restoration, when he was appointed secretary to Richard Vaughan, 2nd earl of Carbery, lord president of the principality of Wales, who made him steward of Ludlow Castle, an office which he held from January 1661 [v.04 p.0886] to January 1662. About this time he married a rich lady, variously described as a Miss Herbert and as a widow named Morgan. His wife's fortune was afterwards, however, lost.

Early in 1663 *Hudibras: The First Part: written in the Time of the Late Wars*, was published, but this, the first genuine edition, had been preceded in 1662 by an unauthorized one. On the 26th of December Pepys bought it, and though neither then nor afterwards could he see the wit of "so silly an abuse of the Presbyter knight going to the wars," he repeatedly testifies to its extraordinary popularity. A spurious second part appeared within the year. This determined the poet to bring out the second part (licensed on the 7th of November 1663, printed 1664), which if possible exceeded the first in popularity. From this time till 1678, the date of the publication of the third part, we hear nothing certain of Butler. On the publication of *Hudibras* he was sent for by Lord Chancellor Hyde (Clarendon), says Aubrey, and received many promises, none of which was fulfilled. He is said to have received a gift of £300 from Charles II., and to have been secretary to George Villiers, 2nd duke of Buckingham, when the latter was chancellor of the university of Cambridge. Most of his biographers, in their eagerness to prove the ill-treatment which Butler is supposed to have received, disbelieve both these stories, perhaps without sufficient reason. Butler's satire on Buckingham in his *Characters* (*Remains*, 1759) shows such an intimate knowledge that it is probable the second story is true. Two years after the publication of the third part of *Hudibras* he died, on the 25th of September 1680, and was buried by his friend Longueville, a bencher of the Middle Temple, in the churchyard of St Paul's, Covent Garden. He was, we are told, "of a leonine-coloured hair, sanguine,

choleric, middle-sized, strong." A portrait by Lely at Oxford and others elsewhere represent him as somewhat hard-featured.

Of the neglect of Butler by the court something must be said. It must be remembered that the complaints on the subject supposed to have been uttered by the poet all occur in the spurious posthumous works, that men of letters have been at all times but too prone to complain of lack of patronage, that Butler's actual service was rendered when the day was already won, and that the pathetic stories of the poet starving and dying in want are contradicted by the best authority—Charles Longueville, son of the poet's friend—who asserted that Butler, though often disappointed, was never reduced to anything like want or beggary and did not die in any person's debt. But the most significant notes on the subject are Aubrey's,[1] that "he might have had preferments at first, but would not accept any but very good, so at last he had none at all, and died in want"; and the memorandum of the same author, that "satirical wits disoblige whom they converse with, &c., consequently make to themselves many enemies and few friends, and this was his manner and case."

Three monuments have been erected to the poet's memory—the first in Westminster Abbey in 1721, by John Barber, mayor of London, who is spitefully referred to by Pope for daring to connect his name with Butler's. In 1786 a tablet was placed in St Paul's, Covent Garden, by residents of the parish. This was destroyed in 1845. Later, another was set up at Strensham by John Taylor of that place. Perhaps the happiest epitaph on him is one by John Dennis, which calls Butler "a whole species of poets in one."

Hudibras itself, though probably quoted as often as ever, has dropped into the class of books which are more quoted than read. In reading it, it is of the utmost importance to comprehend clearly and to bear constantly in mind the purpose of the author in writing it. This purpose is evidently not artistic but polemic, to show in the most unmistakable characters the vileness and folly of the anti-royalist party. Anything like a regular plot—the absence of which has often been deplored or excused—would have been for this end not merely a superfluity but a mistake, as likely to divert the attention and perhaps even enlist some sympathy for the heroes. Anything like regular character-drawing would have been equally unnecessary and dangerous—for to represent anything but monsters, some alleviating strokes must have been introduced. The problem, therefore, was to produce characters just sufficiently unlike lay-figures to excite and maintain a moderate interest, and to set them in motion by dint of a few incidents not absolutely unconnected,—meanwhile to subject the principles and manners of which these characters were the incarnation to ceaseless satire and raillery. The triumphant solution of the problem is undeniable, when it has once been enunciated and understood. Upon a canvas thus prepared and outlined, Butler has embroidered a collection of flowers of wit, which only the utmost fertility or imagination could devise, and the utmost patience of industry elaborate. In the union of these two qualities he is certainly without a parallel, and their combination has produced a work which is unique. The poem is of considerable length, extending to more than ten thousand verses, yet Hazlitt hardly exaggerates when he says that "half the lines are got by heart"; indeed a diligent student of later English literature has read great part of *Hudibras* though he may never have opened its pages. The tableaux or situations, though few and simple in construction, are ludicrous enough. The knight and squire setting forth on their journey; the routing of the bear-baiters; the disastrous renewal of the contest; Hudibras and Ralph in the stocks; the lady's release and conditional acceptance of the unlucky knight; the latter's deliberations on the means of eluding his vow; the Skimmington; the visit to Sidrophel, the astrologer; the attempt to cajole the lady, with its woeful consequences; the consultation with the lawyer, and the immortal pair of letters to which this gives rise, complete the argument of the whole poem. But the story is as nothing; throughout we have little really kept before us but the sordid vices of the sectaries, their hypocrisy, their churlish ungraciousness, their greed of money and authority, their fast and loose morality, their inordinate pride. The extraordinary felicity of the means taken to place all these things in the most ridiculous light has never been questioned. The doggerel metre, never heavy or coarse, but framed as to be the very voice of mocking laughter, the astounding similes and disparates, the rhymes which seem to chuckle and to sneer of themselves, the wonderful learning with which the abuse of learning is rebuked, the subtlety with which subtle casuistry is set at nought can never be missed. Keys like those of L'Estrange are therefore of little use. It signifies nothing whether Hudibras was Sir Samuel Luke of Bedfordshire or Sir Henry Rosewell of Devonshire, still less whether Ralph's name in the flesh was Robinson or Pendle, least of all that Orsin was perhaps Mr Gosling, or Trulla possibly Miss Spencer. Butler was probably as little indebted to mere copying for his characters as for his ideas and style. These latter are in the highest degree original. The first notion of the book, and only the first notion, Butler undoubtedly received from *Don Quixote*. His obligations to the *Satyre Ménippée* have been noticed by Voltaire, and though English writers have sometimes ignored or questioned them, are not to be doubted. The art, perhaps the most terrible of all the weapons of satire, of making characters without any great violation of probability represent themselves in the most atrocious and despicable light, was never perhaps possessed in perfection except by Pithou and his colleagues and by Butler. Against these great merits some defects must certainly be set. As a whole, the poem is no doubt tedious, if only on account of the very blaze of wit, which at length almost wearies us by its ceaseless demands on our attention. It should, however, be remembered that it was originally issued in parts, and therefore, it may be supposed, intended to be read in parts, for there can be little doubt that the second part was written before the first was published. A more real defect, but one which Butler shares with all his contemporaries, is the tendency to delineate humours instead of characters, and to draw from the outside rather than from within.

Attempts have been made to trace the manner and versification of *Hudibras* to earlier writers, especially in Cleveland's satires and in the *Musarum Deliciae* of Sir John Mennis (Pepys's Minnes) and Dr James Smith (1605-1667). But if it had few ancestors it had an abundant offspring. A list of twenty-seven direct imitations of *Hudibras* in the course of a century may be found in the Aldine edition (1893). Complete translations of considerable excellence have been made into French (London, 1757 and 1819) by John Townley (1697-1782), a member of the Irish Brigade; and into German by D.W. Soltau (Riga, 1787); specimens of both may be found in R. Bell's edition. Voltaire tried his hand at a compressed version, but not with happy results.

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Bibliography.—Butler's works published during his life include, besides *Hudibras*: *To the Memory of the most renowned Du Vall: A Pindaric Ode* (1671); and a prose pamphlet against the Puritans, *Two Letters, one from J. Audland ... to W. Prynne, the other Prynne's Answer* (1672). In 1715-1717 three volumes, entitled *Posthumous Works in Prose and Verse ... with a key to Hudibras by Sir Roger l'Estrange ...* were

published with great success. Most of the contents, however, are generally rejected as spurious. The poet's papers, now in the British Museum (Addit. MSS. 32,625-6), remained in the hands of his friend William Longueville, and after his death were left untouched until 1759, when Robert Thyer, keeper of the public library at Manchester, edited two volumes of verse and prose under the title of *Genuine Remains in Verse and Prose of Mr Samuel Butler*. This collection contained *The Elephant in the Moon*, a satire on the Royal Society; a series of sketches in prose, *Characters*; and some satirical poems and prose pamphlets. Another edition, *Poetical Remains*, was issued by Thyer in 1827. In 1726 Hogarth executed some illustrations to *Hudibras*, which are among his earliest but not, perhaps, happiest productions. In 1744 Dr Zachary Grey published an edition of *Hudibras*, with copious and learned annotations; and an additional volume of *Critical and Historical and Explanatory Notes* in 1752. Grey's has formed the basis of all subsequent editions.

Other pieces published separately and ascribed to Butler are: *A Letter from Mercurius Civicus to Mercurius Rusticus, or London's Confession but not repentance ...* (1643), represented in vol. iv. of Somers's tracts; *Mola Asinarum, on the unreasonable and insupportable burthen now pressed ... upon this groaning nation ...* (1659), included in his posthumous works, which is supposed to have been written by John Prynne, though Wood ascribes it to Butler; *The Acts and monuments of our late parliament ...* (1659, printed 1710), of which a continuation appeared in 1659; a "character" of Charles I. (1671); *A New Ballad of King Edward and Jane Shore ...* (1671); *A Congratulatory poem ... to Sir Joseph Sheldon ...* (1675); *The Geneva Ballad, or the occasional conformist display'd* (1674); *The Secret history of the Calves head club, compleat ...* (4th edition, 1707); *The Morning's Salutation, or a friendly conference between a puritan preacher and a family of his flock ...* (reprinted, Dublin, 1714). Two tracts of his appear in Somers's *Tracts*, vol. vii.; he contributed to *Ovid's Epistles translated by several hands* (1680); and works by him are included in *Miscellaneous works, written by ... George Duke of Buckingham ... also State Poems ... (by various hands)* (1704); and in *The Grove ...* (1721), a poetic miscellany, is a "Satyr against Marriage," not found in his works.

The life of Butler was written by an anonymous author, said by William Oldys to be Sir James Astrey, and prefixed to the edition of 1704. The writer professes to supplement and correct the notice given by Anthony à Wood in *Athenae Oxonienses*. Dr Threadneedle Russel Nash, a Worcestershire antiquarian, supplied some additional facts in an edition of 1793. See the Aldine edition of the *Poetical Works of Samuel Butler* (1893), edited by Reginald Brimley Johnson, with complete bibliographical information. There is a good reprint of *Hudibras* (edited by Mr A.R. Waller, 1905) in the *Cambridge Classics*.

[1] *Letters written by Eminent Persons ... and Lives of Eminent Men*, by John Aubrey, Esq. (2 vols., 1813).

BUTLER, SAMUEL (1774-1839), English classical scholar and schoolmaster, and bishop of Lichfield, was born at Kenilworth on the 30th of January 1774. He was educated at Rugby, and in 1792 went to St John's College, Cambridge. Butler's classical career was a brilliant one. He obtained three of Sir William Browne's medals, for the Latin (1792) and Greek (1793, 1794) odes, the medal for the Greek ode in 1792 being won by Samuel Taylor Coleridge. In 1793 Butler was elected to the Craven scholarship, amongst the competitors being John Keate, afterwards headmaster of Eton, and Coleridge. In 1796 he was fourth senior op time and senior chancellor's classical medallist. In 1797 and 1798 he obtained the members' prize for Latin essay. He took the degree of B.A. in 1796, M.A. 1799, and D.D. 1811. In 1797 he was elected a fellow of St John's, and in 1798 became headmaster of Shrewsbury school. In 1802 he was presented to the living of Kenilworth, in 1807 to a prebendal stall in Lichfield cathedral, and in 1822 to the archdeaconry of Derby; all these appointments he held with his headmastership, but in 1836 he was promoted to the bishopric of Lichfield (and Coventry, which was separated from his diocese in the same year). He died on the 4th of December 1839. It is in connexion with Shrewsbury school that Butler will be chiefly remembered. During his headmastership its reputation greatly increased, and in the standard of its scholarship it stood as high as any other public school in England. His edition of Aeschylus, with the text and notes of Stanley, appeared 1809-1816, and was somewhat severely criticized in the *Edinburgh Review*, but Butler was prevented by his elevation to the episcopate from, revising it. He also wrote a *Sketch of Modern and Ancient Geography* (1813, frequently reprinted) for use in schools, and brought out atlases of ancient and modern geography. His large library included a fine collection of Aldine editions and Greek and Latin MSS.; the Aldines were sold by auction, the MSS. purchased by the British Museum.

Butler's life has been written by his grandson, Samuel Butler, author of *Erewhon* (*Life and Letters of Dr Samuel Butler*, 1896); see also Baker's *History of St John's College, Cambridge* (ed. J.E.B. Mayor, 1869); Sandys, *Hist. Class. Schol.* (ed. 1908), vol. iii. p. 398.

BUTLER, SAMUEL (1835-1902), English author, son of the Rev. Thomas Butler, and grandson of the foregoing, was born at Langar, near Bingham, Nottinghamshire, on the 4th of December 1835. He was educated at Shrewsbury school, and at St John's College, Cambridge. He took a high place in the classical tripos of 1858, and was intended for the Church. His opinions, however, prevented his carrying out this intention, and he sailed to New Zealand in the autumn of 1859. He owned a sheep run in the Upper Rangitata district of the province of Canterbury, and in less than five years was able to return home with a moderate competence, most of which was afterwards lost in unlucky investments. The Rangitata district supplied the setting for his romance of *Erewhon, or Over the Range* (1872), satirizing the Darwinian theory and conventional religion. *Erewhon* had a sequel thirty years later (1901) in *Erewhon Revisited*, in which the narrator of the earlier romance, who had escaped from Erewhon in a balloon, finds himself, on revisiting the country after a considerable interval, the object of a topsy-turvy cult, to which he gave the name of "Sunchildism." In 1873 he had published a book of similar tendency, *The Fair Haven*, which purported to be a "work in defence of the miraculous element in our Lord's ministry upon earth" by a fictitious J.P. Owen, of whom he wrote a memoir. Butler was a man of great versatility, who pursued his investigations in classical scholarship, in Shakespearian criticism, biology and art with equal independence and originality. On his return from New Zealand he had established himself at Clifford's Inn, and studied painting, exhibiting regularly in the Academy between 1868 and 1876. But with the publication of *Life and Habit* (1877) he began to recognize literature as his life work. The book was followed by three others, attacking Darwinism—*Evolution Old and New, or the Theories of Buffon, Dr Erasmus Darwin and Lamarck as compared with that of Mr C. Darwin* (1879); *Unconscious Memory* (1880), a comparison between the theory of Dr E. Hering and the *Philosophy of the Unconscious* of Dr E. von Hartmann; and *Luck or Cunning* (1886). He had a thorough knowledge of northern Italy and its art. In

Ex Voto (1888) he introduced many English readers to the art of Tabachetti and Gaudenzio Ferrari at Varallo. He learnt nearly the whole of the *Iliad* and the *Odyssey* by heart, and translated both poems (1898 and 1900) into colloquial English prose. In his *Authoress of the Odyssey* (1897) he propounded two theories: that the poem was the work of a woman, who drew her own portrait in Nausicaa; and that it was written at Trapani, in Sicily, a proposition which he supported by elaborate investigations on the spot. In another book on the *Shakespeare Sonnets* (1899) he aimed at destroying the explanations of the orthodox commentators.

Butler was also a musician, or, as he called himself, a Handelian, and in imitation of the style of Handel he wrote in collaboration with H. Festing Jones a secular oratorio, *Narcissus* (1888), and had completed his share of another, *Ulysses*, at the time of his death on the 18th of June 1902. His other works include: *Life and Letters* (1896) of Dr Samuel Butler, his grandfather, headmaster of Shrewsbury school and afterwards bishop of Lichfield; *Alps and Sanctuaries* (1881); and two posthumous works edited by R.A. Streatfeild, *The Way of All Flesh* (1903), a novel; and *Essays on Life, Art and Science* (1904).

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See *Samuel Butler, Records and Memorials* (1903), by R.A. Streatfeild, a collection printed for private circulation, the most important article included being one by H. Festing Jones originally published in *The Eagle* (Cambridge, December 1902).

BUTLER, WILLIAM ARCHER (1814-1848), Irish historian of philosophy, was born at Annerville, near Clonmel in Ireland, probably in 1814. His father was a Protestant, his mother a Roman Catholic, and he was brought up as a Catholic. As a boy he was imaginative and poetical, and some of his early verses were remarkable. While yet at Clonmel school he became a Protestant. Later he entered Trinity College, Dublin, where he had a brilliant career. He specially devoted himself to literature and metaphysics, and was noted for the beauty of his style. In 1834 he gained the ethical moderatorship, newly instituted by Provost Lloyd, and continued in residence at college. In 1837 he decided to enter the Church, and in the same year he was elected to the professorship of moral philosophy, specially founded for him through Lloyd's exertions. About the same time he was presented to the prebend of Clondahorky, Donegal, and resided there when not called by his professorial duties to Dublin. In 1842 he was promoted to the rectory of Raymochy. He died on the 5th of July 1848. His *Sermons* (2 vols., 1849) were remarkably brilliant and forceful. The *Lectures on the History of Ancient Philosophy*, edited by W. Hepworth Thompson (2 vols., 1856; 2nd ed., 1 vol. 1875), take a high place among the few British works on the history of philosophy. The introductory lectures, and those on the early Greek thinkers, though they evidence wide reading, do not show the complete mastery that is found in Schwegler or Zeller; but the lectures on Plato are of considerable value. Among his other writings were papers in the *Dublin University Magazine* (1834-1837); and "Letters on Development" (in the *Irish Ecclesiastical Journal*, 1845), a reply to Newman's famous *Essay on the Development of Christian Doctrine*.

See *Memoir of W.A. Butler*, prefixed by Rev. J. Woodward to first series of *Sermons*.

BUTLER, SIR WILLIAM FRANCIS (1838-), British soldier, entered the army as an ensign in 1858, becoming captain in 1872 and major in 1874. He took part with distinction in the Red River expedition (1870-71) and the Ashanti operations of 1873-74 under Wolseley, and received the C.B. in 1874. He served with the same general in the Zulu War (brevet lieut.-colonel), the campaign of Tel-el-Kebir, after which he was made an aide-de-camp to the queen, and the Sudan 1884-85, being employed as colonel on the staff 1885, and brigadier-general 1885-1886. In the latter year he was made a K.C.B. He was colonel on the staff in Egypt 1890-1892, and brigadier-general there until 1892, when he was promoted major-general and stationed at Aldershot, after which he commanded the southeastern district. In 1898 he succeeded General Goodenough as commander-in-chief in South Africa, with the local rank of lieutenant-general. For a short period (Dec. 1898-Feb. 1899), during the absence of Sir Alfred Milner in England, he acted as high commissioner, and as such and subsequently in his military capacity he expressed views on the subject of the probabilities of war which were not approved by the home government; he was consequently ordered home to command the western district, and held this post until 1905. He also held the Aldershot command for a brief period in 1900-1901. Sir William Butler was promoted lieutenant-general in 1900. He had long been known as a descriptive writer, since his publication of *The Great Lone Land* (1872) and other works, and he was the biographer (1899) of Sir George Colley. He married in 1877 Miss Elizabeth Thompson, an accomplished painter of battle-scenes, notably "The Roll Call" (1874), "Quatre Bras" (1875), "Rorke's Drift" (1881), "The Camel Corps" (1891), and "The Dawn of Waterloo" (1895).

BUTLER, a borough and the county-seat of Butler county, Pennsylvania, U.S.A., on Conoquenessing Creek, about 30 m. N. of Pittsburg. Pop. (1890) 8734; (1900) 10,853, of whom 928 were foreign-born; (1910 census) 20,728. It is served by the Pennsylvania, the Baltimore & Ohio, the Buffalo, Rochester & Pittsburg, and the Bessemer & Lake Erie railways, and is connected with Pittsburg by two electric lines. It is built on a small hill about 1010 ft. above sea-level, and commands extensive views of the surrounding valley. The Butler County hospital (1899) is located here. A fair is held in Butler annually. Oil, natural gas, clay, coal and iron abound in the vicinity, and the borough has various manufactures, including lumber, railway cars (especially of steel), paint, silk, bricks, plate-glass, bottles and oil-well tools. The value of the city's factory products increased from $1,403,026 in 1900 to $6,832,007 in 1905, or 386.9%, this being much the greatest rate of increase shown by any city in the state having in 1900 a population of 8000 or more. Butler was selected as the site for the county-seat of the newly-formed county in 1802, was laid out in 1803, and was incorporated in the same year. The county and the borough were named in honour of General Richard Butler, a soldier in the War of Independence and leader of the right wing of General St Clair's army, which was sent against the Indians in 1791 and on the 4th of November was defeated, Butler being killed in the engagement.

BUTLER (through the O. Fr. *bouteillier*, from the Late Lat. *buticularius*, *buticula*, a bottle), a domestic servant who superintends the wine-cellar and acts as the chief male servant of a household; among his other duties are the conduct of the service of the table and the custody of the plate. The butler of a royal household was an official of high rank, whose duties, though primarily connected with the supply of wine for the royal table, varied in the different courts in which the office appears. In England, as superintendent of the importation of wine, a duty was payable to him (see BUTLERAGE AND PRISAGE); the butlership of Ireland, *Pincerna Hiberniae*, was given by John, king of England, to Theobald Walter, who added the name of Butler to his own; it then became the surname of his descendants, the earls, dukes and marquesses of Ormonde (see BUTLER, family, above).

BUTLERAGE AND PRISAGE. In England there was an ancient right of the crown to purveyance or pre-emption, *i.e.* the right of buying up provisions and other necessities for the royal household, at a valuation, even without the consent of the owner. Out of this right originated probably that of taking customs, in return for the protection and maintenance of the ports and harbours. One such customs due was that of "prisage," the right of taking one tun of wine from every ship importing from ten to twenty tuns, and two tuns from every ship importing more than twenty tuns. This right of prisage was commuted, by a charter of Edward I. (1302), into a duty of two shillings on every tun imported by merchant strangers, and termed "butlerage," because paid to the king's butler. Butlerage ceased to be levied in 1809, by the Customs Consolidation Act of that year.

BUTO, the Greek name of the Egyptian goddess Uto (hierogl. *W'zy·t*), confused with the name of her city Buto (see Busiris). She was a cobra-goddess of the marshes, worshipped especially in the city of Buto in the north-west of the Delta, and at another Buto (Hdt. ii. 75) in the north-east of the Delta, now Tell Nebesheh. The former city is placed by Petrie at Tell Ferain, a large and important site, but as yet yielding no inscriptions. This western Buto was the capital of the kingdom of Northern Egypt in prehistoric times before the two kingdoms were united; hence the goddess Buto was goddess of Lower Egypt and the North. To correspond to the vulture goddess (Nekhbi) of the south she sometimes is given the form of a vulture; she is also figured in human form. As a serpent she is commonly twined round a papyrus stem, which latter spells her name; and generally she wears the crown of Lower Egypt. The Greeks identified her with Leto; this may be accounted for partly by the resemblance of name, partly by the myth of her having brought up Horus in a floating island, resembling the story of Leto and Apollo on Delos. Perhaps the two
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myths influenced each other. Herodotus describes the temple and other sacred places of (the western) Buto, and refers to its festival, and to its oracle, which must have been important though nothing definite is known about it. It is strange that a city whose leading in the most ancient times was fully recognized throughout Egyptian history does not appear in the early lists of nome-capitals. Like Thebes, however (which lay in the 4th nome of Upper Egypt, its early capital being Hermonthis), it eventually became, at a very late date, the capital of a nome, in this case called Phtheneto, "the land of (the goddess) Buto." The second Buto (hierogl. *'Im·t*) was capital from early times of the 19th nome of Lower Egypt.

See Herodotus ii. 155; *Zeitschr. f. ägyptische Sprache* (1871), I; K. Sethe in Pauly-Wissowa, *Realencyclopädie*, *s.v.* "Buto"; D.G. Hogarth, *Journal of Hellenic Studies*, xxiv. I; W.M.F. Petrie, *Ehnasya*, p. 36; *Nebesheh and Defenneh*.

(F. Ll. G.)

BUTRINTO, a seaport and fortified town of southern Albania, Turkey, in the vilayet of Iannina; directly opposite the island of Corfu (Corcyra), and on a small stream which issues from Lake Vatzindro or Vivari, into the Bay of Butrinto, an inlet of the Adriatic Sea. Pop.(1900) about 2000. The town, which is situated about 2 m. inland, has a small harbour, and was formerly the seat of an Orthodox bishop. In the neighbourhood are the ruins of the ancient *Buthrotum*, from which the modern town derives its name. The ruins consist of a Roman wall, about a mile in circumference, and some remains of both later and Hellenic work. The legendary founder of the city was Helenus, son of Priam, and Virgil (*Aen.* iii. 291 sq.) tells how Helenus here established a new Trojan kingdom. Hence the names *New Troy* and *New Pergamum*, applied to Buthrotum, and those of *Xanthus* and *Simoïs*, given to two small streams in the neighbourhood. In the 1st century B.C. Buthrotum became a Roman colony, and derived some importance from its position near Corcyra, and on the main highway between Dyrrachium and Ambracia. Under the Empire, however, it was overshadowed by the development of Dyrrachium and Apollonia. The modern city belonged to the Venetians from the 14th century until 1797. It was then seized by the French, who in 1799 had to yield to the Russians and Turks.

BUTT, ISAAC (1813-1879), Irish lawyer and Nationalist leader, was born at Glenfin, Donegal, in 1813, his father being the Episcopalian rector of Stranorlar. Having won high honours at Trinity, Dublin, he was appointed professor of political economy in 1836. In 1838 he was called to the bar, and not only soon obtained a good practice, but became known as a politician on the Protestant Conservative side, and an opponent of O'Connell. In 1844 he was made a Q.C. He figured in nearly all the important Irish law cases for many years, and was engaged in the defence of Smith O'Brien in 1848, and of the Fenians between 1865 and 1869. In 1852 he was returned to parliament by Youghal as a Liberal-Conservative, and retained this seat till 1865; but his views gradually became more liberal, and he drifted away from his earlier opinions. His career in parliament was marred by his irregular habits, which resulted in pecuniary embarrassment, and between 1865 and 1870 he returned again to his work at the law courts. The result, however, of the disestablishment of the Irish Church was to drive Butt and other Irish Protestants into union with the Nationalists, who had always repudiated the English connexion; and on 19th May 1870, at a large meeting in Dublin, Butt inaugurated the Home Rule movement in a speech demanding an Irish parliament for local affairs. On this platform he was elected in 1871 for Limerick, and found himself at the head of an Irish Home Rule party of fifty-seven members. But it was an ill-assorted union, and Butt soon found that he had little or no control over his more aggressive followers. He had no liking for violent methods or for "obstruction" in parliament; and his leadership gradually became a nullity. His false position undoubtedly assisted in breaking down his health, and he died in Dublin on the 5th of May 1879.

BUTT. (1) (From the Fr. *botte*, *boute*; Med. Lat. *butta*, a wine vessel), a cask for ale or wine, with a capacity of about two hogsheads. (2) (A word common in Teutonic languages, meaning short, or a stump), the thick end of anything, as of a fishing-rod, a gun, a whip, also the stump of a tree. (3) (From the Fr. *but*, a goal or mark, and *butte*, a target, a rising piece of ground, &c.), a mark for shooting, as in archery, or, in its modern use, a mound or bank in front of which are placed the targets in artillery or musketry practice. This is sometimes called a "stop-butt," its purpose being to secure the ground behind the targets from stray shots. The word is used figuratively of a person or object at which derision or abuse are levelled.

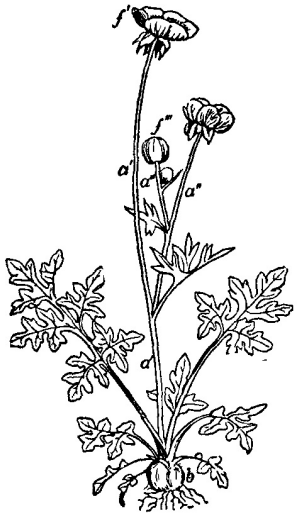
BUTTE, the largest city of Montana, U.S.A., and the county-seat of Silver Bow county. It is situated in the valley of Deer Lodge river, near its head, at an altitude of about 5700 ft. Pop. (1880) 3363; (1890) 10,723; (1900) 30,470, of whom 10,210 were foreign-born, including 2474 Irish, 1518 English-Canadians, and 1505 English; (1910 census) 39,165. It is served by the Great Northern, the Northern Pacific, the Chicago, Milwaukee & Puget Sound, the Butte, Anaconda & Pacific, and the Oregon Short Line railways. Popularly the name "Butte" is applied to an area which embraces the city, Centerville, Walkerville, East Butte, South Butte and Williamsburg. These together form one large and more or less compact city. Butte lies in the

centre of the greatest copper-mining district in the world; the surrounding hills are honey-combed with mines, and some mines are in the very heart of the city itself. The best known of the copper mines is the Anaconda. The annual output of copper from the Butte district almost equals that from all the rest of the country together; the annual value of copper, gold and silver aggregates more than $60,000,000. Although mining and its allied industries of quartz crushing and smelting dominate all other industries in the place, there are also foundries and machine shops, iron-works, tile factories, breweries and extensive planing mills. Electricity, used in the mines particularly, is brought to Butte from Cañon Ferry, 75 m. to the N.; from the plant, also on the Missouri river, of the Helena Power Transmission Company, which has a great steel dam 85 ft. high and 630 ft. long across the river, and a 6000-h.p. substation in Butte; and from the plant of the Madison River Power Company, on Madison river 7½ m. S.E. of Norris, whence power is also transmitted to Bozeman and Belgrade, Gallatin county, to Ruby, Madison county, and to the Greene-Campbell mine near Whitehall, Jefferson county. In 1910 Butte had only one large smelter, and the smoke nuisance was thus abated. The city is the seat of the Montana School of Mines (1900), and has a state industrial school, a high school and a public library (rebuilt in 1906 after a fire) with more than 32,000 volumes. The city hall, Federal building and Silver Bow county court house are among the principal buildings. Butte was first settled as a placer mining camp in 1864. It was platted in 1866; its population in 1870 was only 241, and for many years its growth was slow. Prosperity came, however, with the introduction of quartz mining in 1875, and in 1879 a city charter was granted. In the decade from 1890 to 1900 Butte's increase in population was 184.2%.

BUTTE (O. Fr. *butte*, a hillock or rising ground), a word used in the western states of North America for a flat-topped hill surrounded by a steep escarpment from which a slope descends to the plain. It is sometimes used for "an elevation higher than a hill but not high enough for a mountain." The butte capped by a horizontal platform of hard rock is characteristic of the arid plateau region of the west of North America.

BUTTER (Lat. *butyrum*, Gr. βούτυρον, apparently connected with βοῦς, cow, and τυρός, cheese, but, according to the *New English Dictionary*, perhaps of Scythian origin), the fatty portion of the milk of mammalian animals. The milk of all mammals contains such fatty constituents, and butter from the milk of goats, sheep and other animals has been and may be used; but that yielded by cow's milk is the most savoury, and it alone really constitutes the butter of commerce. The milk of the various breeds of cattle varies widely in the proportion of fatty matter it contains; its richness in this respect being greatly influenced by season, nature of food, state of the animals' health and other considerations. Usually the cream is skimmed off the surface of the milk for making butter, but by some the churning is performed on the milk itself without waiting for the separation of the cream. The operation of churning causes the rupture of the oil sacs, and by the coalescence of the fat so liberated butter is formed. Details regarding churning and the preparation of butter generally will be found under DAIRY AND DAIRY FARMING.

[v.04 p.0890]



Plant of *Ranunculus bulbosus*, showing determinate inflorescence.

BUTTERCUP, a name applied to several species of the genus *Ranunculus* (*q.v.*), characterized by their deeply-cut leaves and yellow, broadly cup-shaped flowers. *Ranunculus acris* and *R. bulbosus* are erect, hairy meadow plants, the latter having the stem swollen at the base, and distinguished also by the furrowed flower-stalks and the often smaller flowers with reflexed, not spreading, sepals. *R. repens*, common on waste ground, produces long runners by means of which it rapidly covers the ground. The plants are native in the north temperate to arctic zones of the Old World, and have been introduced in America.

BUTTERFIELD, DANIEL (1831-1901), American soldier, was born in Utica, New York. He graduated at Union College in 1849, and when the Civil War broke out he became colonel of the 12th New York militia regiment. On the 14th of May 1861 he was transferred to the regular army as a lieutenant-colonel, and in September he was made a brigadier-general U.S.V. He served in Virginia in 1861 and in the Peninsular campaign of 1862, and was wounded at Games' Mill. He took part in the campaign of second Bull Run (August 1862), and in November became major-general U.S.V. and in July 1863 colonel U.S.A. At Fredericksburg he commanded the V. corps, in which he had served since its formation. After General Hooker succeeded Burnside, Butterfield was appointed chief of staff, Army of the Potomac, and in this capacity he served in the Chancellorsville and Gettysburg campaigns. Not being on good terms with General Meade he left the staff, and was soon afterwards sent as chief of staff to Hooker, with the XI. and XII. corps (later combined as the XX.) to Tennessee, and took part in the battle of Chattanooga (1863), and the Atlanta campaign of the following year, when he commanded a division of the XX. corps. His services were recognized by the brevets of brigadier-general and major-general in the regular army. He resigned in 1870, and for the rest of his life was engaged in civil and commercial pursuits. In 1862 he wrote a manual of *Camp and Outpost Duty* (New York, 1862). General Butterfield died at Cold Spring, N.Y., on the 17th of July 1901.

A *Biographical Memorial*, by his widow, was published in 1904.

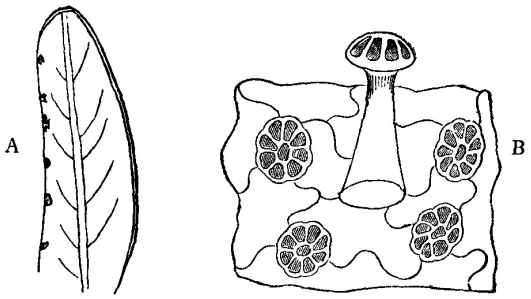
BUTTERFIELD, WILLIAM (1814-1900), English architect, was born in London, and educated for his profession at Worcester, where he laid the foundations of his knowledge of Gothic architecture. He settled in London and became prominent in connexion with the Cambridge Camden Society, and its work in the improvement of church furniture and art. His first important building was St Augustine's, Canterbury (1845), and his reputation was made by All Saints', Margaret Street, London (1859), followed by St Alban's, Holborn (1863), the new part of Merton College, Oxford (1864), Keble College, Oxford (1875), and many houses and ecclesiastical buildings. He also did much work as a restorer, which has been adversely criticized. He was a keen churchman and intimately associated with the English church revival. He had somewhat original views as to colour in architecture, which led to rather garish results, his view being that any combination of the natural colours of the materials was permissible. His private life was retiring, and he died unmarried on the 23rd of February 1900.

BUTTERFLY AND **MOTH** (the former from "butter" and "fly," an old term of uncertain origin, possibly

from the nature of the excrement, or the yellow colour of some particular species; the latter akin to O. Eng. *mod*, an earth-worm), the common English names applied respectively to the two groups of insects forming the scientific order Lepidoptera (*q.v.*).

BUTTER-NUT, the product of *Caryocar nuciferum*, a native of tropical South America. The large nuts, known also as saowari or suwarow nuts, are the hard stone of the fruit and contain an oily nutritious seed. The genus *Caryocar* contains ten species, in tropical South America, some of which form large trees affording a very durable wood, useful for shipbuilding.

BUTTERWORT, the popular name of a small insectivorous plant, *Pinguicula vulgaris*, which grows in wet, boggy land. It is a herb with a rosette of fleshy, oblong leaves, 1 to 3 in. long, appressed to the ground, of a pale colour and with a sticky surface. Small insects settle on the leaves and are caught in the viscid excretion. This, like the excretion of the sundew and other insectivorous plants, contains a digestive ferment (or enzyme) which renders the nitrogenous substances of the body of the insect soluble, and capable of absorption by the leaf. In this way the plant obtains nitrogenous food by means of its leaves. The leaves bear two sets of glands, the larger borne on usually unicellular pedicels, the smaller almost sessile (fig. B). When a fly is captured, the viscid excretion becomes strongly acid and the naturally incurved margins of the leaf curve still further inwards, rendering contact between the insect and the leaf-surface more complete. The plant is widely distributed in the north temperate zone, extending into the arctic zone.



A, leaf of Butterwort (*Pinguicula vulgaris*) with left margin inflected over a row of small flies. (After Darwin.) B, glands from surface of leaf by which the sticky liquid is secreted and by means of which the products of digestion are absorbed.

BUTTERY (from O. Fr. *boterie*, Late Lat. *botaria*, a place where liquor is stored, from *butta*, a cask), a place for storing wine; later, with a confusion with "butter," a pantry or storeroom for food; especially, at colleges at Oxford and Cambridge, the place where food other than meat, especially bread and butter, ale and wines, &c., are kept.

BUTTMANN, PHILIPP KARL (1764-1829), German philologist, was born at Frankfort-On-Main in 1764. He was educated in his native town and at the university of Göttingen. In 1789 he obtained an appointment in the library at Berlin, and for some years he edited *Speners Journal*. In 1796 he became professor at the Joachimsthal Gymnasium in Berlin, a post which he held for twelve years. In 1806 he was admitted to the Academy of Sciences, and in 1811 was made secretary of the Historico-Philological Section. He died in 1829. Buttmann's writings gave a great impetus to the scientific study of the Greek language. His *Griechische Grammatik* (1792) went through many editions, and was translated into English. His *Lexilogus*, a valuable study on some words of difficulty occurring principally in the poems of Homer and Hesiod, was published in 1818-1825, and was translated into English. Buttmann's other works were *Ausführliche griechische Sprachlehre* (2 vols., 1819-1827); *Mythologus*, a collection of essays (1828-1829); and editions of some classical authors, the most important being *Demosthenes in Midiam* (1823) and the continuation of Spalding's *Quintilian*.

[v.04 p.0891]

BUTTON (Fr. *bouton*, O. Fr. *boton*, apparently from the same root as *bouter*, to push), a small piece of metal or other material which, pushed through a loop or button-hole, serves as a catch between different parts of a garment, &c. The word is also used of other objects which have a projecting knob-like character, *e.g.* button-mushrooms, the button of an electric bell-push, or the guard at the tip of a fencing foil; or which resemble a button in size and shape, as the button of metal obtained in assaying operations. At first buttons were apparently used for purposes of ornamentation; in *Piers Plowman* (1377) mention is made of a knife with "botones ouergylte," and in Lord Berner's translation of *Froissart's Chronicles* (1525) of a book covered with crimson velvet with "ten botons of syluer and gylte." While this use has continued, especially in connexion with women's dress, they began to be employed as fastenings at least as early as the 15th century. As a term of comparison for something trivial or worthless, the word is found in the 14th century. Buttons of distinctive colour or pattern, or bearing a portrait or motto, are often worn, especially in the United States, as a decoration, or sign of membership of a society or of adherence to a political party; among the most honoured of such buttons are those worn by members of the military order of the Loyal Legion of the United States, organized in 1865 by officers who had fought in the Civil War. Chinese officials wear a button or knob on their hats as a mark of rank, the grade being denoted by its colour and material (see MANDARIN).

Many varieties of buttons are used on clothing, but they may be divided into two main classes according to the arrangement by which they are attached to the garment; in one class they are provided with a shank which may consist of a metal loop or of a tuft of cloth or similar material, while in the other they are pierced with holes through which are passed threads. To these two classes roughly correspond two broad differences in the method of manufacture, according as the buttons are composite and made up of two or more pieces, or are simply shaped disks of a single material; some composite buttons, however, are provided with holes, and simple metal buttons sometimes have metal shanks soldered or riveted on them. From an early period buttons of the former kind were made by needlework with the aid of a mould or former, but about 1807 B. Sanders, a Dane who had been ruined by the bombardment of Copenhagen, introduced an improved method of manufacturing them at Birmingham. His buttons were formed of two disks of metal locked together by having their edges turned back on each other and enclosing a filling of cloth or pasteboard; and by methods of this kind, carried out by elaborate automatic machinery, buttons are readily produced, presenting faces of silk, mohair, brocade or other material required to harmonize with the fabric on which they are used. Sanders's buttons at first had metal shanks, but about 1825 his son invented flexible shanks of canvas or other substance through which the needle could pass freely in any direction. The mechanical manufacture of covered buttons was started in the United States in 1827 by Samuel Williston, of Easthampton, Mass., who in 1834 joined forces with Joel and Josiah Hayden, of Haydenville.

The number of materials that have been used for making buttons is very large—metals such as brass and

iron for the cheaper kinds, and for more expensive ones, gold and silver, sometimes ornamented with jewels, filigree work, &c.; ivory, horn, bone and mother-of-pearl or other nacreous products of shell-fish; vegetable ivory and wood; glass, porcelain, paper, celluloid and artificial compositions; and even the casein of milk, and blood. Brass buttons were made at Birmingham in 1689, and in the following century the metal button industry underwent considerable development in that city. Matthew Boulton the elder, about 1745, introduced great improvements in the processes of manufacture, and when his son started the Soho works in 1767 one of the departments was devoted to the production of steel buttons with facets, some of which sold for 140 guineas a gross. Gilt buttons also came into fashion about the same period. In this "Augustan age" of the Birmingham button industry, when there was a large export trade, the profits of manufacturers who worked on only a modest scale amounted to £3000 and £4000 a year, and workmen earned from £2 to £4 a week. At one time the buttons had each to be fashioned separately by skilled artisans, but gradually the cost of production was lessened by the adoption of mechanical processes, and instead of being turned out singly and engraved or otherwise ornamented by hand, they came to be stamped out in dies which at once shape them and impress them with the desired pattern. Ivory buttons are among the oldest of all. Horn buttons were made at Birmingham at least by 1777; towards the middle of the igth century Emile Bassot invented a widely-used process for producing them from the hoofs of cattle, which were softened by boiling. Pearl buttons are made from pearl oyster shells obtained from various parts of the world, and after being cut out by tubular drills are shaped and polished by machinery. Buttons of vegetable ivory can be readily dyed. Glass buttons are especially made in Bohemia, as also are those of porcelain, which were invented about 1840 by an Englishman, R. Prosser of Birmingham. In the United States few buttons were made until the beginning of the 19th century, when the manufacture of metal buttons was started at Waterbury, Conn., which is now the centre of that industry. In 1812 Aaron Benedict began to make ivory and horn buttons at the same place. Buttons of vegetable ivory, now one of the most important branches of the American button industry, were first made at Leeds, Mass., in 1859 by an Englishman, A.W. Critchlow, and in 1875 commercial success was attained in the production of composition buttons at Springfield, Mass. Pearl buttons were made on a small scale in 1855, but their manufacture received an enormous impetus in the last decade of the 19th century, when J.F. Boepple began, at Muscatine, Iowa, to utilize the unio or "niggerhead" shells found along the Mississippi. By 1905 the annual output of these "fresh-water pearl" buttons had reached 11,405,723 gross, worth $3,359,167, or 36.6% of the total value of the buttons produced in the United States. In the same year the mother-of-pearl buttons ("ocean pearl buttons") numbered 1,737,830 gross, worth $1,511,107, and the two kinds together constituted 44% of the number, and 53.9% of the value, of the button manufactures of the United States. (See *U.S.A. Census Reports, 1900, Manufactures*, part iii. pp. 315-327.)

BUTTRESS (from the O. Fr. *bouteret*, that which bears a thrust, from *bouter*, to push, cf. Eng. "butt" and "abutment"), masonry projecting from a wall, provided to give additional strength to the same, and also to resist the thrust of the roof or wall, especially when concentrated at any one point. In Roman architecture the plans of the building, where the vaults were of considerable span and the thrust therefore very great, were so arranged as to provide cross-walls, dividing the aisles, as in the case of the Basilica of Maxentius, and, in the Thermae of Rome, the subdivisions of the less important halls, so that there were no visible buttresses. In the baths of Diocletian, however, these cross-walls rose to the height of the great vaulted hall, the tepidarium, and their upper portions were decorated with niches and pilasters. In a palace at Shuka in Syria, attributed to the end of the 2nd century A.D., where, in consequence of the absence of timber, it was necessary to cover over the building with slabs of stones, these latter were carried on arches thrown across the great hall, and this necessitated two precautions, viz. the provision of an abutment inside the building, and of buttresses outside, the earliest example in which the feature was frankly accepted. In Byzantine work there were no external buttresses, the plans being arranged to include them in cross-walls or interior abutments. The buttresses of the early Romanesque churches were only pilaster strips employed to break up the wall surface and decorate the exterior. At a slightly later period a greater depth was given to the lower portion of the buttresses, which was then capped with a deep sloping weathering. The introduction of ribbed vaulting, extended to the nave in the 12th century, and the concentration of thrusts on definite points of the structure, rendered the buttress an absolute necessity, and from the first this would seem to have been recognized, and the architectural treatment already given to the Romanesque buttress received a remarkable development. The buttresses of the early English period have considerable projection with two or three sets-off sloped at an acute angle dividing the stages and crowned by triangular heads; and slender columns ("buttress shafts") are used at the angle. In later work pinnacles and niches are usually employed to decorate the summits of the buttresses, and in the still later Perpendicular work the vertical faces are all richly decorated with panelling.

[v.04 p.0892]

BUTYL ALCOHOLS, C_4H_9OH. Four isomeric alcohols of this formula are known; two of these are primary, one secondary, and one tertiary (see ALCOHOLS). Normal butyl alcohol, $CH_3{\cdot}(CH_2)_2{\cdot}CH_2OH$, is a colourless liquid, boiling at 116.8°, and formed by reducing normal butyl aldehyde with sodium, or by a peculiar fermentation of glycerin, brought about by a schizomycete. Isobutyl alcohol, $(CH_3)_2CH{\cdot}CH_2OH$, the butyl alcohol of fermentation, is a primary alcohol derived from isobutane. It may be prepared by the general methods, and occurs in fusel oil, especially in potato spirit. It is a liquid, smelling like fusel oil and boiling at 108.4° C. Methyl ethyl carbinol, $CH_3{\cdot}C_2H_5{\cdot}CHOH$, is the secondary alcohol derived from n-butane. It is a strongly smelling liquid, boiling at 99°. Trimethyl carbinol or tertiary butyl alcohol, $(CH_3)_3{\cdot}COH$, is the simplest tertiary alcohol, and was obtained by A. Butlerow in 1864 by acting with zinc methyl on acetyl chloride (see ALCOHOLS). It forms rhombic prisms or plates which melt at 25° and boil at 83°, and has a spiritous smell, resembling that of camphor.

BUTYRIC ACID, $C_4H_8O_2$. Two acids are known corresponding to this formula, *normal butyric acid*, $CH_3{\cdot}CH_2{\cdot}CH_2{\cdot}COOH$, and *isobutyric acid*, $(CH_3)_2{\cdot}CH{\cdot}COOH$. Normal butyric acid or fermentation butyric acid is found in butter, as an hexyl ester in the oil of *Heracleum giganteum* and as an octyl ester in parsnip (*Pastinaca sativa*); it has also been noticed in the fluids of the flesh and in perspiration. It may be prepared by the hydrolysis of ethyl acetoacetate, or by passing carbon monoxide over a mixture of sodium acetate and sodium ethylate at 205° C. (A. Geuther, *Ann.*, 1880, 202, p.306), $C_2H_5ONa + CH_3COONa + CO = H{\cdot}CO_2Na + CH_3{\cdot}CH_2{\cdot}CH_2{\cdot}COONa$. It is ordinarily prepared by the fermentation of sugar or starch, brought about by the addition of putrefying cheese, calcium carbonate being added to neutralize the acids formed in the process. A. Fitz (*Ber.*, 1878, 11 p. 52) found that the butyric fermentation of starch is aided by the direct addition of *Bacillus subtilis*. The acid is an oily liquid of unpleasant smell, and solidifies at

-19° C.; it boils at 162.3° C., and has a specific gravity of 0.9746 (0° C.). It is easily soluble in water and alcohol, and is thrown out of its aqueous solution by the addition of calcium chloride. Potassium bichromate and sulphuric acid oxidize it to carbon dioxide and acetic acid, while alkaline potassium permanganate oxidizes it to carbon dioxide. The calcium salt, $Ca(C_4H_7O_2)_2{\cdot}H_2O$, is less soluble in hot water than in cold.

Isobutyric acid is found in the free state in carobs (*Ceratonia siliqua*) and in the root of *Arnica dulcis*, and as an ethyl ester in croton oil. It may be artificially prepared by the hydrolysis of isopropylcyanide with alkalies, by the oxidation of isopropyl alcohol with potassium bichromate and sulphuric acid (I. Pierre and E. Puchot, *Ann. de chim. et de phys.*, 1873, [4] 28, p. 366), or by the action of sodium amalgam on methacrylic acid, $CH_2{\cdot}C(CH_3){\cdot}COOH$. It is a liquid of somewhat unpleasant smell, boiling at 155.5° C. Its specific gravity is 0.9697 (0°). Heated with chromic acid solution to 140° C., it gives carbon dioxide and acetone. Alkaline potassium permanganate oxidizes it to α-oxyisobutyric acid, $(CH_3)_2{\cdot}C(OH){\cdot}COOH$, whilst concentrated nitric acid converts it into dinitroisopropane. Its salts are more soluble in water than those of the normal acid.

BUXAR, or Baxar, a town of India, in the district of Shahabad, Bengal, on the south bank of the Ganges, and on the East Indian railway. Pop. (1901) 13,945. There is a dismantled fort of small size which was important from its commanding the Ganges. A celebrated victory was gained here on the 23rd of October 1764 by the British forces under Major (afterwards Sir Hector) Munro, over the united armies of Shuja-ud-Dowlah and Kasim Ali Khan. The action raged from 9 o'clock till noon, when the enemy gave way. Pursuit was, however, frustrated by Shuja-ud-Dowlah sacrificing a part of his army to the safety of the remainder. A bridge of boats had been constructed over a stream about 2 m. distant from the field of battle, and this the enemy destroyed before their rear had passed over. Through this act 2000 troops were drowned, or otherwise lost; but destructive as was this proceeding, it was, said Major Munro, "the best piece of generalship Shuja-ud-Dowlah showed that day, because if I had crossed the rivulet with the army, I should either have taken or drowned his whole army in the Karamnasa, and come up with his treasure and jewels, and Kasim Ali Khan's jewels, which I was informed amounted to between two and three millions."

BUXTON, JEDEDIAH (1707-1772), English arithmetician, was born on the 20th of March 1707 at Elmton, near Chesterfield, in Derbyshire. Although his father was schoolmaster of the parish, and his grandfather had been the vicar, his education had been so neglected that he could not write; and his knowledge, except of numbers, was extremely limited. How he came first to know the relative proportions of numbers, and their progressive denominations, he did not remember; but on such matters his attention was so constantly riveted, that he frequently took no cognizance of external objects, and when he did, it was only with reference to their numbers. He measured the whole lordship of Elmton, consisting of some thousand acres, simply by striding over it, and gave the area not only in acres, roods and perches, but even in square inches. After this, he reduced them into square hairs'-breadths, reckoning forty-eight to each side of the inch. His memory was so great, that in resolving a question he could leave off and resume the operation again at the same point after the lapse of a week, or even of several months. His perpetual application to figures prevented the smallest acquisition of any other knowledge. His wonderful faculty was tested in 1754 by the Royal Society of London, who acknowledged their satisfaction by presenting him with a handsome gratuity. During his visit to the metropolis he was taken to see the tragedy of *Richard III.* performed at Drury Lane theatre, but his whole mind was given to the counting of the words uttered by David Garrick. Similarly, he set himself to count the steps of the dancers; and he declared that the innumerable sounds produced by the musical instruments had perplexed him beyond measure. He died in 1772.

A memoir appeared in the *Gentleman's Magazine* for June 1754, to which, probably through the medium of a Mr Holliday, of Haughton Hall, Nottinghamshire, Buxton had contributed several letters. In this memoir, his age is given as forty-nine, which points to his birth in 1705; the date adopted above is on the authority of Lysons' *Magna Britannia* (Derbyshire).

BUXTON, SIR THOMAS FOWELL (1786-1845), English philanthropist, was born in Essex on the 1st of April 1786, and was educated at Trinity College, Dublin, where, in spite of his early education having been neglected, hard work made him one of the first men of his time, with a high reputation as a speaker. In 1807 he married Hannah Gurney, sister of the celebrated Elizabeth Fry. As his means were not sufficient to support his family, he entered in 1808 the brewery of Truman, Hanbury & Company, of which his uncles, the Hanburys, were partners. He devoted himself to business with characteristic energy, became a partner in 1811, and soon had the whole concern in his hands. In 1816 he brought himself into notice by his speech on behalf of the Spitalfields weavers, and in 1818 he published his able *Inquiry into Prison Discipline*. The same year he was elected M.P. for Weymouth, a borough for which he continued to sit till 1837. In the House of Commons he had a high reputation as an able and straightforward speaker, devoted to philanthropic schemes. Of these plans the most important was that for the abolition of slavery in the British colonies. Buxton devoted his life to this object, and through defeat and opposition, despite the attacks of enemies and the remonstrances of faint-hearted friends, he remained true to it. Not till 1833 was he successful, and even then only partially, for he was compelled to admit into the bill some clauses against which his better judgment had decided. In 1837 he ceased to sit in the House of Commons. He travelled on the continent in 1839 to recruit his health, which had given way, and took the opportunity of inspecting foreign prisons. He was made a baronet in 1840, and then devoted himself to a plan for ameliorating the condition of the African natives. The failure of the Niger expedition of 1841 was a blow from which he never recovered. He died on the 19th of February 1845.

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See *Memoir and Correspondence of Sir T.F. Buxton* (1848), by his third son, Charles Buxton (1823-1871), a well-known philanthropist and member of parliament.

BUXTON, a market town and fashionable health-resort in the High Peak parliamentary division of Derbyshire, England, on the London & North-Western and Midland railways, 36 m. N.W. by N. of Derby. Pop. of urban district (1901) 10,181. It occupies a high position, lying between 1000 and 1150 ft. above sea-level, in an open hollow, surrounded at a distance by hills of considerable elevation, except on the south-east side, where the Wye, which rises about half a mile away, makes its exit. The old town (High Buxton) stands a little above the new, and consists of one wide street, and a considerable market-place with an old cross. The new town is the richer portion. The Crescent is a fine range of buildings in the Doric

style, erected by the duke of Devonshire in 1779-1788. It contains hotels, a ballroom, a bank, a library and other establishments, and the surrounding open grounds are laid out in terraces and gardens. The Old Hall hotel at the west end of the Crescent stands on the site of the mansion built in 1572 by the earl of Shrewsbury in the reign of Queen Elizabeth, which was the residence of Mary queen of Scots when she visited the town. The mineral waters of Buxton, which have neither taste nor smell, are among the most noted in England, and are particularly efficacious in cases of rheumatism and gout. There are numerous public and private baths, the most important of which are those in the establishment at the eastern end of the Crescent. The springs supply hot and cold water at a very short distance from each other, flowing at the rate of 60 gallons a minute. The former possesses a uniform temperature of 82° Fahr., and the principal substances in solution are bicarbonate of calcium, bicarbonate of magnesium, chloride of sodium, chloride of magnesium and silica acid. There is also a chalybeate spring known as St Anne's well, situated at the S.W. corner of the Crescent, the water of which when mixed with that of the other springs proves purgative. The Devonshire hospital, formerly known as the Bath Charity, is a benevolent institution, supported by voluntary subscriptions. Every year some thousands of poor patients are treated free of cost; and the hospital was enlarged for their accommodation, a dome being added which is of greater circumference than any other in Europe. In 1894 the duke of Devonshire erected a handsome pump-room at St Anne's well. The Buxton season extends from June to October, and during that period the town is visited by thousands, but it is also popular as a winter resort. The Buxton Gardens are beautifully laid out, with ornamental waters, a fine opera-house, pavilion and concert hall, theatre and reading rooms. Electric lighting has been introduced, and there is an excellent golf course. The Cavendish Terrace forms a fine promenade, and the neighbourhood of the town is rich in objects of interest. Of these the chief are Poole's Hole, a vast stalactite cave, about half a mile distant; Diamond Hill, which owes its name to the quartz crystals which are not uncommon in its rocks; and Chee Tor, a remarkable cliff, on the banks of the Wye, 300 ft. high. Ornaments are manufactured by the inhabitants from alabaster and spar; and excellent lime is burned at the quarries near Poole's Hole. Buxton is an important centre for horse-breeding, and a large horse-fair is held annually. Although the annual rainfall, owing to the situation of the town towards the western flank of the Pennine Hills, is about 49 in., the air is particularly dry owing to the high situation and the rapidity with which waters drain off through the limestone. The climate is bracing and healthy.

The waters were known and used by the Romans, but to a limited extent, and no remains of their baths survive. Roman roads connected the place with Derby, Brough in Edale and Manchester. Buxton (Bawdestanes, Bue-stanes), formed into a civil parish from Bakewell in 1895, has thus claims to be considered one of the oldest English spas. It was probably the "Bectune" mentioned in Domesday. After the departure of the Romans the baths seem to have been long neglected, but were again frequented in the 16th century, when the chapel of St Anne was hung round with the crutches of those who were supposed to owe their cure to her healing powers; these interesting relics were destroyed at the Reformation. The baths were visited at least four times by Mary queen of Scots, when a prisoner in charge of George, earl of Shrewsbury, other famous Elizabethan visitors being Lord Burleigh, the earl of Essex, and Robert, earl of Leicester. At the close of the 18th century the duke of Devonshire, lord of the manor (whose ancestor Sir Ralph de Gernons was lord of Bakewell in 1251), spent large sums of money on improvements in the town. In 1781 he began to build the famous Crescent, and since that time Buxton has steadily increased in favour as an inland watering-place. In 1813 a weekly market on Saturday and four annual fairs were granted. These were bought by the local authorities from the duke of Devonshire in 1864.

See Gough's edition of Camden's *Britannia*; Stephen Glover, *History of the County of Derby* (Derby, 1829); W. Bemrose, *Guide to Buxton* (London, 1869).

BUXTORF, or Buxtorff, **JOHANNES** (1564-1629), German Hebrew and Rabbinic scholar, was born at Kamen in Westphalia on the 25th of December 1564. The original form of the name was Bockstrop, or Boxtrop, from which was derived the family crest, which bore the figure of a goat (Ger. *Bock*, he-goat). After the death of his father, who was minister of Kamen, Buxtorf studied at Marburg and the newly-founded university of Herborn, at the latter of which C. Olevian (1536-1587) and J.P. Piscator (1546-1625) had been appointed professors of theology. At a later date Piscator received the assistance of Buxtorf in the preparation of his Latin translation of the Old Testament, published at Herborn in 1602-1603. From Herborn Buxtorf went to Heidelberg, and thence to Basel, attracted by the reputation of J.J. Grynaeus and J.G. Hospinian (1515-1575). After a short residence at Basel he studied successively under H.B. Bullinger (1504-1575) at Zürich and Th. Beza at Geneva. On his return to Basel, Grynaeus, desirous that the services of so promising a scholar should be secured to the university, procured him a situation as tutor in the family of Leo Curio, son of Coelius Secundus Curio, well-known for his sufferings on account of the Reformed faith. At the instance of Grynaeus, Buxtorf undertook the duties of the Hebrew chair in the university, and discharged them for two years with such ability that at the end of that time he was unanimously appointed to the vacant office. From this date (1591) to his death in 1629 he remained in Basel, and devoted himself with remarkable zeal to the study of Hebrew and rabbinic literature. He received into his house many learned Jews, that he might discuss his difficulties with them, and he was frequently consulted by Jews themselves on matters relating to their ceremonial law. He seems to have well deserved the title which was conferred upon him of "Master of the Rabbins." His partiality for Jewish society brought him, indeed, on one occasion into trouble with the authorities of the city, the laws against the Jews being very strict. Nevertheless, on the whole, his relations with the city of Basel were friendly. He remained firmly attached to the university which first recognized his merits, and declined two invitations from Leiden and Saumur successively. His correspondence with the most distinguished scholars of the day was very extensive; the library of the university of Basel contains a rich collection of letters, which are valuable for a literary history of the time.

Works.—*Manuale Hebraicum et Chaldaicum* (1602; 7th ed., 1658); *Synagoga Judaica* (1603 in German; afterwards translated into Latin in an enlarged form), a valuable repertory of information regarding the opinions and ceremonies of the Jews; *Lexicon Hebraicum et Chaldaicum cum brevi Lexico Rabbinico Philosophico* (1607; reprinted at Glasgow, 1824); his great Rabbinical Bible, *Biblic Hebraica cum Paraphr. Chald. et Commentariis Rabbinorum* (2 vols., 1618; 4 vols., 1618-1619), containing, in addition to the Hebrew text, the Aramaic Paraphrases of Targums, punctuated after the analogy of the Aramaic passages in Ezra and Daniel (a proceeding which has been condemned by Richard Simon and others), and the Commentaries of the more celebrated Rabbis, with various other treatises; *Tiberias, sive Commentarius Masoreticus* (1620; quarto edition, improved and enlarged by J. Buxtorf the younger, 1665), so named

from the great school of Jewish criticism which had its seat in the town of Tiberias. It was in this work that Buxtorf controverted the views of Elias Levita regarding the late origin of the Hebrew vowel points, a subject which gave rise to the controversy between Louis Cappel and his son Johannes Buxtorf (*q.v.*). Buxtorf did not live to complete the two works on which his reputation chiefly rests, viz. his great *Lexicon Chaldaicum, Talmudicum, et Rabbinicum*, and the *Concordantiae Bibliorum Hebraicorum*, both of which were edited by his son. They are monuments of untiring labour and industry. The lexicon was republished at Leipzig in 1869 with some additions by Bernard Fischer, and the concordance was assumed by Julius Fürst as the basis of his great Hebrew concordance, which appeared in 1840.

For additional information regarding his writings see *Athenae Rauricae*, pp. 444-448; articles in Ersch and Gruber's *Encyclopädie*, and Herzog-Hauck, *Realencyk.*; J.P. Niceron's *Mémoires*, vol. xxxi. pp. 206-215; J.M. Schroeckh's *Kirchengeschichte*, vol. v. (Post-Reformation period), pp. 72 seq. (Leipzig, 1806); G.W. Meyer's *Geschichte der Schrift-Erklärung*, vol. iii. (Göttingen, 1804); and E. Kautsch, *Johannes Buxtorf der Ältere* (1879).

BUXTORF, or BUXTORFF, **JOHANNES** (1599-1664), son of the preceding, was born at Basel on the 13th of August 1599, and when still a boy attained considerable proficiency in the classical languages. Entering the university at the age of twelve, he was only sixteen when he obtained his master's degree. He now gave himself up to theological and especially to Semitic studies, concentrating later on rabbinical Hebrew, and reading while yet a young man both the Mishna and the Jerusalem and Babylonian Gemaras. These studies he further developed by visits to Heidelberg, Dort (where he made the acquaintance of many of the delegates to the synod of 1619) and Geneva, and in all these places acquired a great reputation. In 1622 he published at Basel a *Lexicon Chaldaicum et Syriacum*, as a companion work to his father's great Rabbinical Bible. He declined the chair of logic at Lausanne, and in 1624 was appointed general deacon of the church at Basel. On the death of his father in 1629, he was unanimously designated his successor in the Hebrew professorship. From this date until his death in 1664 he remained at Basel, declining two offers which were made to him from Groningen and Leiden, to accept the Hebrew chair in these two celebrated schools. In 1647 the governing body of the university founded, specially for him, a third theological professorship, that of "Commonplaces and Controversies," which Buxtorf held for seven years along with the Hebrew chair. When, however, the professorship of the Old Testament became vacant in 1654 by the death of Theodor Zwinger, Buxtorf resigned the chair of theology and accepted that of the Old Testament instead. He was four times married, his three first wives dying shortly after marriage and the fourth predeceasing her husband by seven years. His children died young, with the exception of two boys, the younger of whom, Jakob (1645-1704), became his father's colleague, and then his successor, in the chair of Hebrew. The same distinction fell to the lot of his nephew Johann (1663-1732).

A considerable portion of Buxtorf's public life was spent in controversy regarding disputed points in biblical criticism, in reference to which he had to defend his father's views. The attitude of the Reformed churches at that time, as opposed to the Church of Rome, led them to maintain many opinions in regard to biblical questions which were not only erroneous, but altogether unnecessary for the stability of their position. Having renounced the dogma of an infallible church, it was deemed necessary to maintain as a counterpoise, not only that of an infallible Bible, but, as the necessary foundation of this, of a Bible which had been handed down from the earliest ages without the slightest textual alteration. Even the vowel points and accents were held to have been given by divine inspiration. The Massoretic text of the Old Testament, therefore, as compared either with that of the recently discovered Samaritan Pentateuch, or the Septuagint or of the Vulgate, alone contained the true words of the sacred writers. Although many of the Reformers, as well as learned Jews, had long seen that these assertions could not be made good, there had been as yet no formal controversy upon the subject. Louis Cappel (*q.v.*) was the first effectually to dispel the illusions which had long prevailed by a work on the modern origin of the vowel points and accents. The elder Buxtorf had counselled him not to publish his work, pointing out the injury which it would do the Protestant cause, but Cappel sent his MS. to Thomas Erpenius of Leiden, the most learned orientalist of his day, by whom it was published in 1624, under the title *Arcanum Punctationis revelatum*, but without the author's name. The elder Buxtorf, though he lived five years after the publication of the work, made no public reply to it, and it was not until 1648 that Buxtorf junior published his *Tractatus de punctorum origine, antiquitate, et authoritate, oppositus Arcano punctationis revelato Ludovici Cappelli*. He tried to prove by copious citations from the rabbinical writers, and by arguments of various kinds, that the points, if not so ancient as the time of Moses, were at least as old as that of Ezra, and thus possessed the authority of divine inspiration. Unfortunately he allowed himself to employ contemptuous epithets towards Cappel, such as "innovator" and "visionary." Cappel speedily prepared a second edition of his work, in which, besides replying to the arguments of his opponent, and fortifying his position with new ones, he retorted his contumelious epithets with interest. Owing to various causes, however, this second edition did not see the light until 1685, when it was published at Amsterdam in the edition of his collected works. Besides this controversy, Buxtorf engaged in three others with the same antagonist, on the subject of the integrity of the Massoretic text of the Old Testament, on the antiquity of the present Hebrew characters, and on the Lord's Supper. In the two former Buxtorf supported the untenable position that the text of the Old Testament had been transmitted to us without any errors or alteration, and that the present square or so-called Chaldee characters were coeval with the original composition of the various books. These views were triumphantly refuted by his great opponent in his *Critica Sacra*, and in his *Diatriba veris et antiquis Ebraicorum literis*.

Besides the works already mentioned in the course of this article, Buxtorf edited the great *Lexicon Chaldaicum, Talmudicum, et Rabbinicum*, on which his father had spent the labour of twenty years, and to the completion of which he himself gave ten years of additional study; and the great Hebrew *Concordance*, which his father had little more than begun. In addition to these, he published new editions of many of his father's works, as well as others of his own, complete lists of which may be seen in the *Athenae Rauricae* and other works enumerated at the close of the preceding article.

BUYING IN, on the English stock exchange, a transaction by which, if a member has sold securities which he fails to deliver on settling day, or any of the succeeding ten days following the settlement, the buyer may give instructions to a stock exchange official to "buy in" the stock required. The official announces the quantity of stock, and the purpose for which he requires it, and whoever sells the stock must be prepared to deliver it immediately. The original seller has to pay the difference between the two prices, if the latter is higher than the original contract price. A similar practice, termed "selling out," prevails when a

purchaser fails to take up his securities.

BUYS BALLOT'S LAW, in meteorology, the name given to a law which may be expressed as follows:—"Stand with your back to the wind; the low-pressure area will be on your left-hand." This rule, the truth of which was first recognized by the American meteorologists J.H. Coffin and W. Ferrel, is a direct consequence of Ferrel's Law (*q.v.*). It is approximately true in the higher latitudes of the Northern Hemisphere, and is reversed in the Southern Hemisphere, but the angle between barometric gradient and wind is not a right angle in low latitudes. The law takes its name from C.H.D. Buys Ballot, a Dutch meteorologist, who published it in the *Comptes rendus*, November 1857.

BUZEU, the capital of the department of Buzeu, Rumania, situated near the right bank of the river Buzeu, between the Carpathian Mountains and the fertile lowlands of south Moldavia and east Walachia. Pop. [v.04 p.0895] (1900) 21,561. Buzeu is important as a market for petroleum, timber and grain. It is the meeting place of railroads from Râmnicu Sarat, Braila and Ploesci. Amber is found by the riverside, and there are cloth-mills in the city. Buzeu is the seat of a bishop, whose cathedral was erected in 1640 by Prince Matthias Bassarab of Walachia, on the site of an older church. In the neighbourhood there are many monasteries. Buzeu was formerly called Napuca or Buzograd.

BUZOT, FRANÇOIS NICOLAS LÉONARD (1760-1794), French revolutionist, was born at Evreux on the 1st of March 1760. He studied law, and at the outbreak of the Revolution was an advocate in his native town. In 1789 he was elected deputy to the states-general, and there became known for his advanced opinions. He demanded the nationalization of the possessions of the clergy, and the right of all citizens to carry arms. After the dissolution of the Constituent Assembly, Buzot returned to Evreux, where he was named president of the criminal tribunal. In 1792 he was elected deputy to the Convention, and took his place among the Girondists. He demanded the formation of a national guard from the departments to defend the Convention against the populace of Paris. His proposal was carried, but never put into force; and the Parisians were extremely bitter against him and the Girondists. In the trial of Louis XVI., Buzot voted for death, but with appeal to the people and postponement of sentence. He had a decree of death passed against the *émigrés* who did not return to France, and against anyone who should demand the re-establishment of the monarchy. Proscribed with the Girondists on the 2nd of June 1793, he succeeded in escaping, and took refuge in Normandy, where he contributed to organize a federalist insurrection against the Convention, which was speedily suppressed. Buzot was outlawed, and fled to the neighbourhood of Bordeaux, and committed suicide in the woods of St Émilion on the 18th of June 1794. He was an intelligent and honest man, although he seems to have profited by the sale of the possessions of the clergy, but he had a stubborn, unyielding temperament, was incapable of making concessions, and was dominated by Madame Roland, who imparted to him her hatred of Danton and the Montagnards.

See *Mémoires de Pétion, Barbaroux, Buzot*, published by C.A. Daubon (Paris, 1866). For the history of the federalist movement in Normandy, see L. Boivin Champeaux, *Notices pour servir à, l'histoire de la Révolution dans le département de l'Eure* (Evreux and Paris, 1884).

BUZZARD, a word derived from the Lat. *Buteo*, through the Fr. *Busard*, and used in a general sense for a large group of diurnal birds-of-prey, which contains, among many others, the species usually known as the common buzzard (*Buteo vulgaris*, Leach), though the English epithet is nowadays hardly applicable. The name buzzard, however, belongs quite as rightfully to the birds called in books "harriers," which form a distinct subfamily of *Falconidae* under the title *Circinae*, and by it one species, the moor-buzzard (*Circus aeruginosus*), is still known in such places as it inhabits. "Puttock" is also another name used in some parts of England, but perhaps is rather a synonym of the kite (*Milvus ictinus*). Though ornithological writers are almost unanimous in distinguishing the buzzards as a group from the eagles, the grounds usually assigned for their separation are but slight, and the diagnostic character that can be best trusted is probably that in the former the bill is decurved from the base, while in the latter it is for about a third of its length straight. The head, too, in buzzards is short and round, while in the eagles it is elongated. In a general way buzzards are smaller than eagles, though there are several exceptions to this statement, and have their plumage more mottled. Furthermore, most if not all of the buzzards, about which anything of the kind is with certainty known, assume their adult dress at the first moult, while the eagles take a longer time to reach maturity. The buzzards are fine-looking birds, but are slow and heavy of flight, so that in the old days of falconry they were regarded with infinite scorn, and hence in common English to call a man "a buzzard" is to denounce him as stupid. Their food consists of small mammals, young birds, reptiles, amphibians and insects—particularly beetles—and thus they never could have been very injurious to the game-preserver, if indeed they were not really his friends, though they have fallen under his ban; but at the present day they are so scarce that in England their effect, whatever it may be, is inappreciable. Buzzards are found over the whole world with the exception of the Australian region, and have been split into many genera by systematists. In the British Islands are two species, one resident (the *B. vulgaris* already mentioned), and now almost confined to a few wooded districts; the other the rough-legged buzzard (*Archibuteo lagopus*), an irregular winter-visitant, sometimes arriving in large bands from the north of Europe, and readily distinguishable from the former by being feathered down to the toes. The honey-buzzard (*Pernis apivorus*), a summer-visitor from the south, and breeding, or attempting to breed, yearly in the New Forest, does not come into the subfamily *Buteoninae*, but is probably the type of a distinct group, *Perninae*, of which there are other examples in Africa and Asia. In America the name "buzzard" is popularly given to the turkey-buzzard or turkey-vulture (*Cathartes Aura*).

(A. N.)

BYELAYA TSERKOV (*i.e.* White Church), a town of Russia, in the government of Kiev, 32 m. S.S.W. of Vasilkov, on the main road from Kiev to the Crimea, in 49° 47′ N. lat. and 30° 7′ E. long. Pop. (1860) 12,075; (1897) 20,705. First mentioned in 1155, Byelaya Tserkov was destroyed during the Mongol invasion of the 13th century. In 1550 a castle was built here by the prince of Kiev, and various privileges were bestowed upon the inhabitants. From 1651 the town was subject alternately to Poland and to independent hetmans (Cossack chiefs). In 1793 it was united to Russia. There is a trade in beer, cattle and grain, sold at eleven annual fairs, three of which last for ten days each.

BYELEV, a town of Russia, in the government of Tula, and 67 m. S.W. from the city of that name on the left bank of the Oka, in 53° 48′ N. lat., and 36° 9′ E. long. Pop. (1860) 8063; (1897) 9567. It is first mentioned in 1147. It belonged to Lithuania in the end of the 14th century; and in 1468 it was raised to

the rank of a principality, dependent on that country. In the end of the 15th century this principality began to attach itself to the grand-duchy of Moscow; and by Ivan III. it was ultimately united to Russia. It suffered greatly from the Tatars in 1507, 1512, 1530, 1536 and 1544. In 1826 the empress Elizabeth died here on her way from Taganrog to St Petersburg. A public library was founded in 1858 in memory of the poet Zhukovsky, who was born (1782) in a neighbouring village. The industries comprise tallow-boiling, oil-manufacture, tanning, sugar-refining and distilling. There is a trade in grain, hemp oil, cattle and tallow. A fair is held from the 28th of August to the 10th of September every year.

BYELGOROD (*i.e.* White Town), a town of Russia, in the government of Kursk, 100 m. S.S.E. by rail from the city of that name, in 50° 46′ N. lat. and 36° 37′ E. long., clustering on a chalk hill on the right bank of the Donets. Pop. (1860) 11,722; (1897) 21,850. In the 17th century it suffered repeatedly from Tatar incursions, against which there was built (from 1633 to 1740) an earthen wall, with twelve forts, extending upwards of 200 m. from the Vorskla to the Don, and called the Byelgorod line. In 1666 an archiepiscopal see was established in the town. There are two cathedral churches, both built in the 16th century, as well as a theological seminary. Candles, leather, soap, lime and bricks are manufactured, and a trade is carried on in grain, cattle, wool, honey, wax and tallow. There are three annual fairs, on the 10th Friday after Easter, the 29th of June and the 15th of August respectively.

BYELOSTOK (Polish, *Bialystok*), a town of West Russia, in the government of and 53 m. by rail S.W. of the city of Grodno, on the main railway line from Moscow to Warsaw, at its junction with the Kiev-Grayevo (Prussian frontier) line. Founded in 1320, it became part of Prussia after the third partition of Poland, but was annexed to Russia in 1807, after the peace of Tilsit. Its development dates from 1845, when woollen-mills were built. Since that time it has grown very rapidly, its population being 13,787 in 1857; 56,629 in 1889; and 65,781 in 1901, three-fourths Jews. Its woollen, silk and felt hat factories give occupation to several thousand workers.

[v.04 p.0896] **BYEZHETSK,** a town of Russia, in the government of Tver, and 70 m. N.N.E. of the city of that name, on the right bank of the Mologa, in 57° 46′ N. lat. and 36° 43′ E. long. Pop. (1860) 5423; (1897) 9090. It is mentioned in the chronicles of 1137. On the fall of Novgorod, to which it had belonged, it was incorporated (1479) with the grand-duchy of Moscow. The town is famous for its scythes and shearing hooks, but makes also axes, nails and other hardware, and trades in grain, linen, hemp and flax.

BY-LAW, or BYE-LAW (*by-* being used in the sense of subordinate or secondary, cf. by-path), a regulation made by councils, boards, corporations and companies, usually under statutory power, for the preservation of order and good government within some place or jurisdiction. When made under authority of a statute, by-laws must generally, before they come into operation, be submitted to some confirming authority for sanction and approval; when approved, they are as binding as enacted laws. By-laws must be reasonable in themselves; they must not be retrospective nor contrary to the general law of the land. By various statutes powers are given to borough, county and district councils, to make by-laws for various purposes; corporate bodies, also, are empowered by their charters to make by-laws which are binding on their members. Such by-laws must be in harmony with the objects of the society and must not infringe or limit the powers and duties of its officers.

BYLES, MATHER (1706-1788), American clergyman, was born in Boston, Massachusetts, on the 26th of March 1706, descended, on his mother's side, from John Cotton and Richard Mather. He graduated at Harvard in 1725, and in 1733 became pastor of the Hollis Street church (Congregational), Boston. He held a high rank among the clergy of the province and was noted for his scholarly sermons and his ready wit. At the outbreak of the War of Independence he was outspoken in his advocacy of the royal cause, and after the British evacuation of Boston his connexion with his church was dissolved. He remained in Boston, however, and subsequently (1777) was arrested, tried and sentenced to deportation. This sentence was later changed to imprisonment in his own house. He was soon released, but never resumed his pastorate. He died in Boston on the 5th of July 1788. Besides many sermons he published *A Poem on the Death of George I.* (1727) and *Miscellaneous Poems* (1744).

His son, MATHER BYLES (1735-1814), graduated at Harvard in 1751, and was a Congregational clergyman at New London, Connecticut, until 1768, when he entered the Established Church, and became rector of Christ church, Boston. Sympathizing with the royal cause, he settled, after the War of Independence, in St Johns, New Brunswick, where he was rector of a church until his death.

BYNG, JOHN (1704-1757), British admiral, was the fourth son of George Byng, Lord Torrington, and entered the navy in 1718. The powerful influence of his father accounts for his rapid rise in the service. He received his first appointment as lieutenant in 1723, and became captain in 1727. His career presents nothing of note till after his promotion as rear-admiral in 1745, and as vice-admiral in 1747. He served on the most comfortable stations, and avoided the more arduous work of the navy. On the approach of the Seven Years' War the island of Minorca was threatened by an attack from Toulon and was actually invaded in 1756. Byng, who was then serving in the Channel with the rank of admiral, which he attained in 1755, was ordered to the Mediterranean to relieve the garrison of Fort St Philip, which was still holding out. The squadron was not very well manned, and Byng was in particular much aggrieved because his marines were landed to make room for the soldiers who were to reinforce the garrison, and he feared that if he met a French squadron after he had lost them he would be dangerously undermanned. His correspondence shows clearly that he left prepared for failure, that he did not believe that the garrison could hold out against the French force landed, and that he was already resolved to come back from Minorca if he found that the task presented any great difficulty. He wrote home to that effect to the ministry from Gibraltar. The governor of the fortress refused to spare any of his soldiers to increase the relief for Minorca, and Byng sailed on the 8th of May. On the 19th he was off Minorca, and endeavoured to open communications with the fort. Before he could land any of the soldiers, the French squadron appeared. A battle was fought on the following day. Byng, who had gained the weather gauge, bore down on the French fleet of M. de la Galissonière at an angle, so that his leading ships came into action unsupported by the rest of his line. The French cut the leading ships up, and then slipped away. When the flag captain pointed out to Byng that by standing out of his line he could bring the centre of the enemy to closer action, he declined on the ground that Thomas Mathews had been condemned for so doing. The French, who were equal in number to the English, got away undamaged. After remaining near Minorca for four days without making any further attempt to communicate with the fort or sighting the French, Byng sailed away to Gibraltar leaving Fort St Philip to its fate. The failure caused a savage outburst of wrath in the country. Byng was brought home,

tried by court-martial, condemned to death, and shot on the 14th of March 1757 at Portsmouth. The severity of the penalty, aided by a not unjust suspicion that the ministry sought to cover themselves by throwing all the blame on the admiral, led in after time to a reaction in favour of Byng. It became a commonplace to say that he was put to death for an error of judgment. The court had indeed acquitted him of personal cowardice or of disaffection, and only condemned him for not having done his utmost. But it must be remembered that in consequence of many scandals which had taken place in the previous war the Articles of War had been deliberately revised so as to leave no punishment save death for the officer of any rank who did not do his utmost against the enemy either in battle or pursuit. That Byng had not done all he could is undeniable, and he therefore fell under the law. Neither must it be forgotten that in the previous war in 1745 an unhappy young lieutenant, Baker Phillips by name, whose captain had brought his ship into action unprepared, and who, when his superior was killed, surrendered the ship when she could no longer be defended, was shot by sentence of a court-martial. This savage punishment was approved by the higher officers of the navy, who showed great lenity to men of their own rank. The contrast had angered the country, and the Articles of War had been amended precisely in order that there might be one law for all.

The facts of Byng's life are fairly set out in Charnock's *Biogr. Nav.* vol. iv. pp. 145 to 179. The number of contemporary pamphlets about his case is very great, but they are of no historical value, except as illustrating the state of public opinion.

(D. H.)

BYNKERSHOEK, CORNELIUS VAN (1673-1743), Dutch jurist, was born at Middleburg in Zeeland. In the prosecution of his legal studies, and while holding the offices first of member and afterwards of president of the supreme court, he found the common law of his country so defective as to be nearly useless for practical purposes. This abuse he resolved to reform, and took as the basis of a new system the principles of the ancient Roman law. His works are very voluminous. The most important of them are *De foro legatorum* (1702); *Observationes Juris Romani* (1710), of which a continuation in four books appeared in 1733; the treatise *De Dominio Maris* (1721); and the *Quaestiones Juris Publici* (1737). Complete editions of his works were published after his death; one in folio at Geneva in 1761, and another in two volumes folio at Leiden in 1766.

BYRD, WILLIAM (1543-1623), English musical composer, was probably a member of one of the numerous Lincolnshire families of the name who were to be found at Lincoln, Spalding, Pinchbeck, Moulton and Epworth in the 16th century. According to Wood, he was "bred up to musick under Thomas Tallis." He was appointed organist of Lincoln cathedral about 1563, and on the 14th of September 1568 was married at St Margaret in the Close to Ellen or Julian Birley. On the 22nd of February 1569 he was sworn in as a member of the Chapel Royal, but he does not seem to have left Lincoln immediately. In the
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Chapel Royal he shared with Tallis the honorary post of organist, and on the 22nd of January 1575 the two composers obtained a licence for twenty-one years from Elizabeth to print music and music-paper, a monopoly which does not seem to have been at all remunerative. In 1575 Byrd and Tallis published a collection of Latin motets for five and six voices, printed by Thomas Vautrollier. In 1578 Byrd and his family were living at Harlington, Middlesex. As early as 1581 his name occurs among lists of recusants, and though he retained his post in the Chapel Royal he was throughout his life a Catholic. About 1579 he set a three-part song in Thomas Legge's Latin play *Ricardus Tertius*. In 1588 he published *Psalmes, Sonets and Songs of Sadnes and Pietie,* and in the same year contributed two madrigals to Nicolas Yonge's *Musica Transalpina*. In 1589 appeared *Songs of Sundrie Natures*, a second edition of which was issued in 1610. In the same year he published *Liber Primus Sacrarum Cantionum*, a second series of which was brought out in 1591. In 1590 two madrigals by Byrd were included in Thomas Watson's *First Sett of Italian Madrigalls Englished*; one of these seems to have been sung before Queen Elizabeth on her visit to Lord Hertford at Elvetham in 1591. In April 1592 Byrd was still living at Harlington, but about 1593 he became possessed of the remainder of a lease of Stondon Place, Essex, a farm of some 200 acres, belonging to William Shelley, who was shortly afterwards convicted of high treason. The property was sequestrated, and on the 15th of July 1595 Byrd obtained a crown lease of it for the lives of his eldest son Christopher and his daughters Elizabeth and Rachel. On the death of Shelley his son bought back his estates (in 1604), whereupon his widow attempted to oust Byrd from Stondon Place, on the ground that it formed part of her jointure. Byrd was upheld in his possession of the property by James I. (*Calendar of State Papers, Dom. Series*, James I. add. series, vol. xxxvi.), but Mrs Shelley persevered in her suit, apparently until her death in 1609. In the following year the matter was settled for a time by Byrd's buying Stondon Place in the names of John and Thomas Petre, part of the property being charged with a payment to Byrd of £20 for his life, with remainder to his second son Thomas. Throughout this long suit Byrd, though in possession of property which had been confiscated from a recusant and actually taking part as a member of the Chapel Royal at the coronation of James I., had been excommunicated since 1598, while from 1605 until 1612, and possibly later, he was regularly presented before the archidiaconal court of Essex as a Catholic. In 1603 Easte published a work (no copies of which are known to exist) entitled *Medulla Musicke. Sucked out of the sappe of two* [*of*] *the most famous Musitians that ever were in this land, namely Master Wylliam Byrd ... and Master Alphonso Ferabosco ... either of whom having made 40tie severall waies (without contention), showing most rare and intricate skill in 2 partes in one upon the playne song Miserere*. In 1607 appeared two books of *Gradualia*, a second edition of which was issued in 1610. In the following year he published *Psalmes, Songs and Sonnets; some solemne, others joyfull, framed to the life of the Words*. Probably in the same year was issued *Parthenia*, a collection of virginal music, in which Byrd was associated with Bull and Orlando Gibbons. The last work to which he contributed was Sir Thomas Leighton's *Teares or Lamentations of a Sorrowfull Soule* (1614). His death took place on the 4th of July 1623. It is recorded in the *Cheque Book* of the Chapel Royal as that of a "father of musicke." His will, dated the 15th of November 1622, shows that he remained a Catholic until the end of his life, and he expresses a desire that he may die at Stondon and be buried near his wife. From the same document it seems that his latter years had been embittered by a dispute with his eldest son, but that the matter was settled by an agreement with his daughter-in-law Catherine, to whom he left his property at Stondon, charged with the payment of £20 to his second son Thomas and £10 to his daughter Rachel, with remainder to his grandson Thomas and his second son of the same name. In 1635 the estate again came before the court of chancery, on the ground that the annuities had not been paid. The property seems about 1637 to have been let to one John Leigh, and in 1651 was held by a member of the Petre family. The committee for compounding with delinquents at that date allowed Thomas Byrd the annuity of £20 bequeathed by his father. Byrd's arms, as entered in the Visitation of Essex of 1634 *ex sigillo* were three

stags' heads cabossed, a canton ermine. His children were (1) Christopher, who married Catherine, daughter of Thomas Moore of Bamborough, and had a son, Thomas, living at Stondon in 1634; (2) Thomas; (3) Elizabeth, who married successively John Jackson and—Burdett; (4) Rachel, married (1)—Hook, by whom she had two children, William and Catherine, married to Michael Walton; in 1634 Rachel Hook had married (2) Edward Biggs; (5) Mary, married (1) Henry Hawksworth, by whom she had four sons, William, Henry, George and John; (2) Thomas Falconbridge. Anne Byrd, who is mentioned in the proceedings *Shelley* v. *Byrd* (*Exchequer Decrees*, 7 James I., series ii. vol. vii. fol. 294 and 328), was probably a fourth daughter who died young.

Besides the works already mentioned Byrd was the composer of three masses, for three, four and five voices respectively, which seem to have been published with some privacy about 1588. There exists a second edition (also undated) of the four-part mass; all three have recently appeared in modern editions, and increase Byrd's claim to rank as the greatest English composer of his age. In addition to his published works, a large amount still remains in MS., comprising nearly every kind of composition. The Fitzwilliam *Virginal Book* contains a long series of interesting pieces for the virginal, and more still remains unpublished in Lady Neville's *Virginal Book* and other contemporary collections. His industry was enormous, and though his work is unequal and the licences he allowed can hardly be defended on strict grounds, his Latin church music and his instrumental compositions entitle him to high rank among his contemporaries. As a madrigalist he was inferior to Morley, Wilbye and Gibbons, though even in this branch of his art he often displays great charm and individuality.

(W. B. S.*)

BYROM, JOHN (1692-1763), English poet, writer of hymns and inventor of a system of shorthand, was born at Kersal Cell, near Manchester, on the 29th of February 1692, the younger son of a prosperous merchant. He was educated at Merchant Taylors school, and at Trinity College, Cambridge, of which he became a fellow in 1714. His first poem, "Colin to Phoebe," a pastoral, appeared in the *Spectator*, No. 603. The heroine is said to have been Dr Bentley's daughter, Joanna, the mother of Richard Cumberland, the dramatist. After leaving the university Byrom went abroad, ostensibly to study medicine, but he never practised and possibly his errand was really political, for he was an adherent of the Pretender. He was elected a member of the Royal Society in 1724. On his return to London he married his cousin in 1721, and to support himself taught a new method of shorthand of his own invention, till he succeeded (1740) to his father's estate on the death of his elder brother. His diary gives interesting portraits and letters of the many great men of his time whom he knew intimately. He died on the 26th of September 1763. A collection of his poems was published in 1773, and he is included in Alexander Chalmers's *English Poets*. His system of shorthand was not published until after his death, when it was printed as *The Universal English Shorthand; or the way of writing English in the most easy, concise, regular and beautiful manner, applicable to any other language, but particularly adjusted to our own* (Manchester, 1767).

The *Private Journal and Literary Remains of John Byrom, related by Richard Parkinson, D.D.*, was published by the Chetham Society (1854-1857).

BYRON, GEORGE GORDON BYRON, 6TH BARON (1788-1824), English poet, was born in London at 16 Holles Street, Cavendish Square, on the 22nd of January 1788. The Byrons were of Norman stock, but the founder of the family was Sir John Byron, who entered into possession of the priory and lands of Newstead in the county of Nottingham in 1540. From him it descended (but with a bar-sinister) to a great-grandson, John (1st Baron) Byron (*q.v.*), a Cavalier general, who was raised to the peerage in 1643. The first Lord Byron died childless, and was succeeded by his brother Richard, the great-grandfather of William, the 5th lord, who outlived son and grandson, and was succeeded by his great-nephew, the poet. Admiral the Hon. John Byron (*q.v.*) was the poet's grandfather. His eldest son, Captain John Byron, the poet's father, was a libertine by choice and in an eminent degree. He caused to be divorced, and married (1779) as his first wife, the marchioness of Carmarthen (born Amelia D'Arcy), Baroness Conyers in her own right. One child of the marriage survived, the Hon. Augusta Byron (1783-1851), the poet's half-sister, who, in 1807, married her first cousin, Colonel George Leigh. His second marriage to Catherine Gordon (b. 1765) of Gight in Aberdeenshire took place at Bath on the 13th of May 1785. He is said to have squandered the fortunes of both wives. It is certain that Gight was sold to pay his debts (1786), and that the sole provision for his wife was a settlement of £3000. It was an unhappy marriage. There was an attempt at living together in France, and, when this failed, Mrs Byron returned to Scotland. On her way thither she gave birth to a son, christened George Gordon after his maternal grandfather, who was descended from Sir William Gordon of Gight, grandson of James I. of Scotland. After a while her husband rejoined her, but went back to France and died at Valenciennes on the 2nd of August 1791. His wife was not a bad woman, but she was not a good mother. Vain and capricious, passionate and self-indulgent, she mismanaged her son from his infancy, now provoking him by her foolish fondness, and now exciting his contempt by her paroxysms of impotent rage. She neither looked nor spoke like a gentlewoman; but in the conduct of her affairs she was praiseworthy. She hated and avoided debt, and when relief came (a civil list pension of £300 a year) she spent most of it upon her son. Fairly well educated, she was not without a taste for books, and her letters are sensible and to the point. But the violence of her temper was abnormal. Her father committed suicide, and it is possible that she inherited a tendency to mental derangement. If Byron owed anything to his parents it was a plea for pardon.

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The poet's first years were spent in lodgings at Aberdeen. From 1794 to 1798 he attended the grammar school, "threading all classes" till he reached the fourth. It was a good beginning, a solid foundation, enabling him from the first to keep a hand over his talents and to turn them to a set purpose. He was lame from his birth. His right leg and foot, possibly both feet, were contracted by infantile paralysis, and, to strengthen his muscles, his mother sent him in the summers of 1796, 1797 to a farm house on Deeside. He walked with difficulty, but he wandered at will, soothed and inspired by the grandeur of the scenery. To his Scottish upbringing he owed his love of mountains, his love and knowledge of the Bible, and too much Calvinism for faith or unfaith in Christianity. The death of his great-uncle (May 19, 1798) placed him in possession of the title and estates. Early in the autumn Mrs Byron travelled south with her son and his nurse, and for a time made her home at Newstead Abbey. Byron was old enough to know what had befallen him. "It was a change from a shabby Scotch flat to a palace," a half-ruined palace, indeed, but his very own. It was a proud moment, but in a few weeks he was once more in lodgings. The shrunken leg did not improve, and acting on bad advice his mother entrusted him to the care of a quack named Lavender, truss-maker to the general hospital at Nottingham. His nurse who was in charge of him maltreated him,

and the quack tortured him to no purpose. At his own request he read Virgil and Cicero with a tutor.

In August 1799 he was sent to a preparatory school at Dulwich. The master, Dr Glennie, perceived that the boy liked reading for its own sake and gave him the free run of his library. He read a set of the *British Poets* from beginning to end more than once. This, too, was an initiation and a preparation. He remained at Dulwich till April 1801, when, on his mother's intervention, he was sent to Harrow. His school days, 1801-1805, were fruitful in two respects. He learned enough Latin and Greek to make him a classic, if not a classical scholar, and he made friends with his equals and superiors. He learned something of his own worth and of the worth of others. "My school-friendships," he says, "were with me passions." Two of his closest friends died young, and from Lord Clare, whom he loved best of all, he was separated by chance and circumstance. He was an odd mixture, now lying dreaming on his favourite tombstone in the churchyard, now the ring-leader in whatever mischief was afoot. He was a "record" swimmer, and, in spite of his lameness, enough of a cricketer to play for his school at Lord's, and yet he found time to read and master standard works of history and biography, and to acquire more general knowledge than boys and masters put together.

In the midsummer of 1803, when he was in his sixteenth year, he fell in love, once for all, with his distant relative, Mary Anne Chaworth, a "minor heiress" of the hall and park of Annesley which marches with Newstead. Two years his senior, she was already engaged to a neighbouring squire. There were meetings half-way between Newstead and Annesley, of which she thought little and he only too much. What was sport to the girl was death to the boy, and when at length he realized the "hopelessness of his attachment," he was "thrown out," as he said, "alone, on a wide, wide sea." She is the subject of at least five of his early poems, including the pathetic stanzas, "Hills of Annesley," and there are allusions to his love story in *Childe Harold* (c. i *s.v.*), and in "The Dream" (1816).

Byron went into residence at Trinity College, Cambridge, in October 1805. Cambridge did him no good. "The place is the devil," he said, and according to his own showing he did homage to the *genius loci*. But whatever he did or failed to do, he made friends who were worthy of his choice. Among them were the scholar-dandy Scrope Berdmore Davies, Francis Hodgson, who died provost of Eton, and, best friend of all, John Cam Hobhouse (afterwards Lord Broughton). And there was another friend, a chorister named Edleston, a "humble youth" for whom he formed a romantic attachment. He died whilst Byron was still abroad (May 1811), but not unwept nor unsung, if, as there is little doubt, the mysterious Thyrza poems of 1811, 1812 refer to his death. During the vacation of 1806, and in 1807 which was one "long vacation," he took to his pen, and wrote, printed and published most of his "Juvenile Poems." His first venture was a thin quarto of sixty-six pages, printed by S. and J. Ridge of Newark. The "advertisement" is dated the 23rd of December 1806, but before that date he had begun to prepare a second collection for the press. One poem ("To Mary") contained at least one stanza which was frankly indecent, and yielding to advice he gave orders that the entire issue should be thrown into the fire. Early in January 1807 an expurgated collection entitled *Poems on Various Occasions* was ready for private distribution. Encouraged by two critics, Henry Mackenzie and Lord Woodhouselee, he determined to recast this second issue and publish it under his own name. *Hours of Idleness*, "by George Gordon Lord Byron, a minor," was published in June 1807. The fourth and last issue of *Juvenilia*, entitled *Poems, Original and Translated*, was published in March 1808.

Hours of Idleness enjoyed a brief triumph. The *Critical* and other reviews were "very indulgent," but the *Edinburgh Review* for January 1808 contained an article, not, as Byron believed, by Jeffrey, but by Brougham, which put, or tried to put, the author and "his poesy" to open shame. The sole result was that it supplied fresh material and a new title for some rhyming couplets on "British Bards" which he had begun to write. A satire on Jeffrey, the editor, and Lord Holland, the patron of the *Edinburgh Review*, was slipped into the middle of "British Bards," and the poem rechristened *English Bards and Scotch Reviewers* (published the 1st of March 1809).

In April 1808, whilst he was still "a minor," Byron entered upon his inheritance. Hitherto the less ruinous portions of the abbey had been occupied by a tenant, Lord Grey de Ruthven. The banqueting hall, the grand drawing-room, and other parts of the monastic building were uninhabitable, but by incurring fresh debts, two sets of apartments were refurnished for Byron and for his mother. Dismantled and ruinous, it was still a splendid inheritance. In line with the front of the abbey is the west front of the priory church, with its hollow arch, once a "mighty window," its vacant niches, its delicate Gothic mouldings. The abbey
[v.04 p.0899] buildings enclose a grassy quadrangle overlooked by two-storeyed cloisters. On the eastern side are the state apartments occupied by kings and queens not as guests, but by feudal right. In the park, which is part of Sherwood Forest, there is a chain of lakes—the largest, the north-west, Byron's "lucid lake." A waterfall or "cascade" issues from the lake, in full view of the room where Byron slept. The possession of this lordly and historic domain was an inspiration in itself. It was an ideal home for one who was to be hailed as the spirit or genius of romance.

On the 13th of March 1809, he took his seat in the House of Lords. He had determined, as soon as he was of age, to travel in the East, but before he sought "another zone" he invited Hobhouse and three others to a house-warming. One of the party, C.S. Matthews, describes a day at Newstead. Host and guests lay in bed till one. "The afternoon was passed in various diversions, fencing, single-stick ... riding, cricket, sailing on the lake." They dined at eight, and after the cloth was removed handed round "a human skull filled with Burgundy." After dinner they "buffooned about the house" in a set of monkish dresses. They went to bed some time between one and three in the morning. Moore thinks that the picture of these festivities is "pregnant in character," and argues that there were limits to the misbehaviour of the "wassailers." The story, as told in *Childe Harold* (c. I. s. v.-ix.), need not be taken too seriously. Byron was angry because Lord De La Warr did not wish him goodbye, and visited his displeasure on friends and "lemans" alike. May and June were devoted to the preparation of an enlarged edition of his satire. At length, accompanied by Hobhouse and a small staff of retainers, he set out on his travels. He sailed from Falmouth on the 2nd of July and reached Lisbon on the 7th of July 1809. The first two cantos of *Childe Harold's Pilgrimage* contain a record of the principal events of his first year of absence.

The first canto describes Lisbon, Cintra, the ride through Portugal and Spain to Seville and thence to Cadiz. He is moved by the grandeur of the scenery, but laments the helplessness of the people and their impending fate. Talavera was fought and won whilst he was in Spain, but he is convinced that the "Scourge of the World" will prevail, and that Britain, "the fond ally," will display her blundering heroism in vain. Being against the government, he is against the war. History has falsified his politics, but his

descriptions of places and scenes, of "Morena's dusky height," of Cadiz and the bull-fight, retain their freshness and their warmth.

Byron sailed from Gibraltar on the 16th of August, and spent a month at Malta making love to Mrs Spencer Smith (the "Fair Florence" of c. II. s. xxix.-xxxiii.). He anchored off Prevesa on the 28th of September. The second canto records a journey on horseback through Albania, then almost a *terra incognita*, as far as Tepeleni, where he was entertained by Ali Pacha (October 20th), a yachting tour along the shores of the Ambracian Gulf (November 8-23), a journey by land from Larnaki to Athens (December 15-25), and excursions in Attica, Sunium and Marathon (January 13-25, 1810).

Of the tour in Asia Minor, a visit to Ephesus (March 15, 1810), an excursion in the Troad (April 13), and the famous swim across the Hellespont (May 3), the record is to be sought elsewhere. The stanzas on Constantinople (lxxvii.-lxxxii.), where Byron and Hobhouse stayed for two months, though written at the time and on the spot, were not included in the poem till 1814. They are, probably, part of a projected third canto. On the 14th of July Hobhouse set sail for England and Byron returned to Athens.

Of Byron's second year of residence in the East little is known beyond the bare facts that he was travelling in the Morea during August and September, that early in October he was at Patras, having just recovered from a severe attack of malarial fever, and that by the 14th of November he had returned to Athens and taken up his quarters at the Franciscan convent. Of his movements during the next five months there is no record, but of his studies and pursuits there is substantial evidence. He learnt Romaic, he compiled the notes to the second canto of *Childe Harold*. He wrote (March 12) *Hints from Horace* (published 1831), an imitation or loose translation of the *Epistola ad Pisones* (Art of Poetry), and (March 17) *The Curse of Minerva* (published 1815), a skit on Lord Elgin's deportation of the metopes and frieze of the Parthenon.

He left Athens in April, passed some weeks at Malta, and landed at Portsmouth (*c.* July 20). Arrived in London his first step was to consult his literary adviser, R.C. Dallas, with regard to the publication of *Hints from Horace*. Of *Childe Harold* he said nothing, but after some hesitation produced the MS. from a "small trunk," and, presenting him with the copyright, commissioned Dallas to offer it to a publisher. Rejected by Miller of Albemarle Street, who published for Lord Elgin, it was finally accepted by Murray of Fleet Street, who undertook to share the profits of an edition with Dallas.

Meanwhile Mrs Byron died suddenly from a stroke of apoplexy. Byron set off at once for Newstead, but did not find his mother alive. He had but little affection for her while she lived, but her death touched him to the quick. "I had but one friend," he exclaimed, "and she is gone." Another loss awaited him. Whilst his mother lay dead in his house, he heard that his friend Matthews had been drowned in the Cam. Edleston and Wingfield had died in May, but the news had reached him on landing. There were troubles on every side. On the 11th of October he wrote the "Epistle to a Friend" ("Oh, banish care," &c.) and the lines "To Thyrza," which, with other elegies, were appended to the second edition of *Childe Harold* (April 17, 1812). It was this cry of desolation, this open profession of melancholy, which at first excited the interest of contemporaries, and has since been decried as morbid and unreal. No one who has read his letters can doubt the sincerity of his grief, but it is no less true that he measured and appraised its literary significance. He could and did turn it to account.

Towards the close of the year he made friends with Moore. Some lines in *English Bards*, &c. (ii. 466-467), taunting Moore with fighting a duel with Jeffrey with "leadless pistol" had led to a challenge, and it was not till Byron returned to England that explanations ensued, and that the challenge was withdrawn. As a poet Byron outgrew Moore, giving back more than he had received, but the friendship which sprang up between them still serves Byron in good stead. Moore's *Life of Byron* (1830) is no doubt a picture of the man at his best, but it is a genuine likeness. At the end of October Byron moved to London and took up his quarters at 8 St James's Street. On the 27th of February 1812 he made his first speech in the House of Lords on a bill which made the wilful destruction of certain newly invented stocking-frames a capital offence, speaking in defence of the riotous "hands" who feared that their numbers would be diminished by improved machinery. It was a brilliant speech and won the praise of Burdett and Lord Holland. He made two other speeches during the same session, but thenceforth pride or laziness kept him silent. *Childe Harold* (4to) was published on Tuesday, the 10th of March 1812. "The effect," says Moore, "was ... electric, his fame ... seemed to spring, like the palace of a fairy king, in a night." A fifth edition (8vo) was issued on the 5th of December 1812. Just turned twenty-four he "found himself famous," a great poet, a rising statesman. Society, which in spite of his rank had neglected him, was now at his feet. But he could not keep what he had won. It was not only "villainous company," as he put it, which was to prove his "spoil," but the opportunity for intrigue. The excitement and absorption of one reigning passion after another destroyed his peace of mind and put him out of conceit with himself. His first affair of any moment was with Lady Caroline Lamb the wife of William Lamb, better known as Lord Melbourne, a delicate, golden-haired sprite, who threw herself in his way, and afterwards, when she was shaken off, involved him in her own disgrace. To her succeeded Lady Oxford, who was double his own age, and Lady Frances Wedderburn Webster, the "Ginevra" of his sonnets, the "Medora" of *The Corsair*.

[v.04 p.0900]

His "way of life" was inconsistent with an official career, but there was no slackening of his poetical energies. In February 1813 he published *The Waltz* (anonymously), he wrote and published *The Giaour* (published June 5, 1813) and *The Bride of Abydos* (published November 29, 1813), and he wrote *The Corsair* (published February 1, 1814). The *Turkish Tales* were even more popular than *Childe Harold*. Murray sold 10,000 copies of *The Corsair* on the day of publication. Byron was at pains to make his accessories correct. He prided himself on the accuracy of his "costume." He was under no delusion as to the ethical or artistic value of these experiments on "public patience."

In the summer of 1813 a new and potent influence came into his life. Mrs Leigh, whose home was at Newmarket, came up to London on a visit. After a long interval the brother and sister met, and whether there is or is not any foundation for the dark story obscurely hinted at in Byron's lifetime, and afterwards made public property by Mrs Beecher Stowe (*Macmillan's Magazine*, 1869, pp. 377-396), there is no question as to the depth and sincerity of his love for his "one relative,"—that her well-being was more to him than his own. Byron passed the "seasons" of 1813, 1814 in London. His manner of life we know from his journals. Socially he was on the crest of the wave. He was a welcome guest at the great Whig houses, at Lady Melbourne's, at Lady Jersey's, at Holland House. Sheridan and Moore, Rogers and Campbell, were his intimates and companions. He was a member of the Alfred, of Watier's, of the Cocoa Tree, and half a dozen clubs besides. After the publication of *The Corsair* he had promised an interval of silence, but the

abdication of Napoleon evoked "An Ode," &c., in his dishonour (April 16); *Lara, a Tale*, an informal sequel to *The Corsair*, was published anonymously on August 6, 1814.

Newstead had been put up for sale, but pending the completion of the contract was still in his possession. During his last visit but one, whilst his sister was his guest, he became engaged to Miss Anna Isabella Milbanke (b. May 17, 1792; d. May 16, 1860), the only daughter of Sir Ralph Milbanke, Bart., and the Hon. Judith (born Noel), daughter of Lord Wentworth. She was an heiress, and in succession to a peerage in her own right (becoming Baroness Wentworth in 1856). She was a pretty girl of "a perfect figure," highly educated, a mathematician, and, by courtesy, a poetess. She had rejected Byron's first offer, but, believing that her cruelty had broken his heart and that he was an altered man, she was now determined on marriage. High-principled, but self-willed and opinionated, she believed that she held her future in her own hands. On her side there was ambition touched with fancy—on his, a wish to be married and some hope perhaps of finding an escape from himself. The marriage took place at Seaham in Durham on the 2nd of January 1815. Bride and bridegroom spent three months in paying visits, and at the end of March settled at 13 Piccadilly Terrace, London.

Byron was a member of the committee of management of Drury Lane theatre, and devoted much of his time to his professional duties. He wrote but little poetry. *Hebrew Melodies* (published April 1815), begun at Seaham in October 1814, were finished and given to the musical composer, Isaac Nathan, for publication. *The Siege of Corinth* and *Parisina* (published February 7, 1816) were got ready for the press. On the 10th of December Lady Byron gave birth to a daughter christened Augusta Ada. To judge from his letters, for the first weeks or months of his marriage things went smoothly. His wife's impression was that Byron "had avowedly begun his revenge from the first." It is certain that before the child was born his conduct was so harsh, so violent, and so eccentric, that she believed, or tried to persuade herself, that he was mad.

On the 15th of January 1816 Lady Byron left London for her father's house, claimed his protection, and after some hesitation and consultation with her legal advisers demanded a separation from her husband. It is a matter of common knowledge that in 1869 Mrs Beecher Stowe affirmed that Lady Byron expressly told her that Byron was guilty of incest with his half-sister, Mrs Leigh; also that in 1905 the second Lord Lovelace (Lord Byron's grandson) printed a work entitled *Astarte* which was designed to uphold and to prove the truth of this charge. It is a fact that neither Lady Byron nor her advisers supported their demand by this or any other charge of misconduct, but it is also a fact that Lord Byron yielded to the demand reluctantly, under pressure and for large pecuniary considerations. It is a fact that Lady Byron's letters to Mrs Leigh before and after the separation are inconsistent with a knowledge or suspicion of guilt on the part of her sister-in-law, but it is also a fact (see *Astarte*, pp. 142-145) that she signed a document (dated March 14, 1816) to the effect that any renewal of intercourse did not involve and must not be construed as a withdrawal of the charge. It cannot be doubted that Lady Byron's conviction that her husband's relations with his half-sister before his marriage had been of an immoral character was a factor in her demand for a separation, but whether there were other and what issues, and whether Lady Byron's conviction was founded on fact, are questions which have not been finally answered. Lady Byron's charge, as reported by Mrs Beecher Stowe and upheld by the 2nd earl of Lovelace, is "non-proven." Mr Robert Edgcome, in *Byron: the Last Phase* (1909), insists that Mary Chaworth was the real object of Byron's passion, and that Mrs Leigh was only shielding her.

The separation of Lord and Lady Byron was the talk of the town. Two poems entitled "Fare Thee Well" and "A Sketch," which Byron had written and printed for private circulation, were published by *The Champion* on Sunday, April 14. The other London papers one by one followed suit. The poems, more especially "A Sketch," were provocative of criticism. There was a balance of opinion, but politics turned the scale. Byron had recently published some pro-Gallican stanzas, "On the 'Star of the Legion of Honour,'" in the *Examiner* (April 7), and it was felt by many that private dishonour was the outcome of public disloyalty. The Whigs defended Byron as best they could, but his own world, with one or two exceptions, ostracized him. The "excommunicating voice of society," as Moore put it, was loud and insistent. The articles of separation were signed on or about the 18th of April, and on Sunday, the 25th of April, Byron sailed from Dover for Ostend. The "Lines on Churchill's Grave" were written whilst he was waiting for a favourable wind. His route lay through the Low Countries, and by the Rhine to Switzerland. On his way he halted at Brussels and visited the field of Waterloo. He reached Geneva on the 25th of May, where he met by appointment at Dejean's Hôtel d'Angleterre, Shelley, Mary Godwin and Clare (or "Claire") Clairmont. The meeting was probably at the instance of Claire, who had recently become, and aspired to remain, Byron's mistress. On the 10th of June Byron moved to the Villa Diodati on the southern shore of the lake. Shelley and his party had already settled at an adjoining villa, the Campagne Montalègre. The friends were constantly together. On the 23rd of June Byron and Shelley started for a yachting tour round the lake. They visited the castle of Chillon on the 26th of June, and, being detained by weather at the Hôtel de l'Ancre, Ouchy, Byron finished (June 27-29) the third canto of *Childe Harold* (published November 18), and began the *Prisoner of Chillon* (published December 5, 1816). These and other poems of July-September 1816, *e.g.* "The Dream" and the first two acts of *Manfred* (published June 16, 1817), betray the influence of Shelley, and through him of Wordsworth, both in thought and style. Byron knew that Wordsworth had power, but was against his theories, and resented his criticism of Pope and Dryden. Shelley was a believer and a disciple, and converted Byron to the Wordsworthian creed. Moreover he was an inspiration in himself. Intimacy with Shelley left Byron a greater poet than he was before. Byron passed the summer at the Villa Diodati, where he also wrote the *Monody on the Death of Sheridan*, published September 9, 1816. The second half of September was spent and devoted to "an excursion in the mountains." His journal (September 18-29), which was written for and sent to Mrs Leigh, is a great prose poem, the source of the word pictures of Alpine scenery in *Manfred*. His old friend Hobhouse was with him and he enjoyed himself, but at the close he confesses that he could not lose his "own wretched identity" in the "majesty and the power and the glory" of nature. Remorse was scotched, not killed. On the 6th of October Byron and Hobhouse started via Milan and Verona for Venice, which was reached early in November. For the next three years Byron lived in or near Venice—at first, 1816-1817, in apartments in the Frezzeria, and after January 1818 in the central block of the Mocenigo palace. Venice appealed both to his higher and his lower nature. He set himself to study her history, to understand her constitution, to learn her language. The sights and scenes with which Shakespeare and Otway, Schiller's *Ghostseer*, and Madame de Staël's *Corinne* had made him familiar, were before his eyes, not dreams but realities. He would "repeople" her with her own past, and "stamp her image" on the creations of his pen. But he had no one to live for but himself, and that self he

gave over to a reprobate mind. He planned and pursued a life of deliberate profligacy. Of two of his amours we learn enough or too much from his letters to Murray and to Moore—the first with his landlord's wife, Marianna Segati, the second with Margarita Cogni (the "Fornarina"), a Venetian of the lower class, who amused him with her savagery and her wit. But, if Shelley may be trusted, there was a limit to his candour. There is abundant humour, but there is an economy of detail in his pornographic chronicle. He could not touch pitch without being defiled. But to do him justice he was never idle. He kept his brains at work, and for this reason, perhaps, he seems for a time to have recovered his spirits and sinned with a good courage. His song of carnival, "So we'll go no more a-roving," is a hymn of triumph. About the middle of April he set out for Rome. His first halt was at Ferrara, which inspired the "Lament of Tasso" (published July 17, 1817). He passed through Florence, where he saw "*the* Venus" (of Medici) in the Uffizi Gallery, by reedy Thrasymene and Term's "matchless cataract" to "Rome the Wonderful." At Rome, with Hobhouse as companion and guide, he stayed three weeks. He returned to Venice on the 28th of May, but shortly removed to a villa at Mira on the Brenta, some 7 m. inland. A month later (June 26) when memory had selected and reduced to order the first impressions of his tour, he began to work them up into a fourth canto of *Childe Harold*. A first draft of 126 stanzas was finished by the 29th of July; the 60 additional stanzas which made up the canto as it stands were written up to material suggested by or supplied by Hobhouse, "who put his researches" at Byron's disposal and wrote the learned and elaborate notes which are appended to the poem. Among the books which Murray sent out to Venice was a copy of Hookham Frere's *Whistlecraft*. Byron took the hint and produced *Beppo, a Venetian Story* (published anonymously on the 28th of February 1818). He attributes his choice of the mock heroic *ottava-rima* to Frere's example, but he was certainly familiar with Casti's *Novelle*, and, according to Stendhal, with the poetry of Buratti. The success of *Beppo* and a growing sense that "the excellent manner of *Whistlecraft*" was the manner for him, led him to study Frere's masters and models, Berni and Pulci. An accident had led to a great discovery.

The fourth canto of *Childe Harold* was published on the 28th of April 1818. Nearly three months went by before Murray wrote to him, and he began to think that his new poem was a failure. Meanwhile he completed an "Ode on Venice," in which he laments her apathy and decay, and contrasts the tyranny of the Old World with the new birth of freedom in America. In September he began *Don Juan*. His own account of the inception of his last and greatest work is characteristic but misleading. He says (September 9) that his new poem is to be in the style of *Beppo*, and is "meant to be a little quietly facetious about everything." A year later (August 12, 1819), he says that he neither has nor had a *plan*—but that "he had or has *materials*." By materials he means books, such as Dalzell's *Shipwrecks and Disasters by Sea*, or de Castelnau's *Histoire de la nouvelle Russie*, &c., which might be regarded as poetry in the rough. The dedication to Robert Southey (not published till 1833) is a prologue to the play. The "Lakers" had given samples of their poetry, their politics and their morals, and now it was his turn to speak and to speak out. He too would write "An Excursion." He doubted that *Don Juan* might be "too free for these modest days." It *was* too free for the public, for his publisher, even for his mistress; and the "building up of the drama," as Shelley puts it, was a slow and gradual process. Cantos I., II. were published (4to) on the 15th of July 1819; Cantos III., IV., V., finished in November 1820, were not published till the 8th of August 1821. Cantos VI.-XVI., written between June 1822 and March 1823, were published at intervals between the 15th of July 1823 and the 26th of March 1824. Canto XVII. was begun in May 1823, but was never finished. A fragment of fourteen stanzas, found in his room at Missolonghi, was first published in 1903.

He did not put all his materials into *Don Juan*. "Mazeppa, a tale of the Russian Ukraine," based on a passage in Voltaire's *Charles XII.*, was finished by the 30th of September 1818 and published with "An Ode" (on Venice) on the 28th of June 1819. In the spring of 1819 Byron met in Venice, and formed a connexion with, an Italian lady of rank, Teresa (born Gamba), wife of the Cavaliere Guiccioli. She was young and beautiful, well-read and accomplished. Married at sixteen to a man nearly four times her age, she fell in love with Byron at first sight, soon became and for nearly four years remained his mistress. A good and true wife to him in all but name, she won from Byron ample devotion and a prolonged constancy. Her volume of *Recollections* (*Lord Byron jugé par les témoins de sa vie*, 1869), taken for what it is worth, is testimony in Byron's favour. The countess left Venice for Ravenna at the end of April; within a month she sent for Byron, and on the 10th of June he arrived at Ravenna and took rooms in the Strada di Porto Sisi. The house (now No. 295) is close to Dante's tomb, and to gratify the countess and pass the time he wrote the "Prophecy of Dante" (published April 21, 1821). According to the preface the poem was a metrical experiment, an exercise in *terza rima*; but it had a deeper significance. It was "intended for the Italians." Its purport was revolutionary. In the fourth canto of *Childe Harold*, already translated into Italian, he had attacked the powers, and "Albion most of all" for her betrayal of Venice, and knowing that his word had weight he appeals to the country of his adoption to strike a blow for freedom—to "unite." It is difficult to realize the force or extent of Byron's influence on continental opinion. His own countrymen admired his poetry, but abhorred and laughed at his politics. Abroad he was the prophet and champion of liberty. His hatred of tyranny—his defence of the oppressed—was a word spoken in season when there were few to speak but many to listen. It brought consolation and encouragement, and it was not spoken in vain. It must, however, be borne in mind that Byron was more of a king-hater than a people-lover. He was against the oppressors, but he disliked and despised the oppressed. He was aristocrat by conviction as well as birth, and if he espoused a popular cause it was *de haut en bas*. His connexion with the Gambas brought him into touch with the revolutionary movement, and thenceforth he was under the espionage of the Austrian embassy at Rome. He was suspected and "shadowed," but he was left alone.

Early in September Byron returned to La Mira, bringing the countess with him. A month later he was surprised by a visit from Moore, who was on his way to Rome. Byron installed Moore in the Mocenigo palace and visited him daily. Before the final parting (October 11) Byron placed in Moore's hands the MS. of his *Life and Adventures* brought down to the close of 1816. Moore, as Byron suggested, pledged the MS. to Murray for 2000 guineas, to be Moore's property if redeemed in Byron's lifetime, but if not, to be forfeit to Murray at Byron's death. On the 17th of May 1824, with Murray's assent and goodwill, the MS. was burned in the drawing-room of 50 Albemarle Street. Neither Murray nor Moore lost their money. The Longmans lent Moore a sufficient sum to repay Murray, and were themselves repaid out of the receipts of Moore's *Life of Byron*. Byron told Moore that the memoranda were not "confessions," that they were "the truth but not the whole truth." This, no doubt, was the truth, and the whole truth. Whatever they may or may not have contained, they did not explain the cause or causes of the separation from his wife.[1]

At the close of 1819 Byron finally left Venice and settled at Ravenna in his own apartments in the Palazzo

Guiccioli. His relations with the countess were put on a regular footing, and he was received in society as her *cavaliere servente*. At Ravenna his literary activity was greater than ever. His translation of the first canto of Pulci's *Morgante Maggiore* (published in the *Liberal*, No. IV., July 30, 1832), a laborious and scholarly achievement, was the work of the first two months of the year. From April to July he was at work on the composition of *Marino Faliero, Doge of Venice*, a tragedy in five acts (published April 21, 1821). The plot turns on an episode in Venetian history known as *La Congiura*, the alliance between the doge and the populace to overthrow the state. Byron spared no pains in preparing his materials. In so far as he is unhistorical, he errs in company with Sanudo and early Venetian chronicles. Moved by the example of Alfieri he strove to reform the British drama by "a severer approach to the rules." He would read his countrymen a "moral lesson" on the dramatic propriety of observing the three unities. It was an heroic attempt to reassert classical ideals in a romantic age, but it was "a week too late"; Byron's "regular dramas" are admirably conceived and finely worded, but they are cold and lifeless.

Eighteen additional sheets of the *Memoirs* and a fifth canto of *Don Juan* were the pastime of the autumn, and in January 1821 Byron began to work on his second "historical drama," *Sardanapalus*. But politics intervened, and little progress was made. He had been elected *capo* of the "*Americani*," a branch of the Carbonari, and his time was taken up with buying and storing arms and ammunition, and consultations with leading conspirators. "The poetry of politics" and poetry on paper did not go together. Meanwhile he would try his hand on prose. A controversy had arisen between Bowles and Campbell with regard to the merits of Pope. Byron rushed into the fray. To avenge and exalt Pope, to decry the "Lakers," and to lay down his own canons of art, Byron addressed two letters to **** ****** (*i.e.* John Murray), entitled "Strictures on the Life and Writings of Pope." The first was published in 1821, the second in 1835.

The revolution in Italy came to nothing, and by the 28th of May, Byron had finished his work on *Sardanapalus*. The *Two Foscari*, a third historical drama, was begun on the 12th of June and finished on the 9th of July. On the same day he began *Cain, a Mystery*. *Cain* was an attempt to dramatize the Old Testament; Lucifer's apology for himself and his arraignment of the Creator startled and shocked the orthodox. Theologically the offence lay in its detachment. *Cain* was not irreverent or blasphemous, but it treated accepted dogmas as open questions. *Cain* was published in the same volume with the *Two Foscari* and *Sardanapalus*, December 19, 1821. The "Blues," a skit upon literary coteries and their patronesses, was written in August. It was first published in *The Liberal*, No. III., April 26, 1823, When *Cain* was finished Byron turned from grave to gay, from serious to humorous theology. Southey had thought fit to eulogize George III. in hexameter verse. He called his funeral ode a "Vision of Judgment." In the preface there was an obvious reference to Byron. The "Satanic School" of poetry was attributed to "men of diseased hearts and depraved imaginations." Byron's revenge was complete. In his "Vision of Judgment" (published in *The Liberal*, No. I., October 15, 1822) the tables are turned. The laureate is brought before the hosts of heaven and rejected by devils and angels alike. In October Byron wrote *Heaven and Earth, a Mystery* (*The Liberal*, No. II., January 1, 1823), a lyrical drama based on the legend of the "Watchers," or fallen angels of the Book of Enoch. The countess and her family had been expelled from Ravenna in July, but Byron still lingered on in his apartments in the Palazzo Guiccioli. At length (October 28) he set out for Pisa. On the road he met his old friend, Lord Clare, and spent a few minutes in his company. Rogers, whom he met at Bologna, was his fellow-traveller as far as Florence. At Pisa he rejoined the countess, who had taken on his behalf the Villa Lanfranchi on the Arno. At Ravenna Byron had lived amongst Italians. At Pisa he was surrounded by a knot of his own countrymen, friends and acquaintances of the Shelleys. Among them were E.J. Trelawny, Thomas Medwin, author of the well-known *Conversations of Lord Byron* (1824), and Edward Elliker Williams. His first work at Pisa was to dramatize Miss Lee's *Kruitzner, or the German's Tale*. He had written a first act in 1815, but as the MS. was mislaid he made a fresh adaptation of the story which he rechristened *Werner, or the Inheritance*. It was finished on the 20th of January and published on the 23rd of November 1822. *Werner* is in parts *Kruitzner* cut up into loose blank verse, but it contains lines and passages of great and original merit. Alone of Byron's plays it took hold of the stage. Macready's "Werner" was a famous impersonation.

In the spring of 1822 a heavy and unlooked-for sorrow befell Byron. Allegra, his natural daughter by Claire Clairmont, died at the convent of Bagna Cavallo on the 20th of April 1822. She was in her sixth year, an interesting and attractive child, and he had hoped that her companionship would have atoned for his enforced separation from Ada. She is buried in a nameless grave at the entrance of Harrow church. Soon after the death of Allegra, Byron wrote the last of his eight plays, *The Deformed Transformed* (published by John Hunt, February 20, 1824). The "sources" are Goethe's *Faust*, *The Three Brothers*, a novel by Joshua Pickersgill, and various chronicles of the sack of Rome in 1527. The theme or *motif* is the interaction of personality and individuality. Remonstrances on the part of publisher and critic induced him to turn journalist. The control of a newspaper or periodical would enable him to publish what and as he pleased. With this object in view he entered into a kind of literary partnership with Leigh Hunt, and undertook to transport him, his wife and six children to Pisa, and to lodge them in the Villa Lanfranchi. The outcome of this arrangement was *The Liberal—Verse and Prose from the South*. Four numbers were issued between October 1822 and June 1823. *The Liberal* did not succeed financially, and the joint menage was a lamentable failure. *Correspondence of Byron and some of his Contemporaries* (1828) was Hunt's revenge for the slights and indignities which he suffered in Byron's service. Yachting was one of the chief amusements of the English colony at Pisa. A schooner, the "Bolivar," was built for Byron, and a smaller boat, the "Don Juan" re-named "Ariel," for Shelley. Hunt arrived at Pisa on the 1st of July. On the 8th of July Shelley, who had remained in Pisa on Hunt's account, started for a sail with his friend Williams and a lad named Vivian. The "Ariel" was wrecked in the Gulf of Spezia and Shelley and his companions were drowned. On the 16th of August Byron and Hunt witnessed the "burning of Shelley" on the seashore near Via Reggio. Byron told Moore that "all of Shelley was consumed but the *heart*." Whilst the fire was burning Byron swam out to the "Bolivar" and back to the shore. The hot sun and the violent exercise brought on one of those many fevers which weakened his constitution and shortened his life.

The Austrian government would not allow the Gambas or the countess Guiccioli to remain in Pisa. As a half measure Byron took a villa for them at Montenero near Leghorn, but as the authorities were still dissatisfied they removed to Genoa. Byron and Leigh Hunt left Pisa on the last day of September. On reaching Genoa Byron took up his quarters with the Gambas at the Casa Saluzzo, "a fine old palazzo with an extensive view over the bay," and Hunt and his party at the Casa Negroto with Mrs Shelley. Life at Genoa was uneventful. Of Hunt and Mrs Shelley he saw as little as possible, and though his still unpublished poems were at the service of *The Liberal*, he did little or nothing to further its success. Each

number was badly received. Byron had some reason to fear that his popularity was on the wane, and though he had broken with Murray and was offering *Don Juan* (cantos vi.-xii.) to John Hunt, the publisher of *The Liberal*, he meditated a "run down to Naples" and a recommencement of *Childe Harold*. There was a limit to his defiance of the "world's rebuke." Home politics and the congress of Verona (November-December 1822) suggested a satire entitled "The Age of Bronze" (published April 1, 1823). It is, as he said, "stilted," and cries out for notes, but it embodies some of his finest and most vigorous work as a satirist. By the middle of February (1823) he had completed *The Island; or Christian and his Comrades* (published June 26, 1823). The sources are Bligh's *Narrative of the Mutiny of the Bounty*, and Mariner's *Account of the Tonga Islands*. Satire and tale are a reversion to his earlier method. The execution of *The Island* is hurried and unequal, but there is a deep and tender note in the love-story and the recital of the "feasts and loves and wars" of the islanders. The poetic faculty has been "softened into feeling" by the experience of life.

When *The Island* was finished, Byron went on with *Don Juan*. Early in March the news reached him that he had been elected a member of the Greek Committee, a small body of influential Liberals who had taken up the cause of the liberation of Greece. Byron at once offered money and advice, and after some hesitation on the score of health, determined "to go to Greece." His first step was to sell the "Bolivar" to Lord Blessington, and to purchase the "Hercules," a collier-built tub of 120 tons. On the 23rd of July the "Hercules" sailed from Leghorn and anchored off Cephalonia on the 3rd of August. The party on board consisted of Byron, Pietro Gamba, Trelawny, Hamilton Browne and six or seven servants. The next four months were spent at Cephalonia, at first on board the "Hercules," in the harbour of Argostoli and afterwards at Metaxata. The object of this delay was to ascertain the real state of affairs in Greece. The revolutionary Greeks were split up into parties, not to say factions, and there were several leaders. It was a question to which leader he would attach himself. At length a message reached him which inspired him with confidence. He received a summons from Prince Alexander Mavrocordato, a man of birth and education, urging him to come at once to Missolonghi, and enclosing a request from the legislative body "to co-operate with Mavrocordato in the organization of western Greece." Byron felt that he could act with a "clear conscience" in putting himself at the disposal of a man whom he regarded as the authorized leader and champion of the Greeks. He sailed from Argostoli on the 29th of December 1823, and after an adventurous voyage landed at Missolonghi on the 5th of January 1824. He met with a royal reception. Byron may have sought, but he did not find, "a soldier's grave." During his three months' residence at Missolonghi he accomplished little and he endured much. He advanced large sums of money for the payment of the troops, for repair and construction of fortifications, for the provision of medical appliances. He brought opposing parties into line, and served as a link between Odysseus, the democratic leader of the insurgents, and the "prince" Mavrocordato. He was eager to take the field, but he never got the chance. A revolt in the Morea, and the repeated disaffection of his Suliote guard prevented him from undertaking the capture of Epacto, an exploit which he had reserved for his own leadership. He was beset with difficulties, but at length events began to move. On the 18th of March he received an invitation from Odysseus and other chiefs to attend a conference at Salona, and by the same messenger an offer from the government to appoint him "governor-general of the enfranchised parts of Greece." He promised to attend the conference but did not pledge himself to the immediate acceptance of office. But to Salona he never came. "Roads and rivers were impassable," and the conference was inevitably postponed.

His health had given way, but he does not seem to have realized that his life was in danger. On the 15th of February he was struck down by an epileptic fit, which left him speechless though not motionless. He recovered sufficiently to conduct his business as usual, and to drill the troops. But he suffered from dizziness in the head and spasms in the chest, and a few days later he was seized with a second though slighter convulsion. These attacks may have hastened but they did not cause his death. For the first week of April the weather confined him to the house, but on the 9th a letter from his sister raised his spirits and tempted him to ride out with Gamba. It came on to rain, and though he was drenched to the skin he insisted on dismounting and returning in an open boat to the quay in front of his house. Two hours later he was seized with ague and violent rheumatic pains. On the 11th he rode out once more through the olive groves, attended by his escort of Suliote guards, but for the last time. Whether he had got his deathblow, or whether copious blood-letting made recovery impossible, he gradually grew worse, and on the ninth day of his illness fell into a comatose sleep. It was reported that in his delirium he had called out, half in English, half in Italian, "Forward—forward—courage! follow my example—don't be afraid!" and that he tried to send a last message to his sister and to his wife. He died at six o'clock in the evening of the 19th of April 1824, aged thirty-six years and three months. The Greeks were heartbroken. Mavrocordato gave orders that thirty-seven minute-guns should be fired at daylight and decreed a general mourning of twenty-one days. His body was embalmed and lay in state. On the 25th of May his remains, all but the heart, which is buried at Missolonghi, were sent back to England, and were finally laid beneath the chancel of the village church of Hucknall-Torkard on the 16th of July 1824. The authorities would not sanction burial in Westminster Abbey, and there is neither bust nor statue of Lord Byron in Poets' Corner.

The title passed to his first cousin as 7th baron, from whom the subsequent barons were descended. The poet's daughter Ada (d. 1852) predeceased her mother, but the barony of Wentworth went to her heirs. She was the first wife of Baron King, who in 1838 was created 1st earl of Lovelace, and had two sons (of whom the younger, b. 1839, d. 1906, was 2nd earl of Lovelace) and a daughter, Lady Anne, who married Wilfrid S. Blunt (*q.v.*). On the death of the 2nd earl the barony of Wentworth went to his daughter and only child, and the earldom of Lovelace to his half-brother by the 1st earl's second wife.

Great men are seldom misjudged. The world passes sentence on them, and there is no appeal. Byron's contemporaries judged him by the tone and temper of his works, by his own confessions or self-revelations in prose and verse, by the facts of his life as reported in the newspapers, by the talk of the town. His letters, his journals, the testimony of a dozen memorialists are at the disposal of the modern biographer. Moore thinks that Byron's character was obliterated by his versatility, his mobility, that he was carried away by his imagination, and became the thing he wished to be, or conceived himself as becoming. But his nature was not chameleon-like. Self-will was the very pulse of the machine. Pride ruled his years. All through his life, as child and youth and man, his one aim and endeavour was the subjection of other people's wishes to, his own. He would subject even fate if he could. He has two main objects in view, *glory*, in the French rather than the English use of the word, and passion. It is hard to say which was the strongest or the dearest, but, on the whole, within his "little life" passion prevailed. Other inclinations he could master. Poetry was often but not always an exaltation and a relief. He could fulfil his tasks in "hours

of gloom." If he had not been a great poet he would have gained credit as a painstaking and laborious man of letters. His habitual temperance was the outcome of a stern resolve. He had no scruples, but he kept his body in subjection as a means to an end. In his youth Byron was a cautious spendthrift. Even when he was "cursedly dipped" he knew what he was about; and afterwards, when his income was sufficient for his requirements, he kept a hold on his purse. He loved display, and as he admitted, spent money on women, but he checked his accounts and made both ends meet. On the other hand, the "gift of continency" he did not possess, or trouble himself to acquire. He was, to use his own phrase, "passionate of body," and his desires were stronger than his will. There are points of Byron's character with regard to which opinion is
[v.04 p.0904] divided. Candid he certainly was to the verge of brutality, but was he sincere? Was he as melancholy as his poetry implies? Did he pose as pessimist or misanthropist, or did he speak out of the bitterness of his soul? It stands to reason that Byron knew that his sorrow and his despair would excite public interest, and that he was not ashamed to exhibit "the pageant of a bleeding heart." But it does not follow that he was a hypocrite. His quarrel with mankind, his anger against fate, were perfectly genuine. His outcry is, in fact, the anguish of a baffled will. Byron was too self-conscious, too much interested in himself, to take any pleasures in imaginary woes, or to credit himself with imaginary vices.

Whether he told the whole truth is another matter. He was naturally a truthful man and his friends lived in dread of unguarded disclosures, but his communications were not so free as they seemed. There was a string to the end of the kite. Byron was kindly and generous by nature. He took pleasure in helping necessitous authors, men and women, not at all *en grand seigneur*, or without counting the cost, but because he knew what poverty meant, and a fellow-feeling made him kind. Even in Venice he set aside a fixed sum for charitable purposes. It was to his credit that neither libertinism nor disgrace nor remorse withered at its root this herb of grace. Cynical speeches with regard to friends and friendship, often quoted to his disadvantage, need not be taken too literally. Byron talked for effect, and in accordance with the whim of the moment. His acts do not correspond with his words. Byron rejected and repudiated bath Protestant and Catholic orthodoxy, but like the Athenians he was "exceedingly religious." He could not, he did not wish to, detach himself from a belief in an Invisible Power. "A fearful looking for of judgment" haunted him to the last.

There is an increasing tendency on the part of modern critics to cast a doubt on Byron's sanity. It is true that he inherited bad blood on both sides of his family, that he was of a neurotic temperament, that at one time he maddened himself with drink, but there is no evidence that his brain was actually diseased. Speaking figuratively, he may have been "half mad," but, if so, it was a derangement of the will, not of the mind. He was responsible for his actions, and they rise up in judgment against him. He put indulgence before duty. He made a byword of his marriage and brought lifelong sorrow on his wife. If, as Goethe said, he was "the greatest talent" of the 19th century, he associated that talent with scandal and reproach. But he was born with certain noble qualities which did not fail him at his worst. He was courageous, he was kind, and he loved truth rather than lies. He was a worker and a fighter. He hated tyranny, and was prepared to sacrifice money and ease and life in the cause of popular freedom. If the issue of his call to arms was greater and other than he designed or foresaw, it was a generous instinct which impelled him to begin the struggle.

With regard to the criticism of his works, Byron's personality has always confused the issue. Politics, religion, morality, have confused, and still confuse, the issue. The question for the modern critic is, of what permanent value is Byron's poetry? What did he achieve for art, for the intellect, for the spirit, and in what degree does he still give pleasure to readers of average intelligence? It cannot be denied that he stands out from other poets of his century as a great creative artist, that his canvas is crowded with new and original images, additions to already existing types of poetic workmanship. It has been said that Byron could only represent himself under various disguises, that Childe Harold and The Corsair, Lara and Manfred and Don Juan, are variants of a single personality, the egotist who is at war with his fellows, the generous but nefarious sentimentalist who sins and suffers and yet is to be pitied for his suffering. None the less, with whatever limitations as artist or moralist, he invented characters and types of characters real enough and distinct enough to leave their mark on society as well as on literature. These masks or replicas of his own personality were formative of thought, and were powerful agents in the evolution of sentiment and opinion. In language which was intelligible and persuasive, under shapes and forms which were suggestive and inspiring, Byron delivered a message of liberation. There was a double motive at work in his energies as a poet. He wrote, as he said, because "his mind was full" of his own loves, his own griefs, but also to register a protest against some external tyranny of law or faith or custom. His own countrymen owe Byron another debt. His poems were a liberal education in the manners and customs of "the gorgeous East," in the scenery, the art, the history and politics of Italy and Greece. He widened the horizon of his contemporaries, bringing within their ken wonders and beauties hitherto unknown or unfamiliar, and in so doing he heightened and cultivated, he "touched with emotion," the unlettered and unimaginative many, that "reading public" which despised or eluded the refinements and subtleties of less popular writers.

To the student of literature the first half of the 19th century is the age of Byron. He has failed to retain his influence over English readers. The knowledge, the culture of which he was the immediate channel, were speedily available through other sources. The politics of the Revolution neither interested nor affected the Liberalism or Radicalism of the middle classes. It was not only the loftier and wholesomer poetry of Wordsworth and of Tennyson which averted enthusiasm from Byron, not only moral earnestness and religious revival but the optimism and the materialism of commercial prosperity. As time went on, a severer and more intelligent criticism was brought to bear on his handiwork as a poet. It was pointed out that his constructions were loose and ambiguous, that his grammar was faulty, that his rhythm was inharmonious, and it was argued that these defects and blemishes were outward and visible signs of a lack of fineness in the man's spiritual texture; that below the sentiment and behind the rhetoric the thoughts and ideas were mean and commonplace. There was a suspicion of artifice, a questioning of the passion as genuine. Poetry came to be regarded more and more as a source of spiritual comfort, if not a religious exercise, yet, in some sort, a substitute for religion. There was little or nothing in Byron's poetry which fulfilled this want. He had no message for seekers after truth. Matthew Arnold, in his preface to *The Poetry of Byron*, prophesied that "when the year 1900 is turned, and our nation comes to recount the poetic glories in the century which has then just ended, her first names with her will be those of Byron and Wordsworth."

That prophecy still waits fulfilment, but without doubt there has been a reconsideration of Byron's place in literature, and he stands higher than he did, say, in 1875. His quarrel with orthodoxy neither alarms nor

provokes the modern reader. Cynical or flippant turns of speech, which distressed and outraged his contemporaries, are taken as they were meant, for witty or humorous by-play. He is regarded as the herald and champion *revolt*. He is praised for his "sincerity and strength," for his single-mindedness, his directness, his audacity. A dispassionate criticism recognizes the force and splendour of his rhetoric. The "purple patches" have stood the wear and tear of time. Byron may have mismanaged the Spenserian stanza, may have written up to or anticipated the guide-book, but the spectacle of the bull-fight at Cadiz is "for ever warm," the "sound of revelry" on the eve of Waterloo still echoes in our ears, and Marathon and Venice, Greece and Italy, still rise up before us, "as from the stroke of an enchanter's wand." It was, however, in another vein that Byron achieved his final triumph. In *Don Juan* he set himself to depict life as a whole. The style is often misnamed the mock-heroic. It might be more accurately described as humorous-realistic. His "plan was to have no plan" in the sense of synopsis or argument, but in the person of his hero to "unpack his heart," to avenge himself on his enemies, personal or political, to suggest an apology for himself and to disclose a criticism and philosophy of life. As a satirist in the widest sense of the word, as an analyser of human nature, he comes, at whatever distance, after and yet next to Shakespeare. It is a test of the greatness of *Don Juan* that its reputation has slowly increased and that, in spite of its supposed immoral tendency, in spite of occasional grossness and voluptuousness, it has come to be recognized as Byron's masterpiece. *Don Juan* will be read for its own sake, for its beauty, its humour, its faithfulness. It is a "hymn to the earth," but it is a human sequence to "its own music chaunted."

[v.04 p.0905] In his own lifetime Byron stood higher on the continent of Europe than in England or even in America. His works as they came out were translated into French, into German, into Italian, into Russian, and the stream of translation has never ceased to flow. The *Bride of Abydos* has been translated into ten, *Cain* into nine languages. Of *Manfred* there is one Bohemian translation, two Danish, two Dutch, two French, nine German, three Hungarian, three Italian, two Polish, one Romaic, one Rumanian, four Russian and three Spanish translations. The dictum or verdict of Goethe that "the English may think of Byron as they please, but this is certain that they show no poet who is to be compared with him" was and is the keynote of continental European criticism. A survey of European literature is a testimony to the universality of his influence. Victor Hugo, Lamartine, Delavigne, Alfred de Musset, in France; Börne, Müller and Heine in Germany; the Italian poets Leopardi and Giusti; Pushkin and Lermontov among the Russians; Michiewicz and Slowacki among the Poles—more or less, as eulogists or imitators or disciples—were of the following of Byron. This fact is beyond dispute, that after the first outburst of popularity he has touched and swayed other nations rather than his own. The part he played or seemed to play in revolutionary politics endeared him to those who were struggling to be free. He stood for freedom of thought and of life. He made himself the mouthpiece of an impassioned and welcome protest against the hypocrisy and arrogance of his order and his race. He lived on the continent and was known to many men in many cities. It has been argued that foreigners are insensible to his defects as a writer, and that this may account for an astonishing and perplexing preference. The cause is rather to be sought in the quality of his art. It was as the creator of new types, "forms more real than living man," that Byron appealed to the artistic sense and to the imagination of Latin, Teuton or Slav. That "he taught us little" of the things of the spirit, that he knew no cure for the sickness of the soul, were considerations which lay outside the province of literary criticism. "It is a mark," says Goethe (*Aus meinem Leben: Dichtung und Wahrheit*, 1876, iii. 125), "of true poetry, that as a secular gospel it knows how to free us from the earthly burdens which press upon us, by inward serenity, by outward charm." Now of this "secular gospel" the redemption from "real woes" by the exhibition of imaginary glory, and imaginary delights, Byron was both prophet and evangelist.

Byron was 5 ft. 8 in. in height, and strongly built; only with difficulty and varying success did he prevent himself from growing fat. At five-and-thirty he was extremely thin. He was "very slightly lame," but he was painfully conscious of his deformity and walked as little and as seldom as he could. He had a small head covered and fringed with dark brown or auburn curls. His forehead was high and narrow, of a marble whiteness. His eyes were of a light grey colour, clear and luminous. His nose was straight and well-shaped, but "from being a little too thick, it looked better in profile than in front face." Moore says that it was in "the mouth and chin that the great beauty as well as expression of his fine countenance lay." The upper lip was of a Grecian shortness and the corners descending. His complexion was pale and colourless. Scott speaks of "his beautiful pale face—like a spirit's good or evil." Charles Matthews said that "he was the only man to whom he could apply the word beautiful." Coleridge said that "if you had seen him you could scarce disbelieve him... his eyes the open portals of the sun—things of light and for light." He was likened to "the god of the Vatican," the Apollo Belvidere.

The best-known portraits are: (1) Byron at the age of seven by Kay of Edinburgh; (2) a drawing of Lord Byron at Cambridge by Gilchrist (1808); (3) a portrait in oils by George Sanders (1809); (4) a miniature by Sanders (1812); (5) a portrait in oils by Richard Westall, R.A. (1813); (6) a portrait in oils (Byron in Albanian dress) by Thomas Phillips, R.A. (1813); (7) a portrait in oils by Phillips (1813); (8-9) a sketch for a miniature, and a miniature by James Holmes (1815); (10) a sketch by George Henry Harlow (1818); (11) a portrait in oils by Vincenzio Camuccini (in the Vatican) *c.* 1822; (12) a portrait in oils by W.H. West (1822); (13) a sketch by Count D'Orsay (1823). Busts were taken by Bertel Thorwaldsen (1817) and by Lorenzo Bartolini (1822). The statue (1829) in the library of Trinity College, Cambridge, is by Thorwaldsen after the bust taken in 1817.

Authorities.—The best editions of Lord Byron's poetical works are: (1) *The Works of Lord Byron with his Letters and Journals and his Life*, by Thomas Moore (17 vols., London, John Murray, 1832, 1833); (2) *The Works of Lord Byron* (1 vol., 1837, reissued, 1838-1892); (3) *The Poetical Works of Lord Byron* (6 vols., 1855); (4) *The Works of Lord Byron*, new, revised and enlarged edition, *Letters and Journals*, edited by G.E. Prothero, 6 vols., *Poetry,* edited by E.H. Coleridge (7 vols., 1898-1903); (5) *The Poetical Works of Lord Byron*, with memoir by E.H. Coleridge (1 vol., 1905).

The principal biographies, critical notices, memoirs, &c., are:—*Journey through Albania... with Lord Byron*, by J.C. Hobhouse (1812; reprinted in 2 vols., 1813 and 1855); *Memoirs of the Life and Writings of ... Lord Byron* [by Dr John Watkins] (1822); *Letters on the Character and Poetical Genius of Lord Byron*, by Sir E. Brydges, Bart. (1824); *Correspondence of Lord Byron with a Friend* (3 vols., Paris, 1824); *Recollections of the Life of Lord Byron*, by R.C. Dallas (1824); *Journal of the Conversations of Lord Byron*, by Capt. T. Medwin (1824); *Last Days of Lord Byron*, by W. Parry (1824); *Narrative of a Second Visit to Greece*, by E. Blaquiere (1825); *A Narrative of Lord Byron's Last Journey to Greece*, by Count Gamba (1825); *The Life, Writings, Opinions and Times of Lord Byron* (3 vols., 1825); *The Spirit of the Age*, by W. Hazlitt (1825); *Memoir of the Life and Writings of Lord Byron*, by George Clinton (1826); *Correspondence of Byron and*

some of his Contemporaries, by J.H. Leigh Hunt (2 vols., 1828); *Letters and Journals of Lord Byron, with Notices of his Life*, by Thomas Moore (2 vols., 1830); *The Life of Lord Byron*, by J. Galt (1830); *Conversations on Religion with Lord Byron*, by J. Kennedy (1830); *Conversations of Lord Byron with the Countess of Blessington* (1834); *Critical and Historical Essays*, by T.B. Macaulay, i. 311-352 (1843); *Lord Byron jugé par les témoins de sa vie* (1869), *My Recollections of Lord Byron*, by the Countess *Guiccioli* (1869); *Lady Byron Vindicated, A History of the Byron Controversy*, by H. Beecher Stowe (1870); *Lord Byron, a Biography*, by Karl Elze (1872); *Kunst und Alterthum*, Goethe's *Sämmtliche Werke* (1874), vol. xiii. p. 641; *Memoir of the Rev. F. Hodgson* (2 vols., 1878); *The Real Lord Byron*, by J.C. Jeaffreson (2 vols., 1883); *A Selection*, &c., by A.C. Swinburne (1885); *Records of Shelley, Byron and the Author*, by E.J. Trelawny (1887); *Memoirs of John Murray*, by S. Smiles (2 vols., 1891); *Poetry of Byron*, chosen and arranged by Matthew Arnold (preface) (1892); *The Siege of Corinth*, edited by E. Kölbing (1893); *Prisoner of Chillon and other Poems*, edited by E. Kölbing (1896); *The Works of Lord Byron*, edited by W. Henley, vol. i. (1897); A. Brandl's "Goethes Verhältniss zu Byron," *Goethe Jahrbuch, zwanzigster Band* (1899); *Main Currents in Nineteenth Century Literature*, by G. Brandis (6 vols., 1901-1905), translated from *Hauptströmungen der Literatur des neunzehnten Jahrhunderts*, 4 Bde. (Berlin 1872-1876); *Chambers's Cyclopaedia of English Literature*, vol. iii. (1903) art. "Byron," by T. Watts Dunton; *Studies in Poetry and Criticism*, by J. Churton Collins (1905); *Lord Byron, sein Leben*, &c., by Richard Ackermann; *Byron*, 3 vols. in the *Biblioteka velikikh pisatelei pod redaktsei*, edited by S.A. Vengesova (St Petersburg, 1906): a variorum translation; *Byron et le romantisme français*, by Edmond Estève (1907).

(E. H. C.)

[1] An anonymous work entitled *The Life, Writings, &c. of ... Lord Byron* (3 vols., 1825) purports to give "Recollections of the Lately Destroyed Manuscript." To judge by internal evidence (see "The Wedding Day," &c. ii. 278-284) there is some measure of truth in this assertion, but the work as a whole is untrustworthy.

BYRON, HENRY JAMES (1834-1884), English playwright, son of Henry Byron, at one time British consul at Port-au-Prince, was born in Manchester in January 1834. He entered the Middle Temple as a student in 1858, with the intention of devoting his time to play-writing. He soon ceased to make any pretence of legal study, and joined a provincial company as an actor. In this line he never made any real success; and, though he continued to act for years, chiefly in his own plays, he had neither originality nor charm. Meanwhile he wrote assiduously, and few men have produced so many pieces of so diverse a nature. He was the first editor of the weekly comic paper, *Fun*, and started the short-lived *Comic Trials*. His first successes were in burlesque; but in 1865 he joined Miss Marie Wilton (afterwards Lady Bancroft) in the management of the Prince of Wales's theatre, near Tottenham Court Road. Here several of his pieces, comedies and extravaganzas were produced with success; but, upon his severing the partnership two years later, and starting management on his own account in the provinces, he was financially unfortunate. The commercial success of his life was secured with *Our Boys*, which was played at the Vaudeville from January 1875 till April 1879—a then unprecedented "run." *The Upper Crust*, another of his successes, gave
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a congenial opportunity to Mr J.L. Toole for one of his inimitably broad character-sketches. During the last few years of his life Byron was in frail health; he died in Clapham on the 11th of April 1884. H.J. Byron was the author of some of the most popular stage pieces of his day. Yet his extravaganzas have no wit but that of violence; his rhyming couplets are without polish, and decorated only by forced and often pointless puns. His sentiment had T.W. Robertson's insipidity without its freshness, and restored an element of vulgarity which his predecessor had laboured to eradicate from theatrical tradition. He could draw a "Cockney" character with some fidelity, but his *dramatis personae* were usually mere puppets for the utterance of his jests. Byron was also the author of a novel, *Paid in Full* (1865), which appeared originally in *Temple Bar*. In his social relations he had many friends, among whom he was justly popular for geniality and imperturbable good temper.

BYRON, JOHN BYRON, 1ST BARON (c. 1600-1652), English cavalier, was the eldest son of Sir John Byron (d. 1625), a member of an old Lancashire family which had settled at Newstead, near Nottingham. During the third decade of the 17th century Byron was member of parliament for the town and afterwards for the county of Nottingham; and having been knighted and gained some military experience he was an enthusiastic partisan of Charles I. during his struggle with the parliament. In December 1641 the king made him lieutenant of the Tower of London, but in consequence of the persistent demand of the House of Commons he was removed from this position at his own request early in 1642. At the opening of the Civil War Byron joined Charles at York. He was present at the skirmish at Powick Bridge; he commanded his own regiment of horse at Edgehill and at Roundway Down, where he was largely responsible for the royalist victory; and at the first battle of Newbury Falkland placed himself under his orders. In October 1643 he was created Baron Byron of Rochdale, and was soon serving the king in Cheshire, where the soldiers sent over from Ireland augmented his forces. His defeat at Nantwich, however, in January 1644, compelled him to retire into Chester, and he was made governor of this city by Prince Rupert. At Marston Moor, as previously at Edgehill, Byron's rashness gave a great advantage to the enemy; then after fighting in Lancashire and North Wales he returned to Chester, which he held for about twenty weeks in spite of the king's defeat at Naseby and the general hopelessness of the royal cause. Having obtained favourable terms he surrendered the city in February 1646. Byron took some slight part in the second Civil War, and was one of the seven persons excepted by parliament from all pardon in 1648. But he had already left England, and he lived abroad in attendance on the royal family until his death in Paris in August 1652. Although twice married Byron left no children, and his title descended to his brother Richard (1605-1679), who had been governor of Newark. Byron's five other brothers served Charles I. during the Civil War, and one authority says that the seven Byrons were all present at Edgehill.

BYRON, HON. JOHN (1723-1786), British vice-admiral, second son of the 4th Lord Byron, and grandfather of the poet, was born on the 8th of November 1723. While still very young, he accompanied Anson in his voyage of discovery round the world. During many successive years he saw a great deal of hard service, and so constantly had he to contend, on his various expeditions, with adverse gales and dangerous storms, that he was nicknamed by the sailors, "Foul-weather Jack." It is to this that Lord Byron alludes in his *Epistle to Augusta*:—

"A strange doom is thy father's son's, and past
Recalling as it lies beyond redress,
Reversed for him our grandsire's fate of yore,

He had no rest at sea, nor I on shore."

Among his other expeditions was that to Louisburg in 1760, where he was sent in command of a squadron to destroy the fortifications. And in 1764 in the "Dolphin" he went for a prolonged cruise in the South Seas. In 1768 he published a *Narrative* of some of his early adventures with Anson, which was to some extent utilized by his grandson in *Don Juan*. In 1769 he was appointed governor of Newfoundland. In 1775 he attained his flag rank, and in 1778 became a vice-admiral. In the same year he was despatched with a fleet to watch the movements of the Count d'Estaing, and in July 1779 fought an indecisive engagement with him off Grenada. He soon after returned to England, retiring into private life, and died on the 10th of April 1786.

BYSTRÖM, JOHAN NIKLAS (1783-1848), Swedish sculptor, was born on the 18th of December 1783 at Philipstad. At the age of twenty he went to Stockholm and studied for three years under Sergel. In 1809 he gained the academy prize, and in the following year visited Rome. He sent home a beautiful work, "The Reclining Bacchante," in half life size, which raised him at once to the first rank among Swedish sculptors. On his return to Stockholm in 1816 he presented the crown prince with a colossal statue of himself, and was entrusted with several important works. Although he was appointed professor of sculpture at the academy, he soon returned to Italy, and with the exception of the years from 1838 to 1844 continued to reside there. He died at Rome in 1848. Among Byström's numerous productions the best are his representations of the female form, such as "Hebe," "Pandora," "Juno suckling Hercules," and the "Girl entering the Bath." His colossal statues of the Swedish kings are also much admired.

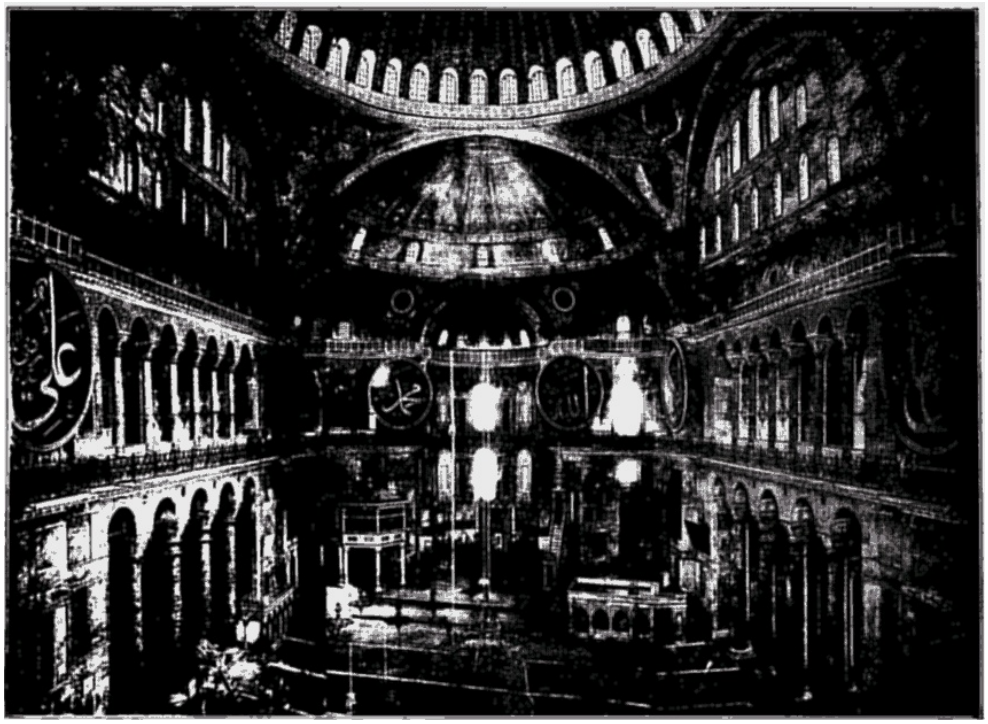
BYTOWNITE, a rock-forming mineral belonging to the plagioclase (*q.v.*) series of the felspars. The name was originally given (1835) by T. Thomson, to a greenish-white felspathic mineral found in a boulder near Bytown (now the city of Ottawa) in Ontario, but this material was later shown on microscopical examination to be a mixture. The name was afterwards applied by G. Tschermak to those plagioclase felspars which lie between labradorite and anorthite; and this has been generally adopted by petrologists. In chemical composition and in optical and other physical characters it is thus much nearer to the anorthite end of the series than to albite. Like labradorite and anorthite, it is a common constituent of basic igneous rocks, such as gabbro and basalt. Isolated crystals of bytownite bounded by well-defined faces are unknown.

(L. J. S.)

BYWATER, INGRAM (1840-), English classical scholar, was born in London on the 27th of June 1840. He was educated at University and King's College schools, and at Queen's College, Oxford. He obtained a first class in Moderations (1860) and in the final classical schools (1862), and became fellow of Exeter (1863), reader in Greek (1883), regius professor of Greek (1893-1908), and student of Christ Church. He received honorary degrees from various universities, and was elected corresponding member of the Prussian Academy of Sciences. He is chiefly known for his editions of Greek philosophical works: *Heracliti Ephesii Reliquiae* (1877); *Prisciani Lydi quae extant* (edited for the Berlin Academy in the *Supplementum Aristolelicum*, 1886); Aristotle, *Ethica Nicomachea* (1890), *De Arte Poetica* (1898); *Contributions to the Textual Criticism of the Nicomachean Ethics* (1892).

BYZANTINE ART

PLATE I.



INTERIOR OF THE HOLY WISDOM (S. SOPHIA), CONSTANTINOPLE.
Sixth century, the dome was rebuilt in the tenth century. The metal balustrades, pulpits, and the large discs are Turkish.

CAPITALS OF COLUMNS.

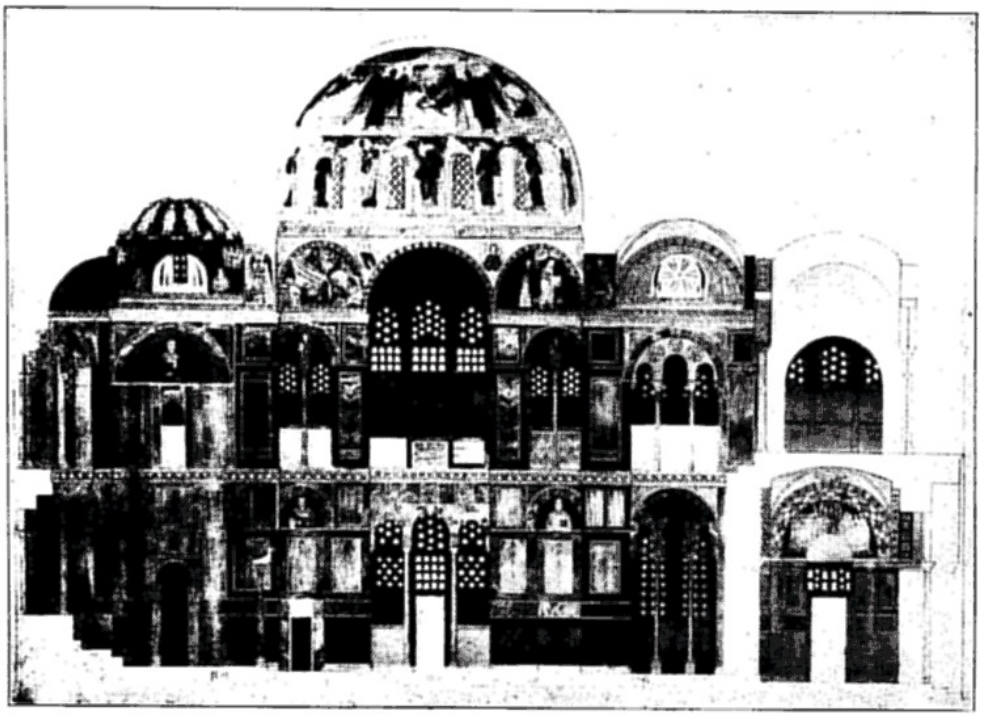
PLATE II.

S. VITALI, RAVENNA.
Sixth century.

S. MARK, VENICE.
Eleventh century.

S. APOLLINARI, RAVENNA.
Sixth century.

SMALL MEDIEVAL CATHEDRAL, ATHENS. *Photo: Emery Walker.*



INTERIOR OF ST. LUKE'S, NEAR DELPHI.
Showing a typical scheme of internal decoration. The lower parts of the walls are covered with marble, and the upper surfaces and vaults with mosaics and paintings. Eleventh century. *From a Drawing by Sidney Barnsley.*

BYZANTINE ART.[1] By "Byzantine art" is meant the art of Constantinople (sometimes called *Byzantium* in the middle ages as in antiquity), and of the Byzantine empire; it represents the form of art which followed the classical, after the transitional interval of the early Christian period. It reached maturity under Justinian (527-565), declined and revived with the fortunes of the empire, and attained a second culmination from the 10th to the 12th centuries. Continuing in existence throughout the later middle ages, it is hardly yet extinct in the lands of the Greek Church. It had enormous influence over the art of Europe and the East during the early middle ages, not only through the distribution of minor works from Constantinople but by the reputation of its architecture and painting. Several buildings in Italy are truly Byzantine. It is difficult to set a time for the origin of the style. When Constantine founded new Rome the art was still classical, although it had even then gathered up many of the elements which were to transform its aspect. Just two hundred years later some of the most characteristic works of this style of art
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were being produced, such as the churches of St Sergius, the Holy Wisdom (St Sophia), and the Holy Apostles at Constantinople, and San Vitale at Ravenna. We may best set an arbitrary point for the demarcation of the new style midway between these two dates, with the practical separation of the eastern and western empires.

The style may be said to have arisen from the orientalization of Roman art, and itself largely contributed to the formation of the Saracenic or Mahommedan styles. As Choisy well says, "The history of art in the Roman epoch presents two currents, one with its source in Rome, the other in Hellenic Asia. When Rome fell the Orient returned to itself and to the freedom of exploring new ways. There was now a new form of society, the Christian civilization, and, in art, an original type of architecture, the Byzantine." It has hardly been sufficiently emphasized how closely the art was identified with the outward expression of the Christian church; in fact, the Christian element in late classical art is the chief root of the new style, and it was the moral and intellectual criticism that was brought to bear on the old material, which really marked off Byzantine art from being merely a late form of classic.

Hardly any distinction can be set up in the material contents of the art; it was at least for a period only simplified and sweetened, and it is this freshening which prepared the way for future development. It must be confessed, however, that certain influences darkened the style even before it had reached maturity; chief among these was a gloomy hierarchical splendour, and a ritual rigidity, which to-day we yet refer to, quite properly, as Byzantinism. Choisy sees a distinction in the constructive types of Roman and Byzantine architecture, in that the former covered spaces by concreted vaults built on centres, which approximated to a sort of "monolithic" formation, whereas in the Byzantine style the vaults were built of brick and drawn forward in space without the help of preparatory support. Building in this way, it became of the greatest importance that the vaults should be so arranged as to bring about an equilibrium of thrusts. The distinction holds as between Rome in the 4th century and Constantinople in the 6th, but we are not sufficiently sure that the concreted construction did not depend on merely local circumstances, and it is possible, in other centres of the empire where strong cement was not so readily obtainable, and wood was scarce, that the Byzantine *constructive* method was already known in classical times. Choisy, following Dieulafoy, would derive the Byzantine system of construction from Persia, but this proposition seems to depend on a mistaken chronology of the monuments as shown by Perrot and Chipiez in their *History of Art in Persia*. It seems probable that the erection of brick vaulting was indigenous in Egypt as a building method. Strzygowski, in his recent elaborate examination of the art-types found at the palace of Mashita (Mschatta), a remarkable ruin discovered by Canon Tristram in Moab, of which the most important parts have now been brought to the new Kaiser Friedrich Museum in Berlin, shows that there are Persian ideas intermixed with Byzantine in its decoration, and there are also brick arches of high elliptical form in the structure. He seems disposed to date this work rather in the 5th than in the 6th century, and to see in it an intermediate step between the Byzantine work of the west and a Mesopotamian style, which he postulates as probably having its centre at Seleucia-Ctesiphon. From the examples brought forward by the learned author himself, it is safer as yet to look on the work as in the main Byzantine, with many Egyptian and Syrian elements, and an admixture, as has been said, of Persian ideas in the ornamentation. Egypt was certainly an important centre in the development of the Byzantine style.

The course of the transition to Byzantine, the first mature Christian style, cannot be satisfactorily traced while, guided by Roman archaeologists, we continue to regard Rome as a source of Christian art apart from the rest of the world. Christianity itself was not of Rome, it was an eastern leaven in Roman society. Christian art even in that capital was, we may say, an eastern leaven in Roman art. If we set the year 450 for the beginning of Byzantine art, counting all that went before as early Christian, we get one thousand years to the Moslem conquest of Constantinople (1453). This millennium is broken into three well-marked periods by the great iconoclastic schism (726-842) and the taking of Constantinople by the Crusaders in 1204. The first we may call the classical epoch of Byzantine art; it includes the mature period under Justinian (the central year of which we may put as 550), from which it declined until the settlement of the quarrel about images, 400 years in all, to, say, 850. The second period, to which we may assign the limits 850-1200, is, in the main, one of orientalizing influences, especially in architecture, although in MSS. and paintings there was, at one time, a distinct and successful classical revival. The interregnum had caused almost complete isolation from the West, and inspiration was only to be found either by casting back on its own course, or by borrowing from the East. This period is best represented by the splendid works undertaken by Basil the Macedonian (867-886) and his immediate successors, in the imperial palace, Constantinople. The third period is marked by the return of western influence, of which the chief agency was probably the establishment of Cistercian monasteries. This western influence, although it may be traced here and there, was not sufficient, however, to change the essentially oriental character of the art, which from first to last may be described as Oriental-Christian.

Architecture.—The architecture of our period is treated in some detail in the article Architecture; here we can only glance at some broad aspects of its development. As early as the building of Constantine's churches in Palestine there were two chief types of plan in use—the basilican, or axial, type, represented by the basilica at the Holy Sepulchre, and the circular, or central, type, represented by the great octagonal church once at Antioch. Those of the latter type we must suppose were nearly always vaulted, for a central dome would seem to furnish their very *raison d'être*. The central space was sometimes surrounded by a very thick wall, in which deep recesses, to the interior, were formed, as at the noble church of St George, Salonica (5th century?), or by a vaulted aisle, as at Sta Costanza, Rome (4th century); or annexes were thrown out from the central space in such a way as to form a cross, in which these additions helped to counterpoise the central vault, as at the mausoleum of Galla Placidia, Ravenna (5th century). The most

famous church of this type was that of the Holy Apostles, Constantinople. Vaults appear to have been early applied to the basilican type of plan; for instance, at St Irene, Constantinople (6th century), the long body of the church is covered by two domes.

At St Sergius, Constantinople, and San Vitale, Ravenna, churches of the central type, the space under the dome was enlarged by having apsidal additions made to the octagon. Finally, at St Sophia (6th century) a combination was made which is perhaps the most remarkable piece of planning ever contrived. A central space of 100 ft. square is increased to 200 ft. in length by adding two hemicycles to it to the east and the west; these are again extended by pushing out three minor apses eastward, and two others, one on either side of a straight extension, to the west. This unbroken area, about 260 ft. long, the larger part of which is over 100 ft. wide, is entirely covered by a system of domical surfaces. Above the conchs of the small apses rise the two great semi-domes which cover the hemicycles, and between these bursts out the vast dome over the central square. On the two sides, to the north and south of the dome, it is supported by vaulted aisles in two storeys which bring the exterior form to a general square. At the Holy Apostles (6th century) five domes were applied to a cruciform plan, that in the midst being the highest. After the 6th century there were no churches built which in any way competed in scale with these great works of Justinian, and the plans more or less tended to approximate to one type. The central area covered by the dome was included in a considerably larger square, of which the four divisions, to the east, west, north and south, were carried up higher in the vaulting and roof system than the four corners, forming in this way a sort of
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nave and transepts. Sometimes the central space was square, sometimes octagonal, or at least there were eight piers supporting the dome instead of four, and the "nave" and "transepts" were narrower in proportion. If we draw a square and divide each side into three so that the middle parts are greater than the others, and then divide the area into nine from these points, we approximate to the typical setting out of a plan of this time. Now add three apses on the east side opening from the three divisions, and opposite to the west put a narrow entrance porch running right across the front. Still in front put a square court. The court is the *atrium* and usually has a fountain in the middle under a canopy resting on pillars. The entrance porch is the *narthex*. The central area covered by the dome is the *solea*, the place for the choir of singers. Here also stood the *ambo*. Across the eastern side of the central square was a screen which divided off the *bema*, where the altar was situated, from the body of the church; this screen, bearing images, is the *iconastasis*. The altar was protected by a canopy or *ciborium* resting on pillars. Rows of rising seats around the curve of the apse with the patriarch's throne at the middle eastern point formed the *synthronon*. The two smaller compartments and apses at the sides of the bema were sacristies, the *diaconicon* and *prothesis*. The continuous influence from the East is strangely shown in the fashion of decorating external brick walls of churches built about the 12th century, in which bricks roughly carved into form are set up so as to make bands of ornamentation which it is quite clear are imitated from Cufic writing. This fashion was associated with the disposition of the exterior brick and stone work generally into many varieties of pattern, zig-zags, key-patterns, &c.; and, as similar decoration is found in many Persian buildings, it is probable that this custom also was derived from the East. The domes and vaults to the exterior were covered with lead or with tiling of the Roman variety. The window and door frames were of marble. The interior surfaces were adorned all over by mosaics or paintings in the higher parts of the edifice, and below with incrustations of marble slabs, which were frequently of very beautiful varieties, and disposed so that, although in one surface, the colouring formed a series of large panels. The choicer marbles were opened out so that the two surfaces produced by the division formed a symmetrical pattern resembling somewhat the marking of skins of beasts.

Mosaics and Paintings.—The method of depicting designs by bringing together morsels of variously colored materials is of high antiquity. We are apt to think of a line of distinction between classical and Christian mosaics in that the former were generally of marble and the latter mostly of colored and gilt glass. But glass mosaics were already in use in the Augustan age, and the use of gilt tesserae goes back to the 1st or 2nd century. The first application of glass to this purpose seems to have been made in Egypt, the great glass-working centre of antiquity, and the gilding of tesserae may with probability be traced to the same source, whence, it is generally agreed, most of the gilt glass vessels, of which so many have been found in the catacombs, were derived. The earliest existing mosaics of a typically Christian character are some to be found at Santa Costanza, Rome (4th century). Other mosaics on the vaults of the same church are of marble and follow a classical tradition. It is probable that we have here the meeting-point of two art-currents, the indigenous and the eastern. In Rome, the great apse-mosaic of S. Pudenziana dates from about A.D. 400. The mausoleum of Galla Placidia, Ravenna, is incrusted within by mosaic work of the 5th century, and most probably the dome mosaics of the church of St George, Salonica, are also of this period. Of the 6th century are many of the magnificent examples still remaining at Ravenna, portions of the original incrustation of St Sophia, Constantinople, those of the basilica at Parenzo, on the Gulf of Istria, and of St Catherines, Sinai. An interesting mosaic which is probably of this period, and has only recently been described, is at the small church of Keti in Cyprus. This, which may be the only Byzantine mosaic in the British dominions, fills the conch of a tiny apse, but is none the less of great dignity. In the centre is a figure of the Virgin with the Holy Child in her arms standing between two angels who hold disks marked with the sign **X**. They are named Michael and Gabriel. Another mosaic of this period brought from Ravenna to Germany two generations ago has been recently almost rediscovered, and set up in the new Museum of Decorative Art in Berlin. In this, a somewhat similar composition fills the conch of the apse, but here it is the Risen Christ who stands between the two archangels. Above, in a broad strip, a frieze of angels blowing trumpets stand on the celestial sea on either hand of the Enthroned Majesty.

Such mosaics flowed out widely over the Christian world trom its art centres, as far east as Sanâ, the capital of Yemen, as far north as Kiev in Russia, and Aachen in Germany, and as far west as Paris, and continued in time for a thousand years without break in the tradition save by the iconoclastic dispute. The finest late example is the well-known "mosaic-church" (the Convent of the Saviour) at Constantinople, a work of the 14th century.

The single figures were from the first, and for the most part, treated with an axial symmetry. Almost all are full front; only occasionally will one, like the announcing angel, be drawn with a three-quarter face. The features are thus kept together on the general map of the face. In the same way the details of a tree will be collected on a simple including form which makes a sort of mat for them. Groups, similarly, are closely gathered up into masses of balanced form, and such masses are arranged with strict regard for general symmetry. "The art," as Bayet says, "in losing something of life and liberty became so much the better fitted for the decoration of great edifices." The technical means were just as much simplified, and

only a few frank colours were made sufficient, by skilful juxtaposition, to do all that was required of them. The fine pure blue, or bright gold, backgrounds on which the figures were spaced, as well as the broken surface incidental to the process, created an atmosphere which harmonized all together. At St Sophia there were literally acres of such mosaics, and they seem to have been applied with similar profusion in the imperial palace.

Mosaic was only a more magnificent kind of painting, and painted design followed exactly the same laws; the difference is in the splendour of effect and in the solidity and depth of colour. Paintings, from the first, must have been of more grey and pearly hues. A large side chapel at the mosaic church at Constantinople is painted, and it is difficult to say which is really the more beautiful, the deep splendour of the one, or the tender yet gay colour of the other. The greatest thing in Byzantine art was this picturing of the interiors of entire buildings with a series of mosaics or paintings, filling the wall space, vaults and domes with a connected story. The typical character of the personages and scenes, the elimination of non-essentials, and the continuity of the tradition, brought about an intensity of expression such as may nowhere else be found. It is part of the limited greatness of this side of Byzantine art that there was no room in it for the gaiety and humour of the later medieval schools; all was solemn, epical, cosmic. When such stories are displayed on the golden ground of arches and domes, and related in a connected cycle, the result produces, as it was intended to produce, a sense of the universal and eternal. Beside this great power of co-ordination possessed by Byzantine artists, they created imaginative types of the highest perfection. They clothed Christian ideas with forms so worthy, which have become so diffused, and so intimately one with the history, that we are apt to take them for granted, and not to see in them the superb results of Greek intuition and power of expression. Such a type is the Pantocrator,—the Creator-Redeemer, the Judge inflexible and yet compassionate,—who is depicted at the zenith of all greater domes; such the Virgin with the Holy Child, enthroned or standing in the conchs of apses, all tenderness and dignity, or with arms extended, all solicitude; of her image the *Painter's Guide* directs that it is to be painted with the "complexion the colour of wheat, hair and eyes brown, grand eyebrows, and beautiful eyes, clad in beautiful clothing, humble, beautiful and faultless"; such are the angels with their mighty wings, splendid impersonations of beneficent power; such are the prophets, doctors, martyrs, saints,—all have been fixed into final types.

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We are apt to speak of the rigidity and fixity of Byzantine work, but the method is germane in the strictest sense to the result desired, and we should ask ourselves how far it is possible to represent such a serious and moving drama except by dealing with more or less unchangeable types. It could be no otherwise. This art was not a matter of taste, it was a growth of thought, cast into an historical mould. Again, the artists had an extraordinary power of concentrating and abstracting the great things of a story into a few elements or symbols. For example, the seven days of creation are each figured by some simple detail, such as a tree, or a flight of birds, or symbolically, as seven spirits; the flood by an ark on the waters. What the capabilities of such a method are, where invention is not allowed to wander into variety, but may only add intensity, may, for instance, be seen in representations of the Agony in the Garden. This subject is usually divided into three sections, each consecutive one showing, with the same general scene, greater darkness, an advance up the hill, and the figure of Christ more bowed. Another composition, the "Sleep (death) of the Virgin," is all sweetness and peace, but no less powerful. A remarkable invention is the *etomasia*, a splendid empty throne prepared for the Second Advent. The stories of the Old Testament are put into relation with the Gospel by way of type and anti-type. There are allegories: the anchorite life contrasted with the mad life of the world, the celestial ladder, &c., and fine impersonations, such as night and dawn, mercy and truth, cities and rivers, are frequently found, especially in MS. pictures.

A few general schemes may be briefly summarized. St Sophia has the Pantocrator in the middle of the dome, and four cherubim of colossal size at the four corners; on the walls below were angels, prophets, saints and doctors. On the circle of the apse was enthroned the Virgin. To the right and left, high above the altar, were two archangels holding banners inscribed "Holy, Holy, Holy." These last are also found at Nicaea, and at the monastery of St Luke. The church of the Holy Apostles had the Ascension in the central dome, and below, the Life of Christ. St Sophia, Salonica, also has the Ascension, a composition which is repeated on the central dome of St Mark's, Venice. In the eastern dome of the Venetian church is Christ surrounded by prophets, and, in the western dome, the Descent of the Holy Spirit upon the Apostles. A Pentecost similar to the last occupies the dome over the Bema of St Luke's monastery in Phocis; in the central dome of this church is the Pantocrator, while in a zone below stand, the Virgin to the east, St John Baptist to the west, and the four archangels, Michael, Gabriel, Raphael and Uriel, to the north and south. A better example of grandeur of treatment can hardly be cited than the paintings of the now destroyed dome of the little church of Megale Panagia at Athens, a dome which was only about 12 ft. across. At the centre was Christ enthroned, next came a series of nine semicircles containing the orders of the angels, seraphim, cherubim, thrones, dominations, virtues, powers, principalities, archangels and angels. Below these came a wide blue belt set with stars and the signs of the zodiac; to the east the sun, to the west the moon. Still below these were the winds, hail and snow; and still lower mountains and trees and the life on the earth, with all of which were interwoven passages from the last three Psalms, forming a Benedicite. After St Mark's, Venice, the completest existing scheme of mosaics is that of the church of St Luke; those of Daphne, Athens, are the most beautiful. A complete series of paintings exists in one of the monastic churches on Mount Athos. The Pantocrator is at the centre of the dome, then comes a zone with the Virgin, St John Baptist and the orders of the angels. Then the prophets between the windows of the dome and the four evangelists in the pendentives. On the rest of the vaults is the life of Christ, ending at the Bema with the Ascension; in the apse is the Virgin above, the Divine Liturgy lower, and the four doctors of the church below. All the walls are painted as well as the vaults. The mosaics overflowed from the interiors on to the external walls of buildings even in Roman days, and the same practice was continued on churches. The remains of an external mosaic of the 6th century exist on the west façade of the basilica at Parenzo. Christ is there seated amongst the seven candlesticks, and adored by saints. At the basilica at Bethlehem the gable end was appropriately covered with a mosaic of the Nativity, also a work of the age of Justinian. In Rome, St Peter's and other churches had mosaics on the façades; a tradition represented, in a small way, at San Miniato, Florence. At Constantinople, according to Clavigo, the Spanish ambassador who visited that city about 1400, the church of St Mary of the Fountain had its exterior richly worked in gold, azure and other colours; and it seems almost necessary to believe that the bare front of the narthex of St Sophia was intended to be decorated in a similar manner. In Damascus the courtyard of the Great Mosque seems to have been adorned with mosaics; photographs taken before the fire in 1893 show patches on the central gable in some of the spandrels of the side colonnade and on the walls of the isolated octagonal treasury.

The mosaics here were of Byzantine workmanship, and their effect, used in such abundance, must have been of great splendour. In Jerusalem the mosque of Omar also had portions of the exterior covered with mosaics. We may imagine that such external decorations of the churches, where a few solemn figures told almost as shadows on the golden background brightly reflecting the sun, must have been even more glorious than the imagery of their interiors.

Painted books were hardly different in their style from the paintings on the walls. Of the MSS. the Cottonian Genesis, now only a collection of charred fragments, was an early example. The great *Natural History* of Dioscorides of Vienna (*c.* 500) and the Joshua Roll of the Vatican, which have both been lately published in perfect facsimile, are magnificent works. In the former the plants are drawn with an accuracy of observation which was to disappear for a thousand years. The latter shows a series of drawings delicately tinted in pinks and blues. Many of the compositions contain classical survivals, like personified rivers.

In some of the miniatures of the later school of the art the classical revival of the 10th century was especially marked. Still later others show a very definite Persian influence in their ornamentation, where intricate arabesques almost of the style of eastern rugs are found.

The Plastic Art.—If painting under the new conditions entered on a fresh course of power and conquest, if it set itself successfully to provide an imagery for new and intense thought, sculpture, on the other hand, seems to have withered away as it became removed from the classic stock. Already in the pre-Constantinian epoch of classical art sculpture had become strangely dry and powerless, and as time went on the traditions of modelling appear to have been forgotten. Two points of recent criticism may be mentioned here. It has been shown that the porphyry images of warriors at the southwest angle of St Mark's, Venice, are of Egyptian origin and are of late classical tradition. The celebrated bronze St Peter at Rome is now assigned to the 13th century. Not only did statue-making become nearly a lost art, but architectural carvings ceased to be seen as *modelled form*, and a new system of relief came into use. Ornament, instead of being gathered up into forcible projections relieved against retiring planes, and instead of having its surfaces modulated all over with delicate gradations of shade, was spread over a given space in an even fretwork. Such a highly developed member as the capital, for instance, was thought of first as a simple, solid form, usually more or less the shape of a bowl, and the carving was spread out over the general surface, the background being sunk into sharply defined spaces of shadow, all about the same size. Often the background was so deeply excavated that it ceased to be a plane supporting the relieved parts, but passed wholly into darkness. Strzygowski has given to this process the name of the "deep-dark" ground. A further step was to relieve the upper fretwork of carving from the ground altogether in certain places by cutting away the sustaining portions.

[v.04 p.0910] The simplicity, the definition and crisp sharpness of some of the results are entirely delightful. The bluntness and weariness of many of the later modelled Roman forms disappear in the new energy of workmanship which was engaged in exploring a fresh field of beauty. These brightly illuminated lattices of carved ornament seem to hold within them masses of cold shadow. Beautiful as was this method of architectural adornment, it must be allowed that it was, in essence, much more elementary than the school of modelled form. All such carvings were usually brightly coloured and gilt, and it seems probable that the whole was considered rather as a colour arrangement than as sculpture proper.

Plaster work, again, an art on which wonderful skill was lavished in Rome, became under the Byzantines extremely rude. Many good examples of this work exist at San Vitale and Sant' Apollinare in Classe at Ravenna, also at Parenzo, and at St Sophia, Constantinople. Later examples of plaster work of Byzantine tradition are to be found at Cividale, and at Sant' Ambrogio, Milan, where the tympana of the well-known baldachin are of this material, and contain modelled figures.

Coins and medallions of even the best period of Byzantine art prove what a deep abyss separates them from the power over modelled relief shown in classical examples. The sculptural art is best displayed by ivory carvings, although this is more to be attributed to their pictorial quality than to a feeling for modelling.

Metal Work, Ivories and Textiles.—One of the greatest of Byzantine arts is the goldsmith's. This absorbed so much from Persian and Oriental schools as to become semi-barbaric. Under Justinian the transformation from Classical art was almost complete. Some few examples, like a silver dish from Cyprus in the British Museum, show refined restraint; on the other hand, the mosaic portraits of the emperor and Theodora show crowns and jewels of full Oriental style, and the description of the splendid fittings of St Sophia read like an eastern tale. Goldsmith's work was executed on such a scale for the great church as to form parts of the architecture of the interior. The altar was wholly of gold, and its ciborium and the iconastasis were of silver. In the later palace-church, built by Basil the Macedonian, the previous metals were used to such an extent that it is clear, from the description, that the interior was intended to be, as far as possible, like a great jewelled shrine. Gold and silver, we are told, were spread over all the church, not only in the mosaics, but in plating and other applications. The enclosure of the bema, with its columns and entablatures, was of silver gilt, and set with gems and pearls.

The most splendid existing example of goldsmith's work on a large scale is the *Paid d'Oro* of St Mark's, Venice; an assemblage of many panels on which saints and angels are enamelled. The monastic church of St Catherine, Sinai, is entered through a pair of enamelled doors, and several doors inlaid with silver still exist. In these doors the ground was of gilt-bronze; but there is also record of silver doors in the imperial palace at Constantinople. The inlaid doors of St Paul Outside the Walls at Rome were executed in Constantinople by Stauricios, in 1070, and have Greek inscriptions. There are others at Salerno (*c.* 1080), but the best known are those at St Mark's, Venice. In all these the imagery was delineated in silver on the gilt-bronze ground. The earliest works of this sort are still to be found in Constantinople. The panels of a door at St Sophia bear the monograms of Theophilus and Michael (840). Two other doors in the narthex of the same church, having simpler ornamentation of inlaid silver, are probably as early as the time of Justinian.

The process of enamelling dates from late classical times and Venturi supposes that it was invented in Alexandria. The cloisonné process, characteristic of Byzantine enamels, is thought by Kondakov to be derived from Persia, and to its study he has devoted a splendid volume. One of the finest examples of this cloisonné is the reliquary at Limburg on which the enthroned Christ appears between St Mary and St John

in the midst of the twelve apostles. An inscription tells that it was executed for the emperors Constantine and Romanus (948-959).

A reliquary lately added to the J. Pierpont Morgan collection at South Kensington is of the greatest beauty in regard to the colour and clearness of the enamel. The cover, which is only about 4½ by 3 ins., has in the centre a crucifixion with St Mary and St John to the right and left, while around are busts of the apostles. Christ is vested in a tunic. The ground colour is the green of emerald, the rest mostly blue and white. The cloisons are of gold. Two other Byzantine enamels are in the permanent collection at the Victoria and Albert Museum: one is a cross with the crucifixion on a background of the same emerald enamel; the other is a small head of St Paul of remarkably fine workmanship.

Ivory-working was another characteristic Byzantine art, although, like so many others it had its origin in antiquity. One of the earliest ivories of the Byzantine type is the diptych at Monza, showing a princess and a boy, supposed to be Galla Placidia and Valentinian III. This already shows the broad, flattened treatment which seems to mark the ivory work of the East. The majestic archangel of the British Museum, one of the largest panels known, is probably of the 5th century, and almost certainly, as Strzygowski has shown, of Syrian origin. Design and execution are equally fine. The drawing of the body, and the modelling of the drapery, are accomplished and classical. Only the full front pose, the balanced disposition of the large wings, and the intense outlook of the face, give it the Byzantine type.

Ivory, like gold-work and enamel, was pressed into the adornment of architectural works. The ambo erected by Justinian at St Sophia was in part covered by ivory panels set into the marble. The best existing specimen of this kind of work is the celebrated ivory throne at Ravenna. This masterpiece, which resembles a large, high-backed chair, is entirely covered with sculptured ivory, delicate carvings of scriptural subjects and ornament. It is of the 6th century and bears the monogram of Bishop Maximian. It is probably of Egyptian or Syrian origin.

So many fragments of ivories have been discovered in recent explorations in Egypt that it is most likely that Alexandria, a fit centre for receiving the material, was also its centre of distribution. The weaving of patterned silks was known in Europe in the classical age, and they reached great development in the Byzantine era. A fragment, long ago figured by Semper, showing a classical design of a nereid on a sea-horse, is so like the designs found on many ivories discovered in Egypt that we may probably assign it to Alexandria. Such fabrics going back to the 3rd century have been found in Egypt which must have been one of the chief centres for the production of silk as for linen textiles. The Victoria and Albert Museum is particularly rich in early silks. One fine example, having rose-coloured stripes and repeated figures of Samson and the lion, must be of the great period of the 6th century. The description of St Sophia written at that time tells of the altar curtains that they bore woven images of Christ, St Peter and St Paul standing under tabernacles upon a crimson ground, their garments being enriched with gold embroidery. Later the patterns became more barbaric and of great scale, lions trampled across the stuff, and in large circles were displayed eagles, griffins and the like in a fine heraldic style. From the origin of the raw material in China and India and the ease of transport, such figured stuffs gathered up and distributed patterns over both Europe and Asia. The Persian influence is marked. There is, for example, a pattern of a curious dragon having front feet and a peacock's tail. It appears on a silver Persian dish in the Hermitage Museum, it is found on the mixed Byzantine and Persian carvings of the palace of Mashita, and it occurs on several silks of which there are two varieties at the Victoria and Albert Museum, both of which are classed as Byzantine; it is difficult to say of many of these patterns whether they are Sassanian originals or Byzantine adaptations from them.

[v.04 p.0911]

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(W. R. L.)

[1] For Byzantine literature see GREEK LITERATURE: *Byzantine*.

BYZANTIUM, an ancient Greek city on the shores of the Bosporus, occupying the most easterly of the seven hills on which modern Constantinople stands. It was said to have been founded by Megarians and Argives under Byzas about 657 B.C., but the original settlement having been destroyed in the reign of Darius Hystaspes by the satrap Otanes, it was recolonized by the Spartan Pausanias, who wrested it from the Medes after the battle of Plataea (479 B.C.)—a circumstance which led several ancient chroniclers to ascribe its foundation to him. Its situation, said to have been fixed by the Delphic oracle, was remarkable for beauty and security. It had complete control over the Euxine grain-trade; the absence of tides and the depth of its harbour rendered its quays accessible to vessels of large burden; while the tunny and other fisheries were so lucrative that the curved inlet near which it stood became known as the Golden Horn. The greatest hindrance to its prosperity was the miscellaneous character of the population, partly Lacedaemonian and partly Athenian, who flocked to it under Pausanias. It was thus a subject of dispute between these states, and was alternately in the possession of each, till it fell into the hands of the

Macedonians. From the same cause arose the violent intestine contests which ended in the establishment of a rude and turbulent democracy. About seven years after its second colonization, the Athenian Cimon wrested it from the Lacedaemonians; but in 440 B.C. it returned to its former allegiance. Alcibiades, after a severe blockade (408 B.C.), gained possession of the city through the treachery of the Athenian party; in 405 B.C. it was retaken by Lysander and placed under a Spartan harmost. It was under the Lacedaemonian power when the Ten Thousand, exasperated by the conduct of the governor, made themselves masters of the city, and would have pillaged it had they not been dissuaded by the eloquence of Xenophon. In 390 B.C. Thrasybulus, with the assistance of Heracleides and Archebius, expelled the Lacedaemonian oligarchy, and restored democracy and the Athenian influence.

After having withstood an attempt under Epaminondas to restore it to the Lacedaemonians, Byzantium joined with Rhodes, Chios, Cos, and Mausolus, King of Caria, in throwing off the yoke of Athens, but soon after sought Athenian assistance when Philip of Macedon, having overrun Thrace, advanced against it. The Athenians under Chares suffered a severe defeat from Amyntas, the Macedonian admiral, but in the following year gained a decisive victory under Phocion and compelled Philip to raise the siege. The deliverance of the besieged from a surprise, by means of a flash of light which revealed the advancing masses of the Macedonian army, has rendered this siege memorable. As a memorial of the miraculous interference, the Byzantines erected an altar to Torch-bearing Hecate, and stamped a crescent on their coins, a device which is retained by the Turks to this day. They also granted the Athenians extraordinary privileges, and erected a monument in honour of the event in a public part of the city.

During the reign of Alexander Byzantium was compelled to acknowledge the Macedonian supremacy; after the decay of the Macedonian power it regained its independence, but suffered from the repeated incursions of the Scythians. The losses which they sustained by land roused the Byzantines to indemnify themselves on the vessels which still crowded the harbour, and the merchantmen which cleared the straits; but this had the effect of provoking a war with the neighbouring naval powers. The exchequer being drained by the payment of 10,000 pieces of gold to buy off the Gauls who had invaded their territories about 279 B.C., and by the imposition of an annual tribute which was ultimately raised to 80 talents, they were compelled to exact a toll on all the ships which passed the Bosporus—a measure which the Rhodians resented and avenged by a war, wherein the Byzantines were defeated. After the retreat of the Gauls Byzantium rendered considerable services to Rome in the contests with Philip II., Antiochus and Mithradates.

During the first years of its alliance with Rome it held the rank of a free confederate city; but, having sought arbitration on some of its domestic disputes, it was subjected to the imperial jurisdiction, and gradually stripped of its privileges, until reduced to the status of an ordinary Roman colony. In recollection of its former services, the emperor Claudius remitted the heavy tribute which had been imposed on it; but the last remnant of its independence was taken away by Vespasian, who, in answer to a remonstrance from Apollonius of Tyana, taunted the inhabitants with having "forgotten to be free." During the civil wars it espoused the party of Pescennius Niger; and though skilfully defended by the engineer Periscus, it was besieged and taken (A.D. 196) by Severus, who destroyed the city, demolished the famous wall, which was built of massive stones so closely riveted together as to appear one block, put the principal inhabitants to the sword and subjected the remainder to the Perinthians. This overthrow of Byzantium was a great loss to the empire, since it might have served as a protection against the Goths, who afterwards sailed past it into the Mediterranean. Severus afterwards relented, and, rebuilding a large portion of the town, gave it the name of Augusta Antonina. He ornamented the city with baths, and surrounded the hippodrome with porticos; but it was not till the time of Caracalla that it was restored to its former political privileges. It had scarcely begun to recover its former position when, through the capricious resentment of Gallienus, the inhabitants were once more put to the sword and the town was pillaged. From this disaster the inhabitants recovered so far as to be able to give an effectual check to an invasion of the Goths in the reign of Claudius II., and the fortifications were greatly strengthened during the civil wars which followed the abdication of Diocletian. Licinius, after his defeat before Adrianople, retired to Byzantium, where he was besieged by Constantine, and compelled to surrender (A.D. 323-324). To check the inroads of the barbarians on the north of the Black Sea, Diocletian had resolved to transfer his capital to Nicomedia; but Constantine, struck with the advantages which the situation of Byzantium presented, resolved to build a new city there on the site of the old and transfer the seat of government to it. The new capital was inaugurated with special ceremonies, A.D. 330. (See CONSTANTINOPLE.)

The ancient historians invariably note the profligacy of the inhabitants of Byzantium. They are described as an idle, depraved people, spending their time for the most part in loitering about the harbour, or carousing over the fine wine of Maronea. In war they trembled at the sound of a trumpet, in peace they quaked before the shouting of their own demagogues; and during the assault of Philip II. they could only be prevailed on to man the walls by the savour of extempore cook-shops distributed along the ramparts. The modern Greeks attribute the introduction of Christianity into Byzantium to St Andrew; it certainly had some hold there in the time of Severus.

[v.04 p.0912]

C The third letter in the Latin alphabet and its descendants corresponds in position and in origin to the Greek Gamma (Γ, γ), which in its turn is borrowed from the third symbol of the Phoenician alphabet (Heb. *Gimel*). The earliest Semitic records give its form as or more frequently or  . The form  is found in the earliest inscriptions of Crete, Attica, Naxos and some other of the Ionic islands. In Argolis and Euboea especially a form with legs of unequal length is found  . From this it is easy to pass to the most widely spread Greek form, the ordinary  . In Corinth, however, and its colony Corcyra, in Ozolian Locris and Elis, a form  inclined at a different angle is found. From this form the transition is simple to the rounded  , which is generally found in the same localities as the pointed form, but is more widely spread, occurring in Arcadia and on Chalcidian vases of the 6th century B.C., in Rhodes and Megara with their colonies in Sicily. In all these cases the sound represented was a hard G (as in *gig*). The rounded form was probably that taken over by the Romans and with the value of G. This is shown by the permanent abbreviation of the proper names Gaius and Gnaeus by C. and Cn. respectively. On the early inscription discovered in the Roman Forum in 1899 the letter occurs but once, in the form  written from right to left. The broad lower end of the symbol is rather an accidental pit in the stone than an attempt at a diacritic mark—the word is *regei*, in all probability the early dative form of *rex*, "king." It is hard to decide

why Latin adopted the *g*-symbol with the value of *k*, a letter which it possessed originally but dropped, except in such stereotyped abbreviations as K. for the proper name *Kaeso* and *Kal.* for *Calendae*. There are at least two possibilities: (1) that in Latium *g* and *k* were pronounced almost identically, as, *e.g.*, in the German of Württemberg or in the Celtic dialects, the difference consisting only in the greater energy with which the *k*-sound is produced; (2) that the confusion is graphic, K being sometimes written  , which was then regarded as two separate symbols. A further peculiarity of the use of C in Latin is in the abbreviation for the district *Subura* in Roma and its adjective *Suburanus*, which appears as SVC. Here C no doubt represents G, but there is no interchange between *g* and *b* in Latin. In other dialects of Italy *b* is found representing an original voiced guttural (*gw*), which, however, is regularly replaced by *v* in Latin. As the district was full of traders, *Subura* may very well be an imported word, but the form with C must either go back to a period before the disappearance of *g* before *v* or must come from some other Italic dialect. The symbol G was a new coinage in the 3rd century B.C. The pronunciation of C throughout the period of classical Latin was that of an unvoiced guttural stop (*k*). In other dialects, however, it had been palatalized to a sibilant before *i*-sounds some time before the Christian era; *e.g.* in the Umbrian *façia* = Latin *facial*. In Latin there is no evidence for the interchange of *c* with a sibilant earlier than the 6th century A.D. in south Italy and the 7th century A.D. in Gaul (Lindsay, *Latin Language*, p. 88). This change has, however, taken place in all Romance languages except Sardinian. In Anglo-Saxon *c* was adopted to represent the hard stop. After the Norman conquest many English words were re-spelt under Norman influence. Thus Norman-French spelt its palatalized *c*-sound (=*tsh*) with *ch* as in *cher* and the English palatalized *cild*, &c. became *child*, &c. In Provençal from the 10th century, and in the northern dialects of France from the 13th century, this palatalized *c* (in different districts *ts* and *tsh*) became a simple *s*. English also adopted the value of *s* for *c* in the 13th century before *e*, *i* and *y*. In some foreign words like *cicala* the *ch-* (*tsh*) value is given to *c*. In the transliteration of foreign languages also it receives different values, having that of *tsh* in the transliteration of Sanskrit and of *ts* in various Slavonic dialects.

As a numeral C denotes 100. This use is borrowed from Latin, in which the symbol was originally  , a form of the Greek θ. This, like the numeral symbols later identified with L and M, was thus utilized since it was not required as a letter, there being no sound in Latin corresponding to the Greek θ. Popular etymology identified the symbol with the initial letter of *centum*, "hundred."

(P. Gi.)

CAB (shortened about 1825 from the Fr. *cabriolet*, derived from *cabriole*, implying a bounding motion), a form of horsed vehicle for passengers either with two ("hansom") or four wheels ("four-wheeler" or "growler"), introduced into London as the *cabriolet de place*, from Paris in 1820 (see Carriage). Other vehicles plying for hire and driven by mechanical means are included in the definition of the word "cab" in the London Cab and Stage Carriage Act 1007. The term "cab" is also applied to the driver's or stoker's shelter on a locomotive-engine.

Cabs, or hackney carriages, as they are called in English acts of parliament, are regulated in the United Kingdom by a variety of statutes. In London the principal acts are the Hackney Carriage Acts of 1831-1853, the Metropolitan Public Carriages Act 1869, the London Cab Act 1896 and the London Cab and Stage Carriage Act 1907. In other large British towns cabs are usually regulated by private acts which incorporate the Town Police Clauses Act 1847, an act which contains provisions more or less similar to the London acts. The act of 1869 defined a hackney carriage as any carriage for the conveyance of passengers which plies for hire within the metropolitan police district and is not a stage coach, *i.e.* a conveyance in which the passengers are charged separate and distinct fares for their seats. Every cab must be licensed by a licence renewable every year by the home secretary, the licence being issued by the commissioner of police. Every cab before being licensed must be inspected at the police station of the district by the inspector of public carriages, and certified by him to be in a fit condition for public use. The licence costs £2. The number of persons which the cab is licensed to carry must be painted at the back on the outside. It must carry a lighted lamp during the period between one hour after sunset and one hour before sunrise. The cab must be under the charge of a driver having a licence from the home secretary. A driver before obtaining a licence, which costs five shillings per annum, must pass an examination as to his ability to drive and as to his knowledge of the topography of London.

General regulations with regard to fares and hiring may be made from time to time by the home secretary under the London Cab and Stage Carriage Act 1907. The hiring is by distance or by time as the hirer may decide at the beginning of the hiring; if not otherwise expressed the fare is paid according to distance. If a driver is hired by distance he is not compelled to drive more than six miles, and if hired by time he is not compelled to drive for more than one hour. When a cab is hired in London by distance, and discharged within a circle the radius of which is four miles (the centre being taken at Charing Cross), the fare is one shilling for any distance not exceeding two miles, and sixpence for every additional mile or part of a mile. Outside the circle the fare for each mile, or part of a mile, is one shilling. When a cab is hired by time, the fare (inside or outside the circle) is two shillings and sixpence for the first hour, and eightpence for every quarter of an hour afterwards. Extra payment has to be made for luggage (twopence per piece outside), for extra passengers (sixpence each for more than two), and for waiting (eightpence each completed quarter of an hour). If a horse cab is fitted with a taximeter (*vide infra*) the fare for a journey wholly *within* or partly without and partly within the four-mile radius, and not exceeding one mile or a period of ten minutes, is sixpence. For each half mile or six minutes an additional threepence is paid. If the journey is wholly *without* the four-mile radius the fare for the first mile is one shilling, and for each additional quarter of a mile or period of three minutes, threepence is paid. If the cab is one propelled by mechanical means the fare for a journey not exceeding one mile or a period of ten minutes is eightpence, and for every additional quarter mile or period of 2½ minutes twopence is paid. A driver required to wait may demand a reasonable sum as a deposit and also payment of the sum which he has already earned. The London Cab Act 1896 (by which for the first time legal sanction was given to the word "cab") made an important change in the law in the interest of cab drivers. It renders liable to a penalty on summary conviction any person who (*a*) hires a cab knowing or having reason to believe that he cannot pay the lawful fare, or with intent to avoid payment; (*b*) fraudulently endeavours to avoid payment; (*c*) refuses to pay or refuses to give his address, or gives a false address with intent to deceive. The offences mentioned (generally known as "bilking") may be punished by imprisonment without the option of a fine, and the whole or any part of the fine imposed may be applied in compensation to the driver.

Strictly speaking, it is an offence for a cab to ply for hire when not waiting on an authorized "standing," but cabs passing in the street for this purpose are not deemed to be "plying for hire." These stands for cabs are appointed by the commissioner of police or the home secretary. "Privileged cabs" is the designation given to those cabs which by virtue of a contract between a railway company and a number of cab-owners are alone admitted to ply for hire within a company's station, until they are all engaged, on condition (1) of paying a certain weekly or annual sum, and (2) of guaranteeing to have cabs in attendance at all hours. This system was abolished by the act of 1907, but the home secretary was empowered to suspend or modify the abolition if it should interfere with the proper accommodation of the public.

At one time there was much discussion in England as to the desirability of legalizing on cabs the use of a mechanical fare-recorder such as, under the name of taximeter or taxameter, is in general use on the continent of Europe. It is now universal on hackney carriages propelled by mechanical means, and it has also extended largely to those drawn by animal power. A taximeter consists of a securely closed and sealed metal box containing a mechanism actuated by a flexible shaft connected with the wheel of the vehicle, in the same manner as the speedometer on a motor car. It has, within plain view of the passenger, a number of apertures in which appear figures showing the amount payable at any time. A small lever, with a metal flag, bearing the words "for hire" stands upright upon it when the cab is disengaged. As soon as a passenger enters the cab the lever is depressed by the driver and the recording mechanism starts. At the end of the journey the figures upon the dials show exactly the sum payable for hire; this sum is based on a combination of time and distance.

CABAL (through the Fr. *cabale* from the *Cabbala* or *Kabbalah*, the theosophical interpretation of the Hebrew scriptures), a private organization or party engaged in secret intrigues, and applied also to the intrigues themselves. The word came into common usage in English during the reign of Charles II. to describe the committee of the privy council known as the "Committee for Foreign Affairs," which developed into the cabinet. The invidious meaning attached to the term was stereotyped by the coincidence that the initial letters of the names of the five ministers, Clifford, Arlington, Buckingham, Ashley and Lauderdale, who signed the treaty of alliance with France in 1673, spelled cabal.

CABALLERO, FERNÁN (1796-1877), the pseudonym adopted from the name of a village in the province of Ciudad Real by the Spanish novelist Cecilia Francisca Josefa Böhl de Faber y Larrea. Born at Morges in Switzerland on the 24th of December 1796, she was the daughter of Johan Nikolas Böhl von Faber, a Hamburg merchant, who lived long in Spain, married a native of Cadiz, and is creditably known to students of Spanish literature as the editor of the *Floresta de rimas antiguas castellanas* (1821-1825), and the *Teatro español anterior á Lope de Vega* (1832). Educated principally at Hamburg, she visited Spain in 1815, and, unfortunately for herself, in 1816 married Antonio Planells y Bardaxi, an infantry captain of bad character. In the following year Planells was killed in action, and in 1822 the young widow married Francisco Ruiz del Arco, marqués de Arco Hermoso, an officer in one of the Spanish household regiments. Upon the death of Arco Hermoso in 1835, the marquesa found herself in straitened circumstances, and in less than two years she married Antonio Arrón de Ayala, a man considerably her junior. Arrón was appointed consul in Australia, engaged in business enterprises and made money; but unfortunate speculations drove him to commit suicide in 1859. Ten years earlier the name of Fernán Caballero became famous in Spain as the author of *La Gaviola*. The writer had already published in German an anonymous romance, *Sola* (1840), and curiously enough the original draft of *La Gaviota* was written in French. This novel, translated into Spanish by José Joaquín de Mora, appeared as the *feuilleton* of *El Heraldo* (1849), and was received with marked favour. Ochoa, a prominent critic of the day, ratified the popular judgment, and hopefully proclaimed the writer to be a rival of Scott. No other Spanish book of the 19th century has obtained such instant and universal recognition. It was translated into most European languages, and, though it scarcely seems to deserve the intense enthusiasm which it excited, it is the best of its author's works, with the possible exception of *La Familia de Alvareda* (which was written, first of all, in German). Less successful attempts are *Lady Virginia* and *Clemencia*; but the short stories entitled *Cuadros de Costumbres* are interesting in matter and form, and *Una en otra* and *Elia ó la España treinta años ha* are excellent specimens of picturesque narration. It would be difficult to maintain that Fernán Caballero was a great literary artist, but it is certain that she was a born teller of stories and that she has a graceful style very suitable to her purpose. She came into Spain at a most happy moment, before the new order had perceptibly disturbed the old, and she brought to bear not alone a fine natural gift of observation, but a freshness of vision, undulled by long familiarity. She combined the advantages of being both a foreigner and a native. In later publications she insisted too emphatically upon the moral lesson, and lost much of her primitive simplicity and charm; but we may believe her statement that, though she occasionally idealized circumstances, she was conscientious in choosing for her themes subjects which had occurred in her own experience. Hence she may be regarded as a pioneer in the realistic field, and this historical fact adds to her positive importance. For many years she was the most popular of Spanish writers, and the sensation caused by her death at Seville on the 7th of April 1877 proved that her naïve truthfulness still attracted readers who were interested in records of national customs and manners.

Her *Obras completas* are included in the *Colección de escritores castellanos*: a useful biography by Fernando de Gabriel Ruiz de Apodaca precedes the *Últimas producciones de Fernán Caballero* (Seville, 1878).

(J. F.-K.)

CABANEL, ALEXANDRE (1823-1889), French painter, was born at Montpellier, and studied in Paris, gaining the Prix de Rome in 1845. His pictures soon attracted attention, and by his "Birth of Venus" (1863), now in the Luxembourg, he became famous, being elected that year to the Institute. He became the most popular portrait painter of the day, and his pupils included a number of famous artists.

CABANIS, PIERRE JEAN GEORGE (1757-1808), French physiologist, was born at Cosnac (Corrèze) on the 5th of June 1757, and was the son of Jean Baptiste Cabanis (1723-1786), a lawyer and agronomist. Sent at the age of ten to the college of Brives, he showed great aptitude for study, but his independence of spirit was so excessive that he was almost constantly in a state of rebellion against his teachers, and was finally dismissed from the school. He was then taken to Paris by his father and left to carry on his studies at his own discretion for two years. From 1773 to 1775 he travelled in Poland and Germany, and on his return to Paris he devoted himself mainly to poetry. About this time he ventured to send in to the Academy a translation of the passage from Homer proposed for their prize, and, though his attempt passed without

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notice, he received so much encouragement from his friends that he contemplated translating the whole of the *Iliad*. But at the desire of his father he relinquished these pleasant literary employments, and resolving to engage in some settled profession selected that of medicine. In 1789 his *Observations sur les hôpitaux* procured him an appointment as administrator of hospitals in Paris, and in 1795 he became professor of hygiene at the medical school of Paris, a post which he exchanged for the chair of legal medicine and the history of medicine in 1799. From inclination and from weak health he never engaged much in practice as a physician, his interests lying in the deeper problems of medical and physiological science. During the last two years of Mirabeau's life he was intimately connected with that extraordinary man, and wrote the four papers on public education which were found among the papers of Mirabeau at his death, and were edited by the real author soon afterwards in 1791. During the illness which terminated his life Mirabeau confided himself entirely to the professional skill of Cabanis. Of the progress of the malady, and the circumstances attending the death of Mirabeau, Cabanis drew up a detailed narrative, intended as a justification of his treatment of the case. Cabanis espoused with enthusiasm the cause of the Revolution. He was a member of the Council of Five Hundred and then of the Conservative senate, and the dissolution of the Directory was the result of a motion which he made to that effect. But his political career was not of long continuance. A foe to tyranny in every shape, he was decidedly hostile to the policy of Bonaparte, and constantly rejected every solicitation to accept a place under his government. He died at Meulan on the 5th of May 1808.

A complete edition of Cabanis's works was begun in 1825, and five volumes were published. His principal work, *Rapports du physique et du moral de l'homme*, consists in part of memoirs, read in 1796 and 1797 to the Institute, and is a sketch of physiological psychology. Psychology is with Cabanis directly linked on to biology, for sensibility, the fundamental fact, is the highest grade of life and the lowest of intelligence. All the intellectual processes are evolved from sensibility, and sensibility itself is a property of the nervous system. The soul is not an entity, but a faculty; thought is the function of the brain. Just as the stomach and intestines receive food and digest it, so the brain receives impressions, digests them, and has as its organic secretion, thought. Alongside of this harsh materialism Cabanis held another principle. He belonged in biology to the vitalistic school of G.E. Stahl, and in the posthumous work, *Lettre sur les causes premières* (1824), the consequences of this opinion became clear. Life is something added to the organism; over and above the universally diffused sensibility there is some living and productive power to which we give the name of Nature. But it is impossible to avoid ascribing to this power both intelligence and will. In us this living power constitutes the ego, which is truly immaterial and immortal. These results Cabanis did not think out of harmony with his earlier theory.

CABARRUS, FRANÇOIS (1752-1810), French adventurer and Spanish financier, was born at Bayonne, where his father was a merchant. Being sent into Spain on business he fell in love with a Spanish lady, and marrying her, settled in Madrid. Here his private business was the manufacture of soap; but he soon began to interest himself in the public questions which were ventilated even at the court of Spain. The enlightenment of the 18th century had penetrated as far as Madrid; the king, Charles III., was favourable to reform; and a circle of men animated by the new spirit were trying to infuse fresh vigour into an enfeebled state. Among these Cabarrus became conspicuous, especially in finance. He originated a bank, and a company to trade with the Philippine Islands; and as one of the council of finance he had planned many reforms in that department of the administration, when Charles III. died (1788), and the reactionary government of Charles IV. arrested every kind of enlightened progress. The men who had taken an active part in reform were suspected and prosecuted. Cabarrus himself was accused of embezzlement and thrown into prison. After a confinement of two years he was released, created a count and employed in many honourable missions; he would even have been sent to Paris as Spanish ambassador, had not the Directory objected to him as being of French birth. Cabarrus took no part in the transactions by which Charles IV. was obliged to abdicate and make way for Joseph, brother of Napoleon, but his French birth and intimate knowledge of Spanish affairs recommended him to the emperor as the fittest person for the difficult post of minister of finance, which he held at his death. His beautiful daughter Thérèse, under the name of Madame Tallien (afterwards princess of Chimay), played an interesting part in the later stages of the French Revolution.

CABASILAS, NICOLAUS (d. 1371), Byzantine mystic and theological writer. He was on intimate terms with the emperor John VI. Cantacuzene, whom he accompanied in his retirement to a monastery. In 1355 he succeeded his uncle Nilus Cabasilas, like himself a determined opponent of the union of the Greek and Latin churches, as archbishop of Thessalonica. In the Hesychast controversy he took the side of the monks of Athos, but refused to agree to the theory of the uncreated light. His chief work is his Περὶ τῆς ἐν Χριστῷ ζωῆς (*ed. pr.* of the Greek text, with copious introduction, by W. Gass, 1849; new ed. by M. Heinze, 1899), in which he lays down the principle that union with Christ is effected by the three great mysteries of baptism, confirmation and the eucharist. He also wrote homilies on various subjects, and a speech against usurers, printed with other works in Migne, *Patrologia Graeca*, c. i. A large number of his works is still extant in MS.

See C. Krumbacher, *Geschichte der byzantinischen Litteratur* (1897), and article in Herzog-Hauck, *Realencyklopädie für protestantische Theologie* (1901).

CABATÚAN, a town of the province of Ilóilo, Panay, Philippine Islands, on a branch of the Suague river, 15 m. N.W. of Ilóilo, the capital. Pop. (1903) 16,497. In 1903, after the census had been taken, the neighbouring town of Maasin, with a population of 8401, was annexed to Cabatúan. Its climate is healthful. The surrounding country is very fertile and produces large quantities of rice, as well as Indian corn, tobacco, sugar, coffee and a great variety of fruits. The language is Visayan. Cabatúan was founded in 1732.

CABBAGE. The parent form of the variety of culinary and fodder vegetables included under this head is generally supposed to be the wild or sea cabbage (*Brassica oleracea*), a plant found near the sea coast of various parts of England and continental Europe, although Alphonse de Candolle considered it to be really descended from the two or three allied species which are yet found growing wild on the Mediterranean coast. In any case the cultivated varieties have departed very widely from the original type, and they present very marked and striking dissimilarities among themselves. The wild cabbage is a comparatively insignificant plant, growing from 1 to 2 ft. high, in appearance very similar to the corn mustard or charlock (*Sinapis arvensis*), but differing from it in having smooth leaves. The wild plant has fleshy, shining, waved and lobed leaves (the uppermost being undivided but toothed), large yellow flowers, elongated seed-pod,

and seeds with conduplicate cotyledons. Notwithstanding the fact that the cultivated forms differ in habit so widely, it is remarkable that the flower, seed-pods and seeds of the varieties present no appreciable difference.

John Lindley proposed the following classification for the various forms, which includes all yet cultivated: (1) All the leaf-buds active and open, as in wild cabbage and kale or greens; (2) All the leaf-buds active, but forming heads, as in Brussels sprouts; (3) Terminal leaf-bud alone active, forming a head, as in common cabbage, savoys, &c.; (4) Terminal leaf-bud alone active and open, with most of the flowers abortive and succulent, as in cauliflower and broccoli; (5) All the leaf-buds active and open, with most of the flowers abortive and succulent, as in sprouting broccoli. The last variety bears the same relation to common broccoli as Brussels sprouts do to the common cabbage. Of all these forms there are numerous gardeners' varieties, all of which reproduce faithfully enough their parent form by proper and separate cultivation.

Under Lindley's first class, common or Scotch kale or borecole (*Brassica oleracea* var. *acephala* or var. *fimbriata*) includes several varieties which are amongst the hardiest of our esculents, and seldom fail to yield a good supply of winter greens. They require well-enriched soil, and sufficient space for full exposure
[v.04 p.0915] to air; and they should also be sown early, so as to be well established and hardened before winter. The main crops should be sown about the first week of April, or, in the north, in the third week of March, and a succession a month later. The Buda kale is sown in May, and planted out in September, but a sowing for late spring use may be made in the last week of August and transplanted towards the end of September. To prevent overcrowding, the plants should be transplanted as soon as they are of sufficient size, but if the ground is not ready to receive them a sufficient number should be pricked out in some open spot. In general the more vigorous sorts should be planted in rows 3 ft. and the smaller growers 2 ft. apart, and 18 in. from plant to plant. In these the heads should be first used, only so much of the heart as is fresh and tender being cut out for boiling; side shoots or sprouts are afterwards produced for a long time in succession, and may be used so long as they are tender enough to admit of being gathered by snapping their stalks asunder.

The plant sends up a stout central stem, growing upright to a height of about 2 ft., with close-set, large thick, plain leaves of a light red or purplish hue. The lower leaves are stripped off for use as the plants grow up, and used for the preparation of broth or "Scotch kail," a dish at one time in great repute in the north-eastern districts of Scotland. A very remarkable variety of open-leaved cabbage is cultivated in the Channel Islands under the name of the Jersey or branching cabbage. It grows to a height of 8 ft, but has been known to attain double that altitude. It throws out branches from the central stem, which is sufficiently firm and woody to be fashioned into walking-sticks; and the stems are even used by the islanders as rafters for bearing the thatch on their cottage-roofs. Several varieties are cultivated as ornamental plants on account of their beautifully coloured, frizzled and laciniated leaves.

Brussels sprouts (*Brassica oleracea* var. *bullata gemmifera*) are miniature cabbage-heads, about an inch in diameter, which form in the axils of the leaves. There appears to be no information as to the plant's origin, but, according to Van Mons (1765-1842), physician and chemist, it is mentioned in the year 1213, in the regulations for holding the markets of Belgium, under the name of *spruyten* (sprouts). It is very hardy and productive, and is much esteemed for the table on account of its flavour and its sightly appearance. The seed should be sown about the middle of March, and again in the first or second week in April for succession. Any good garden soil is suitable. For an early crop it may be sown in a warm pit in February, pricked out and hardened in frames, and planted out in a warm situation in April. The main crop may be planted in rows 2 ft. asunder, the plants 18 in. apart. They should be got out early, so as to be well established and come into use before winter. The head may be cut and used after the best of the little rosettes which feather the stem have been gathered; but, if cut too early, it exposes these rosettes, which are the most delicate portion of the produce, to injury, if the weather be severe. The earliest sprouts become fit for use in November, and they continue good, or even improve in quality, till the month of March following; by successive sowings the sprouts are obtained for the greater part of the year.

The third class is chiefly represented by the common or drumhead cabbage, *Brassica oleracea* var. *capitata*, the varieties of which are distinguished by difference in size, form and colour. In Germany it is converted into a popular article of diet under the name of *Sauerkraut* by placing in a tub alternate layers of salt and cabbage. An acid fermentation sets in, which after a few days is complete, when the vessel is tightly covered over and the product kept for use with animal food.

The savoy is a hardy green variety, characterized by its very wrinkled leaves. The Portugal cabbage, or *Couve Tronchuda*, is a variety, the tops of which form an excellent cabbage, while the midribs of the large leaves are cooked like sea-kale.

Cabbages contain a very small percentage of nitrogenous compounds as compared with most other articles of food. Their percentage composition, when cooked, is—water, 97.4; fat, 0.1; carbohydrate, 0.4; mineral matter, 0.1; cellulose, 1.3; nitrogenous matter (only about half being proteid), 0.6. Their food-value, apart from their anti-scorbutic properties, is therefore practically nil.

The cabbage requires a well-manured and well-wrought loamy soil. It should have abundant water in summer, liquid manure being specially beneficial. Round London where it is grown in perfection, the ground for it is dug to the depth of two spades or spits, the lower portion being brought up to the action of the weather, and rendered available as food for the plants; while the top-soil, containing the eggs and larvae of many insects, being deeply buried, the plants are less liable to be attacked by the club disease. Farm-yard manure is that most suitable for the cabbage, but artificial manures such as guano, superphosphate of lime or gypsum, together with lime-rubbish, wood-ashes and marl, may, if required, be applied with advantage.

The first sowing of cabbage should be made about the beginning of March; this will be ready for use in July and August, following the autumn-sown crops. Another sowing should be made in the last week of March or first week of April, and will afford a supply from August till November; and a further crop may be made in May to supply young-hearted cabbages in the early part of winter. The autumn sowing, which is the most important, and affords the supply for spring and early summer use, should be made about the last week in August, in warm localities in the south, and about a fortnight earlier in the north; or, to meet fluctuations of climate, it is as well in both cases to anticipate this sowing by another two or three weeks earlier, planting out a portion from each, but the larger number from that sowing which promises best to

stand without running to seed.

The cabbages grown late in autumn and in the beginning of winter are denominated coleworts (vulg. collards), from a kindred vegetable no longer cultivated. Two sowings are made, in the middle of June and in July, and the seedlings are planted a foot or 15 in. asunder, the rows being 8 or 10 in. apart. The sorts employed are the Rosette and the Hardy Green.

About London the large sorts, as Enfield Market, are planted for spring cabbages 2 ft. apart each way; but a plant from an earlier sowing is dibbled in between every two in the rows, and an intermediate row a foot apart is put in between the permanent rows, these extra plants being drawn as coleworts in the course of the winter. The smaller sorts of cabbage may be planted 12 in. apart, with 12 or 15 in. between the rows. The large sorts should be planted 2 ft. apart, with 2½ ft. between the rows. The only culture required is to stir the surface with the hoe to destroy the weeds, and to draw up the soil round the stems.

The red cabbage, *Brassica oleracea* var. *capitata rubra*, of which the Red Dutch is the most commonly grown, is much used for pickling. It is sown about the end of July, and again in March or April. The Dwarf Red and Utrecht Red are smaller sorts. The culture is in every respect the same as in the other sorts, but the plants have to stand until they form hard close hearts.

Cauliflower, which is the chief representative of class 4, consists of the inflorescence of the plant modified so as to form a compact succulent white mass or head. The cauliflower (*Brassica oleracea* var. *botrytis cauliflora*) is said by our old authors to have been introduced from Cyprus, where, as well as on the Mediterranean coasts, it appears to have been cultivated for ages. It is one of the most delicately flavoured of vegetables, the dense cluster formed by its incipient succulent flower-buds being the edible portion.

The sowing for the first or spring crop, to be in use in May and June, should be made from the 15th to the 25th of August for England, and from the 1st to the 15th of August for Scotland. In the neighbourhood of London the growers adhere as nearly as possible to the 21st day. A sowing to produce heads in July and August takes place in February on a slight hotbed. A late spring sowing to produce cauliflowers in September or October or later, should be made early in April and another about the 20th of May.

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The cauliflower succeeds best in a rich soil and sheltered position; but, to protect the young plants in winter, they are sometimes pricked out in a warm situation at the foot of a south wall, and in severe weather covered with hoops and mats. A better method is to plant them thickly under a garden frame, securing them from cold by coverings and giving air in mild weather. For a very early supply, a few scores of plants may be potted and kept under glass during winter and planted out in spring, defended with a hand-glass. Sometimes patches of three or four plants on a south border are sheltered by hand-glasses throughout the winter. It is advantageous to prick out the spring-sown plants into some sheltered place before they are finally transplanted in May. The later crop, the transplanting of which may take place at various times, is treated like early cabbages. After planting, all that is necessary is to hoe the ground and draw up the soil about the stems.

It is found that cauliflowers ready for use in October may be kept in perfection over winter. For this purpose they are lifted carefully with the spade, keeping a ball of earth attached to the roots. Some of the large outside leaves are removed, and any points of leaves that immediately overhang the flower are cut off. They are then placed either in pots or in garden frames, the plants being arranged close together, but without touching. In mild dry weather the glass frames are drawn off, but they are kept on during rainstorms, ventilation being afforded by slightly tilting the frames, and in severe frost they are thickly covered with mats.

Broccoli is merely a variety of cauliflower, differing from the other in the form and colour of its inflorescence and its hardiness. The broccoli (*Brassica oleracea* var. *botrytis asparagoides*) succeeds best in loamy soil, somewhat firm in texture. For the autumn broccolis the ground can scarcely be too rich, but the winter and spring sorts on ground of this character are apt to become so succulent and tender that the plants suffer from frost even in sheltered situations, while plants less stimulated by manure and growing in the open field may be nearly all saved, even in severe winters. The main crops of the early sorts for use in autumn should be sown early in May, and planted out while young to prevent them coming too early into flower; in the north they may be sown a fortnight earlier. The later sorts for use during winter and spring should be sown about the middle or end of May, or about ten days earlier in the north. The seed-beds should be made in fresh light soil; and if the season be dry the ground should be well watered before sowing. If the young plants are crowding each other they should be thinned. The ground should not be dug before planting them out, as the firmer it is the better; but a shallow drill may be drawn to mark the lines. The larger-growing sorts may be put in rows 3 ft. apart, and the plants about 2½ ft. apart in the rows, and the smaller-growing ones at from 2 to 2½ ft. between, and 1½ to 2 ft. in the rows. If the ground is not prepared when young plants are ready for removal, they should be transferred to nursery beds and planted at 3 to 4 in. apart, but the earlier they can be got into their permanent places the better.

It is of course the young flower-heads of the plant which are eaten. When these form, they should be shielded from the light by bending or breaking down an inner leaf or two. In some of the sorts the leaves naturally curve over the heads. To prevent injury to the heads by frost in severe winters, the plants should be laid in with their heads sloping towards the north, the soil being thrown back so as to cover their stems; or they may be taken up and laid in closely in deep trenches, so that none of the lower bare portion of the stem may be exposed. Some dry fern may also be laid over the tops. The spring varieties are extremely valuable, as they come at a season when the finer vegetables are scarce. They afford a supply from December to May inclusive.

Broccoli sprouts, the representative of the fifth class, are a form of recent introduction, and consist of flowering sprouts springing from the axils of the leaves. The purple-leaved variety is a very hardy and much-esteemed vegetable.

Kohl-rabi (*Brassica oleracea* var. *caulo-rapa*) is a peculiar variety of cabbage in which the stem, just above ground, swells into a fleshy turnip-like mass. It is much cultivated in certain districts as a food for stock, for which purpose the drumhead cabbage and the thousand-headed kale are also largely used. Kohl-rabi is exceedingly hardy, withstanding both severe frosts and drought. It is not much grown in English gardens, though when used young it forms a good substitute for turnips. The seeds should be sown in May and June, and the seedlings should be planted shallowly in well-manured ground, 8 or 10 in. apart, in rows 15 in.

asunder; and they should be well watered, so as to induce quick growth.

The varieties of cabbage, like other fresh vegetables, are possessed of anti-scorbutic properties; but unless eaten when very fresh and tender they are difficult of digestion, and have a very decided tendency to produce flatulence.

Although the varieties reproduce by seed with remarkable constancy, occasional departures from the types occur, more especially among the varieties of spring cabbages, cauliflowers and broccoli. The departures, known technically as "rogues," are not as a rule sufficiently numerous to materially affect crops grown for domestic purposes. Rogues appearing among the stocks of seed-growers, however, if allowed to remain, very materially affect the character of particular stocks by the dissemination of strange pollen and by the admixture of their seed. Great care is exercised by seed-growers, with reputations to maintain, to eliminate these from among their stock-plants before the flowering period is reached.

Several species of palm, from the fact of yielding large sapid central buds which are cooked as vegetables, are known as cabbage-palms. The principal of these is *Areca oleracea*, but other species, such as the coco-palm, the royal palm (*Oreodoxa regia*), *Arenga saccharifera* and others yield similar edible leaf-buds.

CABEIRI, in Greek mythology, a group of minor deities, of whose character and worship nothing certain is known. Their chief seats of worship were the islands of Lemnos, Imbros and Samothrace, the coast of Troas, Thessalia and Boeotia. The name appears to be of Phoenician origin, signifying the "great" gods, and the Cabeiri seem to have been deities of the sea who protected sailors and navigation, as such often identified with the Dioscuri, the symbol of their presence being St Elmo's fire. Originally the Cabeiri were two in number, an older identified with Hephaestus (or Dionysus), and a younger identified with Hermes, who in the Samothracian mysteries was called Cadmilus or Casmilus. Their cult at an early date was united with that of Demeter and Kore, with the result that two pairs of Cabeiri appeared, Hephaestus and Demeter, and Cadmilus and Kore. According to Mnaseas[1] (quoted by the scholiast on Apollonius Rhodius i. 917) they were four in number:—Axieros, Axiokersa, Axiokersos, Casmilus. It is there stated that Axieros is Demeter; Axiokersa, Persephone; Axiokersos, Hades; and Casmilus, Hermes. The substitution of Hades for Hephaestus is due to the fact that Hades was regarded as the husband of Persephone. Cabeiro, who is mentioned in the logographers Acusilaus and Pherecydes as the wife of Hephaestus, is identical with Demeter, who indeed is expressly called Καβειρία in Thebes. Roman antiquarians identified the Cabeiri with the three Capitoline deities or with the Penates. In Lemnos an annual festival of the Cabeiri was held, lasting nine days, during which all the fires were extinguished and fire brought from Delos. From this fact and from the statement of Strabo x. p. 473, that the father of the Cabeiri was Camillus, a son of Hephaestus, the Cabeiri have been thought to be, like the Corybantes, Curetes and Dactyli, demons of volcanic fire. But this view is not now generally held. In Lemnos they fostered the vine and fruits of the field, and from their connexion with Hermes in Samothrace it would also seem that they promoted the fruitfulness of cattle.

By far the most important seat of their worship was Samothrace. Here, as early as the 5th century B.C., their mysteries, possibly under Athenian influence, attracted great attention, and initiation was looked upon as a general safeguard against all misfortune. But it was in the period after the death of Alexander the Great that their cult reached its height. Demetrius Poliorcetes, Lysimachus and Arsinoë regarded the Cabeiri with especial favour, and initiation was sought, not only by large numbers of pilgrims, but by persons of distinction. Initiation included also an asylum or refuge within the strong walls of Samothrace, for which purpose it was used among others by Arsinoë, who, to show her gratitude, afterwards caused a
[v.04 p.0917] monument to be erected there, the ruins of which were explored in 1874 by an Austrian archaeological expedition. In 1888 interesting details as to the Boeotian cult of the Cabeiri were obtained by the excavations of their temple in the neighbourhood of Thebes, conducted by the German archaeological institute. The two male deities worshipped were Cabeiros and a boy: the Cabeiros resembles Dionysus, being represented on vases as lying on a couch, his head surrounded with a garland of ivy, a drinking cup in his right hand; and accompanied by maenads and satyrs. The boy is probably his cup-bearer. The Cabeiri were held in even greater esteem by the Romans, who regarded themselves as descendants of the Trojans, whose ancestor Dardanus (himself identified in heroic legend with one of the Cabeiri) came from Samothrace. The identification of the three Capitoline deities with the Penates, and of these with the Cabeiri, tended to increase this feeling.

See C.A. Lobeck, *Aglaophamus* (1829); F.G. Welcker, *Die Aeschylische Trilogie und die Kabirenweihe zu Lemnos* (1824); J.P. Rossignol, *Les Métaux dans l'antiquité* (1863), discussing the gods of Samothrace (the Dactyli, the Cabeiri, the Corybantes, the Curetes, and the Telchines) as workers in metal, and the religious origin of metallurgy; O. Rubensohn, *Die Mysterienheiligtümer in Eleusis und Samothrake* (1892); W.H. Roscher, *Lexikon der Mythologie* (*s.v.* "Megaloi Theoi"); L. Preller, *Griechische Mythologie* (4th ed., appendix); and the article by F. Lenormant in Daremberg and Saglio, *Dictionnaire des Antiquités*.

[1] A grammarian of Patrae in Achaea (or Patara in Lycia), pupil of Eratosthenes (275-195 B.C.), and author of a periplus and a collection of Delphic oracles.

CABER TOSSING (Gaelic *cabar*, a pole or beam), a Scottish athletic exercise which consists in throwing a section of a trunk of a tree, called the "caber," in such a manner that it shall turn over in the air and fall on the ground with its small end pointing in the direction directly opposite to the "tosser." Tossing the caber is usually considered to be a distinctly Scottish sport, although "casting the bar," an exercise evidently similar in character, was popular in England in the 16th century but afterwards died out. The caber is the heavy trunk of a tree from 16 to 20 ft. long. It is often brought upon the field heavier than can be thrown and then cut to suit the contestants, although sometimes cabers of different sizes are kept, each contestant taking his choice. The toss is made after a run, the caber being set up perpendicularly with the heavy end up by assistants on the spot indicated by the tosser, who sets one foot against it, grasps it with both hands, and, as soon as he feels it properly balanced, gives the word to the assistants to let go their hold. He then raises the caber and gets both hands underneath the lower end. "A practised hand, having freed the caber from the ground, and got his hands underneath the end, raises it till the lower end is nearly on a level with his elbows, then advances for several yards, gradually increasing his speed till he is sometimes at a smart run before he gives the toss. Just before doing this he allows the caber to leave his shoulder, and as the heavy top end begins to fall forward, he throws the end he has in his hands upwards with all his strength, and, if successful, after the heavy end strikes the ground the small end continues its

upward motion till perpendicular, when it falls forward, and the caber lies in a straight line with the tosser" (W.M. Smith). The winner is he who tosses with the best and easiest style, according to old Highland traditions, and whose caber falls straightest in a direct line from him. In America a style called the Scottish-American prevails at Caledonian games. In this the object is distance alone, the same caber being used by all contestants and the toss being measured from the tosser's foot to the spot where the small end strikes the ground. This style is repudiated in Scotland. Donald Dinnie, born in 1837 and still a champion in 1890, was the best tosser of modern times.

See W.M. Smith, *Athletics and Athletic Sports in Scotland* (Edinburgh, 1891).

CABET, ÉTIENNE (1788-1856), French communist, was born at Dijon in 1788, the son of a cooper. He chose the profession of advocate, without succeeding in it, but ere long became notable as the persevering apostle of republicanism and communism. He assisted in a secondary way in the revolution of 1830, and obtained the appointment of *procureur-général* in Corsica under the government of Louis Philippe; but was dismissed for his attack upon the conservatism of the government, in his *Histoire de la révolution de 1830*. Elected, notwithstanding, to the chamber of deputies, he was prosecuted for his bitter criticism of the government, and obliged to go into exile in England in 1834, where he became an ardent disciple of Robert Owen. On the amnesty of 1839 he returned to France, and attracted some notice by the publication of a badly written and fiercely democratic history of the Revolution of 1789 (4 vols., 1840), and of a social romance, *Voyage en Icarie*, in which he set forth his peculiar views. These works met with some success among the radical working-men of Paris. Like Owen, he sought to realize his ideas in practice, and, pressed as well by his friends, he made arrangements for an experiment in communism on American soil. By negotiations in England favoured by Owen, he purchased a considerable tract of land on the Red river, Texas, and drew up an elaborate scheme for the intending colony, community of property being the distinctive principle of the society. Accordingly in 1848 an expedition of 1500 "Icarians" sailed to America; but unexpected difficulties arose and the complaints of the disenchanted settlers soon reached Europe. Cabet, who had remained in France, had more than one judicial investigation to undergo in consequence, but was honourably acquitted. In 1849 he went out in person to America, but on his arrival, finding that the Mormons had been expelled from their city Nauvoo (*q.v.*), in Illinois, he transferred his settlement thither. There, with the exception of a journey to France, where he returned to defend himself successfully before the tribunals, he remained, the dictator of his little society. In 1856, however, he withdrew and died the same year at St Louis.

See Communism. Also Félix Bonnaud, *Cabet et son œuvre, appel à tous les socialistes* (Paris, 1900); J. Prudhommeaux, *Icaria and its Founder, Étienne Cabet* (Nîmes, 1907).

CABIN, a small, roughly built hut or shelter; the term is particularly applied to the thatched mud cottages of the negro slaves of the southern states of the Unites States of America, or of the poverty-stricken peasantry of Ireland or the crofter districts of Scotland. In a special sense it is used of the small rooms or compartments on board a vessel used for sleeping, eating or other accommodation. The word in its earlier English forms was *cabane* or *caban*, and thus seems to be an adaptation of the French *cabane*; the French have taken *cabine*, for the room on board a ship, from the English. In French and other Romanic languages, in which the word occurs, *e.g.* Spanish *cabaña*, Portuguese *cabana*, the origin is usually found in the Medieval Latin *capanna*. Isidore of Seville (*Origines*, lib. xiv. 12) says:—*Tugurium* (hut) *parva casula est, quam faciunt sibi custodes vinearum, ad tegimen seu quasi tegurium. Hoc rustici Capannam vocant, quod unum tantum capiat* (see Du Cange, *Glossarium*, s.v. *Capanna*). Others derive from Greek κάπη, crib, manger. Skeat considers the English word was taken from the Welsh *caban*, rather than from the French, and that the original source for all the forms was Celtic.

CABINET, a word with various applications which may be traced to two principal meanings, (1) a small private chamber, and (2) an article of furniture containing compartments formed of drawers, shelves, &c. The word is a diminutive of "cabin" and therefore properly means a small hut or shelter. This meaning is now obsolete; the *New English Dictionary* quotes from Leonard Digges's *Stratioticos* (published with additions by his son Thomas in 1579), "the Lance Knights encamp always in the field very strongly, two or three to a Cabbonet." From the use both of the article of furniture and of a small chamber for the safe-keeping of a collection of valuable prints, pictures, medals or other objects, the word is frequently applied to such a collection or to objects fit for such safe-keeping. The name of *Cabinet du Roi* was given to the collection of prints prepared by the best artists of the 17th century by order of Louis XIV. These were intended to commemorate the chief events of his reign, and also to reproduce the paintings and sculptures and other art treasures contained in the royal palaces. It was begun in 1667 and was placed under the superintendence of Nicholas Clement (1647 or 1651-1712), the royal librarian. The collection was
[v.04 p.0918]
published in 1727. The plates are now in the Louvre. A "cabinet" edition of a literary work is one of somewhat small size, and bound in such a way as would suit a tasteful collection. The term is applied also to a size of photograph of a larger size than the *carte de visite* but smaller than the "panel." The political use of the term is derived from the private chamber of the sovereign or head of a state in which his advisers met.

Cabinet in Furniture.—The artificer who constructs furniture is still called a "cabinet-maker," although the manufacture of cabinets, properly so called, is now a very occasional part of his work. Cabinets can be divided into a very large number of classes according to their shape, style, period and country of origin; but their usual characteristic is that they are supported upon a stand, and that they contain a series of drawers and pigeon-holes. The name is, however, now given to many pieces of furniture for the safe-keeping or exhibition of valuable objects, which really answer very little to the old conception of a cabinet. The cabinet represented an evolution brought about by the necessities of convenience, and it appealed to so many tastes and needs that it rapidly became universal in the houses of the gentle classes, and in great measure took the impress of the peoples who adopted it. It would appear to have originated in Italy, probably at the very beginning of the 16th century. In its rudimentary form it was little more than an oblong box, with or without feet, small enough to stand upon a table or chair, filled with drawers and closed with doors. In this early form its restricted dimensions permitted of its use only for the safeguard of jewels, precious stones and sometimes money. One of the earliest cabinets of which we have mention belonged to Francis I. of France, and is described as covered with gilt leather, tooled with mauresque work. As the Renaissance became general these early forms gave place to larger, more elaborate and more architectural efforts, until the cabinet became one of the most sumptuous of household adornments. It was natural that the countries which were earliest and most deeply touched by the Renaissance should excel in

the designing of these noble and costly pieces of furniture. The cabinets of Italy, France and the Netherlands were especially rich and monumental. Those of Italy and Flanders are often of great magnificence and of real artistic skill, though like all other furniture their style was often grievously debased, and their details incongruous and bizarre. Flanders and Burgundy were, indeed, their lands of adoption, and Antwerp added to its renown as a metropolis of art by developing consummate skill in their manufacture and adornment. The cost and importance of the finer types have ensured the preservation of innumerable examples of all but the very earliest periods; and the student never ceases to be impressed by the extraordinary variety of the work of the 16th and 17th centuries, and very often of the 18th also. The basis of the cabinet has always been wood, carved, polished or inlaid; but lavish use has been made of ivory, tortoise-shell, and those cut and polished precious stones which the Italians call *pietra dura*. In the great Flemish period of the 17th century the doors and drawers of cabinets were often painted with classical or mythological scenes. Many French and Florentine cabinets were also painted. In many classes the drawers and pigeon-holes are enclosed by folding doors, carved or inlaid, and often painted on the inner sides. Perhaps the most favourite type during a great part of the 16th and 17th centuries—a type which grew so common that it became cosmopolitan—was characterized by a conceit which acquired astonishing popularity. When the folding doors are opened there is disclosed in the centre of the cabinet a tiny but palatial interior. Floored with alternate squares of ebony and ivory to imitate a black and white marble pavement, adorned with Corinthian columns or pilasters, and surrounded by mirrors, the effect, if occasionally affected and artificial, is quite as often exquisite. Although cabinets have been produced in England in considerable variety, and sometimes of very elegant and graceful form, the foreign makers on the whole produced the most elaborate and monumental examples. As we have said, Italy and the Netherlands acquired especial distinction in this kind of work. In France, which has always enjoyed a peculiar genius for assimilating modes in furniture, Flemish cabinets were so greatly in demand that Henry IV. determined to establish the industry in his own dominions. He therefore sent French workmen to the Low Countries to acquire the art of making cabinets, and especially those which were largely constructed of ebony and ivory. Among these workmen were Jean Macé and Pierre Boulle, a member of a family which was destined to acquire something approaching immortality. Many of the Flemish cabinets so called, which were in such high favour in France and also in England, were really *armoires* consisting of two bodies superimposed, whereas the cabinet proper does not reach to the floor. Pillared and fluted, with panelled sides, and front elaborately carved with masks and human figures, these pieces which were most often in oak were exceedingly harmonious and balanced. Long before this, however, France had its own school of makers of cabinets, and some of their carved work was of the most admirable character. At a somewhat later date André Charles Boulle made many pieces to which the name of cabinet has been more or less loosely given. They were usually of massive proportions and of extreme elaboration of marquetry. The North Italian cabinets, and especially those which were made or influenced by the Florentine school, were grandiose and often gloomy. Conceived on a palatial scale, painted or carved, or incrusted with marble and *pietra dura*, they were intended for the adornment of galleries and lofty bare apartments where they were not felt to be overpowering. These North Italian cabinets were often covered with intarsia or marquetry, which by its subdued gaiety retrieved somewhat their heavy stateliness of form. It is, however, often difficult to ascribe a particular fashion of shape or of workmanship to a given country, since the interchange of ideas and the imports of actual pieces caused a rapid assimilation which destroyed frontiers. The close connexion of centuries between Spain and the Netherlands, for instance, led to the production north and south of work that was not definitely characteristic of either. Spain, however, was more closely influenced than the Low Countries, and contains to this day numbers of cabinets which are not easily to be distinguished from the characteristic ebony, ivory and tortoise-shell work of the craftsmen whose skill was so rapidly acquired by the emissaries of Henry IV. The cabinets of southern Germany were much influenced by the models of northern Italy, but retained to a late date some of the characteristics of domestic Gothic work such as elaborately fashioned wrought-iron handles and polished steel hinges. Often, indeed, 17th-century South Germany work is a curious blend of Flemish and Italian ideas executed in oak and Hungarian ash. Such work, however interesting, necessarily lacks simplicity and repose. A curious little detail of Flemish and Italian, and sometimes of French later 17th-century cabinets, is that the interiors of the drawers are often lined with stamped gold or silver paper, or marbled ones somewhat similar to the "end papers" of old books. The great English cabinet-makers of the 18th century were very various in their cabinets, which did not always answer strictly to their name; but as a rule they will not bear comparison with the native work of the preceding century, which was most commonly executed in richly marked walnut, frequently enriched with excellent marquetry of woods. Mahogany was the dominating timber in English furniture from the accession of George II. almost to the time of the Napoleonic wars; but many cabinets were made in lacquer or in the bright-hued foreign woods which did so much to give lightness and grace to the British style. The glass-fronted cabinet for China or glass was in high favour in the Georgian period, and for pieces of that type, for which massiveness would have been inappropriate, satin and tulip woods, and other timbers with a handsome grain taking a high polish were much used.

(J. P.-B.)

The Political Cabinet.—Among English political institutions, the "Cabinet" is a conventional but not a legal term employed to describe those members of the privy council who fill the highest executive offices in the state, and by their concerted policy direct the government, and are responsible for all the acts of the crown. The cabinet now always includes the persons filling the following offices, who are therefore called "cabinet ministers," viz.:—the first lord of the treasury, the lord chancellor of England, the lord president of the council, the lord privy seal, the five secretaries of state, the chancellor of the exchequer and the first lord of the admiralty. The chancellor of the duchy of Lancaster, the postmaster-general, the first commissioner of works, the president of the board of trade, the chief secretary for Ireland, the lord chancellor of Ireland, the president of the local government board, the president of the board of agriculture, and the president of the board of education, are usually members of the cabinet, but not necessarily so. A modern cabinet contains from sixteen to twenty members. It used to be said that a large cabinet is an evil; and the increase in its numbers in recent years has often been criticized. But the modern widening of the franchise has tended to give the cabinet the character of an executive committee for the party in power, no less than that of the prime-minister's consultative committee, and to make such a committee representative it is necessary to include the holders of all the more important offices in the administration, who are generally selected as the influential politicians of the party rather than for special aptitude in the work of the departments.

The word "cabinet," or "cabinet council," was originally employed as a term of reproach. Thus Lord Bacon says, in his essay *Of Counsel* (xx.), "The doctrine of Italy and practice of France, in some kings' times, hath introduced cabinet councils—a remedy worse than the disease"; and, again, "As for cabinet councils, it may be their motto *Plenus rimarum sum*." Lord Clarendon—after stating that, in 1640, when the great Council of Peers was convened by the king at York, the burden of affairs rested principally on Laud, Strafford and Cottington, with five or six others added to them on account of their official position and ability—adds, "These persons made up the committee of state, which was reproachfully after called the *Juncto*, and enviously then in court the *Cabinet Council*." And in the Second Remonstrance in January 1642, parliament complained "of the managing of the great affairs of the realm in *Cabinet Councils* by men unknown and not publicly trusted." But this use of the term, though historically curious, has in truth nothing in common with the modern application of it. It meant, at that time, the employment of a select body of favourites by the king, who were supposed to possess a larger share of his confidence than the privy council at large. Under the Tudors, at least from the later years of Henry VIII. and under the Stuarts, the privy council was the council of state or government. During the Commonwealth it assumed that name.

The Cabinet Council, properly so called, dates from the reign of William III. and from the year 1693, for it was not until some years after the Revolution that the king discovered and adopted the two fundamental principles of a constitutional executive government, namely, that a ministry should consist of statesmen holding the same political principles and identified with each other; and, secondly, that the ministry should stand upon a parliamentary basis, that is, that it must command and retain the majority of votes in the legislature. It was long before these principles were thoroughly worked out and understood, and the perfection to which they have been brought in modern times is the result of time, experience and in part of accident. But the result is that the cabinet council for the time being *is* the government of Great Britain; that all the powers vested in the sovereign (with one or two exceptions) are practically exercised by the members of this body; that all the members of the cabinet are jointly and severally responsible for all its measures, for if differences of opinion arise their existence is unknown as long as the cabinet lasts—when publicly manifested the cabinet is at an end; and lastly, that the cabinet, being responsible to the sovereign for the conduct of executive business, is also collectively responsible to parliament both for its executive conduct and for its legislative measures, the same men being as members of the cabinet the servants of the crown, and as members of parliament and leaders of the majority responsible to those who support them by their votes and may challenge in debate every one of their actions. In this latter sense the cabinet has sometimes been described as a standing committee of both Houses of Parliament.

One of the consequences of the close connexion of the cabinet with the legislature is that it is desirable to divide the strength of the ministry between the two Houses of Parliament. Pitt's cabinet of 1783 consisted of himself in the House of Commons and seven peers. But so aristocratic a government would now be impracticable. In Gladstone's cabinet of 1868, eight, and afterwards nine, ministers were in the House of Commons and six in the House of Lords. Great efforts were made to strengthen the ministerial bench in the Commons, and a new principle was introduced, that the representatives of what are called the spending departments—that is, the secretary of state for war and the first lord of the admiralty—should, if possible, be members of the House which votes the supplies. Disraeli followed this precedent but it has since been disregarded. In Sir H. Campbell-Bannerman's cabinet formed in 1905, six ministers were in the House of Lords and thirteen in the House of Commons.

Cabinets are usually convoked by a summons addressed to "His Majesty's confidential servants" by the prime minister; and the ordinary place of meeting is either at the official residence of the first lord of the treasury in Downing Street or at the foreign office, but they may be held anywhere. No secretary or other officer is present at the deliberations of this council. No official record is kept of its proceedings, and it is even considered a breach of ministerial confidence to keep a private record of what passed in the cabinet, inasmuch as such memoranda may fall into other hands. But on some important occasions, as is known from the *Memoirs of Lord Sidmouth*, the *Correspondence of Earl Grey with King William IV.*, and from Sir Robert Peel's *Memoirs*, published by permission of Queen Victoria, cabinet minutes are drawn up and submitted to the sovereign, as the most formal manner in which the advice of the ministry can be tendered to the crown and placed upon record. (See also Sir Algernon West's *Recollections*, 1899.) More commonly, it is the duty of the prime minister to lay the collective opinion of his colleagues before the sovereign, and take his pleasure on public measures and appointments. The sovereign never presides at a cabinet; and at the meetings of the privy council, where the sovereign does preside, the business is purely formal. It has been laid down by some writers as a principle of the British constitution that the sovereign is never present at a discussion between the advisers of the crown; and this is, no doubt, an established fact and practice. But like many other political usages of Great Britain it originated in a happy accident.

King William and Queen Anne always presided at weekly cabinet councils. But when the Hanoverian princes ascended the throne, they knew no English, and were barely able to converse at all with their ministers; for George I. or George II. to take part in, or even to listen to, a debate in council was impossible. When George III. mounted the throne the practice of the independent deliberations of the cabinet was well established, and it has never been departed from.

Upon the resignation or dissolution of a ministry, the sovereign exercises the undoubted prerogative of selecting the person who may be thought by him most fit to form a new cabinet. In several instances the statesmen selected by the crown have found themselves unable to accomplish the task confided to them. But in more favourable cases the minister chosen for this supreme office by the crown has the power of distributing all the political offices of the government as may seem best to himself, subject only to the ultimate approval of the sovereign. The prime minister is therefore in reality the author and constructor of the cabinet; he holds it together; and in the event of his retirement, from whatever cause, the cabinet is really dissolved, even though its members are again united under another head.

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such works as W.E. Gladstone's *Gleanings*; the third earl of Malmesbury's *Memoirs of an ex-Minister* (1884-1885); Greville's *Memoirs*; Sir A. West's *Recollections*, 1832-1886 (1889), &c.

CABINET NOIR, the name given in France to the office where the letters of suspected persons were opened and read by public officials before being forwarded to their destination. This practice had been in vogue since the establishment of posts, and was frequently used by the ministers of Louis XIII. and Louis XIV.; but it was not until the reign of Louis XV. that a separate office for this purpose was created. This was called the *cabinet du secret des postes*, or more popularly the *cabinet noir*. Although declaimed against at the time of the Revolution, it was used both by the revolutionary leaders and by Napoleon. The *cabinet noir* has now disappeared, but the right to open letters in cases of emergency appears still to be retained by the French government; and a similar right is occasionally exercised in England under the direction of a secretary of state, and, indeed, in all civilized countries. In England this power was frequently employed during the 18th century and was confirmed by the Post Office Act of 1837; its most notorious use being, perhaps, the opening of Mazzini's letters in 1844.

CABLE, GEORGE WASHINGTON (1844-) American author, was born in New Orleans, Louisiana, on the 12th of October 1844. At the age of fourteen he entered a mercantile establishment as a clerk; joined the Confederate army (4th Mississippi Cavalry) at the age of nineteen; at the close of the war engaged in civil engineering, and in newspaper work in New Orleans; and first became known in literature by sketches and stories of old French-American life in that city. These were first published in *Scribner's Monthly*, and were collected in book form in 1879, under the title of *Old Creole Days*. The characteristics of the series—of which the novelette *Madame Delphine* (1881) is virtually a part—are neatness of touch, sympathetic accuracy of description of people and places, and a constant combination of gentle pathos with quiet humour. These shorter tales were followed by the novels *The Grandissimes* (1880), *Dr Sevier* (1883) and *Bonaventure* (1888), of which the first dealt with Creole life in Louisiana a hundred years ago, while the second was related to the period of the Civil War of 1861-65. *Dr Sevier*, on the whole, is to be accounted Cable's masterpiece, its character of Narcisse combining nearly all the qualities which have given him his place in American literature as an artist and a social chronicler. In this, as in nearly all of his stories, he makes much use of the soft French-English dialect of Louisiana. He does not confine himself to New Orleans, laying many of his scenes, as in the short story *Belles Demoiselles Plantation*, in the marshy lowlands towards the mouth of the Mississippi. Cable was the leader in the noteworthy literary movement which has influenced nearly all southern writers since the war of 1861—a movement of which the chief importance lay in the determination to portray local scenes, characters and historical episodes with accuracy instead of merely imaginative romanticism, and to interest readers by fidelity and sympathy in the portrayal of things well known to the authors. Other writings by Cable have dealt with various problems of race and politics in the southern states during and after the "reconstruction period" following the Civil War; while in *The Creoles of Louisiana* (1884) he presented a history of that folk from the time of its appearance as a social and military factor. His dispassionate treatment of his theme in this volume and its predecessors gave increasing offence to sensitive Creoles and their sympathizers, and in 1886 Cable removed to Northampton, Massachusetts. At one time he edited a magazine in Northampton, and afterwards conducted the monthly *Current Literature*, published in New York. His *Collected Works* were published in a uniform issue in 5 vols. (New York, 1898). Among his later volumes are *The Cavalier* (1901), *Bylow Hill* (1902), and *Kincaid's Battery* (1908).

CABLE (from Late Lat. *capulum*, a halter, from *capere*, to take hold of), a large rope or chain, used generally with ships, but often employed for other purposes; the term "cable" is also used by analogy in minor varieties of similar engineering or other attachments, and in the case of "electric cables" for the submarine wires (see Telegraph) by which telegraphic messages are transmitted.[1]

The cable by which a ship rides at her anchor is now made of iron; prior to 1811 only hempen cables were supplied to ships of the British navy, a first-rate's complement on the East Indian station being eleven; the largest was 25 in. (equal to 2¼ in. iron cable) and weighed 6 tons. In 1811, iron cables were supplied to stationary ships; their superiority over hempen ones was manifest, as they were less liable to foul or to be cut by rocks, or to be injured by enemy's shot. Iron cables are also handier and cleaner, an offensive odour being exhaled from dirty hempen cables, when unbent and stowed inboard. The first patent for iron cables was by Phillip White in 1634; twisted links were suggested in 1813 by Captain Brown (who afterwards, in conjunction with Brown, Lenox & Co., planned the Brighton chain pier in 1823); and studs were introduced in 1816. Hempen cables are not now supplied to ships, having been superseded by steel wire hawsers. The length of a hempen cable is 101 fathoms, and a cable's length, as a standard of measurement, usually placed on charts, is assumed to be 100 fathoms or 600 ft. The sizes, number and lengths of cables supplied to ships of the British navy are given in the official publication, the *Ship's Establishment*; cables for merchant ships are regulated by Lloyds, and are tested according to the Anchors and Chain Cables Act 1899.

In manufacturing chain cables, the bars are cut to the required length of link, at an angle for forming the welds and, after heating, are bent by machinery to the form of a link and welded by smiths, each link being inserted in the previous one before welding. Cables of less than 1¼ in. are welded at the crown, there not being sufficient room for a side weld; experience has shown that the latter method is preferable and it is employed in making larger sized cables. In 1898 steel studs were introduced instead of cast iron ones, the latter having a tendency to work loose, but the practice is not universal. After testing, the licensed tester must place on every five fathoms of cable a distinctive mark which also indicates the testing establishments; the stamp or die employed must be approved by the Board of Trade. The iron used in the construction, also the testing, of mooring chains and cables for the London Trinity House Corporation are subject to more stringent regulations.

Cables for the British navy and mercantile marine are supplied in 12½ fathom and 15 fathom lengths respectively, connected together by "joining shackles", D (fig. 1). Each length is "marked" by pieces of iron wire being twisted round the studs of the links; the wire is placed on the first studs on each side of the first shackle, on the second studs on each side of the second shackle, and so on; thus the number of lengths of cable out is clearly indicated. For instance, if the wire is on the sixth studs on each side of the shackle, it indicates that six lengths or 75 fathoms of cable are out. In joining the lengths together, the round end of the shackle is placed towards the anchor. The end links of each length (C.C.) are made without studs, in order to take the shackle; but as studs increase the strength of a link, in a studless or open link the iron is of greater diameter. The next links (B.B.) have to be enlarged, in order to take the increased size of the

links C.C. In the joining shackle (D), the pin is oval, its greater diameter being in the direction of the strain. The pin of a shackle, which attaches the cable to the anchor (called an "anchor shackle", to distinguish it from a joining shackle) projects and is secured by a forelock; but since any projection in a joining shackle would be liable to be injured when the cable is running out or when passing around a capstan, the pins are made as shown at D, and are secured by a small pin d. This small pin is kept from coming out by being made a little short, and lead pellets are driven in at either end to fill up the holes in the shackle, which are made with a groove, so that as the pellets are driven in they expand or dovetail, keeping the small pin in its place.[2]

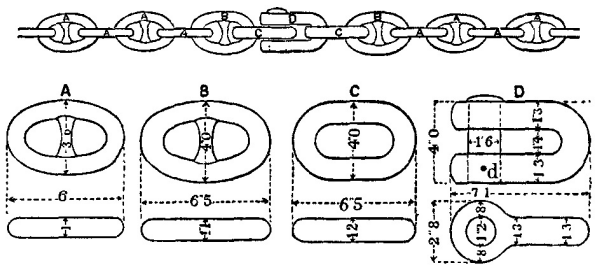

FIG. 1.—Stud-link Chain.

The cables are stowed in chain lockers, the inboard ends being secured by a "slip" (in the mercantile marine the cable is often shackled or lashed to the kelson); the slip prevents the cable's inner end from passing overboard, and also enables the cable to be "slipped", or let go, in case of necessity. In the British navy, swivel pieces are fitted in the first and last lengths of cable, to avoid and, if required, to take out turns in a cable, caused by a ship swinging round when at anchor. With a ship moored with two anchors, the cables are secured to a mooring swivel (fig. 2), which prevents a "foul hawse", *i.e.* the cables being entwined round each other. When mooring, unmooring, and as may be necessary, cables are temporarily secured by "slips" shackled to eye or ring bolts in the deck (see ANCHOR). The cable is hove up by either a capstan or windlass (see CAPSTAN) actuated by steam, electricity or manual power. Ships in the British navy usually ride by the compressor, the cable holder being used for checking the cable running out. When a ship has been given the necessary cable, the cable holder is eased up and the compressor "bowsed to"; in a heavy sea, a turn, or if necessary two turns, are taken round the "bitts," a strong iron structure placed between the hawse and navel ("deck") pipes. A single turn of cable is often taken round the bitts when anchoring in deep water. Small vessels of the mercantile marine ride by turns around the windlass; in larger or more modern vessels fitted with a steam windlass, the friction brakes take the strain, aided when required by the bitts, compressor or controller in bad weather.

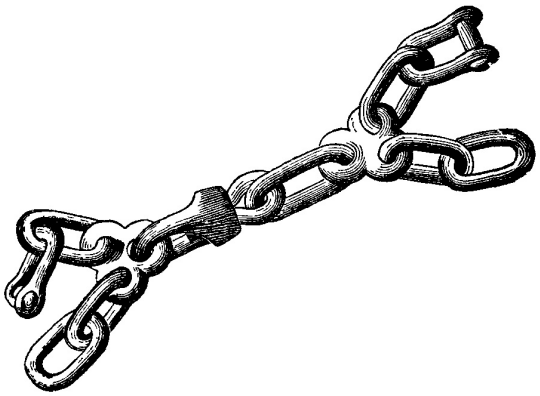

FIG. 2.—Mooring Swivel.

(J. W. D.)

[1] The word "cable" is a various reading for "camel" in the Biblical phrase, "it is easier for a camel to go through the eye of a needle" of Matt. xix. 24, Mark x. 25, and Luke xviii. 25, mentioned as early as Cyril of Alexandria (5th cent.); and it was adopted by Sir John Cheke and other 16th century and later English writers. The reading κάμιλος for κάμηλος is found in several late cursive MSS. Cheyne, in the *Ency. Biblica*, ascribes it to a non-Semitic scribe, and regards κάμηλος as correct. (See under CAMEL.)

[2] The dimensions marked in the figure are those for 1-in. chains, and signify so many diameters of the iron of the common links; thus forming a scale for all sizes.

CABLE MOULDING, in architecture, the term given to a convex moulding carved in imitation of a rope or cord, and used to decorate the mouldings of the Romanesque style in England, France and Spain. The word "cabling" by itself indicates a convex circular moulding sunk in the concave fluting of a classic column, and rising about one-third of the height of the shaft.

CABOCHE, SIMON. Simon Lecoustellier, called "Caboche", a skinner of the Paris Boucherie, played an important part in the Parisian riots of 1413. He had relations with John the Fearless, duke of Burgundy, since 1411, and was prominent in the seditious disturbances which broke out in April and May, following on the *États* of February 1413. In April he stirred the people to the point of revolt, and was among the first to enter the hôtel of the dauphin. When the butchers had made themselves masters of Paris, Caboche became bailiff (*huissier d'armes*) and warden of the bridge of Charenton. Upon the publication of the great ordinance of May 26th, he used all his efforts to prevent conciliation between the Burgundians and the Armagnacs. After the fall of the *Cabochien* party on the 4th of August he fled to Burgundy in order to escape from royal justice. Doubtless he returned to Paris in 1418 with the Burgundians.

See Colville, *Les Cabochiens et l'ordonnance de 1413* (Paris, 1888).

CABOT, GEORGE (1751-1823), American political leader, was born in Salem, Massachusetts, on the 16th of December 1751. He studied at Harvard from 1766 to 1768, when he went to sea as a cabin boy. He gradually became a ship-owner and a successful merchant, retiring from business in 1794. Throughout his life he was much interested in politics, and though his temperamental indolence and his aversion for public life often prevented his accepting office, he exercised, as a contributor to the press and through his friendships, a powerful political influence, especially in New England. He was a member of the Massachusetts Constitutional Convention of 1770-1780, of the state senate in 1782-1783, of the convention which in 1788 ratified for Massachusetts the Federal Constitution, and from 1791 to 1796 of the United States Senate, in which, besides serving on various important committees, he became recognized as an authority on economic and commercial matters. Among the bills introduced by him in the Senate was the Fugitive Slave Act of 1793. Upon the establishment of the navy department in 1798, he was appointed and confirmed as its secretary, but he never performed the duties of the office, and was soon replaced by Benjamin Stoddert (1751-1813), actually though not nominally the first secretary of the

department. In 1814-1815 Cabot was the president of the Hartford Convention, and as such was then and afterwards acrimoniously attacked by the Republicans throughout the country. He died in Boston on the 18th of April 1823. In politics he was a staunch Federalist, and with Fisher Ames, Timothy Pickering and Theophilus Parsons (all of whom lived in Essex county, Massachusetts) was classed as a member of the "Essex Junto",—a wing of the party and not a formal organization. A fervent advocate of a strong centralized government, he did much to secure the ratification by Massachusetts of the Federal Constitution, and after the overturn of the Federalist by the Republican party, he wrote (1804): "We are democratic altogether, and I hold democracy in its natural operation to be a government of the worst".

See Henry Cabot Lodge's *Life and Letters of George Cabot* (Boston, 1877).

CABOT, JOHN [Giovanni Caboto] (1450-1498), Italian navigator and discoverer of North America, was born in Genoa, but in 1461 went to live in Venice, of which he became a naturalized citizen in 1476. During one of his trading voyages to the eastern Mediterranean, Cabot paid a visit to Mecca, then the greatest mart in the world for the exchange of the goods of the East for those of the West. On inquiring whence came the spices, perfumes, silks and precious stones bartered there in great quantities, Cabot learned that they were brought by caravan from the north-eastern parts of farther Asia. Being versed in a knowledge of the sphere, it occurred to him that it would be shorter and quicker to bring these goods to Europe straight across the western ocean. First of all, however, a way would have to be found across this ocean from Europe to Asia. Full of this idea, Cabot, about the year 1484, removed with his family to
[v.04 p.0922]
London. His plans were in course of time made known to the leading merchants of Bristol, from which port an extensive trade was carried on already with Iceland. It was decided that an attempt should be made to reach the island of Brazil or that of the Seven Cities, placed on medieval maps to the west of Ireland, and that these should form the first halting-places on the route to Asia by the west.

To find these islands vessels were despatched from Bristol during several years, but all in vain. No land of any sort could be seen. Affairs were in this state when in the summer of 1493 news reached England that another Genoese, Christopher Columbus, had set sail westward from Spain and had reached the Indies. Cabot and his friends at once determined to forgo further search for the islands and to push straight on to Asia. With this end in view application was made to the king for formal letters patent, which were not issued until March 5, 1496. By these Henry VII. granted to his "well-beloved John Cabot, citizen of Venice, to Lewis, Sebastian and Santius,[1] sonnes of the said John, full and free authority, leave and power upon theyr own proper costs and charges, to seeke out, discover and finde whatsoever isles, countries, regions or provinces of the heathen and infidels, which before this time have been unknown to all Christians". Merchandise from the countries visited was to be entered at Bristol free of duty, but one-fifth of the net gains was to go to the king.

Armed with these powers Cabot set sail from Bristol on Tuesday the 2nd of May 1497, on board a ship called the "Mathew" manned by eighteen men. Rounding Ireland they headed first north and then west. During several weeks they were forced by variable winds to keep an irregular course, although steadily towards the west. At length, after being fifty-two days at sea, at five o'clock on Saturday morning, June 24, they reached the northern extremity of Cape Breton Island. The royal banner was unfurled, and in solemn form Cabot took possession of the country in the name of King Henry VII. The soil being found fertile and the climate temperate, Cabot was convinced he had reached the north-eastern coast of Asia, whence came the silks and precious stones he had seen at Mecca. Cape North was named Cape Discovery, and as the day was the festival of St John the Baptist, St Paul Island, which lies opposite, was called the island of St John.

Having taken on board wood and water, preparations were made to return home as quickly as possible. Sailing north, Cabot named Cape Ray, St George's Cape, and christened St Pierre and Miquelon, which then with Langley formed three separate islands, the Trinity group. Hereabout they met great schools of cod, quantities of which were caught by the sailors merely by lowering baskets into the water. Cape Race, the last land seen, was named England's Cape.

The return voyage was made without difficulty, since the prevailing winds in the North Atlantic are westerly, and on Sunday, the 6th of August, the "Mathew" dropped anchor once more in Bristol harbour. Cabot hastened to Court, and on Thursday the 10th of August received from the king £10 for having "found the new isle". Cabot reported that 700 leagues beyond Ireland he had reached the country of the Grand Khan. Although both silk and brazil-wood could be obtained there, he intended on his next voyage to follow the coast southward as far as Cipangu or Japan, then placed near the equator. Once Cipangu had been reached London would become a greater centre for spices than Alexandria. Henry VII. was delighted, and besides granting Cabot a pension of £20 promised him in the spring a fleet of ten ships with which to sail to Cipangu.

On the 3rd of February 1498, fresh letters patent were issued, whereby Cabot was empowered to "take at his pleasure VI. englisshe shippes and theym convey and lede to the londe and iles of late founde by the seid John". Henry VII. himself also advanced considerable sums of money to various members of the expedition. As success seemed assured, it was expected the returns would be high.

In the spring Cabot visited Lisbon and Seville, to secure the services of men who had sailed along the African coast with Cam and Diaz or to the Indies with Columbus. At Lisbon he met a certain João Fernandes, called Llavrador, who about the year 1492 appears to have made his way from Iceland to Greenland. Cabot, on learning from Fernandes that part of Asia, as they supposed Greenland to be, lay so near Iceland, determined to return by way of this country. On reaching Bristol he laid his plans accordingly. Early in May the expedition, which consisted of two ships and 300 men, left Bristol. Several vessels in the habit of trading to Iceland accompanied them. Off Ireland a storm forced one of these to return, but the rest of the fleet proceeded on its way along the parallel of 58°. Each day the ships were carried northward by the Gulf Stream. Early in June Cabot reached the east coast of Greenland, and as Fernandes was the first who had told him of this country he named it the Labrador's Land.

In the hope of finding a passage Cabot proceeded northward along the coast. As he advanced, the cold became more intense and the icebergs thicker and larger. It was also noticed that the land trended eastward. As a result on the 11th of June in latitude 67° 30′ the crews mutinied and refused to proceed farther in that direction. Cabot had no alternative but to put his ships about and look for a passage towards the south. Rounding Cape Farewell he explored the southern coast of Greenland and then made

his way a certain distance up the west coast. Here again his progress was checked by icebergs, whereupon a course was set towards the west. Crossing Davis Strait Cabot reached our modern Baffin Land in 66°. Judging this to be the Asiatic mainland, he set off southward in search of Cipangu. South of Hudson Strait a little bartering was done with the Indians, but these could offer nothing in exchange but furs. Our strait of Belle Isle was mistaken for an ordinary bay, and Newfoundland was regarded by Cabot as the main shore itself. Rounding Cape Race he visited once more the region explored in the previous summer, and then proceeded to follow the coast of our Nova Scotia and New England in search of Cipangu. He made his way as far south as the thirty-eighth parallel, when the absence of all signs of eastern civilization and the low state of his stores forced him to abandon all hope of reaching Cipangu on this voyage. Accordingly the ships were put about and a course set for England, where they arrived safely late in the autumn of 1498. Not long after his return John Cabot died.

His son, Sebastian Cabot (1476-1557),[2] is not independently heard of until May 1512, when he was paid twenty shillings "for making a carde of Gascoigne and Guyenne", whither he accompanied the English army sent that year by Henry VIII. to aid his father-in-law Ferdinand of Aragon against the French. Since Ferdinand and his daughter Joanna were contemplating the dispatch of an expedition from Santander to explore Newfoundland, Sebastian was questioned about this coast by the king's councillors. As a result Ferdinand summoned him in September 1512 to Logroño, and on the 30th of October appointed him a captain in the navy at a salary of 50,000 maravedis a year. A letter was also written to the Spanish ambassador in England to help Cabot and his family to return to Spain, with the result that in March 1514 he was again back at Court discussing with Ferdinand the proposed expedition to Newfoundland. Preparations were made for him to set sail in March 1516; but the death of the king in January of that year put an end to the undertaking. His services were retained by Charles V., and on the 5th of February 1518 Cabot was named Pilot Major and official examiner of pilots.

[v.04 p.0923] In the winter of 1520-1521 Sebastian Cabot returned to England and while there was offered by Wolsey the command of five vessels which Henry VIII. intended to despatch to Newfoundland. Being reproached by a fellow Venetian with having done nothing for his own country, Cabot refused, and on reaching Spain entered into secret negotiations with the Council of Ten at Venice. It was agreed that as soon as an opportunity offered Cabot should come to Venice and lay his plans before the Signiory. The conference of Badajoz took up his time in 1524, and on the 4th of March 1525 he was appointed commander of an expedition fitted out at Seville "to discover the Moluccas, Tarsis, Ophir, Cipango and Cathay."

The three vessels set sail in April, and by June were off the coast of Brazil and on their way to the Straits of Magellan. Near the La Plata river Cabot found three Spaniards who had formed part of De Solis's expedition of 1515. These men gave such glowing accounts of the riches of the country watered by this river that Cabot was at length induced, partly by their descriptions and in part by the casting away of his flag-ship, to forgo the search for Tarsis and Ophir and to enter the La Plata, which was reached in February 1527. All the way up the Parana Cabot found the Indians friendly, but those on the Paraguay proved so hostile that the attempt to reach the mountains, where the gold and silver were procured, had to be given up. On reaching Seville in August 1530, Cabot was condemned to four years' banishment to Oran in Africa, but in June 1533 he was once more reinstated in his former post of Pilot Major, which he continued to fill until he again removed to England.

As early as 1538 Cabot tried to obtain employment under Henry VIII., and it is possible he was the Sevillian pilot who was brought to London by the king in 1541. Soon after the accession of Edward VI., however, his friends induced the Privy Council to advance money for his removal to England, and on the 5th of January 1549 the king granted him a pension of £166, 13s. 4d. On Charles V. objecting to this proceeding, the Privy Council, on the zist of April 1550, made answer that since "Cabot of himself refused to go either into Spayne or to the emperour, no reason or equitie wolde that he shulde be forced or compelled to go against his will." A fresh application to Queen Mary on the 9th of September 1553 likewise proved of no avail.

On the 26th of June 1550 Cabot received £200 "by waie of the kinges Majesties rewarde," but it is not clear whether this was for his services in putting down the privileges of the German Merchants of the Steelyard or for founding the company of Merchant Adventurers incorporated on the 18th of December 1551. Of this company Cabot was made governor for life. Three ships were sent out in May 1553 to search for a passage to the East by the north-east. Two of the vessels were caught in the ice near Arzina and the crews frozen to death. Chancellor's vessel alone reached the White Sea, whence her captain made his way overland to Moscow. He returned to England in the summer of 1554 and was the means of opening up a very considerable trade with Russia. Vessels were again despatched to Russia in 1555 and 1556. On the departure of the "Searchthrift" in May 1556, "the good old gentleman Master Cabot gave to the poor most liberal alms, wishing them to pray for the good fortune and prosperous success of the 'Searchthrift'; and then, at the sign of the Christopher, he and his friends banqueted and made them that were in the company good cheer; and for very joy that he had to see the towardness of our intended discovery, he entered into the dance himself among the rest of the young and lusty company." On the arrival of King Philip II. in England Cabot's pension was stopped on the 26th of May 1557, but three days later Mary had it renewed. The date of Cabot's death has not been definitely discovered. It is supposed that he died within the year.

See G.P. Winship, *Cabot Bibliography, with an Introductory Essay on the Careers of the Cabots* (London, 1900); and H.P. Biggar, "The Voyages of the Cabots to North America and Greenland," in the *Revue Hispanique*, tome x. pp. 485-593 (Paris, 1903).

(H. P. B.)

[1] Nothing further is known of Lewis and Santius.

[2] The dates are conjectural. Richard Eden (*Decades of the Newe Worlde*, f. 255) says Sebastian told him that when four years old he was taken by his father to Venice, and returned to England "after certeyne yeares; wherby he was thought to have bin born in Venice"; Stow (*Annals*, under year 1498) styles "Sebastian Caboto, a Genoas sonne, borne in Bristow". Galvano and Herrera also give England the honour of his nativity. See also Nicholls, *Remarkable Life of Sebastian Cabot* (1869), a eulogistic account, with which may be contrasted Henry Harrisse's *John Cabot and his son Sebastian* (1896).

CABOTAGE, the French term for coasting-trade, a coast-pilotage. It is probably derived from *cabot*, a small boat, with which the name Cabot may be connected; the conjecture that the word comes from *cabo*, the Spanish for cape, and means "sailing from cape to cape", has little foundation.

CABRA, a town of southern Spain, in the province of Cordova, 28 m. S.E. by S. of Cordova, on the Jaen-Málaga railway. Pop. (1900) 13,127. Cabra is built in a fertile valley between the Sierra de Cabra and the Sierra de Montilla, which together form the watershed between the rivers Cabra and Guadajoz. The town was for several centuries an episcopal see. Its chief buildings are the cathedral, originally a mosque, and the ruined castle, which is the chief among many interesting relics of Moorish rule. The neighbouring fields of clay afford material for the manufacture of bricks and pottery; coarse cloth is woven in the town; and there is a considerable trade in farm produce. Cabra is the Roman *Baebro* or *Aegabro*. It was delivered from the Moors by Ferdinand III. of Castile in 1240, and entrusted to the Order of Calatrava; in 1331 it was recaptured by the Moorish king of Granada; but in the following century it was finally reunited to Christian Spain.

CABRERA, RAMON (1806-1877), Carlist general, was born at Tortosa, province of Tarragona, Spain, on the 27th of December 1806. As his family had in their gift two chaplaincies, young Cabrera was sent to the seminary of Tortosa, where he made himself conspicuous as an unruly pupil, ever mixed up in disturbances and careless in his studies. After he had taken minor orders, the bishop refused to ordain him as a priest, telling him that the Church was not his vocation, and that everything in him showed that he ought to be a soldier. Cabrera followed this advice and took part in Carlist conspiracies on the death of Ferdinand VII. The authorities exiled him and he absconded to Morella to join the forces of the pretender Don Carlos. In a very short time he rose by sheer daring, fanaticism and ferocity to the front rank among the Carlist chiefs who led the bands of Don Carlos in Catalonia, Aragon and Valencia. As a raider he was often successful, and he was many times wounded in the brilliant fights in which he again and again defeated the generals of Queen Isabella. He sullied his victories by acts of cruelty, shooting prisoners of war whose lives he had promised to spare and not respecting the lives and property of non-combatants. The queen's generals seized his mother as a hostage, whereupon Cabrera shot several mayors and officers. General Nogueras unfortunately caused the mother of Cabrera to be shot, and the Carlist leader then started upon a policy of reprisals so merciless that the people nicknamed him "The Tiger of the Maeztrazgo". It will suffice to say that he shot 1110 prisoners of war, 100 officers and many civilians, including the wives of four leading Isabellinos, to avenge his mother. When Marshal Espartero induced the Carlists of the north-western provinces, with Maroto at their head, to submit in accordance with the Convention of Vergara, which secured the recognition of the rank and titles of 1000 Carlist officers, Cabrera held out in Central Spain for nearly a year. Marshals Espartero and O'Donnell, with the bulk of the Isabellino armies, had to conduct a long and bloody campaign against Cabrera before they succeeded in driving him into French territory in July 1840. The government of Louis Philippe kept him in a fortress for some months and then allowed him to go to England, where he quarrelled with the pretender, disapproving of his abdication in favour of the count of Montemolin. In 1848 Cabrera reappeared in the mountains of Catalonia at the head of Carlist bands. These were soon dispersed and he again fled to France. After this last effort he did not take a very active part in the propaganda and subsequent risings of the Carlists, who, however, continued to consult him. He took offence when new men, not a few of them quondam regular officers, became the advisers and lieutenants of Don Carlos in the war which lasted more or less from 1870-1876. Indeed, his long residence in England, his marriage with Miss Richards, and his prolonged absence from Spain had much shaken his devotion to his old cause and belief in its success. In March 1875 Cabrera sprang upon Don Carlos a manifesto in which he called upon the adherents of the pretender to follow his own example and submit to the restored monarchy of Alphonso XII., the son of Queen Isabella, who recognized the rank of captain-general and the title of count of Morella conferred on Cabrera by the first pretender. Only a very few insignificant Carlists followed Cabrera's example, and Don Carlos issued a proclamation declaring him a traitor and depriving him of all his honours and titles. Cabrera, who was ever afterwards regarded with contempt and execration by the Carlists, died in London on the 24th of May 1877. He did not receive much attention from the majority of his fellow-countrymen, who commonly said that his disloyalty to his old cause had proved more harmful to him than beneficial to the new state of things. A pension which had been granted to his widow was renounced by her in 1899 in aid of the Spanish treasury after the loss of the colonies.

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(A. E. H.)

CACCINI, GIULIO (1558-1615?), Italian musical composer, also known as Giulio Romano, but to be distinguished from the painter of that name, was born at Rome about 1558, and in 1578 entered the service of the grand duke of Tuscany at Florence. He collaborated with J. Peri in the early attempts at musical drama which were the ancestors of modern opera (*Dafne*, 1594, and *Euridice*, 1600), produced at Florence by the circle of musicians and amateurs which met at the houses of G. Bardi and Corsi. He also published in 1601 *Le nuove musiche*, a collection of songs which is of great importance in the history of singing as well as in that of the transition period of musical composition. He was a lyric composer rather than a dramatist like Peri, and the genuine beauty of his works makes them acceptable even at the present day.

CÁCERES, a province of western Spain, formed in 1833 of districts taken from Estremadura, and bounded on the N. by Salamanca and Ávila, E. by Toledo, S. by Badajoz, and W. by Portugal. Pop. (1900) 362,164; area, 7667 sq. m. Cáceres is the largest of Spanish provinces, after Badajoz, and one of the most thinly peopled, although the number of its inhabitants steadily increases. Except for the mountainous north, where the Sierra de Gata and the Sierra de Grédos mark respectively the boundaries of Salamanca and Ávila, and in the south-east, where there are several lower ranges, almost the entire surface is flat or undulating, with wide tracts of moorland and thin pasture. There is little forest and many districts suffer from drought. The whole province, except the extreme south, belongs to the basin of the river Tagus, which flows from east to west through the central districts, and is joined by several tributaries, notably the Alagon and Tietar, from the north, and the Salor and Almonte from the south. The climate is temperate except in summer, when hot east winds prevail. Fair quantities of grain and olives are raised, but as a stock-breeding province Cáceres ranks second only to Badajoz. In 1900 its flocks and herds numbered more than 1,000,000 head. It is famed for its sheep and pigs, and exports wool, hams and the red sausages called *embutidos*. Its mineral resources are comparatively insignificant. The total number of mines at work in 1903 was only nine; their output consisted of phosphates, with a small amount of zinc and tin. Brandy,

leather and cork goods, and coarse woollen stuffs are manufactured in many of the towns, but the backwardness of education, the lack of good roads, and the general poverty retard the development of commerce. The more northerly of the two Madrid-Lisbon railways enters the province on the east; passes south of Plasencia, where it is joined by the railway from Salamanca, on the north; and reaches the Portuguese frontier at Valencia de Alcántara. This line is supplemented by a branch from Arroyo to the city of Cáceres, and thence southwards to Mérida in Badajoz. Here it meets the railways from Seville and Cordova. The principal towns of Cáceres are Cáceres (pop. 1900, 16,933); Alcántara (3248), famous for its Roman bridge; Plasencia (8208); Trujillo (12,512), and Valencia de Alcántara (9417). These are described in separate articles. Arroyo, or Arroyo del Puerco (7094), is an important agricultural market. (See also Estremadura.)

CÁCERES, the capital of the Spanish province of Cáceres, about 20 m. S. of the river Tagus, on the Cáceres-Mérida railway, and on a branch line which meets the more northerly of the two Madrid-Lisbon railways at Arroyo, 10 m. W. Pop. (1900) 16,933. Cáceres occupies a conspicuous eminence on a low ridge running east and west. At the highest point rises the lofty tower of San Mateo, a fine Gothic church, which overlooks the old town, with its ancient palaces and massive walls, gateways and towers. Many of the palaces, notably those of the provincial legislature, the dukes of Abrantes, and the counts of la Torre, are good examples of medieval domestic architecture. The monastery and college of the Jesuits, formerly one of the finest in Spain, has been secularized and converted into a hospital. In the modern town, built on lower ground beyond the walls, are the law courts, town-hall, schools and the palace of the bishops of Cória (pop. 3124), a town on the river Alagon. The industries of Cáceres include the manufacture of cork and leather goods, pottery and cloth. There is also a large trade in grain, oil, live-stock and phosphates from the neighbouring mines. The name of *Cáceres* is probably an adaptation of *Los Alcázares*, from the Moorish *Alcázar*, a tower or castle; but it is frequently connected with the neighbouring *Castra Caecilia* and *Castra Servilia*, two Roman camps on the Mérida-Salamanca road. The town is of Roman origin and probably stands on the site of *Norba Caesarina*. Several Roman inscriptions, statues and other remains have been discovered.

CACHAR, or Kachar, a district of British India, in the province of Eastern Bengal and Assam. It occupies the upper basin of the Surma or Barak river, and is bounded on three sides by lofty hills. Its area is 3769 sq. m. It is divided naturally between the plain and hills. The scenery is beautiful, the hills rising generally steeply and being clothed with forests, while the plain is relieved of monotony by small isolated undulations and by its rich vegetation. The Surma is the chief river, and its principal tributaries from the north are the Jiri and Jatinga, and from the south the Sonai and Daleswari. The climate is extremely moist. Several extensive fens, notably that of Chatla, which becomes lakes in time of flood, are characteristic of the plain. This is alluvial and bears heavy crops of rice, next to which in importance is tea. The industry connected with the latter crop employs large numbers of the population; manufacturing industries are otherwise slight. The Assam-Bengal railway serves the district, including the capital town of Silchar. The population of the district in 1901 was 455,593, and showed a large increase, owing in great part to immigration from the adjacent district of Sylhet. The plain is the most thickly populated part of the district; in the North Cachar Hills the population is sparse. About 66% of the population are Hindus and 29% Mahommedans. There are three administrative subdivisions of the district: Silchar, Hailakandi and North Cachar. The district takes name from its former rulers of the Kachari tribe, of whom the first to settle here did so early in the 18th century, after being driven out of the Assam valley in 1536, and from the North Cachar Hills in 1706, by the Ahoms. About the close of the 18th century the Burmans threatened to expel the Kachari raja and annex his territory; the British, however, intervened to prevent this, and on the death of the last raja without heir in 1830 they obtained the territory under treaty. A separate principality which had been established in the North Cachar Hills earlier in the century by a servant of the raja, and had been subsequently recognized as such, was taken over by the British in 1854 owing to the misconduct of its rulers. The southern part of the district was raided several times in the 19th century by the turbulent tribe of Lushais.

CACHOEIRA, an important inland town of Bahia, Brazil, on the Paraguassu river, about 48 m. from São Salvador, with which it is connected by river-boats. Pop. (1890) of the city, 12,607; of the municipality, 48,352. The Bahia Central railway starts from this point and extends S. of W. to Machado Portella, 161 m., and N. to Feira de Santa Anna, 28 m. Although badly situated on the lower levels of the river (52 ft. above sea-level) and subject to destructive floods, Cachoeira is one of the most thriving commercial and industrial centres in the state. It exports sugar and tobacco and is noted for its cigar and cotton factories.

CACTUS. This word, applied in the form of Κάκτος by the ancient Greeks to some prickly plant, was adopted by Linnaeus as the name of a group of curious succulent or fleshy-stemmed plants, most of them prickly and leafless, some of which produce beautiful flowers, and are now so popular in our gardens that the name has become familiar. As applied by Linnaeus, the name *Cactus* is almost conterminous with what is now regarded as the natural order Cactaceae, which embraces several modern genera. It is one of the few Linnaean generic terms which have been entirely set aside by the names adopted for the modern divisions of the group.

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The *Cacti* may be described in general terms as plants having a woody axis, overlaid with thick masses of cellular tissue forming the fleshy stems. These are extremely various in character and form, being globose, cylindrical, columnar or flattened into leafy expansions or thick joint-like divisions, the surface being either ribbed like a melon, or developed into nipple-like protuberances, or variously angular, but in the greater number of the species furnished copiously with tufts of horny spines, some of which are exceedingly keen and powerful. These tufts show the position of buds, of which, however, comparatively few are developed. The stems are in most cases leafless, using the term in a popular sense; the leaves, if present at all, being generally reduced to minute scales. In one genus, however, *Peireskia*, the stems are less

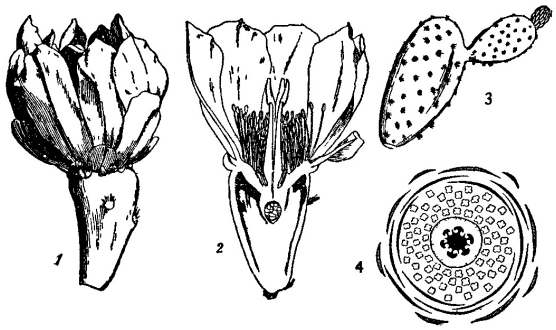

Fig. 1.—Prickly Pear (*Opuntia vulgaris*). 1, Flower reduced; 2, Same in vertical section; 3, Flattened branch much reduced; 4, Horizontal plan of arrangement of

succulent, and the leaves, though rather fleshy, are developed in the usual form. The flowers are frequently large and showy, and are generally attractive from their high colouring. In one group, represented by *Cereus*, they consist of a tube, more or less elongated, on the outer surface of which, towards the base, are developed small and at first inconspicuous scales, which gradually increase in size upwards, and at length become crowded, numerous and petaloid, forming a funnel-shaped blossom, the beauty of which is much enhanced by the multitude of conspicuous stamens which with the pistil occupy the centre. In another group, represented by *Opuntia* (fig. 1), the flowers are rotate, that is to say, the long tube is replaced by a very short one. At the base of the tube, in both groups, the ovary becomes developed into a fleshy (often edible) fruit, that produced by the *Opuntia* being known as the prickly pear or Indian fig. flower.

The principal modern genera are grouped by the differences in the flower-tube just explained. Those with long-tubed flowers comprise the genera *Melocactus*, *Mammillaria*, *Echinocactus*, *Cereus*, *Pilocereus*, *Echinopsis*, *Phyllocactus*, *Epiphyllum*, &c.; while those with short-tubed flowers are *Rhipsalis*, *Opuntia*, *Peireskia*, and one or two of minor importance. Cactaceae belong almost entirely to the New World; but some of the Opuntias have been so long distributed over certain parts of Europe, especially on the shores of the Mediterranean and the volcanic soil of Italy, that they appear in some places to have taken possession of the soil, and to be distinguished with difficulty from the aboriginal vegetation. The habitats which they affect are the hot, dry regions of tropical America, the aridity of which they are enabled to withstand in consequence of the thickness of their skin and the paucity of evaporating pores or stomata with which they are furnished,—these conditions not permitting the moisture they contain to be carried off too rapidly; the thick fleshy stems and branches contain a store of water. The succulent fruits are not only edible but agreeable, and in fevers are freely administered as a cooling drink. The Spanish Americans plant the Opuntias around their houses, where they serve as impenetrable fences.

Melocactus, the genus of melon-thistle or Turk's-cap cactuses, contains, according to a recent estimate, about 90 species, which inhabit chiefly the West Indies, Mexico and Brazil, a few extending into New Granada. The typical species, *M. communis*, forms a succulent mass of roundish or ovate form, from 1 ft. to 2 ft. high, the surface divided into numerous furrows like the ribs of a melon, with projecting angles, which are set with a regular series of stellated spines—each bundle consisting of about five larger spines, accompanied by smaller but sharp bristles—and the tip of the plant being surmounted by a cylindrical crown 3 to 5 in. high, composed of reddish-brown, needle-like bristles, closely packed with cottony wool. At the summit of this crown the small rosy-pink flowers are produced, half protruding from the mass of wool, and these are succeeded by small red berries. These strange plants usually grow in rocky places with little or no earth to support them; and it is said that in times of drought the cattle resort to them to allay their thirst, first ripping them up with their horns and tearing off the outer skin, and then devouring the moist succulent parts. The fruit, which has an agreeably acid flavour, is frequently eaten in the West Indies. The *Melocacti* are distinguished by the distinct cephalium or crown which bears the flowers.

Mammillaria.—This genus, which comprises nearly 300 species, mostly Mexican, with a few Brazilian and West Indian, is called nipple cactus, and consists of globular or cylindrical succulent plants, whose surface instead of being cut up into ridges with alternate furrows, as in *Melocactus*, is broken up into teat-like cylindrical or angular tubercles, spirally arranged, and terminating in a radiating tuft of spines which spring from a little woolly cushion. The flowers issue from between the mammillae, towards the upper part of the stem, often disposed in a zone just below the apex, and are either purple, rose-pink, white or yellow, and of moderate size. The spines are variously coloured, white and yellow tints predominating, and from the symmetrical arrangement of the areolae or tufts of spines they are very pretty objects, and are hence frequently kept in drawing-room plant cases. They grow freely in a cool greenhouse.

Echinocactus (fig. 2) is the name given to the genus bearing the popular name of hedgehog cactus. It comprises some 200 species, distributed from the south-west United States to Brazil and Chile. They have the fleshy stems characteristic of the order, these being either globose, oblong or cylindrical, and either ribbed as in *Melocactus*, or broken up into distinct tubercles, and most of them armed with stiff sharp pines, set in little woolly cushions occupying the place of the buds. The flowers, produced near the apex of the plant, are generally large and showy, yellow and rose being the prevailing colours. They are succeeded by succulent fruits, which are exserted, and frequently scaly or spiny, in which respects this genus differs both from *Melocactus* and *Mamrmllaria*, which have the fruits immersed and smooth. One of the most interesting species is the *E. ingens*, of which some very large plants have been from time to time imported. These large plants have from 40 to 50 ridges, on which the buds and clusters of spines are sunk at intervals, the aggregate number of the spines having been in some cases computed at upwards of 50,000 on a single plant. These spines are used by the Mexicans as toothpicks. The plants are slow growers and must have plenty of sun heat; they require sandy loam with a mixture of sand and bricks finely broken and must be kept dry in winter.

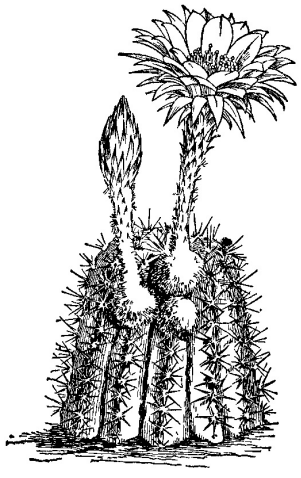

Fig. 2.—*Echinocactus* much reduced; the flowers are several inches in diameter.

Cereus.—This group bears the common name of torch thistle. It comprises about 100 species, largely Mexican but scattered through South America and the West Indies. The stems are columnar or elongated, some of the latter creeping on the ground or climbing up the trunks of trees, rooting as they grow. *C. giganteus*, the largest and most striking species of the genus, is a native of hot, arid, desert regions of New Mexico, growing there in rocky valleys and on mountain sides, where the tall stems with their erect branches have the appearance of telegraph poles. The stems grow to a height of from 50 ft. to 60 ft., and have a diameter of from 1 ft. to 2 ft., often unbranched, but sometimes furnished with branches which grow out at right angles from the main stem, and then curve upwards and continue their growth parallel to it; these stems have from twelve to twenty ribs, on which at intervals of about an inch are the buds with their thick yellow cushions, from which issue five or six large and numerous smaller spines. The fruits of this plant, which are green oval bodies from 2 to 3 in. long, contain a crimson pulp from which the Pimos and Papagos Indians prepare an excellent preserve; and they also use the ripe fruit as an article of food, gathering it by means of a forked stick attached to a long pole. The Cereuses include some of our most interesting and beautiful hothouse plants. In the allied genus *Echinocereus*, with 25 to 30 species in North and South

America, the stems are short, branched or simple, divided into few or many ridges all armed with sharp, formidable spines. *E. pectinatus* produces a purplish fruit resembling a gooseberry, which is very good eating; and the fleshy part of the stem itself, which is called *cabeza del viego* by the Mexicans, is eaten by them as a vegetable after removing the spines.

Pilocereus, the old man cactus, forms a small genus with tallish erect, fleshy, angulate stems, on which, with the tufts of spines, are developed hair-like bodies, which, though rather coarse, bear some resemblance to the hoary locks of an old man. The plants are nearly allied to *Cereus*, differing chiefly in the floriferous portion developing these longer and more attenuated hair-like spines, which surround the base of the flowers and form a dense woolly head or cephalium. The most familiar species is *P. senilis*, a Mexican plant, which though seldom seen more than a foot or two in height in greenhouses, reaches from 20 ft. to 30 ft. in its native country.

Echinopsis is another small group of species, separated by some authors from *Cereus*. They are dwarf, ribbed, globose or cylindrical plants; and the flowers, which are produced from the side instead of the apex of the stem, are large, and in some cases very beautiful, being remarkable for the length of the tube, which is more or less covered with bristly hairs. They are natives of Brazil, Bolivia and Chile.

Phyllocactus (fig. 3), the Leaf Cactus family, consists of about a dozen species, found in Central and tropical South America. They differ from all the forms already noticed in being shrubby and epiphytal in habit, and in having the branches compressed and dilated so as to resemble thick fleshy leaves, with a strong median axis and rounded woody base. The margins of these leaf-like branches are more or less crenately notched, the notches representing buds, as do the spine-clusters in the spiny genera; and from these crenatures the large showy flowers are produced. As garden plants the *Phyllocacti* are amongst the most ornamental of the whole family, being of easy culture, free blooming and remarkably showy, the colour of the flowers ranging from rich crimson, through rose-pink to creamy white. Cuttings strike readily in spring before growth has commenced; they should be potted in 3-in. or 4-in. pots, well drained, in loamy soil made very porous by the admixture of finely broken crocks and sand, and placed in a temperature of 60°; when these pots are filled with roots they are to be shifted into larger ones, but overpotting must be avoided. During the summer they need considerable heat, all the light possible and plenty of air; in winter a temperature of 45° or 50° will be sufficient, and they must be kept tolerably dry at the root. By the spring they may have larger pots if required and should be kept in a hot and fairly moistened atmosphere; and by the end of June, when they have made new growth, they may be turned out under a south wall in the full sun, water being given only as required. In autumn they are to be returned to a cool house and wintered in a dry stove. The turning of them outdoors to ripen their growth is the surest way to obtain flowers, but they do not take on a free blooming habit until they have attained some age. They are often called *Epiphyllum*, which name is, however, properly restricted to the group next to be mentioned.

Fig. 3.—Branch of *Phyllocactus* much reduced; the flowers are 6 in. or more in diameter.

Epiphyllum.—This name is now restricted to two or three dwarf branching Brazilian epiphytal plants of extreme beauty, which agree with *Phyllocactus* in having the branches dilated into the form of fleshy leaves, but differ in haying them divided into short truncate leaf-like portions, which are articulated, that is to say, provided with a joint by which they separate spontaneously; the margins are crenate or dentate, and the flowers, which are large and showy, magenta or crimson, appear at the apex of the terminal joints. In *E. truncatum* the flowers have a very different aspect from that of other *Cacti*, from the mouth of the tube being oblique and the segments all reflexed at the tip. The short separate pieces of which these plants are made up grow out of each other, so that the branches may be said to resemble leaves joined together endwise.

Rhipsalis, a genus of about 50 tropical species, mainly in Central and South America, but a few in tropical Africa and Madagascar. It is a very heterogeneous group, being fleshy-stemmed with a woody axis, the branches being angular, winged, flattened or cylindrical, and the flowers small, short-tubed, succeeded by small, round, pea-shaped berries. *Rhipsalis Cassytha*, when seen laden with its white berries, bears some resemblance to a branch of mistletoe. All the species are epiphytal in habit.

Opuntia, the prickly pear, or Indian fig cactus, is a large typical group, comprising some 150 species, found in North America, the West Indies, and warmer parts of South America, extending as far as Chile. In aspect they are very distinct from any of the other groups. They are fleshy shrubs, with rounded, woody stems, and numerous succulent branches, composed in most of the species of separate joints or parts, which are much compressed, often elliptic or suborbicular, dotted over in spiral lines with small, fleshy, caducous leaves, in the axils of which are placed the areoles or tufts of barbed or hooked spines of two forms. The flowers are mostly yellow or reddish-yellow, and are succeeded by pear-shaped or egg-shaped fruits, having a broad scar at the top, furnished on their soft, fleshy rind with tufts of small spines. The sweet, juicy fruits of *O. vulgaris* and *O. Tuna* are much eaten under the name of prickly pears, and are greatly esteemed for their cooling properties. Both these species are extensively cultivated for their fruit in Southern Europe, the Canaries and northern Africa; and the fruits are not unfrequently to be seen in Covent Garden Market and in the shops of the leading fruiterers of the metropolis. *O. vulgaris* is hardy in the south of England.

The cochineal insect is nurtured on a species of *Opuntia* (*O. coccinellifera*), separated by some authors under the name of *Nopalea*, and sometimes also on *O. Tuna*. Plantations of the nopal and the tuna, which are called nopaleries, are established for the purpose of rearing this insect, the *Coccus Cacti*, and these often contain as many as 50,000 plants. The females are placed on the plants about August, and in four

months the first crop of cochineal is gathered, two more being produced in the course of the year. The native country of the insect is Mexico, and it is there more or less cultivated; but the greater part of our supply comes from Colombia and the Canary Islands.

PEIRESKIA ACULEATA, or Barbadoes gooseberry, the *Cactus peireskia* of Linnaeus, differs from the rest in having woody stems and leaf-bearing branches, the leaves being somewhat fleshy, but otherwise of the ordinary laminate character. The flowers are subpaniculate, white or yellowish. This species is frequently used as a stock on which to graft other *Cacti*. There are about a dozen species known of this genus, mainly Mexican.

CADALSO VAZQUEZ, JOSÉ (1741-1782), Spanish author, was born at Cadiz on the 8th of October 1741. Before completing his twentieth year he had travelled through Italy, Germany, England, France and Portugal, and had studied the literatures of these countries. On his return to Spain he entered the army and rose to the rank of colonel. He was killed at the siege of Gibraltar, on the 27th of February 1782. His first published work was a rhymed tragedy, *Don Sancho Garcia, Conde de Castilla* (1771). In the following year he published his *Eruditos á la Violeta*, a prose satire on superficial knowledge, which was very successful. In 1773 appeared a volume of miscellaneous poems, *Ocios de mi juventud*, and after his death there was found among his MSS. a series of fictitious letters in the style of the *Lettres Persanes*; these were issued in 1793 under the title of *Cartas marruecas*. A good edition of his works appeared at Madrid, in 3 vols., 1823. This is supplemented by the *Obras inéditas* (Paris, 1894) published by R. Foulché-Delbosc.

[v.04 p.0927]

CADAMOSTO (or CA DA MOSTO), **ALVISE** (1432-1477), a Venetian explorer, navigator and writer, celebrated for his voyages in the Portuguese service to West Africa. In 1454 he sailed from Venice for Flanders, and, being detained by contrary winds off Cape St Vincent, was enlisted by Prince Henry the Navigator among his explorers, and given command of an expedition which sailed (22nd of March 1455) for the south. Visiting the Madeira group and the Canary Islands (of both which he gives an elaborate account, especially concerned with European colonization and native customs), and coasting the West Sahara (whose tribes, trade and trade-routes he likewise describes in detail), he arrived at the Senegal, whose lower course had already, as he tells us, been explored by the Portuguese 60 m. up. The negro lands and tribes south of the Senegal, and especially the country and people of Budomel, a friendly chief reigning about 50 m. beyond the river, are next treated with equal wealth of interesting detail, and Cadamosto thence proceeded towards the Gambia, which he ascended some distance (here also examining races, manners and customs with minute attention), but found the natives extremely hostile, and so returned direct to Portugal. Cadamosto expressly refers to the chart he kept of this voyage. At the mouth of the Gambia he records an observation of the "Southern Chariot" (Southern Cross). Next year (1456) he went out again under the patronage of Prince Henry. Doubling Cape Blanco he was driven out to sea by contrary winds, and thus made the first known discovery of the Cape Verde Islands. Having explored Boavista and Santiago, and found them uninhabited, he returned to the African mainland, and pushed on to the Gambia, Rio Grande and Geba. Returning thence to Portugal, he seems to have remained there till 1463, when he reappeared at Venice. He died in 1477.

Besides the accounts of his two voyages, Cadamosto left a narrative of Pedro de Cintra's explorations in 1461 (or 1462) to Sierre Leone and beyond Cape Mesurado to El Mina and the Gold Coast; all these relations first appeared in the 1507 Vicenza Collection of Voyages and Travels (the *Paesi novamente retrovati et novo mondo da Alberico Vesputio Florentino*); they have frequently since been reprinted and translated (*e.g.* Ital. text in 1508, 1512, 1519, 1521, 1550 (Ramusio), &c.; Lat. version, *Itinerarium Portugallensium*, &c.,1508, 1532 (Grynaeus), &c.; Fr. *Sensuyt le nouveau monde*, &c., 1516, 1521; German, *Newe unbekante Landte*, &c., 1508). See also C. Schefer, *Relation des voyages ... de Ca' da Mosto* (1895); R.H. Major, *Henry the Navigator* (1868), pp. 246-287; C.R. Beazley, *Henry the Navigator* (1895), pp. 261-288; Yule Oldham, *Discovery of the Cape Verde Islands* (1892), esp. pp. 4-15.

It may be noted that Antonio Uso di Mare (Antoniotto Ususmaris), the Genoese, wrote his famous letter of the 12th of December 1455 (purporting to record a meeting with the last surviving descendant of the Genoese-Indian expedition of 1291, at or near the Gambia), after accompanying Cadamosto to West Africa; see Beazley, *Dawn of Modern Geography* (1892), iii. 416-418.

CADASTRE (a French word from the Late Lat. *capitastrum*, a register of the poll-tax), a register of the real property of a country, with details of the area, the owners and the value. A "cadastral survey" is properly, therefore, one which gives such information as the Domesday Book, but the term is sometimes used loosely of the Ordnance Survey of the United Kingdom (1=2500), which is on sufficiently large a scale to give the area of every field or piece of ground.

CADDIS-FLY and **CADDIS-WORM,** the name given to insects with a superficial resemblance to moths, sometimes referred to the Neuroptera, sometimes to a special order, the Trichoptera, in allusion to the hairy clothing of the body and wings. Apart from this feature the Trichoptera also differ from the typical Neuroptera in the relatively simple, mostly longitudinal neuration of the wings, the absence or obsolescence of the mandibles and the semi-haustellate nature of the rest of the mouth-parts. Although caddis-flies are sometimes referred to several families, the differences between the groups are of no great importance. Hence the insects may more conveniently be regarded as constituting the single family *Phryganeidae*. The larvae known as caddis-worms are aquatic. The mature females lay their eggs in the water, and the newly-hatched larvae provide themselves with cases made of various particles such as grains of sand, pieces of wood or leaves stuck together with silk secreted from the salivary glands of the insect. These cases differ greatly in structure and shape. Those of *Phyrganea* consist of bits of twigs or leaves cut to a suitable length and laid side by side in a long spirally-coiled band, forming the wall of a subcylindrical cavity. The cavity of the tube of *Helicopsyche*, composed of grains of sand, is itself spirally coiled, so that the case exactly resembles a small snail-shell in shape. One species of *Limnophilus* uses small but entire leaves; another, the shells of the pond-snail *Planorbis*; another, pieces of stick arranged transversely with reference to the long axis of the tube. To admit of the free inflow and outflow of currents of water necessary for respiration, which is effected by means of filamentous abdominal tracheal gills, the two ends of the tube are open. Sometimes the cases are fixed, but more often portable. In the latter case the larva crawls about the bottom of the water or up the stems of plants, with its thickly-chitinized head and legs protruding from the larger orifice, while it maintains a secure hold of the silk lining of the tube by means of a pair of strong hooks at the posterior end of its soft defenceless abdomen. Their food appears for the most part to be of a vegetable nature. Some species, however, are alleged to be carnivorous, and a

North American form of the genus *Hydropsyche* is said to spin around the mouth of its burrow a silken net for the capture of small animal organisms living in the water. Before passing into the pupal stage, the larva partially closes the orifice of the tube with silk or pieces of stone loosely spun together and pervious to water. Through this temporary protection the active pupa, which closely resembles the mature insect, subsequently bites a way by means of its strong mandibles, and rising to the surface of the water casts the pupal integument and becomes sexually adult.

The above sketch may be regarded as descriptive of the life-history of a great majority of species of caddis-flies. It is only necessary here to mention one anomalous form, *Enoicyla pusilla*, in which the mature female is wingless and the larva is terrestrial, living in moss or decayed leaves.

Caddis-flies are universally distributed. Geologically they are known to date back to the Oligocene period, and wings believed to be referable to them have been found in Liassic and Jurassic beds.

(R. I. P.)

CADDO, a confederacy of North American Indian tribes which gave its name to the Caddoan stock, represented in the south by the Caddos, Wichita and Kichai, and in the north by the Pawnee and Arikara tribes. The Caddos, now reduced to some 500, settled in western Oklahoma, formerly ranged over the Red River (Louisiana) country, in what is now Arkansas, northern Texas and Oklahoma. The native name of the confederacy is Hasinai, corrupted by the French into Asinais and Cenis. The Caddoan tribes were mostly agricultural and sedentary, and to-day they are distinguished by their industry and intelligence.

See *Handbook of American Indians* (Washington, 1907).

CADE, JOHN (d. 1450), commonly called Jack Cade, English rebel and leader of the rising of 1450, was probably an Irishman by birth, but the details of his early life are very scanty. He seems to have resided for a time in Sussex, to have fled from the country after committing a murder, and to have served in the French wars. Returning to England, he settled in Kent under the name of Aylmer and married a lady of good position. When the men of Kent rose in rebellion in May 1450, they were led by a man who took the name of Mortimer, and who has generally been regarded as identical with Cade. Mr James Gairdner, however, considers it probable that Cade did not take command of the rebels until after the skirmish at Sevenoaks on the 18th of June. At all events, it was Cade who led the insurgents from Blackheath to Southwark, and under him they made their way into London on the 3rd of July. A part of the populace was doubtless favourable to the rebels, but the opposing party gained strength when Cade and his men began to plunder. Having secured the execution of James Fiennes, Baron Say and Sele, and of William Crowmer, sheriff of Kent, Cade and his followers retired to Southwark, and on the 5th of July, after a fierce struggle on London Bridge, the citizens prevented them from re-entering the city. Cade then met the chancellor, [v.04 p.0928] John Kemp, archbishop of York, and William of Wayneflete, bishop of Winchester, and terms of peace were arranged. Pardons were drawn up, that for the leaders being in the name of Mortimer. Cade, however, retained some of his men, and at this time, or a day or two earlier, broke open the prisons in Southwark and released the prisoners, many of whom joined his band. Having collected some booty, he went to Rochester, made a futile attempt to capture Queenborough castle, and then quarrelled with his followers over some plunder. On the 10th of July a proclamation was issued against him in the name of Cade, and a reward was offered for his apprehension. Escaping into Sussex he was captured at Heathfield on the 12th. During the scuffle he had been severely wounded, and on the day of his capture he died in the cart which was conveying him to London. The body was afterwards beheaded and quartered, and in 1451 Cade was attainted.

See Robert Fabyan, *The New Chronicles of England and France*, edited by H. Ellis (London, 1811); William of Worcester, *Annales rerum Anglicarum*, edited by J. Stevenson, (London, 1864); *An English Chronicle of the Reigns of Richard II., Henry IV., Henry V. and Henry VI.*, edited by J.S. Davies (London, 1856); *Historical Collections of a Citizen of London*, edited by J. Gairdner (London, 1876); *Three Fifteenth Century Chronicles*, edited by J. Gairdner (London, 1880); J. Gairdner, Introduction to the *Paston Letters* (London, 1904); G. Kriehn, *The English Rising of 1450* (Strassburg, 1892.)

CADENABBIA, a village of Lombardy, Italy, in the province of Como, about 15 m. N.N.E. by steamer from the town of Como. It is situated on the W. shore of the lake of Como, and owing to the great beauty of the scenery and of the vegetation, and its sheltered situation, is a favourite spring and autumn resort. The most famous of its villas is the Villa Carlotta, now the property of the duke of Saxe-Meiningen, which contains marble reliefs by Thorwaldsen, representing the triumph of Alexander, and statues by Canova.

CADENCE (through the Fr. from the Lat. *cadentia*, from *cadere*, to fall), a falling or sinking, especially as applied to rhythmical or musical sounds, as in the "fall" of the voice in speaking, the rhythm or measure of verses, song or dance. In music, the word is used of the closing chords of a musical phrase, which succeed one another in such a way as to produce, first an expectation or suspense, and then an impression of finality, indicating also the key strongly. "Cadenza," the Italian form of the same word, is used of a free flourish in a vocal or instrumental composition, introduced immediately before the close of a movement or at the end of the piece. The object is to display the performer's technique, or to prevent too abrupt a contrast between two movements. Cadenzas are usually left to the improvisation of the performer, but are sometimes written in full by the composer, or by some famous executant, as in the cadenza in Brahms's *Violin Concerto*, written by Joseph Joachim.

CADER IDRIS ("the Seat of Idris"), the second most imposing mountain in North Wales, standing in Merionethshire to the S. of Dolgelly, between the broad estuaries of the Mawddach and the Dovey. It is so called in memory of Idris Gawr, celebrated in the Triads as one of the three "Gwyn Serenyddion," or "Happy Astronomers," of Wales, who is traditionally supposed to have made his observations on this peak. Its loftiest point, known as Pen-y-gader, rises to the height of 2914 ft., and in clear weather commands a magnificent panorama of immense extent. The mountain is everywhere steep and rocky, especially on its southern side, which falls abruptly towards the Lake of Tal-y-llyn. Mention of Cader Idris and its legends is frequent in Welsh literature, old and modern.

CADET (through the Fr. from the Late Lat. *capitettum*, a diminutive of *caput*, head, through the Provençal form *capdet*), the head of an inferior branch of a family, a younger son; particularly a military term for an accepted candidate for a commission in the army or navy, who is undergoing training to become an officer.

This latter use of the term arose in France, where it was applied to the younger sons of the *noblesse* who gained commissioned rank, not by serving in the ranks or by entering the *écoles militaires*, but by becoming attached to corps without pay but with certain privileges. "Cadet Corps," in the British service, are bodies of boys or youths organized, armed and trained on volunteer military lines. Derived from "cadet," through the Scots form "cadee," comes "caddie," a messenger-boy, and particularly one who carries clubs at golf, and also the slang word "cad," a vulgar, ill-bred person.

CADGER (a word of obscure origin possibly connected with "catch"), a hawker or pedlar, a carrier of farm produce to market. The word in this sense has fallen into disuse, and now is used for a beggar or loafer, one who gets his living in more or less questionable ways.

CADI (*qāḍī*), a judge in a *maḥkama* or Mahommedan ecclesiastical court, in which decisions are rendered on the basis of the canon law of Islam (*sharī `a*). It is a general duty, according to canon law, upon a Moslem community to judge legal disputes on this basis, and it is an individual duty upon the ruler of the community to appoint a cadi to act for the community. According to Shāfi`ite law, such a cadi must be a male, free, adult Moslem, intelligent, of unassailed character, able to see, hear and write, learned in the Koran, the traditions, the Agreement, the differences of the legal schools, acquainted with Arabic grammar and the exegesis of the Koran. He must not sit in a mosque, except under necessity, but in some open, accessible place. He must maintain a strictly impartial attitude of body and mind, accept no presents from the people of his district, and render judgment only when he is in a normal condition mentally and physically. He may not engage in any business. He shall ride to the place where he holds court, greeting the people on both sides. He shall visit the sick and those returned from a journey, and attend funerals. On some of these points the codes differ, and the whole is to be regarded as the ideal qualification, built up theoretically by the canonists.

See Mahommedan Law; also Juynboll, *De Mohammedaansche Wet* (Leiden, 1903), pp. 287 ff.; Sachau, *Muhammedanisches Recht* (Berlin, 1897), pp. 687 ff.

(D. B. Ma.)

CADILLAC, a city and the county seat of Wexford county, Michigan, U.S.A., on Lake Cadillac, about 95 m. N. by E. of Grand Rapids and about 85 m. N.W. of Bay City. Pop. (1890) 4461; (1900) 5997, of whom 1676 were foreign-born; (1904) 6893; (1910) 8375. It is served by the Ann Arbor and the Grand Rapids & Indiana railways. Cadillac overlooks picturesque lake scenery, and the good fishing for pike, pickerel and perch in the lake, and for brook trout in streams near by, attracts many visitors. Among the city's chief manufactures are hardwood lumber, iron, tables, crates and woodenware, veneer, flooring and flour. Cadillac was settled in 1871, was incorporated as a village under the name of Clam Lake in 1875, was chartered as a city under its present name (from Antoine de la Mothe Cadillac) in 1877, and was rechartered in 1895.

CADIZ, a town of the province of Negros Occidental, island of Negros, Philippine Islands, on the N. coast, about 53 m. N.N.E. of Bacólod, the capital. Pop. (1903) 16,429. Lumber products are manufactured in the town, and a saw-mill here is said to be the largest in the Philippines.

CADIZ (*Cádiz*), a maritime province in the extreme south of Spain, formed in 1833 of districts taken from the province of Seville; and bounded on the N. by Seville, E. by Málaga, S.E. by the Mediterranean sea, S. by the Straits of Gibraltar, and W. by the Atlantic Ocean. Pop. (1900) 452,659; area 2834 sq. m.; inclusive, in each case, of the town and territory of Ceuta, on the Moroccan coast, which belong, for administrative purposes, to Cadiz. The sea-board of Cadiz possesses several features of exceptional interest. On the Atlantic littoral, the broad Guadalquivir estuary marks the frontier of Seville; farther south, the river Guadalete, which waters the northern districts, falls into the magnificent double bay of Cadiz; farther south again, is Cape Trafalgar, famous for the British naval victory of 1805. Near Trafalgar, the river Barbate issues into the straits of Gibraltar, after receiving several small tributaries, which combine with it to form, near its mouth, the broad and marshy Laguna de la Janda. Punta Marroqui, on the straits, is the
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southernmost promontory of the European mainland. The most conspicuous feature of the east coast is Algeciras Bay, overlooked by the rock and fortress of Gibraltar. The river Guadiaro, which drains the eastern highlands, enters the Mediterranean close to the frontier of Málaga. In the interior there is a striking contrast between the comparatively level western half of Cadiz and the very picturesque mountain ranges of the eastern half, which are well wooded and abound in game. The whole region known as the Campo de Gibraltar is of this character; but it is in the north-east that the summits are most closely massed together, and attain their greatest altitudes in the Cerro de San Cristobal (5630 ft.) and the Sierra del Pinar (5413 ft.).

The climate is generally mild and temperate, some parts of the coast only being unhealthy owing to a marshy soil. Severe drought is not unusual, and it was largely this cause, together with want of capital, and the dependence of the peasantry on farming and fishing, that brought about the distress so prevalent early in the 20th century. The manufactures are insignificant compared with the importance of the natural products of the soil, especially wines and olives. Jerez de la Frontera (Xeres) is famous for the manufacture and export of sherry. The fisheries furnish about 2500 tons of fish per annum, one-fifth part of which is salted for export and the rest consumed in Spain. There are no important mines, but a considerable amount of salt is obtained by evaporation of sea-water in pans near Cadiz, San Fernando, Puerto Real and Santa Maria. The railway from Seville passes through Jerez de la Frontera to Cadiz and San Fernando, and another line, from Granada, terminates at Algeciras; but at the beginning of the 20th century, although it was proposed to construct railways from Jerez inland to Grazalema and coastwise from San Fernando to Tarifa, travellers who wished to visit these places were compelled to use the old-fashioned diligence, over indifferent roads, or to go by sea. The principal seaports are, after Cadiz the capital (pop. 1900, 69,382), Algeciras (13,302), La Línea (31,862), Puerto de Santa Maria (20,120), Puerto Real (10,535), the naval station of San Fernando (29,635), San Lucar (23,883) and Tarifa (11,723); the principal inland towns are Arcos de la Frontera (13,926), Chiclana (10,868), Jerez de la Frontera (63,473), Medina Sidonia (11,040), and Véjer de la Frontera (11,298). These are all described in separate articles. Grazalema (5587), Jimena de la Frontera (7549), and San Roque (8569) are less important towns with some trade in leather, cork, wine and farm produce. They all contain many Moorish antiquities, and Grazalema probably represents the Roman *Lacidulermium*. (See also Andalusia.)

CADIZ (in Lat. *Gades*, and formerly called *Cales* by the English), the capital and principal seaport of the

Spanish province of Cadiz; on the Bay of Cadiz, an inlet of the Atlantic Ocean, in 36° 27′ N. and 6° 12′ W., 94 m. by rail S. of Seville. Pop. (1900) 69,382. Cadiz is built on the extremity of a tongue of land, projecting about 5 m. into the sea, in a north-westerly direction from the Isla de Leon. Its noble bay, more than 30 m. in circuit, and almost entirely land-locked by the isthmus and the headlands which lie to the north-east, has principally contributed to its commercial importance. The outer bay stretches from the promontory and town of Rota to the mouth of the river Guadalete; the inner bay, protected by the forts of Matagorda and Puntales, affords generally good anchorage, and contains a harbour formed by a projecting mole, where vessels of small burden may discharge. The entrance to the bays is rendered somewhat dangerous by the low shelving rocks (Cochinos and Las Puercas) which encumber the passage, and by the shifting banks of mud deposited by the Guadalete and the Rio Santi Petri, a broad channel separating the Isla de Leon from the mainland. At the mouth of this channel is the village of Caracca; close beside it is the important naval arsenal of San Fernando (*q.v.*); and on the isthmus are the defensive works known as the Cortadura, or Fort San Fernando, and the well-frequented sea-bathing establishments.

From its almost insular position Cadiz enjoys a mild and serene climate. The *Medina*, or land-wind, so-called because it blows from the direction of Medina Sidonia, prevails during the winter; the moisture-laden *Virazón*, a westerly sea-breeze, sets in with the spring. The mean annual temperature is about 64° F., while the mean summer and winter temperatures vary only about 10° above and below this point; but the damp atmosphere is very oppressive in summer, and its unhealthiness is enhanced by the inadequate drainage and the masses of rotting seaweed piled along the shore. The high death-rate, nearly 45 per thousand, is also due to the bad water-supply, the water being either collected in cisterns from the tops of the houses, or brought at great expense from Santa Maria on the opposite coast by an aqueduct nearly 30 m. long. An English company started a waterworks in Cadiz about 1875, but came to grief through the incapacity of the population to appreciate its necessity.

The city, which is 6 or 7 m. in circumference, is surrounded by a wall with five gates, one of which communicates with the isthmus. Seen from a distance off the coast, it presents a magnificent display of snow-white turrets rising majestically from the sea; and for the uniformity and elegance of its buildings, it must certainly be ranked as one of the finest cities of Spain, although, being hemmed in on all sides, its streets and squares are necessarily contracted. Every house annually receives a coating of whitewash, which, when it is new, produces a disagreeable glare. The city is distinguished by its somewhat deceptive air of cleanliness, its quiet streets, where no wheeled traffic passes, and its lavish use of white Italian marble. But the most characteristic feature of Cadiz is the marine promenades, fringing the city all round between the ramparts and the sea, especially that called the *Alameda*, on the eastern side, commanding a view of the shipping in the bay and the ports on the opposite shore. The houses are generally lofty and surmounted by turrets and flat roofs in the Moorish style.

Cadiz is the see of a bishop, who is suffragan to the archbishop of Seville, but its chief conventual and monastic institutions have been suppressed. Of its two cathedrals, one was originally erected by Alphonso X. of Castile (1252-1284), and rebuilt after 1596; the other, begun in 1722, was completed between 1832 and 1838. Under the high altar of the old cathedral rises the only freshwater spring in Cadiz. The chief secular buildings include the Hospicio, or Casa de Misericordia, adorned with a marble portico, and having an interior court with Doric colonnades; the bull-ring, with room for 12,000 spectators; the two theatres, the prison, the custom-house, and the lighthouse of San Sebastian on the western side rising 172 ft. from the rock on which it stands. Besides the Hospicio already mentioned, which sometimes contains 1000 inmates, there are numerous other charitable institutions, such as the women's hospital, the foundling institution, the admirable Hospicio de San Juan de Dios for men, and the lunatic asylum. Gratuitous instruction is given to a large number of children, and there are several mathematical and commercial academies, maintained by different commercial corporations, a nautical school, a school of design, a theological seminary and a flourishing medical school. The museum is filled for the most part with Roman and Carthaginian coins and other antiquities; the academy contains a valuable collection of pictures. In the church of Santa Catalina, which formerly belonged to the Capuchin convent, now secularized, there is an unfinished picture of the marriage of St Catherine, by Murillo, who met his death by falling from the scaffold on which he was painting it (3rd of April 1682).

Cadiz no longer ranks among the first marine cities of the world. Its harbour works are insufficient and antiquated, though a scheme for their improvement was adopted in 1903; its communications with the mainland consist of a road and a single line of railway; its inhabitants, apart from foreign residents and a few of the more enterprising merchants, rest contented with such prosperity as a fine natural harbour and an unsurpassed geographical situation cannot fail to confer. Several great shipping lines call here; shipbuilding yards and various factories exist on the mainland; and there is a considerable trade in the exportation of wine, principally sherry from Jerez, salt, olives, figs, canary-seed and ready-made corks; and in the importation of fuel, iron and machinery, building materials, American oak staves for casks, &c. In
[v.04 p.0930] 1904, 2753 ships of 1,745,588 tons entered the port. But local trade, though still considerable, remains stationary if it does not actually recede. Its decline, originally due to the Napoleonic wars and the acquisition of independence by many Spanish colonies early in the 19th century, was already recognised, and an attempt made to check it in 1828, when the Spanish government declared Cadiz a free warehousing port; but this valuable privilege was withdrawn in 1832. Among the more modern causes of depression have been the rivalry of Gibraltar and Seville; the decreasing demand for sherry; and the disasters of the Spanish-American war of 1898, which almost ruined local commerce with Cuba and Porto Rico.

History.—Cadiz represents the Sem. *Agadir*, *Gadir*, or *Gaddir* ("stronghold") of the Carthaginians, the Gr. *Gadeira*, and the Lat. *Gades*. Tradition ascribes its foundation to Phoenician merchants from Tyre, as early as 1100 B.C.; and in the 7th century it had already become the great mart of the west for amber and tin from the Cassiterides (*q.v.*). About 501 B.C. it was occupied by the Carthaginians, who made it their base for the conquest of southern Iberia, and in the 3rd century for the equipment of the armaments with which Hannibal undertook to destroy the power of Rome. But the loyalty of Gades, already weakened by trade rivalry with Carthage, gave way after the second Punic War. Its citizens welcomed the victorious Romans, and assisted them in turn to fit out an expedition against Carthage. Thenceforward, its rapidly-growing trade in dried fish and meat, and in all the produce of the fertile Baetis (Guadalquivir) valley, attracted many Greek settlers; while men of learning, such as Pytheas in the 4th century B.C., Polybius and Artemidorus of Ephesus in the 2nd, and Posidonius in the 1st, came to study the ebb and flow of its tides, unparalleled in the Mediterranean. C. Julius Caesar conferred the *civitas* of Rome on all its citizens in 49

B.C.; and, not long after L. Cornelius Balbus Minor built what was called the "New City," constructed the harbour which is now known as Puerto Real, and spanned the strait of Santi Petri with the bridge which unites the Isla de Leon with the mainland, and is now known as the Puente de Zuazo, after Juan Sanchez de Zuazo, who restored it in the 15th century. Under Augustus, when it was the residence of no fewer than 500 *equites*, a total only surpassed in Rome and Padua, Gades was made a *municipium* with the name of *Augusta Urbs Gaditana*, and its citizens ranked next to those of Rome. In the 1st century A.D. it was the birthplace or home of several famous authors, including Lucius Columella, poet and writer on husbandry; but it was more renowned for gaiety and luxury than for learning. Juvenal and Martial write of *Jocosae Gades*, "Cadiz the Joyous," as naturally as the modern Andalusian speaks of *Cadiz la Joyosa*; and throughout the Roman world its cookery and its dancing-girls were famous. In the 5th century, however, the overthrow of Roman dominion in Spain by the Visigoths involved Cadiz in destruction. A few fragments of masonry, submerged under the sea, are almost all that remains of the original city. Moorish rule over the port, which was renamed *Jezirat-Kadis*, lasted from 711 until 1262, when Cadiz was captured, rebuilt and repeopled by Alphonso X. of Castile. Its renewed prosperity dates from the discovery of America in 1492. As the headquarters of the Spanish treasure fleets, it soon recovered its position as the wealthiest port of western Europe, and consequently it was a favourite point of attack for the enemies of Spain. During the 16th century it repelled a series of raids by the Barbary corsairs; in 1587 all the shipping in its harbour was burned by the English squadron under Sir Francis Drake; in 1596 the fleet of the earl of Essex and Lord Charles Howard sacked the city, and destroyed forty merchant vessels and thirteen warships. This disaster necessitated the rebuilding of Cadiz on a new plan. Its recovered wealth tempted the duke of Buckingham to promote the fruitless expedition to Cadiz of 1626; thirty years later Admiral Blake blockaded the harbour in an endeavour to intercept the treasure fleet; and in 1702 another attack was made by the British under Sir George Rooke and the duke of Ormonde. During the 18th century the wealth of Cadiz became greater than ever; from 1720 to 1765, when it enjoyed a monopoly of the trade with Spanish America, the city annually imported gold and silver to the value of about £5,000,000. With the closing years of the century, however, it entered upon a period of misfortune. From February 1797 to April 1798 it was blockaded by the British fleet, after the battle of Cape St Vincent; and in 1800 it was bombarded by Nelson. In 1808 the citizens captured a French squadron which was imprisoned by the British fleet in the inner bay. From February 1810 until the duke of Wellington raised the siege in August 1812, Cadiz resisted the French forces sent to capture it; and during these two years it served as the capital of all Spain which could escape annexation by Napoleon. Here, too, the Cortes met and promulgated the famous Liberal constitution of March 1812. To secure a renewal of this constitution, the citizens revolted in 1820; the revolution spread throughout Spain; the king, Ferdinand VII., was imprisoned at Cadiz, which again became the seat of the Cortes; and foreign intervention alone checked the movement towards reform. A French army, under the duc d'Angoulême, seized Cadiz in 1823, secured the release of Ferdinand and suppressed Liberalism. In 1868 the city was the centre of the revolution which effected the dethronement of Queen Isabella.

See *Sevilla y Cadiz, sus monumentos y artes, su naturaleza é historia*, an illustrated volume in the series "España," by P. de Madrazo (Barcelona, 1884); *Recuerdos Gaditanos*, a very full history of local affairs, by J.M. León y Dominguez (Cadiz, 1897); *Historia de Cadiz y de su provincia desde los remotos tiempos hasta* 1824, by A. de Castro (Cadiz, 1858); and *Descripcion historico-artistica de la catedral de Cadiz*, by J. de Urrutia (Cadiz, 1843).

CADMIUM (symbol Cd, atomic weight 112.4 (O=16)), a metallic element, showing a close relationship to zinc, with which it is very frequently associated. It was discovered in 1817 by F. Stromeyer in a sample of zinc carbonate from which a specimen of zinc oxide was obtained, having a yellow colour, although quite free from iron; Stromeyer showing that this coloration was due to the presence of the oxide of a new metal. Simultaneously Hermann, a German chemical manufacturer, discovered the new metal in a specimen of zinc oxide which had been thought to contain arsenic, since it gave a yellow precipitate, in acid solution, on the addition of sulphuretted hydrogen. This supposition was shown to be incorrect, and the nature of the new element was ascertained.

Cadmium does not occur naturally in the uncombined condition, and only one mineral is known which contains it in any appreciable quantity, namely, greenockite, or cadmium sulphide, found at Greenock and at Bishopton in Scotland, and in Bohemia and Pennsylvania. It is, however, nearly always found associated with zinc blende, and with calamine, although only in small quantities.

The metal is usually obtained from the flue-dust (produced during the first three or four hours working of a zinc distillation) which is collected in the sheet iron cones or adapters of the zinc retorts. This is mixed with small coal, and when redistilled gives an enriched dust, and by repeating the process and distilling from cast iron retorts the metal is obtained. It can be purified by solution in hydrochloric acid and subsequent precipitation by metallic zinc.

Cadmium is a white metal, possessing a bluish tinge, and is capable of taking a high polish; on breaking, it shows a distinct fibrous fracture. By sublimation in a current of hydrogen it can be crystallized in the form of regular octahedra; it is slightly harder than tin, but is softer than zinc, and like tin, emits a crackling sound when bent. It is malleable and can be rolled out into sheets. The specific gravity of the metal is 8.564, this value being slightly increased after hammering; its specific heat is 0.0548 (R. Bunsen), it melts at 310-320° C. and boils between 763-772° C. (T. Carnelley), forming a deep yellow vapour. The cadmium molecule, as shown by determinations of the density of its vapour, is monatomic. The metal unites with the majority of the heavy metals to form alloys; some of these, the so-called fusible alloys, find a useful application from the fact that they possess a low melting-point. It also forms amalgams with mercury, and on this account has been employed in dentistry for the purpose of stopping (or filling) teeth. The metal is quite permanent in dry air, but in moist air it becomes coated with a superficial layer of the oxide; it burns on heating to redness, forming a brown coloured oxide; and is readily soluble in mineral acids with formation of the corresponding salts. Cadmium vapour decomposes water at a red heat, with liberation of hydrogen, and formation of the oxide of the metal.

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Cadmium oxide, CdO, is a brown powder of specific gravity 6.5, which can be prepared by heating the metal in air or in oxygen; or by ignition of the nitrate or carbonate; by heating the metal to a white heat in a current of oxygen it is obtained as a dark red crystalline sublimate. It does not melt at a white heat, and is easily reduced to the metal by heating in a current of hydrogen or with carbon. It is a basic oxide, dissolving readily in acids, with the formation of salts, somewhat analogous to those of zinc.

Cadmium hydroxide, $Cd(OH)_2$, is obtained as a white precipitate by adding potassium hydroxide to a solution of any soluble cadmium salt. It is decomposed by heat into the oxide and water, and is soluble in ammonia but not in excess of dilute potassium hydroxide; this latter property serves to distinguish it from zinc hydroxide.

The chloride, $CdCl_2$, bromide, $CdBr_2$, and iodide, CdI_2, are also known, cadmium iodide being sometimes used in photography, as it is one of the few iodides which are soluble in alcohol. Cadmium chloride and iodide have been shown to behave in an anomalous way in aqueous solution (W. Hittorf, *Pogg. Ann.*, 1859, 106, 513), probably owing to the formation of complex ions; the abnormal behaviour apparently diminishing as the solution becomes more and more dilute, until, at very high dilutions the salts are ionized in the normal manner.

Cadmium sulphate, $CdSO_4$, is known in several hydrated forms; being deposited, on spontaneous evaporation of a concentrated aqueous solution, in the form of large monosymmetric crystals of composition $3CdSO_4{\cdot}8H_2O$, whilst a boiling saturated solution, to which concentrated sulphuric acid has been added, deposits crystals of composition $CdSO_4{\cdot}H_2O$. It is largely used for the purpose of making standard electric cells, such for example as the Weston cell.

Cadmium sulphide, CdS, occurs naturally as greenockite (*q.v.*), and can be artificially prepared by passing sulphuretted hydrogen through acid solutions of soluble cadmium salts, when it is precipitated as a pale yellow amorphous solid. It is used as a pigment (cadmium yellow), for it retains its colour in an atmosphere containing sulphuretted hydrogen; it melts at a white heat, and on cooling solidifies to a lemon-yellow micaceous mass.

Normal cadmium carbonates are unknown, a white precipitate of variable composition being obtained on the addition of solutions of the alkaline carbonates to soluble cadmium salts.

Cadmium nitrate, $Cd(NO_3)_2{\cdot}4H_2O$, is a deliquescent salt, which may be obtained by dissolving either the metal, or its oxide or carbonate in dilute nitric acid. It crystallizes in needles and is soluble in alcohol.

Cadmium salts can be recognized by the brown incrustation which is formed when they are heated on charcoal in the oxidizing flame of the blowpipe; and also by the yellow precipitate formed when sulphuretted hydrogen is passed though their acidified solutions. This precipitate is insoluble in cold dilute acids, in ammonium sulphide, and in solutions of the caustic alkalis, a behaviour which distinguishes it from the yellow sulphides of arsenic and tin. Cadmium is estimated quantitatively by conversion into the oxide, being precipitated from boiling solutions by the addition of sodium carbonate, the carbonate thus formed passing into the oxide on ignition. It can also be determined as sulphide, by precipitation with sulphuretted hydrogen, the precipitated sulphide being dried at 100° C. and weighed.

The atomic weight of cadmium was found by O.W. Huntington (*Berichte*, 1882, 15, p. 80), from an analysis of the pure bromide, to be 111.9. H.N. Morse and H.C. Jones (*Amer. Chem. Journ.*, 1892, 14, p. 261) by conversion of cadmium into the oxalate and then into oxide, obtained values ranging from 111.981 to 112.05, whilst W.S. Lorimer and E.F. Smith (*Zeit. für anorg. Chem.*, 1891, 1, p. 364), by the electrolytic reduction of cadmium oxide in potassium cyanide solution, obtained as a mean value 112.055. The atomic weight of cadmium has been revised by G.P. Baxter and M.A. Hines (*Journ. Amer. Chem. Soc.*, 1905, 27, p. 222), by determinations of the ratio of cadmium chloride to silver chloride, and of the amount of silver required to precipitate cadmium chloride. The mean value obtained was 112.469 (Ag=107.93). The mean value 112.467 was obtained by Baxter, Hines and Frevert (ibid., 1906, 28, p. 770) by analysing cadmium bromide.

CADMUS, in Greek legend, son of Agenor, king of Phoenicia and brother of Europa. After his sister had been carried off by Zeus, he was sent out to find her. Unsuccessful in his search, he came in the course of his wanderings to Delphi, where he consulted the oracle. He was ordered to give up his quest and follow a cow which would meet him, and to build a town on the spot where she should lie down exhausted. The cow met him in Phocis, and guided him to Boeotia, where he founded the city of Thebes. Intending to sacrifice the cow, he sent some of his companions to a neighbouring spring for water. They were slain by a dragon, which was in turn destroyed by Cadmus; and by the instructions of Athena he sowed its teeth in the ground, from which there sprang a race of fierce armed men, called Sparti (sown). By throwing a stone among them Cadmus caused them to fall upon each other till only five survived, who assisted him to build the Cadmeia or citadel of Thebes and became the founders of the noblest families of that city (Ovid, *Metam.* iii. 1 ff.; Apollodorus iii. 4, 5). Cadmus, however, because of this bloodshed, had to do penance for eight years. At the expiration of this period the gods gave him to wife Harmonia (*q.v.*), daughter of Ares and Aphrodite, by whom he had a son Polydorus, and four daughters, Ino, Autonoë, Agave and Semele—a family which was overtaken by grievous misfortunes. At the marriage all the gods were present; Harmonia received as bridal gifts a peplos worked by Athena and a necklace made by Hephaestus. Cadmus is said to have finally retired with Harmonia to Illyria, where he became king. After death, he and his wife were changed into snakes, which watched the tomb while their souls were translated to the Elysian fields.

There is little doubt that Cadmus was originally a Boeotian, that is, a Greek hero. In later times the story of a Phoenician immigrant of that name became current, to whom was ascribed the introduction of the alphabet, the invention of agriculture and working in bronze and of civilization generally. But the name itself is Greek rather than Phoenician; and the fact that Hermes was worshipped in Samothrace under the name of Cadmus or Cadmilus seems to show that the Theban Cadmus was originally an ancestral Theban hero corresponding to the Samothracian. The name may mean "order," and be used to characterize one who introduces order and civilization.

The exhaustive article by O. Crusius in W.H. Roscher's *Lexikon der Mythologie* contains a list of modern authorities on the subject of Cadmus; see also O. Gruppe, *De Cadmi Fabula* (1891).

CADMUS OF MILETUS, according to some ancient authorities the oldest of the logographi (*q.v.*). Modern scholars, who accept this view, assign him to about 550 B.C.; others regard him as purely mythical. A confused notice in Suidas mentions three persons of the name: the first, the inventor of the alphabet; the second, the son of Pandion, "according to some" the first prose writer, a little later than Orpheus, author of a history of the *Foundation of Miletus* and of Ionia generally, in four books; the third, the son of Archelaus,

of later date, author of a history of Attica in fourteen books, and of some poems of an erotic character. As Dionysius of Halicarnassus (*Judicium de Thucydide*, c. 23) distinctly states that the work current in his time under the name of Cadmus was a forgery, it is most probable that the two first are identical with the Phoenician Cadmus, who, as the reputed inventor of letters, was subsequently transformed into the Milesian and the author of an historical work. In this connexion it should be observed that the old Milesian nobles traced their descent back to the Phoenician or one of his companions. The text of the notice of the third Cadmus of Miletus in Suidas is unsatisfactory; and it is uncertain whether he is to be explained in the same way, or whether he was an historical personage, of whom all further record is lost.

See C.W. Müller, *Frag. Hist. Graec*, ii. 2-4; and O. Crusius in Roscher's *Lexikon der Mythologie* (article "Kadmos," 90, 91).

CADOGAN, WILLIAM CADOGAN, 1ST EARL (1675-1726), British soldier, was the son of Henry Cadogan, a Dublin barrister, and grandson of Major William Cadogan (1601-1661), governor of Trim. The family has been credited with a descent from Cadwgan, the old Welsh prince. Cadogan began his military career as a cornet of horse under William III. at the Boyne, and, with the regiment now known as the 5th (Royal Irish) Lancers, made the campaigns in the Low Countries. In the course of these years he attracted the notice of Marlborough. In 1701 Cadogan was employed by him as a staff officer in the complicated task of
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concentrating the grand army formed by contingents from multitudinous states, and Marlborough soon made the young officer his confidential staff officer and right-hand man. His services in the campaign of 1701 were rewarded with the colonelcy of the famous "Cadogan's Horse" (now the 5th Dragoon Guards). As quartermaster-general, it fell to his lot to organize the celebrated march of the allies to the Danube, which, as well as the return march with its heavy convoys, he managed with consummate skill. At the Schellenberg he was wounded and his horse shot under him, and at Blenheim he acted as Marlborough's chief of staff. Soon afterwards he was promoted brigadier-general, and in 1705 he led "Cadogan's Horse" at the forcing of the Brabant lines between Wange and Elissem, capturing four standards. He was present at Ramillies, and immediately afterwards was sent to take Antwerp, which he did without difficulty. Becoming major-general in 1706, he continued to perform the numerous duties of chief staff officer, quartermaster-general and colonel of cavalry, besides which he was throughout constantly employed in delicate diplomatic missions. In the course of the campaign of 1707, when leading a foraging expedition, he fell into the hands of the enemy but was soon exchanged. In 1708 he commanded the advanced guard of the army in the operations which culminated in the victory of Oudenarde, and in the same year he was with Webb at the action of Wynendael. On the 1st of January 1709 he was made lieutenant-general. At the siege of Menin in this year occurred an incident which well illustrates his qualifications as a staff officer and diplomatist. Marlborough, riding with his staff close to the French, suddenly dropped his glove and told Cadogan to pick it up. This seemingly insolent command was carried out at once, and when Marlborough on the return to camp explained that he wished a battery to be erected on the spot, Cadogan informed him that he had already given orders to that effect. He was present at Malplaquet, and after the battle was sent off to form the siege of Mons, at which he was dangerously wounded. At the end of the year he received the appointment of lieutenant of the Tower, but he continued with the army in Flanders to the end of the war. His loyalty to the fallen Marlborough cost him, in 1712, his rank, positions and emoluments under the crown. George I. on his accession, however, reinstated Cadogan, and, amongst other appointments, made him lieutenant of the ordnance. In 1715, as British plenipotentiary, he signed the third Barrier Treaty between Great Britain, Holland and the emperor. His last campaign was the Jacobite insurrection of 1715-1716. At first as Argyle's subordinate (see Coxe, *Memoirs of Marlborough*, cap. cxiv.), and later as commander-in-chief, General Cadogan by his firm, energetic and skilful handling of his task restored quiet and order in Scotland. Up to the death of Marlborough he was continually employed in diplomatic posts of special trust, and in 1718 he was made Earl Cadogan, Viscount Caversham and Baron Cadogan of Oakley. In 1722 he succeeded his old chief as head of the army and master-general of the ordnance, becoming at the same time colonel of the 1st or Grenadier Guards. He sat in five successive parliaments as member for Woodstock. He died at Kensington in 1726, leaving two daughters, one of whom married the second duke of Richmond and the other the second son of William earl of Portland.

Readers of *Esmond* will have formed a very unfavourable estimate of Cadogan, and it should be remembered that Thackeray's hero was the friend and supporter of the opposition and General Webb. As a soldier, Cadogan was one of the best staff officers in the annals of the British army, and in command of detachments, and also as a commander-in-chief, he showed himself to be an able, careful and withal dashing leader.

He was succeeded, by special remainder, in the barony by his brother, General Charles Cadogan (1691-1776), who married the daughter of Sir Hans Sloane, thus beginning the association of the family with Chelsea, and died in 1776, being succeeded in turn by his son Charles Sloane (1728-1807), who in the year 1800 was created Viscount Chelsea and Earl Cadogan. His descendant George Henry, 5th Earl Cadogan (b. 1840), was lord privy seal from 1886 to 1892, and lord-lieutenant of Ireland from 1895 to 1902.

CADOUDAL, GEORGES (1771-1804), leader of the *Chouans* during the French Revolution, was born in 1771 near Auray. He had received a fair education, and when the Revolution broke out he remained true to his royalist and Catholic teaching. From 1793 he organized a rebellion in the Morbihan against the revolutionary government. It was quickly suppressed and he thereupon joined the army of the revolted Vendeans, taking part in the battles of Le Mans and of Savenay in December 1793. Returning to Morbihan, he was arrested, and imprisoned at Brest. He succeeded, however, in escaping, and began again the struggle against the Revolution. In spite of the defeat of his party, and of the fact that he was forced several times to take refuge in England, Cadoudal did not cease both to wage war and to conspire in favour of the royalist pretenders. He refused to come to any understanding with the government, although offers were made to him by Bonaparte, who admired his skill and his obstinate energy. From 1800 it was impossible for Cadoudal to continue to wage open war, so he took altogether to plotting. He was indirectly concerned in the attempt made by Saint Régent in the rue Sainte Nicaise on the life of the First Consul, in December 1800, and fled to England again. In 1803 he returned to France to undertake a new attempt against Bonaparte. Though watched for by the police, he succeeded in eluding them for six months, but was at length arrested. Found guilty and condemned to death, he refused to ask for pardon and was executed in Paris on the 10th of June 1804, along with eleven of his companions. He is often called simply Georges.

See *Procès de Georges, Moreau et Pichegru* (Paris, 1804, 8 vols. 8vo); the *Mémoires* of Bourrienne, of Hyde de Neuville and of Rohu; Lenotre, *Tournebut* (on the arrest); Lejean, *Biographie bretonne*; and the bibliography to the article VENDÉE.

CADRE (Fr. for a frame, from the Lat. *quadrum*, a square), a framework or skeleton, particularly the permanent establishment of a military corps, regiment, &c. which can be expanded on emergency.

CADUCEUS (the Lat. adaptation of the Doric Gr. καρύκειον, Attic κηρύκειον, a herald's wand), the staff used by the messengers of the gods, and especially by Hermes as conductor of the souls of the dead to the world below. The caduceus of Hermes, which was given him by Apollo in exchange for the lyre, was a magic wand which exercised influence over the living and the dead, bestowed wealth and prosperity and turned everything it touched into gold. In its oldest form it was a rod ending in two prongs twined into a knot (probably an olive branch with two shoots, adorned with ribbons or garlands), for which, later, two serpents, with heads meeting at the top, were substituted. The mythologists explained this by the story of Hermes finding two serpents thus knotted together while fighting; he separated them with his wand, which, crowned by the serpents, became the symbol of the settlement of quarrels (Thucydides i. 53; Macrobius, *Sat.* i. 19; Hyginus, *Poet. Astron.* ii. 7). A pair of wings was sometimes attached to the top of the staff, in token of the speed of Hermes as a messenger. In historical times the caduceus was the attribute of Hermes as the god of commerce and peace, and among the Greeks it was the distinctive mark of heralds and ambassadors, whose persons it rendered inviolable. The caduceus itself was not used by the Romans, but the derivative *caduceator* occurs in the sense of a peace commissioner.

See L. Preller, "Der Hermesstab" in *Philologus*, i. (1846); O.A. Hoffmann, *Hermes und Kerykeion* (1890), who argues that Hermes is a male lunar divinity and his staff the special attribute of Aphrodite-Astarte.

CADUCOUS (Lat. *caducus*), a botanical term for "falling early," as the sepals of a poppy, before the petals expand.

CAECILIA. This name was given by Linnaeus to the blind, or nearly blind, worm-like Batrachians which were formerly associated with the snakes and are now classed as an order under the names of *Apoda, Peromela* or *Gymnophiona*. The type of the genus *Caecilia* is *Caecilia tentaculata*, a moderately slender species, not unlike a huge earth-worm, growing to 2 ft. in length with a diameter of three-quarters of an inch. It is one of the largest species of the order. Other species of the same genus are very slender in form, as for instance *Caecilia gracilis*, which with a length of 2¼ ft. has a diameter of only a quarter of an inch. One of the most remarkable characters of the genus *Caecilia*, which it shares with about two-thirds of the known genera of the order, is the presence of thin, cycloid, imbricate scales imbedded in the skin, a character only to be detected by raising the epidermis near the dermal folds, which more or less completely encircle the body. This feature, unique among living Batrachians, is probably directly inherited from the scaly *Stegocephalia*, a view which is further strengthened by the similarity of structure of these scales in both groups, which the histological investigations of H. Credner have revealed. The skull is well ossified and contains a greater number of bones than occur in any other living Batrachian. There is therefore strong reason for tracing the Caecilians directly from the Stegocephalia, as was the view of T.H. Huxley and of R. Wiedersheim, since supported by H. Gadow and by J.S. Kingsley. E.D. Cope had advocated the abolition of the order Apoda and the incorporation of the Caecilians among the Urodela or Caudata in the vicinity of the Amphiumidae, of which he regarded them as further degraded descendants; and this opinion, which was supported by very feeble and partly erroneous arguments, has unfortunately received the support of the two great authorities, P. and F. Sarasin, to whom we are indebted for our first information on the breeding habits and development of these Batrachians.

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The knowledge of species of Caecilians has made rapid progress, and we are now acquainted with about fifty, which are referred to twenty-one genera. The principal characters on which these genera are founded reside in the presence or absence of scales, the presence or absence of eyes, the presence of one or of two series of teeth in the lower jaw, the structure of the tentacle (representing the so-called "balancers" of Urodele larvae) on the side of the snout, and the presence or absence of a vacuity between the parietal and squamosal bones of the skull. Of these twenty-one genera six are peculiar to tropical Africa, one to the Seychelles, four to south-eastern Asia, eight to Central and South America, one occurs in both continental Africa and the Seychelles, and one is common to Africa and South America.

These Batrachians are found in damp situations, usually in soft mud. The complete development of *Ichthyophis glutinosus* has been observed in Ceylon by P. and F. Sarasin. The eggs, forming a rosary-like string, are very large, and deposited in a burrow near the water. The female protects them by coiling herself round the egg-mass, which the young do not leave till after the loss of the very large external gills (one on each side); they then lead an aquatic life, and are provided with an opening, or spiraculum, on each side of the neck. In these larvae the head is fish-like, provided with much-developed labial lobes, with the eyes much more distinct than in the perfect animal; the tail, which is quite rudimentary in all Caecilians, is very distinct, strongly compressed, and bordered above and beneath by a dermal fold.

In *Hypogeophis*, a Caecilian from the Seychelles studied by A. Brauer, the development resembles that of *Ichthyophis*, but there is no aquatic larval stage. The young leaves the egg in the perfect condition, and at once leads a terrestrial life like its parents. In accordance with this abbreviated development, the caudal membranous crest does not exist, and the branchial aperture closes as soon as the external gills disappear.

In the South American *Typhlonectes*, and in the *Dermophis* from the Island of St Thomé, West Africa, the young are brought forth alive, in the former as larvae with external gills, and in the latter in the perfect air-breathing condition.

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(G. A. B.)

CAECILIA, VIA, an ancient highroad of Italy, which diverged from the Via Salaria at the 35th m. from Rome, and ran by Amiternum to the Adriatic coast, passing probably by Hadria. A branch ran to Interamna Praetuttiorum (Teramo) and thence probably to the sea at Castrum Novum (Giulianova), a distance of about 151 m. from Rome. It was probably constructed by L. Caecilius Metellus Diadematus (consul in 117 B.C.).

See C. Hülsen in *Notizie degli Scavi* (1896), 87 seq. N. Persichetti in *Römische Mitteilungen* (1898), 193 seq.; (1902), 277 seq.

CAECILIUS, of Calacte (Καλὴ Ἀκτή) in Sicily, Greek rhetorician, flourished at Rome during the reign of Augustus. Originally called Archagathus, he took the name of Caecilius from his patron, one of the Metelli. According to Suidas, he was by birth a Jew. Next to Dionysius of Halicarnassus, he was the most important critic and rhetorician of the Augustan age. Only fragments are extant of his numerous and important works, among which may be mentioned: *On the Style of the Ten Orators* (including their lives and a critical examination of their works), the basis of the pseudo-Plutarchian treatise of the same name, in which Caecilius is frequently referred to; *On the Sublime*, attacked by (?) Longinus in his essay on the same subject (see L. Martens, *De Libello* Περὶ ὕψους, 1877); *History of the Servile Wars*, or slave risings in Sicily, the local interest of which would naturally appeal to the author; *On Rhetoric* and *Rhetorical Figures*; an *Alphabetical Selection of Phrases*, intended to serve as a guide to the acquirement of a pure Attic style—the first example of an Atticist lexicon, mentioned by Suidas in the preface to his lexicon as one of his authorities; *Against the Phrygians*, probably an attack on the florid style of the Asiatic school of rhetoric.

The fragments have been collected and edited by T. Burckhardt (1863), and E. Ofenloch (1907); some in C.W. Müller, *Fragmenta Historicorum Graecorum*, iii.; C. Bursian's *Jahresbericht ... der classischen Altertumswissenschaft*, xxiii. (1896), contains full notices of recent works on Caecilius, by C. Hammer; F. Blass, *Griechische Beredsamkeit von Alexander bis auf Augustus* (1865), treats of Dionysius of Halicarnassus and Caecilius together; see also J. Brzoska in Pauly-Wissowa, *Realencyclopädie* (1897).

CAECILIUS STATIUS, or Statius Caecilius, Roman comic poet, contemporary and intimate friend of Ennius, died in 168 (or 166) B.C. He was born in the territory of the Insubrian Gauls, and was probably taken as a prisoner to Rome (c. 200), during the great Gallic war. Originally a slave, he assumed the name of Caecilius from his patron, probably one of the Metelli. He supported himself by adapting Greek plays for the Roman stage from the new comedy writers, especially Menander. If the statement in the life of Terence by Suetonius is correct and the reading sound, Caecilius's judgment was so esteemed that he was ordered to hear Terence's *Andria* (exhibited 166 B.C.) read and to pronounce an opinion upon it. After several failures Caecilius gained a high reputation. Volcacius Sedigitus, the dramatic critic, places him first amongst the comic poets; Varro credits him with pathos and skill in the construction of his plots; Horace (*Epistles*, ii. 1. 59) contrasts his dignity with the art of Terence. Quintilian (*Inst. Orat.*, x. 1. 99) speaks somewhat disparagingly of him, and Cicero, although he admits with some hesitation that Caecilius may have been the chief of the comic poets (*De Optimo Genere Oratorum*, 1), considers him inferior to Terence in style and Latinity (*Ad Att.* vii. 3), as was only natural, considering his foreign extraction. The fact that his plays could be referred to by name alone without any indication of the author (Cicero, *De Finibus*, ii. 7) is sufficient proof of their widespread popularity. Caecilius holds a place between Plautus and Terence in his treatment of the Greek originals; he did not, like Plautus, confound things Greek and Roman, nor, like Terence, eliminate everything that could not be romanized.

The fragments of his plays are chiefly preserved in Aulus Gellius, who cites several passages from the *Plocium* (necklace) together with the original Greek of Menander. The translation which is diffuse and by no means close, fails to reproduce the spirit of the original. Fragments in Ribbeck, *Scaenicae Romanorum Poesis Fragmenta* (1898); see also W.S. Teuffel, *Caecilius Statius*, &c. (1858); Mommsen, *Hist. of Rome* (Eng. tr.), bk. iii. ch. 14; F. Skutsch in Pauly-Wissowa, *Realencyclopädie* (1897).

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CAECĪNA, the name of a distinguished Etruscan family of Volaterrae. Graves have been discovered belonging to the family, whose name is still preserved in the river and hamlet of Cecina.

Aulus Caecina, son of Aulus Caecina who was defended by Cicero (69 B.C.) in a speech still extant, took the side of Pompey in the civil wars, and published a violent tirade against Caesar, for which he was banished. He recanted in a work called *Querelae*, and by the intercession of his friends, above all, of Cicero, obtained pardon from Caesar. Caecina was regarded as an important authority on the Etruscan system of divination (*Etrusca Disciplina*), which he endeavoured to place on a scientific footing by harmonizing its theories with the doctrines of the Stoics. Considerable fragments of his work (dealing with lightning) are to be found in Seneca (*Naturales Quaestiones*, ii. 31-49). Caecina was on intimate terms with Cicero, who speaks of him as a gifted and eloquent man and was no doubt considerably indebted to him in his own treatise *De Divinatione*. Some of their correspondence is preserved in Cicero's letters (*Ad Fam.* vi. 5-8; see also ix. and xiii. 66).

Aulus Caecina Alienus, Roman general, was quaestor of Baetica in Spain (A.D. 68). On the death of Nero, he attached himself to Galba, who appointed him to the command of a legion in upper Germany. Having been prosecuted for embezzling public money, Caecina went over to Vitellius, who sent him with a large army into Italy. Caecina crossed the Alps, but was defeated near Cremona by Suetonius Paulinus, the chief general of Otho. Subsequently, in conjunction with Fabius Valens, Caecina defeated Otho at the decisive battle of Bedriacum (Betriacum). The incapacity of Vitellius tempted Vespasian to take up arms against him. Caecina, who had been entrusted with the repression of the revolt, turned traitor, and tried to persuade his army to go over to Vespasian, but was thrown into chains by the soldiers. After the overthrow of Vitellius, he was released, and taken into favour by the new emperor. But he could not remain loyal to any one. In 79 he was implicated in a conspiracy against Vespasian, and was put to death by order of Titus. Caecina is described by Tacitus as a man of handsome presence and boundless ambition, a gifted orator and a great favourite with the soldiers.

Tacitus, *Histories*, i. 53, 61, 67-70, ii. 20-25, 41-44, iii. 13; Dio Cassius lxv. 10-14, lxvi. 16; Plutarch, *Otho*, 7; Suetonius, *Titus*, 6; Zonaras xi. 17.

CÆDMON, the earliest English Christian poet. His story, and even his very name, are known to us only from Bæda (*Hist. Eccl.* iv. 24). He was, according to Bæda (see Bede), a herdsman, who received a divine

call to poetry by means of a dream. One night, having quitted a festive company because, from want of skill, he could not comply with the demand made of each guest in turn to sing to the harp, he sought his bed and fell asleep. He dreamed that there appeared to him a stranger, who addressed him by his name, and commanded him to sing of "the beginning of created things." He pleaded inability, but the stranger insisted, and he was compelled to obey. He found himself uttering "verses which he had never heard." Of Cædmon's song Bæda gives a prose paraphrase, which may be literally rendered as follows:—"Now must we praise the author of the heavenly kingdom, the Creator's power and counsel, the deeds of the Father of glory: how He, the eternal God, was the author of all marvels—He, who first gave to the sons of men the heaven for a roof, and then, Almighty Guardian of mankind, created the earth." Bæda explains that his version represents the sense only, not the arrangement of the words, because no poetry, however excellent, can be rendered into another language, without the loss of its beauty of expression. When Cædmon awoke he remembered the verses that he had sung and added to them others. He related his dream to the farm bailiff under whom he worked, and was conducted by him to the neighbouring monastery at Streanæshalch (now called Whitby). The abbess Hild and her monks recognized that the illiterate herdsman had received a gift from heaven, and, in order to test his powers, proposed to him that he should try to render into verse a portion of sacred history which they explained to him. On the following morning he returned having fulfilled his task. At the request of the abbess he became an inmate of the monastery. Throughout the remainder of his life his more learned brethren from time to time expounded to him the events of Scripture history and the doctrines of the faith, and all that he heard from them he reproduced in beautiful poetry. "He sang of the creation of the world, of the origin of mankind and of all the history of Genesis, of the exodus of Israel from Egypt and their entrance into the Promised Land, of many other incidents of Scripture history, of the Lord's incarnation, passion, resurrection and ascension, of the coming of the Holy Ghost and the teaching of the apostles. He also made many songs of the terrors of the coming judgment, of the horrors of hell and the sweetness of heaven; and of the mercies and the judgments of God." All his poetry was on sacred themes, and its unvarying aim was to turn men from sin to righteousness and the love of God. Although many amongst the Angles had, following his example, essayed to compose religious poetry, none of them, in Bæda's opinion, had approached the excellence of Cædmon's songs.

Bæda's account of Cædmon's deathbed has often been quoted, and is of singular beauty. It is commonly stated that he died in 680, in the same year as the abbess Hild, but for this there is no authority. All that we know of his date is that his dream took place during the period (658-680) in which Hild was abbess of Streanæshalch, and that he must have died some considerable time before Bæda finished his history in 731.

The hymn said to have been composed by Cædmon in his dream is extant in its original language. A copy of it, in the poet's own Northumbrian dialect, and in a handwriting of the 8th century, appears on a blank page of the Moore MS. of Bæda's History; and five other Latin MSS. of Bæda have the poem (but transliterated into a more southern dialect) as a marginal note. In the old English version of Bæda, ascribed to King Alfred, and certainly made by his command if not by himself, it is given in the text. Probably the Latin MS. used by the translator was one that contained this addition. It was formerly maintained by some scholars that the extant Old English verses are not Bæda's original, but a mere retranslation from his Latin prose version. The argument was that they correspond too closely with the Latin; Bæda's words, "hic est sensus, non autem ordo ipse verborum," being taken to mean that he had given, not a literal translation, but only a free paraphrase. But the form of the sentences in Bæda's prose shows a close adherence to the parallelistic structure of Old English verse, and the alliterating words in the poem are in nearly every case the most obvious and almost the inevitable equivalents of those used by Bæda. The sentence quoted above[1] can therefore have been meant only as an apology for the absence of those poetic graces that necessarily disappear in translations into another tongue. Even on the assumption that the existing verses are a retranslation, it would still be certain that they differ very slightly from what the original must have been. It is of course possible to hold that the story of the dream is pure fiction, and that the lines which Bæda translated were not Cædmon's at all. But there is really nothing to justify this extreme of scepticism. As the hymn is said to have been Cædmon's first essay in verse, its lack of poetic merit is rather an argument for its genuineness than against it. Whether Bæda's narrative be historical or not—and it involves nothing either miraculous or essentially improbable—there is no reason to doubt that the nine lines of the Moore MS. are Cædmon's composition.

This poor fragment is all that can with confidence be affirmed to remain of the voluminous works of the man whom Bæda regarded as the greatest of vernacular religious poets. It is true that for two centuries and a half a considerable body of verse has been currently known by his name; but among modern scholars the use of the customary designation is merely a matter of convenience, and does not imply any
[v.04 p.0935] belief in the correctness of the attribution. The so-called Cædmon poems are contained in a MS. written about A.D. 1000, which was given in 1651 by Archbishop Ussher to the famous scholar Francis Junius, and is now in the Bodleian library. They consist of paraphrases of parts of Genesis, Exodus and Daniel, and three separate poems the first on the lamentations of the fallen angels, the second on the "Harrowing of Hell," the resurrection, ascension and second coming of Christ, and the third (a mere fragment) on the temptation. The subjects correspond so well with those of Cædmon's poetry as described by Bæda that it is not surprising that Junius, in his edition, published in 1655, unhesitatingly attributed the poems to him. The ascription was rejected in 1684 by G. Hickes, whose chief argument, based on the character of the language, is now known to be fallacious, as most of the poetry that has come down to us in the West Saxon dialect is certainly of Northumbrian origin. Since, however, we learn from Bæda that already in his time Cædmon had had many imitators, the abstract probability is rather unfavourable than otherwise to the assumption that a collection of poems contained in a late 10th century MS. contains any of his work. Modern criticism has shown conclusively that the poetry of the "Cædmon MS." cannot be all by one author. Some portions of it are plainly the work of a scholar who wrote with his Latin Bible before him. It is possible that some of the rest may be the composition of the Northumbrian herdsman; but in the absence of any authenticated example of the poet's work to serve as a basis of comparison, the internal evidence can afford no ground for an affirmative conclusion. On the other hand, the mere unlikeness of any particular passage to the nine lines of the *Hymn* is obviously no reason for denying that it may have been by the same author.

The *Genesis* contains a long passage (ii. 235-851) on the fall of the angels and the temptation of our first parents, which differs markedly in style and metre from the rest. This passage, which begins in the middle

of a sentence (two leaves of the MS. having been lost) is one of the finest in all Old English poetry. In 1877 Professor E. Sievers argued, on linguistic grounds, that it was a translation, with some original insertions, from a lost poem in Old Saxon, probably by the author of the *Heliand*. Sievers's conclusions were brilliantly confirmed in 1894 by the discovery in the Vatican library of a MS. containing 62 lines of the *Heliand* and three fragments of an old Saxon poem on the story of Genesis. The first of these fragments includes the original of 28 lines of the interpolated passage of the Old English *Genesis*. The Old Saxon Biblical poetry belongs to the middle of the 9th century; the Old English translation of a portion of it is consequently later than this.

As the *Genesis* begins with a line identical in meaning, though not in wording, with the opening of Cædmon's *Hymn*, we may perhaps infer that the writer knew and used Cædmon's genuine poems. Some of the more poetical passages may possibly echo Cædmon's expressions; but when, after treating of the creation of the angels and the revolt of Lucifer, the paraphrast comes to the Biblical part of the story, he follows the sacred text with servile fidelity, omitting no detail, however prosaic. The ages of the antediluvian patriarchs, for instance, are accurately rendered into verse. In all probability the *Genesis* is of Northumbrian origin. The names assigned to the wives of Noah and his three sons (Phercoba, Olla, Olliua, Olliuani[2]) have been traced to an Irish source, and this fact seems to point to the influence of the Irish missionaries in Northumbria.

The *Exodus* is a fine poem, strangely unlike anything else in Old English literature. It is full of martial spirit, yet makes no use of the phrases of the heathen epic, which Cynewulf and other Christian poets were accustomed to borrow freely, often with little appropriateness. The condensation of the style and the peculiar vocabulary make the *Exodus* somewhat obscure in many places. It is probably of southern origin, and can hardly be supposed to be even an imitation of Cædmon.

The *Daniel* is often unjustly depreciated. It is not a great poem but the narration is lucid and interesting. The author has borrowed some 70 lines from the beginning of a poetical rendering of the Prayer of Azarias and the Song of the Three Children, of which there is a copy in the Exeter Book. The borrowed portion ends with verse 3 of the canticle, the remainder of which follows in a version for the most part independent, though containing here and there a line from *Azarias*. Except in inserting the prayer and the *Benedicite*, the paraphrast draws only from the canonical part of the book of Daniel. The poem is obviously the work of a scholar, though the Bible is the only source used.

The three other poems, designated as "Book II" in the Junius MS., are characterized by considerable imaginative power and vigour of expression, but they show an absence of literary culture and are somewhat rambling, full of repetitions and generally lacking in finish. They abound in passages of fervid religious exhortation. On the whole, both their merits and their defects are such as we should expect to find in the work of the poet celebrated by Bæda, and it seems possible, though hardly more than possible, that we have in these pieces a comparatively little altered specimen of Cædmon's compositions.

Of poems not included in the Junius MS., the *Dream of the Rood* (see CYNEWULF) is the only one that has with any plausibility been ascribed to Cædmon. It was affirmed by Professor G. Stephens that the Ruthwell Cross, on which a portion of the poem is inscribed in runes, bore on its top-stone the name "Cadmon";[3] but, according to Professor W. Vietor, the traces of runes that are still visible exclude all possibility of this reading. The poem is certainly Northumbrian and earlier than the date of Cynewulf. It would be impossible to prove that Cædmon was not the author, though the production of such a work by the herdsman of Streanæshalch would certainly deserve to rank among the miracles of genius.

Certain similarities between passages in *Paradise Lost* and parts of the translation from Old Saxon interpolated in the Old English *Genesis* have given occasion to the suggestion that some scholar may have talked to Milton about the poetry published by Junius in 1655, and that the poet may thus have gained some hints which he used in his great work. The parallels, however, though very interesting, are only such as might be expected to occur between two poets of kindred genius working on what was essentially the same body of traditional material.

The name Cædmon (in the MSS. of the Old English version of Bæda written *Cedmon, Ceadmann*) is not explicable by means of Old English; the statement that it means "boatman" is founded on the corrupt gloss *liburnam, ced*, where *ced* is an editorial misreading for *ceol*. It is most probably the British *Cadman*, intermediate between the Old Celtic *Catumanus* and the modern Welsh *Cadfan*. Possibly the poet may have been of British descent, though the inference is not certain, as British names may sometimes have been given to English children. The name Caedwalla or Ceadwalla was borne by a British king mentioned by Bæda and by a king of the West Saxons. The initial element *Caed*—or *Cead* (probably adopted from British names in which it represents *catu*, war) appears combined with an Old English terminal element in the name *Caedbaed* (cp., however, the Irish name Cathbad), and hypocoristic forms of names containing it were borne by the English saints Ceadda (commonly known as St Chad) and his brother Cedd, called Ceadwealla in one MS. of the *Old English Martyrology*. A Cadmon witnesses a Buckinghamshire charter of about A.D. 948.

The older editions of the so-called "Cædmon's Paraphrase" by F. Junius (1655); B. Thorpe (1832), with an English translation; K.W. Bouterwek (1851-1854); C.W.M. Grein in his *Bibliothek der angelsächsischen Poesie* (1857) are superseded, so far as the text is concerned, by R. Wülker's re-edition of Grein's *Bibliothek*, Bd. ii. (1895). This work contains also the texts of the *Hymn* and the *Dream of the Rood*. The pictorial illustrations of the Junius MS. were published in 1833 by Sir H. Ellis.

(H. BR.)

[1] It is a significant fact that the Alfredian version, instead of translating this sentence, introduces the verses with the words, "This is the order of the words."

[2] The invention of these names was perhaps suggested by *Pericope Oollae et Oolibae*, which may have been a current title for the 23rd chapter of Ezekiel.

[3] Stephens read the inscription on the top-stone as *Cadmon mae fauaepo*, which he rendered "Cadmon made me." But these words are mere jargon, not belonging to any known or possible Old English dialect.

CAELIA, the name of two ancient cities in Italy, (1) In Apulia (mod. *Ceglie di Bari*) on the Via Traiana, 5 m. S. of Barium. Coins found here bearing the inscription Καιλίνων prove that it was once an independent town. Discoveries of ruins and tombs have also been made. (2) In Calabria (mod. *Ceglie Messapica*) 25 m. W. of Brundusium, and 991 ft. above sea-level. It was in early times a place of some importance, as is indicated by the remains of a prehistoric *enceinte* and by the discovery of several Messapian inscriptions.

See Ch. Hülsen in Pauly-Wissowa, *Realencyclopadie*, iii. 1252.

CAEN, a city of north-western France, capital of the department of Calvados, 7½ m. from the English Channel and 149 m. W.N.W. of Paris on the Western railway to Cherbourg. Pop. (1906) 36,247. It is situated in the valley and on the left bank of the Orne, the right bank of which is occupied by the suburb of Vaucelles with the station of the Western railway. To the south-west of Caen, the Orne is joined by the Odon, arms of which water the "Prairie," a fine plain on which a well-known race-course is laid out. Its wide streets, of which the most important is the rue St Jean, shady boulevards, and public gardens enhance the attraction which the town derives from an abundance of fine churches and old houses. Hardly any remains of its once extensive ramparts and towers are now to be seen; but the castle, founded by William the Conqueror and completed by Henry I., is still employed as barracks, though in a greatly altered condition. St Pierre, the most beautiful church in Caen, stands at the northern extremity of the rue St Jean, in the centre of the town. In the main, its architecture is Gothic, but the choir and the apsidal chapels, with their elaborate interior and exterior decoration, are of Renaissance workmanship. The graceful tower, which rises beside the southern portal to a height of 255 ft., belongs to the early 14th century. The church of St Étienne, or l'Abbaye-aux-Hommes, in the west of the town, is an important specimen of Romanesque architecture, dating from about 1070, when it was founded by William the Conqueror. It is unfortunately hemmed in by other buildings, so that a comprehensive view of it is not to be obtained. The whole building, and especially the west façade, which is flanked by two towers with lofty spires, is characterized by its simplicity. The choir, which is one of the earliest examples of the Norman Gothic style, dates from the early 13th century. In 1562 the Protestants did great damage to the building, which was skilfully restored in the early 17th century. A marble slab marks the former resting-place of William the Conqueror. The abbey-buildings were rebuilt in the 17th and 18th centuries, and now shelter the lycée. Matilda, wife of the Conqueror, was the foundress of the church of La Trinité or l'Abbaye-aux-Dames, which is of the same date as St Étienne. Two square unfinished towers flank the western entrance, and another rises above the transept. Queen Matilda is interred in the choir, and a fine crypt beneath it contains the remains of former abbesses. The buildings of the nunnery, reconstructed in the early 18th century, now serve as a hospital. Other interesting old churches are those of St Sauveur, St Michel de Vaucelles, St Jean, St Gilles, Notre-Dame de la Gloriette, St Étienne le Vieux and St Nicolas, the last two now secularized. Caen possesses many old timber houses and stone mansions, in one of which, the hôtel d'Ecoville (c. 1530), the exchange and the tribunal of commerce are established. The hôtel de Than, also of the 16th century, is remarkable for its graceful dormer-windows. The Maison des Gens d'Armes (15th century), in the eastern outskirts of the town, has a massive tower adorned with medallions and surmounted by two figures of armed men. The monuments at Caen include one to the natives of Calvados killed in 1870 and 1871 and one to the lawyer J.C.F. Demolombe, together with statues of Louis XIV, Élie de Beaumont, Pierre Simon, marquis de Laplace, D.F.E. Auber and François de Malherbe, the two last natives of the town. Caen is the seat of a court of appeal, of a court of assizes and of a prefect. It is the centre of an academy and has a university with faculties of law, science and letters and a preparatory school of medicine and pharmacy; there are also a lycée, training colleges, schools of art and music, and two large hospitals. The other chief public institutions are tribunals of first instance and commerce, an exchange, a chamber of commerce and a branch of the Bank of France. The hôtel-de-ville contains the library, with more than 100,000 volumes and the art museum with a fine collection of paintings. The town is the seat of several learned societies including the Société des Antiquaires, which has a rich museum of antiquities. Caen, despite a diversity of manufactures, is commercial rather than industrial. Its trade is due to its position in the agricultural and horse-breeding district known as the "Campagne de Caen" and to its proximity to the iron mines of the Orne valley, and to manufacturing towns such as Falaise, Le Mans, &c. In the south-east of the town there is a floating basin lined with quays and connected with the Orne and with the canal which debouches into the sea at Ouistreham 9 m. to the N.N.E. The port, which also includes a portion of the river-bed, communicates with Havre and Newhaven by a regular line of steamers; it has a considerable fishing population. In 1905 the number of vessels entered was 563 with a tonnage of 190,190. English coal is foremost among the imports, which also include timber and grain, while iron ore, Caen stone[1], butter and eggs and fruit are among the exports. Important horse and cattle fairs are held in the town. The industries of Caen include timber-sawing, metal-founding and machine-construction, cloth-weaving, lace-making, the manufacture of leather and gloves, and of oil from the colza grown in the district, furniture and other wooden goods and chemical products.

Though Caen is not a town of great antiquity, the date of its foundation is unknown. It existed as early as the 9th century, and when, in 912, Neustria was ceded to the Normans by Charles the Simple, it was a large and important place. Under the dukes of Normandy, and particularly under William the Conqueror, it rapidly increased. It became the capital of lower Normandy, and in 1346 was besieged and taken by Edward III. of England. It was again taken by the English in 1417, and was retained by them till 1450, when it capitulated to the French. The university was founded in 1436 by Henry VI. of England. During the Wars of Religion, Caen embraced the reform; in the succeeding century its prosperity was shattered by the revocation of the edict of Nantes (1685). In 1793 the city was the focus of the Girondist movement against the Convention.

See G. Mancel et C. Woinez, *Hist. de la ville de Caen et de ses progrès* (Caen, 1836); B. Pent, *Hist. de la ville de Caen, ses origines* (Caen, 1866); E. de R. de Beaurepaire, *Caen illustré: son histoire, ses monuments* (Caen, 1896).

[1] A limestone well adapted for building. It was well known in the 15th and 16th centuries, at which period many English churches were built of it.

CAEPIO, QUINTUS SERVILIUS, Roman general, consul 106 B.C. During his year of office, he brought forward a law by which the jurymen were again to be chosen from the senators instead of the equites (Tacitus, *Ann.* xii. 60). As governor of Gallia Narbonensis, he plundered the temple of the Celtic Apollo at Tolosa (Toulouse), which had joined the Cimbri. In 105, Caepio suffered a crushing defeat from the Cimbri at Arausio (Orange) on the Rhone, which was looked upon as a punishment for his sacrilege; hence the

proverb *Aurum Tolosanum habet*, of an act involving disastrous consequences. In the same year he was deprived of his proconsulship and his property confiscated; subsequently (the chronology is obscure, see Mommsen, *History of Rome*, bk. iv. ch. 5) he was expelled from the senate, accused by the tribune Norbanus of embezzlement and misconduct during the war, condemned and imprisoned. He either died during his confinement or escaped to Smyrna.

Livy, *Epit.* 67; Valerius Maximus iv. 7. 3; Justin xxxii. 3; Aulus Gellius iii. 9.

CAERE (mod. *Cerveteri*, *i.e. Caere vetus*, see below), an ancient city of Etruria about 5 m. from the sea coast and about 20 m. N.W. of Rome, direct from which it was reached by branch roads from the Via Aurelia and Via Clodia. Ancient writers tell us that its original Pelasgian name was Agylla, and that the
[v.04 p.0937] Etruscans took it and called it Caere (when this occurred is not known), but the former name lasted on into later times as well as Caere. It was one of the twelve cities of Etruria, and its trade, through its port Pyrgos (*q.v.*), was of considerable importance. It fought with Rome in the time of Tarquinus Priscus and Servius Tullius, and subsequently became the refuge of the expelled Tarquins. After the invasion of the Gauls in 390 B.C., the vestal virgins and the sacred objects in their custody were conveyed to Caere for safety, and from this fact some ancient authorities derive the word *caerimonia*, ceremony. A treaty was made between Rome and Caere in the same year. In 353, however, Caere took up arms against Rome out of friendship for Tarquinii, but was defeated, and it is probably at this time that it became partially incorporated with the Roman state, as a community whose members enjoyed only a restricted form of Roman citizenship, without the right to a vote, and which was, further, without internal autonomy. The status is known as the *ius Caeritum*, and Caere was the first of a class of such municipalities (Th. Mommsen, *Römische Staatsrecht*, iii. 583). In the First Punic War, Caere furnished Rome with corn and provisions, but otherwise, up till the end of the Republic, we only hear of prodigies being observed at Caere and reported at Rome, the Etruscans being especially expert in augural lore. By the time of Augustus its population had actually fallen behind that of the Aquae Caeretanae (the sulphur springs now known as the Bagni del Sasso, about 5 m. W.), but under either Augustus or Tiberius its prosperity was to a certain extent restored, and inscriptions speak of its municipal officials (the chief of them called *dictator*) and its town council, which had the title of *senatus*. In the middle ages, however, it sank in importance, and early in the 13th century, a part of the inhabitants founded Caere novum (mod. *Ceri*) 3 m. to the east.

The town lay on a hill of tufa, running from N.E. to S.W., isolated except on the N.E., and about 300 ft. above sea-level. The modern town, at the western extremity, probably occupies the site of the acropolis. The line of the city walls, of rectangular blocks of tufa, can be traced, and there seem to have been eight gates in the circuit, which was about 4 m. in length. There are no remains of buildings of importance, except the theatre, in which many inscriptions and statues of emperors were found. The necropolis in the hill to the north-west, known as the Banditaccia, is important. The tomb chambers are either hewn in the rock or covered by mounds. One of the former class was the family tomb of the Tarchna-Tarquinii, perhaps descended from the Roman kings; others are interesting from their architectural and decorative details. One especially, the Grotta dei Bassirilievi, has interesting reliefs cut in the rock and painted, while the walls of another were decorated with painted tiles of terracotta. The most important tomb of all, the Regolini-Galassi tomb (taking its name from its discoverers), which lies S.W. of the ancient city, is a narrow rock-hewn chamber about 60 ft. long, lined with masonry, the sides converging to form the roof. The objects found in it (a chariot, a bed, silver goblets with reliefs, rich gold ornaments, &c.) are now in the Etruscan Museum at the Vatican: they are attributed to about the middle of the 7th century B.C. At a short distance from the modern town on the west, thousands of votive terracottas were found in 1886, some representing divinities, others parts of the human body (*Notizie degli Scavi*, 1886, 38). They must have belonged to some temple.

See G. Dennis, *Cities and Cemeteries of Etruria*, i. 226 seq.; C. Hülsen in Pauly-Wissowa, *Realencyclopädie*, iii. 1281.

(T. As.)

CAERLEON, an ancient village in the southern parliamentary division of Monmouthshire, England, on the right (west) bank of the Usk, 3 m. N.E. of Newport. Pop. (1901) 1411. Its claim to notice rests on its Roman and British associations. As *Isca Silurum*, it was one of the three great legionary fortresses of Roman Britain, established either about A.D. 50 (Tacitus, *Annals*, xii. 32), or perhaps, as coin-finds suggest, about A.D. 74-78 in the governorship of Julius Frontinus, and in either case intended to coerce the wild Silures. It was garrisoned by the Legio II. Augusta from its foundation till near the end of the Roman rule in Britain. Though never seriously excavated, it contains plentiful visible traces of its Roman period—part of the ramparts, the site of an amphitheatre, and many inscriptions, sculptured stones, &c., in the local museum. No civil life or municipality seems, however, to have grown up outside its walls, as at York (*Eburācum*). Like Chester (see DEVA), it remained purely military, and the common notion that it was the seat of a Christian bishopric in the 4th century is unproved and improbable. Its later history is obscure. We do not know when the legion was finally withdrawn, nor what succeeded. But Welsh legend has made the site very famous with tales of Arthur (revived by Tennyson in his *Idylls*), of Christian martyrs, Aaron and Julius, and of an archbishopric held by St Dubric and shifted to St David's in the 6th century. Most of these traditions date from Geoffrey of Monmouth (about 1130-1140), and must not be taken for history. The ruins of Caerleon attracted notice in the 12th and following centuries, and gave plain cause for legend-making. There is better, but still slender, reason for the belief that it was here, and not at Chester, that five kings of the Cymry rowed Edgar in a barge as a sign of his sovereignty (A.D. 973). The name Caerleon seems to be derived from the Latin *Castra legionum*, but it is not peculiar to Caerleon-on-Usk, being often used of Chester and occasionally of Leicester and one or two other places.

(F. J. H.)

CAERPHILLY, a market town of Glamorganshire, Wales, 152¼ m. from London by rail *via* Cardiff, 7 m. from Cardiff, 12 m. from Newport and 6 m. from Pontypridd. The origin of the name is unknown. It was formerly in the ancient parish of Eglwysilan, but from that and Bedwas (Mon.) an ecclesiastical parish was formed in 1850, while the whole of the parishes of Eglwysilan and Llanfabon, with a total acreage of 14,426, were in 1893 constituted into an urban district; its population in 1901 was 15,385, of which 4343 were in the "town" ward. In 1858 was opened the Rhymney railway from Rhymney to Caerphilly and on to Taff's Well, whence it had running powers over the Taff Vale railway to Cardiff, but in 1871, by means of a tunnel about 2000 yds. long, under Cefn Onn, a direct line was provided from Caerphilly to Cardiff. A

branch line, 4 m. long, was opened in 1894 to Senghenydd. The Pontypridd and Newport railway was constructed in 1887, and there is a joint station at Caerphilly for both railways. Some 2 m. eastwards there is a station on the Brecon and Merthyr railway at Bedwas.

The ancient commote of Senghenydd (corresponding to the modern hundred of Caerphilly) comprised the mountainous district extending from the ridge of Cefn Onn on the south to Breconshire on the north, being bounded by the rivers Taff and Rumney on the west and east. Its inhabitants, though nominally subject to the lords of Glamorgan since Fitzhamon's conquest, enjoyed a large measure of independence and often raided the lowlands. To keep these in check, Gilbert de Clare, during the closing years of the reign of Henry III., built the castle of Caerphilly on the southern edge of this district, in a wide plain between the two rivers. It had probably not been completed, though it was already defensible, when Prince Llewelyn ab Griffith, incensed by its construction and claiming its site as his own, laid siege to it in 1271 and refused to retire except on conditions. Subsequently completed and strengthened it became and still remains (in the words of G.T. Clark) "both the earliest and the most complete example in Britain of a concentric castle of the type known as 'Edwardian', the circle of walls and towers of the outer, inner and middle wards exhibiting the most complete illustration of the most scientific military architecture". The knoll on which it stood was converted almost into an island by the damming up of an adjacent brook, and the whole enclosed area amounted to 30 acres. The great hall (which is 73 ft. by 35 ft. and about 30 ft. high) is a fine example of Decorated architecture. This and other additions are attributed to Hugh le Despenser (1318-1326). Edward II. visited the castle shortly before his capture in 1326. The defence of the castle was committed by Henry IV. to Constance, Lady Despenser, in September 1403, but it was shortly afterwards taken by Owen Glyndwr, to whose mining operations tradition ascribes the leaning position of a large
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circular tower, about 50 ft. high, the summit of which overhangs its base about 9 ft. Before the middle of the 15th century it had ceased to be a fortified residence and was used as a prison, which was also the case in the time of Leland (1535), who describes it as in a ruinous state. It is still, however, one of the most extensive and imposing ruins of the kind in the kingdom.

The town grew up around the castle but never received a charter or had a governing body. In 1661 the corporation of Cardiff complained of Cardiff's impoverishment by reason of a fair held every three weeks for the previous four years at Caerphilly, though "no Borough." Its markets during the 19th century had been chiefly noted for the Caerphilly cheese sold there. The district was one of the chief centres of the Methodist revival of the 18th century, the first synod of the Calvinistic Methodists being held in 1743 at Watford farm close to the town, from which place George Whitefield was married at Eglwysilan church two years previously. The church of St Martin was built in 1879, and there are Nonconformist chapels. Mining is now the chief industry of the district.

(D. Ll. T.)

CAESALPINUS (Cesalpino), **ANDREAS** (1519-1603), Italian natural philosopher, was born in Arezzo in Tuscany in 1519. He studied anatomy and medicine at the university of Pisa, where he took his doctor's degree in 1551, and in 1555 became professor materia medica and director of the botanical garden. Appointed physician to Pope Clement VIII., he removed in 1592 to Rome, where he died on the 23rd of February 1603. Caesalpinus was the most distinguished botanist of his time. His work, *De Plantis libri xvi.* (Florence, 1583), was not only the source from which various subsequent writers, and especially Robert Morison (1620-1683) derived their ideas of botanical arrangement but it was a mine of science to which Linnaeus himself gratefully avowed his obligations. Linnaeus's copy of the book evinces the great assiduity with which he studied it; he laboured throughout to remedy the defect of the want of synonyms, sub-joined his own generic names to nearly every species, and particularly indicated the two remarkable passages where the germination of plants and their sexual distinctions are explained. Caesalpinus was also distinguished as a physiologist, and it has been claimed that he had a clear idea of the circulation of the blood (see Harvey, William). His other works include *Daemonum investigatio peripatetica* (1580), *Quaestionum medicarum libri ii.* (1593), *De Metallicis* (1596), and *Quaestionum peripateticarum libri v.* (1571)

CAESAR, GAIUS JULIUS (102-44 B.C.), the great Roman soldier and statesman, was born on the 12th of July 102 B.C.[1] His family was of patrician rank and traced a legendary descent from Iulus, the founder of Alba Longa, son of Aeneas and grandson of Venus and Anchises. Caesar made the most of his divine ancestry and built a temple in his forum to Venus Genetrix; but his patrician descent was of little importance in politics and disqualified Caesar from holding the tribunate, an office to which, as a leader of the popular party, he would naturally have aspired. The Julii Caesares, however, had also acquired the new *nobilitas*, which belonged to holders of the great magistracies. Caesar's uncle was consul in 91 B.C., and his father held the praetorship. Most of the family seem to have belonged to the senatorial party (*optimates*); but Caesar himself was from the first a *popularis*. The determining factor is no doubt to be sought in his relationship with C. Marius, the husband of his aunt Julia. Caesar was born in the year of Marius's first great victory over the Teutones, and as he grew up, inspired by the traditions of the great soldier's career, attached himself to his party and its fortunes. Of his education we know scarcely anything. His mother, Aurelia, belonged to a distinguished family, and Tacitus (*Dial. de Orat.* xxviii.) couples her name with that of Cornelia, the mother of the Gracchi, as an example of the Roman matron whose *disciplina* and *severitas* formed her son for the duties of a soldier and statesman. His tutor was M. Antonius Gnipho, a native of Gaul (by which Cisalpine Gaul may be meant), who is said to have been equally learned in Greek and Latin literature, and to have set up in later years a school of rhetoric which was attended by Cicero in his praetorship 66 B.C. It is possible that Caesar may have derived from him his interest in Gaul and its people and his sympathy with the claims of the Romanized Gauls of northern Italy to political rights.

Early years.

In his sixteenth year (87 B.C.) Caesar lost his father, and assumed the *toga virilis* as the token of manhood. The social war (90-89 B.C.) had been brought to a close by the enfranchisement of Rome's Italian subjects; and the civil war which followed it led, after the departure of Sulla for the East, to the temporary triumph of the *populares*, led by Marius and Cinna, and the indiscriminate massacre of their political opponents, including both of Caesar's uncles. Caesar was at once marked out for high distinction, being created *flamen Dialis* or priest of Jupiter. In the following year (which saw the death of Marius) Caesar, rejecting a proposed marriage with a wealthy capitalist's heiress, sought and obtained the hand of Cornelia, the daughter of Cinna, and thus became further identified with the ruling party. His career was soon after interrupted by the triumphant return of Sulla (82 B.C.), who ordered him to divorce his wife, and on his

refusal deprived him of his property and priesthood and was induced to spare his life only by the intercession of his aristocratic relatives and the college of vestal virgins.

Released from his religious obligations, Caesar now (81 B.C.) left Rome for the East and served his first campaign under Minucius Thermus, who was engaged in stamping out the embers of resistance to Roman rule in the province of Asia, and received from him the "civic crown" for saving a fellow-soldier's life at the storm of Mytilene. In 78 B.C. he was serving under Servilius Isauricus against the Cilician pirates when the news of Sulla's death reached him and he at once returned to Rome. Refusing to entangle himself in the abortive and equivocal schemes of Lepidus to subvert the Sullan constitution, Caesar took up the only instrument of political warfare left to the opposition by prosecuting two senatorial governors, Cn. Cornelius Dolabella (in 77 B.C.) and C. Antonius (in 76 B.C.) for extortion in the provinces of Macedonia and Greece, and though he lost both cases, probably convinced the world at large of the corruption of the senatorial tribunals. After these failures Caesar determined to take no active part in politics for a time, and retraced his steps to the East in order to study rhetoric under Molon, at Rhodes. On the journey thither he was caught by pirates, whom he treated with consummate nonchalance while awaiting his ransom, threatening to return and crucify them; when released he lost no time in carrying out his threat. Whilst he was studying at Rhodes the third Mithradatic War broke out, and Caesar at once raised a corps of volunteers and helped to secure the wavering loyalty of the provincials of Asia. When Lucullus assumed the command of the Roman troops in Asia, Caesar returned to Rome, to find that he had been elected to a seat on the college of *pontifices* left vacant by the death of his uncle, C. Aurelius Cotta. He was likewise elected first of the six *tribuni militum a populo*, but we hear nothing of his service in this capacity. Suetonius tells us that he threw himself into the agitation for the restoration of the ancient powers of the tribunate curtailed by Sulla, and that he secured the passing of a law of amnesty in favour of the partisans of Sertorius. He was not, however, destined to compass the downfall of the Sullan *régime*; the crisis of the Slave War placed the Senate at the mercy of Pompey and Crassus, who in 70 B.C. swept away the safeguards of senatorial ascendancy, restored the initiative in legislation to the tribunes, and replaced the Equestrian order, *i.e.* the capitalists, in partial possession of the jury-courts. This judicial reform (or rather compromise) was the work of Caesar's uncle, L. Aurelius Cotta. Caesar himself, however, gained no accession of influence. In 69 B.C. he served as quaestor under Antistius Vetus, governor of Hither Spain, and on his way back to Rome (according to Suetonius) promoted a revolutionary agitation amongst the Transpadanes for the acquisition of full political rights, which had been denied them by Sulla's settlement.

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Opposition to the Optimates.

Caesar was now best known as a man of pleasure, celebrated for his debts and his intrigues; in politics he had no force behind him save that of the discredited party of the *populares*, reduced to lending a passive support to Pompey and Crassus. But as soon as the proved incompetence of the senatorial government had brought about the mission of Pompey to the East with the almost unlimited powers conferred on him by the Gabinian and Manilian laws of 67 and 66 B.C. (see Pompey), Caesar plunged into a network of political intrigues which it is no longer possible to unravel. In his public acts he lost no opportunity of upholding the democratic tradition. Already in 68 B.C. he had paraded the bust of Marius at his aunt's funeral; in 65 B.C., as curule aedile, he restored the trophies of Marius to their place on the Capitol; in 64 B.C., as president of the murder commission, he brought three of Sulla's executioners to trial, and in 63 B.C. he caused the ancient procedure of trial by popular assembly to be revived against the murderer of Saturninus. By these means, and by the lavishness of his expenditure on public entertainments as aedile, he acquired such popularity with the plebs that he was elected *pontifex maximus* in 63 B.C. against such distinguished rivals as Q. Lutatius Catulus and P. Servilius Isauricus. But all this was on the surface. There can be no doubt that Caesar was cognizant of some at least of the threads of conspiracy which were woven during Pompey's absence in the East. According to one story, the *enfants perdus* of the revolutionary party —Catiline, Autronius and others—designed to assassinate the consuls on the 1st of January 65, and make Crassus dictator, with Caesar as master of the horse. We are also told that a public proposal was made to confer upon him an extraordinary military command in Egypt, not without a legitimate king and nominally under the protection of Rome. An equally abortive attempt to create a counterpoise to Pompey's power was made by the tribune Rullus at the close of 64 B.C. He proposed to create a land commission with very wide powers, which would in effect have been wielded by Caesar and Crassus. The bill was defeated by Cicero, consul in 63 B.C. In the same year the conspiracy associated with the name of Catiline came to a head. The charge of complicity was freely levelled at Caesar, and indeed was hinted at by Cato in the great debate in the senate. But Caesar, for party reasons, was bound to oppose the execution of the conspirators; while Crassus, who shared in the accusation, was the richest man in Rome and the least likely to further anarchist plots. Both, however, doubtless knew as much and as little as suited their convenience of the doings of the left wing of their party, which served to aggravate the embarrassments of the government.

As praetor (62 B.C.) Caesar supported proposals in Pompey's favour which brought him into violent collision with the senate. This was a master-stroke of tactics, as Pompey's return was imminent. Thus when Pompey landed in Italy and disbanded his army he found in Caesar a natural ally. After some delay, said to have been caused by the exigencies of his creditors, which were met by a loan of £200,000 from Crassus, Caesar left Rome for his province of Further Spain, where he was able to retrieve his financial position, and to lay the foundations of a military reputation. He returned to Rome in 60 B.C. to find that the senate had sacrificed the support of the capitalists (which Cicero had worked so hard to secure), and had finally alienated Pompey by refusing to ratify his acts and grant lands to his soldiers. Caesar at once approached both Pompey and Crassus, who alike detested the existing system of government but were personally at variance, and succeeded in persuading them to forget their quarrel and join him in a coalition which should put an end to the rule of the oligarchy. He even made a generous, though unsuccessful, endeavour to enlist the support of Cicero. The so-called First Triumvirate was formed, and constitutional government ceased to exist save in name.

Coalition with Pompey and Crassus.

The first prize which fell to Caesar was the consulship, to secure which he forewent the triumph which he had earned in Spain. His colleague was M. Bibulus, who belonged to the straitest sect of the senatorial oligarchy and, together with his party, placed every form of constitutional obstruction in the path of Caesar's legislation. Caesar, however, overrode all opposition, mustering Pompey's veterans to drive his colleague from the forum. Bibulus became a virtual prisoner in his own house, and Caesar placed himself outside the pale of the free republic. Thus the programme of the coalition was carried through. Pompey

was satisfied by the ratification of his acts in Asia, and by the assignment of the Campanian state domains to his veterans, the capitalists (with whose interests Crassus was identified) had their bargain for the farming of the Asiatic revenues cancelled, Ptolemy Auletes received the confirmation of his title to the throne of Egypt (for a consideration amounting to £1,500,000), and a fresh act was passed for preventing extortion by provincial governors.

Gallic wars.

It was now all-important for Caesar to secure practical irresponsibility by obtaining a military command. The senate, in virtue of its constitutional prerogative, had assigned as the *provincia* of the consuls of 59 B.C. the supervision of roads and forests in Italy. Caesar secured the passing of a legislative enactment conferring upon himself the government of Cisalpine Gaul and Illyria for five years, and exacted from the terrorized senate the addition of Transalpine Gaul, where, as he well knew, a storm was brewing which threatened to sweep away Roman civilization beyond the Alps. The mutual jealousies of the Gallic tribes had enabled German invaders first to gain a foothold on the left bank of the Rhine, and then to obtain a predominant position in Central Gaul. In 60 B.C. the German king Ariovistus had defeated the Aedui, who were allies of Rome, and had wrested from the Sequani a large portion of their territory. Caesar must have seen that the Germans were preparing to dispute with Rome the mastery of Gaul; but it was necessary to gain time, and in 59 B.C. Ariovistus was inscribed on the roll of the friends of the Roman people. In 58 B.C. the Helvetii, a Celtic people inhabiting Switzerland, determined to migrate for the shores of the Atlantic and demanded a passage through Roman territory. According to Caesar's statement they numbered 368,000, and it was necessary at all hazards to save the Roman province from the invasion. Caesar had but one legion beyond the Alps. With this he marched to Geneva, destroyed the bridge over the Rhone, fortified the left bank of the river, and forced the Helvetii to follow the right bank. Hastening back to Italy he withdrew his three remaining legions from Aquileia, raised two more, and, crossing the Alps by forced marches, arrived in the neighbourhood of Lyons to find that three-fourths of the Helvetii had already crossed the Saône, marching westward. He destroyed their rearguard, the Tigurini, as it was about to cross, transported his army across the river in twenty-four hours, pursued the Helvetii in a northerly direction, and utterly defeated them at Bibracte (Mont Beuvray). Of the survivors a few were settled amongst the Aedui; the rest were sent back to Switzerland lest it should fall into German hands.

The Gallic chiefs now appealed to Caesar to deliver them from the actual or threatened tyranny of Ariovistus. He at once demanded a conference, which Ariovistus refused, and on hearing that fresh swarms were crossing the Rhine, marched with all haste to Vesontio (Besançon) and thence by way of Belfort into the plain of Alsace, where he gained a decisive victory over the Germans, of whom only a few (including Ariovistus) reached the right bank of the Rhine in safety. These successes roused natural alarm in the minds of the Belgae—a confederacy of tribes in the north-west of Gaul, whose civilization was less advanced than that of the Celtae of the centre—and in the spring of 57 B.C. Caesar determined to anticipate the offensive movement which they were understood to be preparing and marched northwards into the territory of the Remī (about Reims), who alone amongst their neighbours were friendly to Rome. He successfully checked the advance of the enemy at the passage of the Aisne (between Laon and Reims) and their ill-organized force melted away as he advanced. But the Nervii, and their neighbours further to
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the north-west, remained to be dealt with, and were crushed only after a desperate struggle on the banks of the Sambre, in which Caesar was forced to expose his person in the *mêlée*. Finally, the Aduatuci (near Namur) were compelled to submit, and were punished for their subsequent treachery by being sold wholesale into slavery. In the meantime Caesar's lieutenant, P. Crassus, received the submission of the tribes of the north-east, so that by the close of the campaign almost the whole of Gaul—except the Aquitani in the south-west—acknowledged Roman suzerainty.

In 56 B.C., however, the Veneti of Brittany threw off the yoke and detained two of Crassus's officers as hostages. Caesar, who had been hastily summoned from Illyricum, crossed the Loire and invaded Brittany, but found that he could make no headway without destroying the powerful fleet of high, flat-bottomed boats like floating castles possessed by the Veneti. A fleet was hastily constructed in the estuary of the Loire, and placed under the command of Decimus Brutus. The decisive engagement was fought (probably) in the Gulf of Morbihan and the Romans gained the victory by cutting down the enemy's rigging with sickles attached to poles. As a punishment for their treachery, Caesar put to death the senate of the Veneti and sold their people into slavery. Meanwhile Sabinus was victorious on the northern coasts, and Crassus subdued the Aquitani. At the close of the season Caesar raided the territories of the Morini and Menapii in the extreme north-west.

Expeditions to Britain

In 55 B.C. certain German tribes, the Usipetes and Tencteri, crossed the lower Rhine, and invaded the modern Flanders. Caesar at once marched to meet them, and, on the pretext that they had violated a truce, seized their leaders who had come to parley with him, and then surprised and practically destroyed their host. His enemies in Rome accused him of treachery, and Cato even proposed that he should be handed over to the Germans. Caesar meanwhile constructed his famous bridge over the Rhine in ten days, and made a demonstration of force on the right bank. In the remaining weeks of the summer he made his first expedition to Britain, and this was followed by a second crossing in 54 B.C. On the first occasion Caesar took with him only two legions, and effected little beyond a landing on the coast of Kent. The second expedition consisted of five legions and 2000 cavalry, and set out from the Portus Itius (Boulogne or Wissant; see T. Rice Holmes, *Ancient Britain and the Invasions of Julius Caesar*, 1907, later views in *Classical Review*, May 1909, and H.S. Jones, in *Eng. Hist. Rev.* xxiv., 1909, p. 115). Caesar now penetrated into Middlesex and crossed the Thames, but the British prince Cassivellaunus with his war-chariots harassed the Roman columns, and Caesar was compelled to return to Gaul after imposing a tribute which was never paid.

The next two years witnessed the final struggle of the Gauls for freedom. Just before the second crossing to Britain, Dumnorix, an Aeduan chief, had been detected in treasonable intrigues, and killed in an attempt to escape from Caesar's camp. At the close of the campaign Caesar distributed his legions over a somewhat wide extent of territory. Two of their camps were treacherously attacked. At Aduatuca (near Aix-la-Chapelle) a newly-raised legion was cut to pieces by the Eburones under Ambiorix, while Quintus Cicero was besieged in the neighbourhood of Namur and only just relieved in time by Caesar, who was obliged to winter in Gaul in order to check the spread of the rebellion. Indutiomarus, indeed, chief of the Treveri (about Trèves), revolted and attacked Labienus, but was defeated and killed. The campaign of 53 B.C. was marked by a second crossing of the Rhine and by the destruction of the Eburones, whose leader

Ambiorix, however, escaped. In the autumn Caesar held a conference at Durocortorum (Reims), and Acco, a chief of the Senones, was convicted of treason and flogged to death.

Early in 52 B.C. some Roman traders were massacred at Cenabum (Orléans), and, on hearing the news, the Arverni revolted under Vercingetorix and were quickly joined by other tribes, especially the Bituriges, whose capital was Avaricum (Bourges). Caesar hastened back from Italy, slipped past Vercingetorix and reached Agedincum (Sens), the headquarters of his legions. Vercingetorix saw that Caesar could not be met in open battle, and determined to concentrate his forces in a few strong positions. Caesar first besieged and took Avaricum, whose occupants were massacred, and then invested Gergovia (near the Puy-de-Dôme), the capital of the Arverni, but suffered a severe repulse and was forced to raise the siege. Hearing that the Roman province was threatened, he marched westward, defeated Vercingetorix near Dijon and shut him up in Alesia (Mont-Auxois), which he surrounded with lines of circumvallation. An attempt at relief by Vercassivellaunus was defeated after a desperate struggle and Vercingetorix surrendered. The struggle was over except for some isolated operations in 51 B.C., ending with the siege and capture of Uxellodunum (Puy d'Issolu), whose defenders had their hands cut off. Caesar now reduced Gaul to the form of a province, fixing the tribute at 40,000,000 sesterces (£350,000), and dealing liberally with the conquered tribes, whose cantons were not broken up.

Break-up of the Coalition.

In the meantime his own position was becoming critical. In 56 B.C., at the conference of Luca (Lucca), Caesar, Pompey and Crassus had renewed their agreement, and Caesar's command in Gaul, which would have expired on the 1st of March 54 B.C., was renewed, probably for five years, *i.e.* to the 1st of March 49 B.C., and it was enacted that the question of his successor should not be discussed until the 1st of March 50 B.C., by which time the provincial commands for 49 B.C. would have been assigned, so that Caesar would retain *imperium*, and thus immunity from persecution, until the end of 49 B.C. He was to be elected consul for 48 B.C., and, as the law prescribed a personal canvass, he was by special enactment dispensed from its provisions. But in 54 B.C. Julia, the daughter of Caesar and wife of Pompey, died, and in 53 B.C. Crassus was killed at Carrhae. Pompey now drifted apart from Caesar and became the champion of the senate. In 52 B.C. he passed a fresh law *de jure magistratuum* which cut away the ground beneath Caesar's feet by making it possible to provide a successor to the Gallic provinces before the close of 49 B.C., which meant that Caesar would become for some months a private person, and thus liable to be called to account for his unconstitutional acts. Caesar had no resource left but uncompromising obstruction, which he sustained by enormous bribes. His representative in 50 B.C., the tribune C. Scribonius Curio, served him well, and induced the lukewarm majority of the senate to refrain from extreme measures, insisting that Pompey, as well as Caesar, should resign the *imperium*. But all attempts at negotiation failed, and in January 49 B.C., martial law having been proclaimed on the proposal of the consuls, the tribunes Antony and Cassius fled to Caesar, who crossed the Rubicon (the frontier of Italy) with a single legion, exclaiming "*Alea jacta est.*"

The Civil war

Pompey's available force consisted in two legions stationed in Campania, and eight, commanded by his lieutenants, Afranius and Petreius, in Spain; both sides levied troops in Italy. Caesar was soon joined by two legions from Gaul and marched rapidly down the Adriatic coast, overtaking Pompey at Brundisium (Brindisi), but failing to prevent him from embarking with his troops for the East, where the prestige of his name was greatest. Hereupon Caesar (it is said) exclaimed "I am going to Spain to fight an army without a general, and thence to the East to fight a general without an army." He carried out the first part of this programme with marvellous rapidity. He reached Ilerda (Lerida) on the 23rd of June and, after extricating his army from a perilous situation, outmanœuvred Pompey's lieutenants and received their submission on the 2nd of August. Returning to Rome, he held the dictatorship for eleven days, was elected consul for 48 B.C., and set sail for Epirus at Brundisium on the 4th of January. He attempted to invest Pompey's lines at Dyrrhachium (Durazzo), though his opponent's force was double that of his own, and was defeated with considerable loss. He now marched eastwards, in order if possible to intercept the reinforcements which Pompeys father-in-law, Scipio, was bringing up; but Pompey was able to effect a junction with this force and descended into the plain of Thessaly, where at the battle of Pharsalus he was decisively defeated and fled to Egypt, pursued by Caesar, who learnt of his rival's murder on landing at Alexandria. Here he remained for nine months, fascinated (if the story be true) by Cleopatra, and almost lost his life in an *émeute*. In June 47 B.C. he proceeded to the East and Asia Minor, where he "came, saw and conquered" Pharnaces, son of Mithradates the Great, at Zela. Returning to Italy, he quelled a mutiny of the legions (including the faithful Tenth) in Campania, and crossed to Africa, where a republican army of fourteen legions under Scipio was cut to pieces at Thapsus (6th of April 46 B.C.). Here most of the republican leaders were killed and Cato committed suicide. On the 26th to 29th July Caesar celebrated a fourfold triumph and received the dictatorship for ten years. In November, however, he was obliged to sail for Spain, where the sons of Pompey still held out. On the 17th of March 45 B.C. they were crushed at Munda. Caesar returned to Rome in September, and six months later (15th of March 44 B.C.) was murdered in the senate house at the foot of Pompey's statue.

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Caesar's dictatorship

It was remarked by Seneca that amongst the murderers of Caesar were to be found more of his friends than of his enemies. We can account for this only by emphasizing the fact that the form of Caesar's government became as time went on more undisguised in its absolutism, while the honours conferred upon seemed designed to raise him above the rest of humanity. It is explained elsewhere (see Rome: *History, Ancient*) that Caesar's power was exercised under the form of dictatorship. In the first instance (autumn of 49 B.C.) this was conferred upon him as the only solution of the constitutional deadlock created by the flight of the magistrates and senate, in order that elections (including that of Caesar himself to the consulship) might be held in due course. For this there were republican precedents. In 48 B.C. he was created dictator for the second time, probably with constituent powers and for an undefined period, according to the dangerous and unpopular precedent of Sulla. In May 46 B.C. a third dictatorship was conferred on Caesar, this time for ten years and apparently as a yearly office, so that he became Dictator IV. in May 45 B.C. Finally, before the 15th of February 44 B.C., this was exchanged for a life-dictatorship. Not only was this a contradiction in terms, since the dictatorship was by tradition a makeshift justified only when the state had to be carried through a serious crisis, but it involved military rule in Italy and the permanent suspension of the constitutional guarantees, such as *intercessio* and *provocatio*, by which the liberties of Romans were protected. That Caesar held the *imperium* which he enjoyed as dictator to be distinct in kind from that of the republican magistrates he indicated by placing the term *imperator* at the head of his titles.[2] Besides the dictatorship,

Caesar held the consulship in each year of his reign except 47 B.C. (when no curule magistrates were elected save for the last three months of the year); and he was moreover invested by special enactments with a number of other privileges and powers; of these the most important was the *tribunicia potestas*, which we may believe to have been free from the limits of place (*i.e.* Rome) and collegiality. Thus, too, he was granted the sole right of making peace and war, and of disposing of the funds in the treasury of the state.[3] Save for the title of dictator, which undoubtedly carried unpopular associations and was formally abolished on the proposal of Antony after Caesar's death, this cumulation of powers has little to distinguish it from the Principate of Augustus; and the assumption of the perpetual dictatorship would hardly by itself suffice to account for the murder of Caesar. But there are signs that in the last six months of his life he aspired not only to a monarchy in name as well as in fact, but also to a divinity which Romans should acknowledge as well as Greeks, Orientals and barbarians. His statue was set up beside those of the seven kings of Rome, and he adopted the throne of gold, the sceptre of ivory and the embroidered robe which tradition ascribed to them. He allowed his supporters to suggest the offer of the regal title by putting in circulation an oracle according to which it was destined for a king of Rome to subdue the Parthians, and when at the Lupercalia (15th February 44 B.C.) Antony set the diadem on his head he rejected the offer half-heartedly on account of the groans of the people. His image was carried in the *pompa circensis* amongst those of the immortal gods, and his statue set up in the temple of Quirinus with the inscription "To the Unconquerable God." A college of Luperci, with the surname Juliani, was instituted in his honour and *flamines* were created as priests of his godhead. This was intolerable to the aristocratic republicans, to whom it seemed becoming that victorious commanders should accept divine honours at the hands of Greeks and Asiatics, but unpardonable that Romans should offer the same worship to a Roman.

Legislative reforms.

Thus Caesar's work remained unfinished, and this must be borne in mind in considering his record of legislative and administrative reform. Some account of this is given elsewhere (see Rome: *History, Ancient*), but it may be well to single out from the list of his measures (some of which, such as the restoration of exiles and the children of proscribed persons, were dictated by political expediency, while others, such as his financial proposals for the relief of debtors, and the steps which he took to restore Italian agriculture, were of the nature of palliatives) those which have a permanent significance as indicating his grasp of imperial problems. The Social War had brought to the inhabitants of Italy as far as the Po the privileges of Roman citizenship; it remained to extend this gift to the Transpadane Italians, to establish a uniform system of local administration and to devise representative institutions by which at least some voice in the government of Rome might be permitted to her new citizens. This last conception lay beyond the horizon of Caesar, as of all ancient statesmen, but his first act on gaining control of Italy was to enfranchise the Transpadanes, whose claims he had consistently advocated, and in 45 B.C. he passed the *Lex Julia Municipalis*, an act of which considerable fragments are inscribed on two bronze tables found at Heraclea near Tarentum.[4] This law deals *inter alia* with the police and the sanitary arrangements of the city of Rome, and hence it has been argued by Mommsen that it was Caesar's intention to reduce Rome to the level of a municipal town. But it is not likely that such is the case. Caesar made no far-reaching modifications in the government of the city, such as were afterwards carried out by Augustus, and the presence in the *Lex Julia Municipalis* of the clauses referred to is an example of the common process of "tacking" (legislation *per saturam*, as it was called by the Romans). The law deals with the constitution of the local senates, for whose members qualifications of age (30 years) and military service are laid down, while persons who have suffered conviction for various specified offences, or who are insolvent, or who carry on discreditable or immoral trades are excluded. It also provides that the local magistrates shall take a census of the citizens at the same time as the census takes place in Rome, and send the registers to Rome within sixty days. The existing fragments tell us little as to the decentralization of the functions of government, but from the *Lex Rubria*, which applies to the Transpadane districts enfranchised by Caesar (it must be remembered that Cisalpine Gaul remained nominally a province until 42 B.C.) we gather that considerable powers of independent jurisdiction were reserved to the municipal magistrates. But Caesar was not content with framing a uniform system of local government for Italy. He was the first to carry out on a large scale those plans of transmarine colonization whose inception was due to the Gracchi. As consul in 59 B.C. Caesar had established colonies of veterans in Campania under the *Lex Julia Agraria*, and had even then laid down rules for the foundation of such communities. As dictator he planted numerous colonies both in the eastern and western provinces, notably at Corinth and Carthage. Mommsen interprets this policy as signifying that "the rule of the urban community of Rome over the shores of the Mediterranean was at an end," and says that the first act of the "new Mediterranean state" was "to atone for the two greatest outrages which that urban community had perpetrated on civilization." This, however, cannot be admitted. The sites of Caesar's colonies were selected for their commercial value, and that the citizens of Rome should cease to be rulers of the Mediterranean basin could never have entered into Caesar's mind. The colonists were in many cases veterans who had served under Caesar, in others members of the city proletariat. We possess the charter of the colony planted at Urso in southern Spain under the name of *Colonia Julia Genetiva Urbanorum*. Of the two latter titles, the first is derived from the name of Venus Genetrix, the ancestress of the Julian house, the second indicates that the colonists were drawn from the *plebs urbana*. Accordingly, we find that free birth is not, as in Italy, a necessary qualification for municipal office. By such foundations Caesar began the extension to the provinces of that Roman civilization which the republic had carried to the bounds of the Italian peninsula. Lack of time alone prevented him from carrying into effect such projects as the piercing of the Isthmus of Corinth, whose object was to promote trade and intercourse throughout the Roman dominions, and we are told that at the time of his death he was contemplating the extension of the empire to its natural frontiers, and was about to engage in a war with Parthia with the object of carrying Roman arms to the Euphrates. Above all, he was determined that the empire should be governed in the true sense of the word and no longer exploited by its rulers, and he kept a strict control over the *legati*, who, under the form of military subordination, were responsible to him for the administration of their provinces.

Colonies.

The Commentaries.

Caesar's writings are treated under Latin Literature. It is sufficient here to say that of those preserved to us the seven books *Commentarii de bello Gallico* appear to have been written in 51 B.C. and carry the narrative of the Gallic campaigns down to the close of the previous year (the eighth book, written by A. Hirtius, is a supplement relating the events of 51-50 B.C.), while the three books *De bello civili* record the struggle between Caesar and Pompey (49-48 B.C.). Their veracity was impeached in ancient times by Asinius Pollio and has often been called in

question by modern critics. The *Gallic War*, though its publication was doubtless timed to impress on the mind of the Roman people the great services rendered by Caesar to Rome, stands the test of criticism as far as it is possible to apply it, and the accuracy of its narrative has never been seriously shaken. The *Civil War*, especially in its opening chapters is, however, not altogether free from traces of misrepresentation. With respect to the first moves made in the struggle, and the negotiations for peace at the outset of hostilities, Caesar's account sometimes conflicts with the testimony of Cicero's correspondence or implies movements which cannot be reconciled with geographical facts. We have but few fragments of Caesar's other works, whether political pamphlets such as the *Anticato*, grammatical treatises (*De Analogia*) or poems. All authorities agree in describing him as a consummate orator. Cicero (*Brut. 22*) wrote: *de Caesare ita judico, illum omnium fere oratorum Latine loqui elegantissime*, while Quintilian (x. i. 114) says that had he practised at the bar he would have been the only serious rival of Cicero.

Character.

The verdict of historians on Caesar has always been coloured by their political sympathies. All have recognised his commanding genius, and few have failed to do justice to his personal charm and magnanimity, which almost won the heart of Cicero, who rarely appealed in vain to his clemency. Indeed, he was singularly tolerant of all but intellectual opposition. His private life was not free from scandal, especially in his youth, but it is difficult to believe the worst of the tales which were circulated by his opponents, *e.g.* as to his relations with Nicomedes of Bithynia. As to his public character, however, no agreement is possible between those who regard Caesarism as a great political creation, and those who hold that Caesar by destroying liberty lost a great opportunity and crushed the sense of dignity in mankind. The latter view is unfortunately confirmed by the undoubted fact that Caesar treated with scant respect the historical institutions of Rome, which with their magnificent traditions might still have been the organs of true political life. He increased the number of senators to 900 and introduced provincials into that body; but instead of making it into a grand council of the empire, representative of its various races and nationalities, he treated it with studied contempt, and Cicero writes that his own name had been set down as the proposer of decrees of which he knew nothing, conferring the title of king on potentates of whom he had never heard. A similar treatment was meted out to the ancient magistracies of the republic; and thus began the process by which the emperors undermined the self-respect of their subjects and eventually came to rule over a nation of slaves. Few men, indeed, have partaken as freely of the inspiration of genius as Julius Caesar; few have suffered more disastrously from its illusions. See further Rome: *History*, ii. "The Republic," Period C *ad fin.*

Authorities.—The principal ancient authorities for the life of Caesar are his own *Commentaries*, the biographies of Plutarch and Suetonius, letters and speeches of Cicero, the *Catiline* of Sallust, the *Pharsalia* of Lucan, and the histories of Appian, Dio Cassius and Velleius Paterculus (that of Livy exists only in the *Epitome*). Amongst modern works may be named the exhaustive repertory of fact contained in Drumann, *Geschichte Roms*, vol. iii. (new ed. by Groebe, 1906, pp. 125-829), and the brilliant but partial panegyric of Th. Mommsen in his *History of Rome* (Eng. trans., vol. iv., esp. p. 450 ff.). J.A. Froude's *Caesar; a Sketch* (2nd ed., 1896) is equally biased and much less critical. W. Warde Fowler's *Julius Caesar* (1892) gives a favourable account (see also his *Social Life at Rome*, 1909). On the other side see especially A. Holm, *History of Greece* (Eng. trans., vol. iv. p. 582 ff.), J.L. Strachan Davidson, *Cicero* (1894), p. 345 ff., and the introductory Lections in Prof. Tyrrell's edition of the *Correspondence of Cicero*, particularly "Cicero's case against Caesar," vol. v. p. 13 ff. Vol. ii. of G. Ferrero's *Greatness and Decline of Rome* (Eng. trans., 1907) is largely devoted to Caesar, but must be used with caution. The Gallic campaigns have been treated by Napoleon III., *Histoire de Jules César* (1865-1866), which is valuable as giving the result of excavations, and in English by T. Rice Holmes, *Caesar's Conquest of Gaul* (1901), in which references to earlier literature will be found. A later account is that of G. Veith, *Geschichte der Feldzüge C. Julius Caesars* (1906). For maps see A. von Kampen. For the Civil War see Colonel Stoffel (the collaborator of Napoleon III.), *Histoire de Jules César: guerre civile* (1887). There is an interesting article, "The Likenesses of Julius Caesar," by J.C. Ropes, in *Scribner's Magazine*, Feb. 1887, with 18 plates.

(H. S. J.)

Medieval Legends.

In the middle ages the story of Caesar did not undergo such extraordinary transformations as befell the history of Alexander the Great and the Theban legend. Lucan was regularly read in medieval schools, and the general facts of Caesar's life were too well known. He was generally, by a curious error, regarded as the first emperor of Rome,[5] and representing as he did in the popular mind the glory of Rome, by an easy transition he became a pillar of the Church. Thus, in a French pseudo-historic romance, *Les Faits des Romains* (c. 1223), he receives the honour of a bishopric. His name was not usually associated with the marvellous, and the *trouvère* of *Huon de Bordeaux* outstepped the usual sober tradition when he made Oberon the son of Julius Caesar and Morgan la Fay. About 1240 Jehan de Tuim composed a prose *Hystore de Julius Cesar* (ed. F. Settegast, Halle, 1881) based on the *Pharsalia* of Lucan, and the *commentaries* of Caesar (on the Civil War) and his continuators (on the Alexandrine, African and Spanish wars). The author gives a romantic description of the meeting with Cleopatra, with an interpolated dissertation on *amour courtois* as understood by the *trouvères*. The *Hystore* was turned into verse (alexandrines) by Jacot de Forest (latter part of the 13th century) under the title of *Roman de Julius César*. A prose compilation by an unknown author, *Les Fails des Romains* (*c.* 1225), has little resemblance to the last two works, although mainly derived from the same sources. It was originally intended to contain a history of the twelve Caesars, but concluded with the murder of the dictator, and in some MSS. bears the title of *Li livres de César*. Its popularity is proved by the numerous MSS. in which it is preserved and by three separate translations into Italian. A *Mistaire de Julius César* is said to have been represented at Amboise in 1500 before Louis XII.

[v.04 p.0943]

See A. Graf, *Roma nella memoria e nella imaginazione del medio evo*, i. ch. 8 (1882-1883); P. Meyer in *Romania*, xiv. (Paris, 1885), where the *Faits des Romains* is analysed at length; A. Duval in *Histoire littéraire de la France*, xix. (1838); L. Constans in Petit de Julleville's' *Hist. de la langue et de la litt. française*, i. (1896); H. Wesemann, *Die Cäsarfabeln des Mittelalters* (Löwenberg, 1879).

(M. Br.)

[1] In spite of the explicit statements of Suetonius, Plutarch and Appian that Caesar was in his fifty-sixth year at the time of his murder, it is, as Mommsen has shown, practically certain that he

was born in 102 B.C., since he held the chief offices of state in regular order, beginning with the aedileship in 65 B.C., and the legal age for this was fixed at 37-38.

[2] Suetonius, *Jul.* 76, errs in stating that he used the title *imperator* as a *praenomen*.

[3] The statement of Dio and Suetonius, that a general *cura legum et morum* was conferred on Caesar in 46 B.C., is rejected by Mommsen. It is possible that it may have some foundation in the terms of the law establishing his third dictatorship.

[4] Since the discovery of a fragmentary municipal charter at Tarentum (see ROME), dating from a period shortly after the Social War, doubts have been cast on the identification of the tables of Heraclea with Caesar's municipal statute. It has been questioned whether Caesar passed such a law, since the *Lex Julia Municipalis* mentioned in an inscription of Patavium (Padua) may have been a local charter. See Legras, *La Table latine d'Héraclée* (Paris, 1907).

[5] Brunetto Latini, *Trésor*: "*Et ainsi Julius César fu li premiers empereres des Romains.*"

CAESAR, SIR JULIUS (1557-1558-1636), English judge, descended by the female line from the dukes de' Cesarini in Italy, was born near Tottenham in Middlesex. He was educated at Magdalen Hall, Oxford, and afterwards studied at the university of Paris, where in the year 1581 he was made a doctor of the civil law. Two years later he was admitted to the same degree at Oxford, and also became doctor of the canon law. He held many high offices during the reigns of Elizabeth and James I., including a judgeship of the admiralty court (1584), a mastership in chancery (1588), a mastership of the court of requests (1595), chancellor and under treasurer of the exchequer (1606). He was knighted by King James in 1603, and in 1614 was appointed master of the rolls, an office which he held till his death on the 18th of April 1636, He was so remarkable for his bounty and charity to all persons of worth that it was said of him that he seemed to be the almoner-general of the nation. His manuscripts, many of which are now in the British Museum, were sold by auction in 1757 for upwards of £500.

See E. Lodge, *Life of Sir Julius Caesar* (1810); Wood, *Fasti Oxonienses*, ed. Bliss; Foss, *Lives of the Judges*.

CAESAREA MAZACA (mod. *Kaisarieh*), chief town of a sanjak in the Angora vilayet of Asia Minor. Mazaca, the residence of the kings of Cappadocia, later called *Eusebea* (perhaps after Ariarathes Eusebes), and named *Caesarea* probably by Claudius, stood on a low spur on the north side of Erjies Dagh (*M. Argaeus*). The site, now called *Eski-shehr*, shows only a few traces of the old town. It was taken by Tigranes and destroyed by the Persian king Shapur (Sapor) I. after his defeat of Valerian in A.D. 260. At this time it is stated to have contained 400,000 inhabitants. In the 4th century Basil, when bishop, established an ecclesiastical centre on the plain, about 1 m. to the north-east, and this gradually supplanted the old town. A portion of Basil's new city was surrounded with strong walls and turned into a fortress by Justinian; and within the walls, rebuilt in the 13th and 16th centuries, lies the greater part of Kaisarieh, altitude 3500 ft. The town was captured by the Seljuk sultan, Alp Arslan, 1064, and by the Mongols, 1243, before passing to the Osmanli Turks. Its geographical situation has made it a place of commercial importance throughout history. It lay on the ancient trade route from Sinope to the Euphrates, on the Persian "Royal Road" from Sardis to Susa, and on the great Roman highway from Ephesus to the East. It is still the most important trade centre in eastern Asia Minor. The town is noted for its fruit, especially its vines; and it exports tissues, carpets, hides, yellow berries and dried fruit. Kaisarieh is the headquarters of the American mission in Cappadocia, which has several churches and schools for boys and girls and does splendid medical work. It is the seat of a Greek bishop, an Armenian archbishop and a Roman Catholic bishop, and there is a Jesuit school. On the 30th of November 1895 there was a massacre of Armenians, in which several Gregorian priests and Protestant pastors lost their lives. Pop., according to Cuinet, 71,000 (of whom 26,000 are Christians). Sir C. Wilson gave it as 50,000 (23,000 Christians).

(C. W. W.; J. G. C. A.)

CAESAREAN SECTION, in obstetrics (*q.v.*) the operation for removal of a foetus from the uterus by an abdominal incision, so called from a legend of its employment at the birth of Julius Caesar. This procedure has been practised on the dead mother since very early times; in fact it was prescribed by Roman law that every woman dying in advanced pregnancy should be so treated; and in 1608 the senate of Venice enacted that any practitioner who failed to perform this operation on a pregnant woman supposed to be dead, laid himself open to very heavy penalties. But the first recorded instance of its being performed on a living woman occurred about 1500, when a Swiss pig-gelder operated on his own wife. From this time onwards it was tried in many ways and under many conditions, but almost invariably with the same result, the death of the mother. Even as recently as the first half of the 19th century the recorded mortality is over 50%. Thus it is no surprise that craniotomy—in which the life of the child is sacrificed to save that of the mother—was almost invariably preferred. As the use of antiseptics was not then understood, and as it was customary to return the uterus to the body cavity without suturing the incision, the immediate cause of death was either septicaemia or haemorrhage. But in 1882 Sänger published his method of suturing the uterus—that of employing two series of sutures, one deep, the other superficial. This method of procedure was immediately adopted by many obstetricians, and it has proved so satisfactory that it is still in use today. This, and the increasing knowledge of aseptic technique, has brought the mortality from this operation to less than 3% for the mother and about 5% for the child; and every year it is being advised more freely for a larger number of morbid conditions, and with increasingly favourable results. Craniotomy, *i.e.* crushing the head of the foetus to reduce its size, is now very rarely performed on the living child, but symphysiotomy, *i.e.* the division of the symphysis pubis to produce a temporary enlargement of the pelvis, or caesarean section, is advocated in its place. Of these two operations, symphysiotomy is steadily being replaced by caesarean section.

This operation is now advised for (1) extreme degrees of pelvic contraction, (2) any malformation or tumour of the uterus, cervix or vagina, which would render the birth of the child through the natural passages impossible, (3) maternal complications, as eclampsia and concealed accidental haemorrhage, and (4) at the death of the mother for the purpose of saving the child.

CAESAREA PALAESTINA, a town built by Herod about 25-13 B.C., on the sea-coast of Palestine, 30 miles N. of Joppa, on the site of a place previously called *Tunis Stratonis*. Remains of all the principal buildings erected by Herod existed down to the end of the 19th century; the ruins were much injured by a colony of Bosnians established here in 1884. These buildings are a temple, dedicated to Caesar; a theatre; a

hippodrome; two aqueducts; a boundary wall; and, chief of all, a gigantic mole, 200 ft. wide, built of stones 50 ft. long, in 20 fathoms of water, protecting the harbour on the south and west. The harbour measures 180 yds. across. The massacre of Jews at this place led to the Jewish rebellion and to the Roman war. Vespasian made it a colony and called it Flavia: the old name, however, persisted, and still survives as *Kaisarieh*. Eusebius was archbishop here (A.D. 315-318). It was captured by the Moslems in 638 and by the Crusaders in 1102, by Saladin in 1187, recaptured by the Crusaders in 1191, and finally lost by them in 1265, since when till its recent settlement it has lain in ruins. Remains of the medieval town are also visible, consisting of the walls (one-tenth the area of the Roman city), the castle, the cathedral (now covered by modern houses), and a church.

(R. A. S. M.)

CAESAREA PHILIPPI, the name of a town 95 miles N. of Jerusalem, 35 miles S.W. from Damascus, 1150 ft. above the sea, on the south base of Hermon, and at an important source of the Jordan. It does not certainly appear in the Old Testament history, though identifications with Baal-Gad and (less certainly) with Laish (Dan) have been proposed. It was certainly a place of great sanctity from very early times, and
[v.04 p.0944] when foreign religious influences intruded upon Palestine, the cult of its local *numen* gave place to the worship of Pan, to whom was dedicated the cave in which the copious spring feeding the Jordan arises. It was long known as *Panium* or *Panias*, a name that has survived in the modern *Banias*. When Herod the Great received the territory from Augustus, 20 B.C., he erected here a temple in honour of his patron; but the re-foundation of the town is due to his son, Philip the Tetrarch, who here erected a city which he named *Caesarea* in honour of Tiberius, adding *Philippi* to immortalize his own name and to distinguish his city from the similarly-named city founded by his father on the sea-coast. Here Christ gave His charge to Peter (Matt. xvi. 13). Many Greek inscriptions have been found here, some referring to the shrine. Agrippa II. changed the name to *Neronias*, but this name endured but a short while. Titus here exhibited gladiatorial shows to celebrate the capture of Jerusalem. The Crusaders took the city in 1130, and lost it to the Moslems in 1165. Banias is a poor village inhabited by about 350 Moslems; all round it are gardens of fruit-trees. It is well watered and fertile. There are not many remains of the Roman city above ground. The Crusaders' castle of Subeibeh, one of the finest in Palestine, occupies the summit of a conical hill above the village.

(R. A. S. M.)

CAESIUM (symbol Cs, atomic weight 132.9), one of the alkali metals. Its name is derived from the Lat. *caesius*, sky-blue, from two bright blue lines of its spectrum. It is of historical importance, since it was the first metal to be discovered by the aid of the spectroscope (R. Bunsen, *Berlin Acad. Ber.*, 1860), although caesium salts had undoubtedly been examined before, but had been mistaken for potassium salts (see C.F. Plattner, *Pog. Ann.*, 1846, p. 443, on the analysis of pollux and the subsequent work of F. Pisani, *Comptes Rendus*, 1864, 58, p. 714). Caesium is found in the mineral springs of Frankenhausen, Montecatini, di Val di Nievole, Tuscany, and Wheal Clifford near Redruth, Cornwall (W.A. Miller, *Chem. News*, 1864, 10, p. 181), and, associated with rubidium, at Dürkheim; it is also found in lepidolite, leucite, petalite, triphylline and in the carnallite from Stassfurt. The separation of caesium from the minerals which contain it is an exceedingly difficult and laborious process. According to R. Bunsen, the best source of rubidium and caesium salts is the residue left after extraction of lithium salts from lepidolite. This residue consists of sodium, potassium and lithium chlorides, with small quantities of caesium and rubidium chlorides. The caesium and rubidium are separated from this by repeated fractional crystallization of their double platinum chlorides, which are much less soluble in water than those of the other alkali metals (R. Bunsen, *Ann.*, 1862, 122, p. 347; 1863, 125, p. 367). The platino-chlorides are reduced by hydrogen, and the caesium and rubidium chlorides extracted by water. See also A. Schrötter (*Jour. prak. Chem.*, 1864, 93, p. 2075) and W. Heintz (*Journ. prak. Chem.*, 1862, 87, p. 310). W. Feit and K. Kubierschky (*Chem. Zeit.*, 1892, 16, p. 335) separate rubidium and caesium from the other alkali metals by converting them into double chlorides with stannic chloride; whilst J. Redtenbacher (*Jour. prak. Chem.*, 1865, 94, p. 442) separates them from potassium by conversion into alums, which C. Setterberg (*Ann.*, 1882, 211, p. 100) has shown are very slightly soluble in a solution of potash alum. In order to separate caesium from rubidium, use is made of the different solubilities of their various salts. The bitartrates $RbHC_4H_40_6$ and $CsHC_4H_40_6$ have been employed, as have also the alums (see above). The double chloride of caesium and antimony $3CsCl{\cdot}2SbCl_3$ (R. Godeffroy, *Ber.*, 1874, 7, p. 375; *Ann.*, 1876, 181, p. 176) has been used, the corresponding compound not being formed by rubidium. The metal has been obtained by electrolysis of a mixture of caesium and barium cyanides (C. Setterberg, *Ann.*, 1882, 211, p. 100) and by heating the hydroxide with magnesium or aluminium (N. Beketoff, *Chem. Centralblatt*, 1889, 2, p. 245). L. Hackspill (*Comptes Rendus*, 1905, 141, p. 101) finds that metallic caesium can be obtained more readily by heating the chloride with metallic calcium. A special V-shaped tube is used in the operation, and the reaction commences between 400°C. and 500°C. It is a silvery white metal which burns on heating in air. It melts at 26° to 27°C. and has a specific gravity of 1.88 (15°C.).

The atomic weight of caesium has been determined by the analysis of its chloride and bromide. Richards and Archibald (*Zeit. anorg. Chem.*, 1903, 34, p. 353) obtained 132.879 (O=16).

Caesium hydroxide, $Cs(OH)_2$, obtained by the decomposition of the sulphate with baryta water, is a greyish-white deliquescent solid, which melts at a red heat and absorbs carbon dioxide rapidly. It readily dissolves in water, with evolution of much heat. *Caesium chloride*, CsCl, is obtained by the direct action of chlorine on caesium, or by solution of the hydroxide in hydrochloric acid. It forms small cubes which melt at a red heat and volatilize readily. It deliquesces in moist air. Many double chlorides are known, and may be prepared by mixing solutions of the two components in the requisite proportions. The *bromide*, CsBr, and *iodide*, CsI, resemble the corresponding potassium salts. Many trihaloid salts of caesium are also known, such as $CsBr_3$, $CsClBr_2$, CsI_3, $CsBrI_2$, $CsBr_2I$, &c. (H.L. Wells and S.L. Penfield, *Zeit. fur anorg. Chem.*, 1892, i, p. 85). *Caesium sulphate*, Cs_2SO_4, may be prepared by dissolving the hydroxide or carbonate in sulphuric acid. It crystallizes in short hard prisms, which are readily soluble in water but insoluble in alcohol. It combines with many metallic sulphates (silver, zinc, cobalt, nickel, &c.) to form double sulphates of the type $Cs_2SO_4{\cdot}RSO_4{\cdot}6H_2O$. It also forms a caesium-alum $Cs_2SO_4{\cdot}Al_2(SO_4)_3{\cdot}24H_2O$. *Caesium nitrate*, $CsNO_3$, is obtained by dissolving the carbonate in nitric acid, and crystallizes in glittering prisms, which melt readily, and on heating evolve oxygen and leave a residue of caesium nitrite. The

carbonate, Cs_2CO_3, silicofluoride, Cs_2SiF_6, borate, $Cs_2O{\cdot}3B_2O_3$, and the sulphides $Cs_2S{\cdot}4H_2O$, $Cs_2S_2{\cdot}H_2O$, $Cs_2S_3{\cdot}H_2O$, Cs_2S_4 and $Cs_2S_6{\cdot}H_2O$, are also known.

Caesium compounds can be readily recognized by the two bright blue lines (of wave length 4555 and 4593) in their flame spectrum, but these are not present in the spark spectrum. The other lines include three in the green, two in the yellow, and two in the orange.

CAESPITOSE (Lat. *caespes*, a sod), a botanical term for "growing in tufts," like many grasses.

CAESTUS, or Cestus (from Lat. *caedo*, strike), a gauntlet or boxing-glove used by the ancient pugilists. Of this there were several varieties, the simplest and least dangerous being the *meilichae* (μειλίχαι), which consisted of strips of raw hide tied under the palm, leaving the fingers bare. With these the athletes in the *palaestrae* were wont to practise, reserving for serious contests the more formidable kinds, such as the *sphaerae* (σφαῖραι), which were sewn with small metal balls covered with leather, and the terrible *murmekes* (μύρμηκες), sometimes called "limb-breakers" (γυιοτόροι), which were studded with heavy nails. The straps (ἱμαντες) were of different lengths, many reaching to the elbow, in order to protect the forearm when guarding heavy blows (see J.H. Krause, *Gymnastik und Agonistik der Hellenen*, 1841). The *caestus* is to be distinguished from *cestus* (=embroidered, from κεντεῖν), an adjective used as a noun in the sense of "girdle," especially the girdle of Aphrodite, which was supposed to have the power of exciting love.

CAESURA (Lat. for "cutting," Gr. τομη), in prosody, a rest or pause, usually occurring about the middle of a verse, which is thereby separated into two parts (κωλα, members). In Greek and Latin hexameters the best and most common caesura is the penthemimeral (*i.e.* after the 5th half-foot):

Μῆνιν ἄ | ειδε, θε | ά, | Πη | ληϊα | δέω Ἀχι | λῆος
Arma vi | rumque ca | no, Tro | jae qui | primus ab | oris.

Another caesura very common in Homer, but rare in Latin verse, is after the 2nd syllable of the 3rd dactyl:

Οἰω | νοῖσί τε | πᾶσι Δι | ὸς δ' ἐτε | λείετο | βουλή.

On the other hand, the hephthemimeral caesura (*i.e.* after the 7th half-foot) is common in Latin, but rare in Greek:

Formo | sam reso | nare do | ces Ama | ryllida | silvas.

The "bucolic" caesura, peculiar to Greek (so called because it is chiefly found in writers like Theocritus) occurs after the 4th dactyl:

Ἄνδρα μοι | ἔννεπε, | Μοῦσα, πο | λύτροπον, | ὃς μάλα | πολλά

In the pentameter verse of the elegiac distich the caesura is always penthemimeral. In the iambic trimeter (consisting of three dipodia or pairs of feet), both in Greek and Latin, the most usual caesura is the penthemimeral; next, the hephthemimeral:

Ὦ τέκ | να Κάδ | μου τοῦ | πάλαι | νέα | τροφή
Supplex | et o | ro reg | na per | Proser | pinae.

[v.04 p.0945] Verses in which neither of these caesuras occurs are considered faulty. On the other hand, secondary or subsidiary caesuras are found in both Greek and Latin; thus, a trithemimeral (after the 3rd half-foot) is combined with the hephthemimeral, which divides the verse into two unequal parts. A caesura is often called masculine when it falls after a long, feminine when it falls after a short syllable.

The best treatise on Greek and Latin metre for general use is L. Müller, *Die Metrik der Griechen und Romer* (1885); see also the article Verse.

CAFFEINE, or Theine (1.3.7 trimethyl 2.6 dioxypurin), $C_8H_{10}N_4O_2{\cdot}H_2O$, a substance found in the leaves and beans of the coffee tree, in tea, in Paraguay tea, and in small quantities in cocoa and in the kola nut. It may be extracted from tea or coffee by boiling with water, the dissolved tannin precipitated by basic lead acetate, the solution filtered, excess of lead precipitated by sulphuretted hydrogen and the filtered liquid then evaporated to crystallization; or, tea is boiled with water, and the whole then evaporated to a syrup, which is mixed with slaked lime, evaporated to dryness on the water-bath and extracted with chloroform (P. Cazeneuve, *Bull. de la soc. chim. de Paris*, 1876-1877, 27, p. 199). Synthetically it may be prepared by the methylation of silver theobromine and silver theophyllin or by boiling heteroxanthine with methyl iodide and potash. E. Fischer and L. Ach (*Berichte*, 1895, 28, p. 3135) have synthesized it from dimethyl alloxan, whilst W. Traube (*Berichte*, 1900, 33, p. 3435) has obtained it from 1.3 diamethyl 4.5 diamino 2.6 dioxypyrimidine. On the constitution of caffeine see Purin and also E. Fischer (*Annalen*, 1882, 215, p. 253).

Caffeine crystallizes in long silky needles, which are slightly soluble in cold water. It becomes anhydrous at 100°C. and melts at 234° to 235°C. It has a faint bitter taste and gives salts with mineral acids. On oxidation with nitric acid caffeine gives cholesterophane (dimethyl parabanic acid), but if chlorine water be used as the oxidant, then it yields monomethyl urea and dimethyl alloxan (E. Fischer).

CAFFIERI, JACQUES (1678-1755), French worker in metal, the most famous member of a family several of whom distinguished themselves in plastic art, was the fifth son of Philippe Caffieri (1634-1716), a decorative sculptor, who, after serving Pope Alexander VII., entered the service of Louis XIV. in 1660. An elder son of Philippe, François Charles (1667-1721), was associated with him. As a *fondeur ciseleur*, however, the renown of the house centred in Jacques, though it is not always easy to distinguish between his own work and that of his son Philippe (1714-1777). A large proportion of his brilliant achievement as a designer and chaser in bronze and other metals was executed for the crown at Versailles, Fontainebleau, Compiègne, Choisy and La Muette, and the crown, ever in his debt, still owed him money at his death. Jacques and his son Philippe undoubtedly worked together in the "Appartement du Dauphin" at Versailles, and although much of their contribution to the palace has disappeared, the decorations of the marble chimney-piece still remain. They belong to the best type of the Louis XV. style—vigorous and graceful in design, they are executed with splendid skill. It is equally certain that father and son worked together

upon the gorgeous bronze case of the famous astronomical clock made by Passement and Danthiau for Louis XV. between 1749 and 1753. The form of the case has been much criticized, and even ridiculed, but the severest critics in that particular have been the readiest to laud the boldness and freedom of the motives, the jewel-like finish of the craftsmanship, the magnificent dexterity of the master-hand. The elder Caffieri was, indeed, the most consummate practitioner of the *style rocaille*, which he constantly redeemed from its mannered conventionalism by the ease and mastery with which he treated it. From the studio in which he and his son worked side by side came an amazing amount of work, chiefly in the shape of those gilded bronze mounts which in the end became more insistent than the pieces of furniture which they adorned. Little of his achievement was ordinary; an astonishingly large proportion of it is famous. There is in the Wallace collection (Hertford House, London) a commode from the hand of Jacques Caffieri in which the brilliance and spontaneity, the sweeping boldness and elegance of line that mark his style at its best, are seen in a perfection hardly exceeded in any other example. Also at Hertford House is the exceptionally fine lustre which was a wedding present from Louis XV. to Louise Elizabeth of France. After Jacques' death his son Philippe continued to work for the crown, but had many private clients. He made a great cross and six candlesticks for the high altar of Notre Dame, which disappeared in the revolution, but similar work for Bayeux cathedral still exists. A wonderful enamelled toilet set which he executed for the Princess of Asturias has also disappeared. Philippe's style was gradually modified into that which prevailed in the third quarter of the 18th century, since by 1777, when he died, the taste for the magnificent mounts of his early days had passed away. Like his father, he drew large sums from the crown, usually after giving many years' credit, while many other years were needed by his heirs to get in the balance of the royal indebtedness. Philippe's younger brother, Jean Jacques Caffieri (1725-1792), was a sculptor, but was sufficiently adept in the treatment of metals to design the fine *rampe d'escalier* which still adorns the Palais Royal.

CAFTAN, or KAFTAN (a Turkish word, also in use in Persia), a tunic or under-dress with long hanging sleeves, tied with a girdle at the waist, worn in the East by persons of both sexes. The caftan was worn by the upper and middle classes in Russia till the time of Peter the Great, when it was generally discarded.

CAGLI, a town and (with Pergola) an episcopal see of the Marches, Italy, in the province of Pesaro and Urbino, 18 m. S. of the latter town by rail, and 830 ft. above sea-level. Pop. (1901) of town, 4628; commune, 12,533. The church of S. Domenico contains a good fresco (Madonna and saints) by Giovanni Santi, the father of Raphael. The citadel of the 15th century, constructed by Francesco di Giorgio Martini of Siena, is on the S.E. of the modern town. Cagli occupies the site of an ancient *vicus* (village) on the Via Flaminia, which seems to have borne the name Cale, 24 m. N. of Helvillum (mod. *Sigillo*) and 18 m. S.W. of Forum Sempronii (mod. *Fossombrone*). Below the town to the north is a single arched bridge of the road, the arch having the span of 38¼ ft. (See G. Mochi, *Storia di Cagli*, Cagli, 1878.) About 5 m. to the N.N.W. of Cagli and 2½ m. W. of the Via Flaminia at the mod. *Acqualagna* is the site of an ancient town; the place is now called *piano di Valeria*, and is scattered with ruins. Inscriptions show that this was a Roman *municipium*, perhaps Pitinum Mergens (*Corp. Inscr. Lat.* xi. [Berlin, 1901] p. 876). Three miles north of Acqualagna the Via Flaminia, which is still in use as the modern high-road, traverses the Furlo Pass, a tunnel about 40 yds. long, excavated by Vespasian in A.D. 77, as an inscription at the north end records. There is another tunnel at lower level, which belongs to an earlier date; this seems to have been in use till the construction of the Roman road, which at first ran round the rock on the outside, until Vespasian cut the tunnel. In repairing the modern road just outside the south entrance to the tunnel, a stratum of carbonized corn, beans, &c., and a quantity of burnt wood, stones, tiles, pottery, &c., was found under and above the modern road, for a distance of some 500 yds. This débris must have belonged to the castle of Petra Pertusa, burned by the Lombards in 570 or 571 on their way to Rome. The castle itself is mentioned by Procopius (*Bell. Goth.* ii. 11, iii. 6, iv. 28, 34). Here also was found the inscription of A.D. 295, relating to the measures taken to suppress brigandage in these parts. (See APENNINES.)

See A. Vernarecci in *Notizie degli Scavi*, 1886, 411 (cf. *ibid.* 227); *Corp. Inscr. Lat.* (Berlin, 1901), Nos. 6106, 6107.

(T. As.)

CAGLIARI (anc. *Carales*), the capital of the island of Sardinia, an archiepiscopal see, and the chief town of the province of Cagliari, which embraces the southern half of the island. It is 270 m. W.S.W. of Naples, and 375 m. south of Genoa by sea. Pop. (1900) of town, 48,098; of commune, 53,057. It is finely situated at the northern extremity of the Gulf of Cagliari, in the centre of the south coast of the island. The medieval town
[v.04 p.0946] occupies a long narrow hill running N. and S. with precipitous cliffs on the E. and W. which must have been the ancient acropolis, but the modern town, like the Roman town before it, extends to the slopes of the hill and to the low ground by the sea. On each side of the town are lagoons. That of S. Gilla on the W., which produces fish in abundance, was originally an open bay. That of Molentargius on the E. has large saltpans. The upper town still retains in part its fortifications, including the two great towers at the two extremities, called the Torre dell' Elefante (S.) and the Torre di S. Pancrazio (N.), both erected by the Pisans, the former in 1307, the latter in 1305. The Torre di S. Pancrazio at the highest point (367 ft. above sea-level) commands a magnificent view. Close to it is the archaeological museum, the most important in the island. To the north of it are the modern citadel and the barracks, and beyond, a public promenade. The narrow streets run from north to south for the whole length of the upper town. On the edge of the cliffs on the E. is the cathedral, built in 1257-1312 by the Pisans, and retaining two of the original transept doors. The pulpit of the same period is also fine: it now stands, divided into two, on each side of the entrance, while the lions which supported it are on the balustrade in front of the cathedral (see E. Brunelli in *L'Arte*, Rome, 1901, 59; D. Scano, *ibid.* 204). Near the sacristy are also some Gothic chapels of the Aragonese period. The church was, however, remodelled in 1676, and the interior is baroque. Two fine silver candelabra, the tabernacle and the altar front are of the 17th century; and the treasury also contains some good silver work. (See D. Scano in *Bolletino d'Arte*, February 1907, p. 14; and E. Brunelli in *L'Arte*, 1907, p. 47.) The crypt contains three ancient sarcophagi. The façade, in the baroque style, was added in 1703. The university, a little farther north, the buildings of which were erected in 1764, has some 240 students. At the south extremity of the hill, on the site of the bastian of south Caterina, a large terrace, the Passeggiata Umberto Primo, has been constructed: it is much in use on summer evenings, and has a splendid view. Below it are covered promenades, and from it steps descend to the lower town, the oldest part of which (the so-called Marina), sloping gradually towards the sea, is probably the nucleus of the Roman *municipium*, while the quarter of Stampace lies to the west, and beyond it again the suburb of

Sant' Avendrace. The northern portion of this, below the castle hill, is the older, while the part near the shore consists mainly of modern buildings of no great interest. To the east of the castle hill and the Marina is the quarter of Villanova, which contains the church of S. Saturnino, a domed church of the 8th century with a choir of the Pisan period. The harbour of Cagliari (along the north side of which runs a promenade called the Via Romo) is a good one, and has a considerable trade, exporting chiefly lead, zinc and other minerals and salt, the total annual value of exports amounting to nearly 1½ million sterling in value. The Campidano of Cagliari, the plain which begins at the north end of the lagoon of S. Gilla, is very fertile and much cultivated, as is also the district to the east round Quarto S. Elena, a village with 8459 inhabitants (1901). The national costumes are rarely now seen in the neighbourhood of Cagliari, except at certain festivals, especially that of S. Efisio (May 1-4) at Pula (see NORA). The methods of cultivation are primitive: the curious water-wheels, made of brushwood with pots tied on to them, and turned by a blindfolded donkey, may be noted. The ox-carts are often made with solid wheels, for greater strength. Prickly pear (*opuntia*) hedges are as frequent as in Sicily. Cagliari is considerably exposed to winds in winter, while in summer it is almost African in climate. The aqueduct was constructed in quite recent times, rain-water having previously given the only supply. The main line of railway runs north to Decimomannu (for Iglesias), Oristano, Macomer and Chilivani (for Golfo degli Aranci and Sassari); while another line (narrow-gauge) runs to Mandas (for Sorgono and Tortoli). There is also a tramway to Quarto S. Elena.

In A.D. 485 the whole of Sardinia was taken by the Vandals from Africa; but in 533 it was retaken by Justinian. In 687 Cagliari rose against the East Roman emperors, under Gialetus, one of the citizens, who made himself king of the whole island, his three brothers becoming governors of Torres (in the N.W.), Arborea (in the S.W.) and Gallura (in the N.E. of the island). The Saracens devastated it in the 8th century, but were driven out, and the island returned to the rule of kings, until they fell in the 10th century, their place being taken by four "judges" of the four provinces, Cagliari, Torres, Arborea and Gallura. In the 12th century Musatto, a Saracen, established himself in Cagliari, but was driven out with the help of the Pisans and Genoese. The Pisans soon acquired the sovereignty over the whole island with the exception of Arborea, which continued to be independent. In 1297 Boniface VIII. invested the kings of Aragon with Sardinia, and in 1326 they finally drove the Pisans out of Cagliari, and made it the seat of their government. In 1348 the island was devastated by the plague described by Boccaccio. It was not until 1403 that the kings of Aragon were able to conquer the district of Arborea, which, under the celebrated Eleonora (whose code of laws—the so-called *Carta de Logu*—was famous), offered a heroic resistance. In 1479 the native princes were deprived of all independence. The island remained in the hands of Spain until the peace of Utrecht (1714), by which it was assigned to Austria. In 1720 it was ceded by the latter, in exchange for Sicily, to the duke of Savoy, who assumed the title of king of Sardinia (Cagliari continuing to be the seat of government), and this remained the title of the house of Savoy until 1861. Cagliari was bombarded by the French fleet in 1793, but Napoleon's attempt to take the island failed.

(T. AS.)

CAGLIOSTRO, ALESSANDRO, COUNT (1743-1793), Italian alchemist and impostor, was born at Palermo on the 8th of June 1743. Giuseppe Balsamo—for such was the "count's" real name—gave early indications of those talents which afterwards gained for him so wide a notoriety. He received the rudiments of his education at the monastery of Caltagirone in Sicily, but was expelled from it for misconduct and disowned by his relations. He now signalized himself by his dissolute life and the ingenuity with which he contrived to perpetrate forgeries and other crimes without exposing himself to the risk of detection. Having at last got into trouble with the authorities he fled from Sicily, and visited in succession Greece, Egypt, Arabia, Persia, Rhodes—where he took lessons in alchemy and the cognate sciences from the Greek Althotas—and Malta. There he presented himself to the grand master of the Maltese order as Count Cagliostro, and curried favour with him as a fellow alchemist, for the grand master's tastes lay in the same direction. From him he obtained introductions to the great houses of Rome and Naples, whither he now hastened. At Rome he married a beautiful but unprincipled woman, Lorenza Feliciani, with whom he travelled, under different names, through many parts of Europe. It is unnecessary to recount the various infamous means which he employed to pay his expenses during these journeys. He visited London and Paris in 1771, selling love-philtres, elixirs of youth, mixtures for making ugly women beautiful, alchemistic powders, &c., and deriving large profits from his trade. After further travels on the continent he returned to London, where he posed as the founder of a new system of freemasonry, and was well received in the best society, being adored by the ladies. He went to Germany and Holland once more, and to Russia, Poland, and then again to Paris, where, in 1785, he was implicated in the affair of the Diamond Necklace (*q.v.*); and although Cagliostro escaped conviction by the matchless impudence of his defence, he was imprisoned for other reasons in the Bastille. On his liberation he visited England once more, where he succeeded well at first; but was ultimately outwitted by some English lawyers, and confined for a while in the Fleet prison. Leaving England, he travelled through Europe as far as Rome, where he was arrested in 1789. He was tried and condemned to death for being a heretic, but the sentence was commuted to perpetual imprisonment, while his wife was immured in a convent. He died in the fortress prison of San Leo in 1795.

[v.04 p.0947]

The best account of the life, adventures and character of Giuseppe Balsamo is contained in Carlyle's *Miscellanies*. Dumas's novel, *Memoirs of a Physician*, is founded on his adventures; see also a series of papers in the *Dublin University Magazine*, vols. lxxviii. and lxxix.; *Memorial, or Brief for Cagliostro in the Cause of Card. de Rohan*, &c. (Fr.) by P. Macmahon (1786); *Compendio della vita e delle gesta di Giuseppe Balsamo denominato il conte di Cagliostro* (Rome, 1791); Sierke, *Schwarmer und Schwindler zu Ende des XVIII. Jahrhunderts* (1875); and the sketch of his life in D. Silvagni's *La Corte e la Società Romana nei secoli XVIII. e XIX.* vol. i. (Florence, 1881).

(L. V.*)

CAGNIARD DE LA TOUR, CHARLES (1777-1859), French engineer and physicist, was born in Paris on the 31st of March 1777, and after attending the École Polytechnique became one of the *ingénieurs géographiques*. He was made a baron in 1818, and died in Paris on the 5th of July 1859. He was the author of numerous inventions, including the cagniardelle, a blowing machine, which consists essentially of an Archimedean screw set obliquely in a tank of water in such a way that its lower end is completely and its upper end partially immersed, and operated by being rotated in the opposite direction to that required for raising water. In acoustics he invented, about 1819, the improved siren which is known by his name, using it for ascertaining the number of vibrations corresponding to a sound of any particular pitch, and he also made experiments on the mechanism of voice-production. In course of an investigation in 1822-1823 on

the effects of heat and pressure on certain liquids he found that for each there was a certain temperature above which it refused to remain liquid but passed into the gaseous state, no matter what the amount of pressure to which it was subjected, and in the case of water he determined this critical temperature, with a remarkable approach to accuracy, to be 362°C. He also studied the nature of yeast and the influence of extreme cold upon its life.

CAGNOLA, LUIGI, Marchese (1762-1833), Italian architect, was born on the 9th of June 1762 in Milan. He was sent at the age of fourteen to the Clementine College at Rome, and afterwards studied at the university of Pavia. He was intended for the legal profession, but his passion for architecture was too strong, and after holding some government posts at Milan, he entered as a competitor for the construction of the Porta Orientale. His designs were commended, but were not selected on account of the expense their adoption would have involved. From that time Cagnola devoted himself entirely to architecture. After the death of his father he spent two years in Verona and Venice, studying the architectural structures of these cities. In 1806 he was called upon to erect a triumphal arch for the marriage of Eugene Beauharnais with the princess of Bavaria. The arch was of wood, but was of such beauty that it was resolved to carry it out in marble. The result was the magnificent Arco della Pace in Milan, surpassed in dimensions only by the Arc de l'Étoile at Paris. Among other works executed by Cagnola are the Porta di Marengo at Milan, the campanile at Urgnano, and the chapel of Santa Marcellina in Milan. He died on the 14th of August 1833, five years before the completion of the Arco del Sempione, which he designed for his native city.

CAGOTS, a people found in the Basque provinces, Béarn, Gascony and Brittany. The earliest mention of them is in 1288, when they appear to have been called Christiens or Christianos. In the 16th century they had many names, Cagots, Gahets, Gafets in France; Agotes, Gafos in Spain; and Cacons, Cahets, Caqueux and Caquins in Brittany. During the middle ages they were popularly looked upon as cretins, lepers, heretics and even as cannibals. They were shunned and hated; were allotted separate quarters in towns, called *cagoteries*, and lived in wretched huts in the country distinct from the villages. Excluded from all political and social rights, they were only allowed to enter a church by a special door, and during the service a rail separated them from the other worshippers. Either they were altogether forbidden to partake of the sacrament, or the holy wafer was handed to them on the end of a stick, while a receptacle for holy water was reserved for their exclusive use. They were compelled to wear a distinctive dress, to which, in some places, was attached the foot of a goose or duck (whence they were sometimes called *Canards*). And so pestilential was their touch considered that it was a crime for them to walk the common road barefooted. The only trades allowed them were those of butcher and carpenter, and their ordinary occupation was wood-cutting. Their language is merely a corrupt form of that spoken around them; but a Teutonic origin seems to be indicated by their fair complexions and blue eyes. Their crania have a normal development; their cheek-bones are high; their noses prominent, with large nostrils; their lips straight; and they are marked by the absence of the auricular lobules.

The origin of the Cagots is undecided. Littré defines them as "a people of the Pyrenees affected with a kind of cretinism." It has been suggested that they were descendants of the Visigoths, and Michael derives the name from *caas* (dog) and *Goth*. But opposed to this etymology is the fact that the word *cagot* is first found in the *for* of Béarn not earlier than 1551. Marca, in his *Histoire de Béarn*, holds that the word signifies "hunters of the Goths," and that the Cagots are descendants of the Saracens. Others made them descendants of the Albigenses. The old MSS. call them Chrétiens or Chrestiaas, and from this it has been argued that they were Visigoths who originally lived as Christians among the Gascon pagans. A far more probable explanation of their name "Chrétiens" is to be found in the fact that in medieval times all lepers were known as *pauperes Christi*, and that, Goths or not, these Cagots were affected in the middle ages with a particular form of leprosy or a condition resembling it. Thus would arise the confusion between Christians and Cretins. To-day their descendants are not more subject to goitre and cretinism than those dwelling around them, and are recognized by tradition and not by features or physical degeneracy. It was not until the French Revolution that any steps were taken to ameliorate their lot, but to-day they no longer form a class, but have been practically lost sight of in the general peasantry.

See Francisque Michel, *Histoire des races maudites de France et d'Espagne* (Paris, 1846); Abbé Venuti, *Recherches sur les Cahets de Bordeaux* (1754); *Bulletins de la société anthropologique* (1861, 1867, 1868, 1871); *Annales medico-psychologiques* (Jan. 1867); Lagneau, *Questionnaire sur l'ethnologie de la France*; Paul Raymond, *Mœurs béarnaises* (Pau, 1872); V. de Rochas, *Les Parias de France et d'Espagne (Cagots et Bohémiens)* (Paris, 1877); J. Hack Tuke, *Jour. Anthropological Institute* (vol. ix., 1880).

CAHER (or Cahir), a market-town of Co. Tipperary, Ireland, in the south parliamentary division, beautifully situated on the river Suir at the foot of the Galtee Mountains. Pop. (1901) 2058. It stands midway between Clonmel and Tipperary town on the Waterford and Limerick line of the Great Southern and Western railway, 124 m. S.W. from Dublin. It is the centre of a rich agricultural district, and there is some industry in flour-milling. Its name (*cathair*, stone fortress) implies a high antiquity and the site of the castle, picturesquely placed on an island in the river, was occupied from very early times. Here was a fortress-palace of Munster, originally called *Dun-iasgach*, the suffix signifying "abounding in fish." The present castle dates from 1142, being built by O'Connor, lord of Thomond, and is well restored. It was besieged during the wars of 1599 and 1647, and by Cromwell. Among the fine environs of the town the demesne of Caher Park is especially noteworthy. The Mitchelstown stalactite caverns, 10 m. S.W., and the finely-placed Norman castle of Ardfinnan, on a precipitous crag 6 m. down the Suir, are other neighbouring features of interest, while the Galtee Mountains, reaching in Galtymore a height of 3015 ft., command admirable prospects.

CAHITA, a group of North American Indians, mainly of the Mayo and Yaqui tribes, found chiefly in Mexico, belonging to the Piman family, and numbering some 40,000.

CAHOKIA, the name of a North American Indian tribe of the Illinois confederacy, and of their mission station, near St Louis. The "Cahokia mound" there (a model of which is in the Peabody Museum, Cambridge, Mass.) is interesting as the largest pre-historic earth-work in America.

CAHORS, a city of south-western France, capital of the department of Lot, 70 m. N. of Toulouse, on the railway between that city and Limoges. Pop. (1906) 10,047. Cahors stands on the right bank of the river Lot, occupying a rocky peninsula formed by a bend in the stream. It is divided into two portions by the Boulevard Gambetta, which runs from the Pont Louis Philippe on the south to within a short distance of

the fortified wall of the 14th and 15th centuries enclosing the town on the north. To the east lies the old town, with its dark narrow streets and closely-packed houses; west of the Boulevard a newer quarter, with spacious squares and promenades, stretches to the bank of the river. Cahors communicates with the opposite shore by three bridges. One of these, the Pont Valentré to the west of the town, is the finest fortified bridge of the middle ages in France. It is a structure of the early 14th century, restored in the 19th century, and is defended at either end by high machicolated towers, another tower, less elaborate, surmounting the centre pier. The east bridge, the Pont Neuf, also dates from the 14th century. The cathedral of St Étienne stands in the heart of the old town. It dates from the 12th century, but was entirely restored in the 13th century. Its exterior, for the most part severe in appearance, is relieved by some fine sculpture, that of the north portal being especially remarkable. The nave, which is without aisles, is surmounted by two cupolas; its interior is whitewashed and plain in appearance, while the choir is decorated with medieval paintings. Adjoining the church to the south-east there are remains of a cloister built from 1494 to 1509. St Urcisse, the chief of the other ecclesiastical buildings, stands near the cathedral. Dating from the 12th and 13th centuries, it preserves Romanesque capitals recarved in the 14th century. The principal of the civil buildings is the palace of Pope John XXII., built at the beginning of the 14th century; a massive square tower is still standing, but the rest is in ruins. The residence of the seneschals of Quercy, a building of the 14th to the 17th centuries, known as the Logis du Roi, also remains. The chief of the old houses, of which there are many in Cahors, is one of the 15th century, known as the Maison d'Henri IV. Most of the state buildings are modern, with the exception of the prefecture which occupies the old episcopal palace, and the old convent and the Jesuit college in which the Lycée Gambetta is established. The Porte de Diane is a large archway of the Roman period, probably the entrance to the baths. Of the commemorative monuments, the finest is that erected in the Place d'Armes to Gambetta, who was a native of the town. There is also a statue of the poet Clément Marot, born at Cahors in 1496. Cahors is the seat of a bishopric, a prefect and a court of assizes. It has tribunals of first instance and of commerce, a chamber of commerce and a branch of the Bank of France. There are also training colleges, a lycée, a communal college for girls, an ecclesiastical seminary, a library, museum and hospital. The manufacture of farm implements, tanning, wool-spinning, metal-founding, distilling and the preparation of *pâté de foie gras* and other delicacies are carried on. Wine, nuts, oil of nuts, tobacco, truffles and plums are leading articles of commerce.

History.—Before the Roman conquest, Cahors, which grew up near the sacred fountain of Divona (now known as the Fontaine des Chartreux), was the capital of the Cadurci. Under the Romans it enjoyed a prosperity partly due to its manufacture of cloth and of mattresses, which were exported even to Rome. The first bishop of Cahors, St Genulfus, appears to have lived in the 3rd century. In the middle ages the town was the capital of Quercy, and its territory until after the Albigensian Crusade was a fief of the counts of Toulouse. The seigniorial rights, including that of coining money, belonged to the bishops. In the 13th century Cahors was a financial centre of much importance owing to its colony of Lombard bankers, and the name *cahorsin* consequently came to signify "banker" or "usurer." At the beginning of the century a commune was organized in the town. Its constant opposition to the bishops drove them, in 1316, to come to an arrangement with the French king, by which the administration of the town was placed almost entirely in the hands of royal officers, king and bishop being co-seigneurs. This arrangement survived till the Revolution. In 1331 Pope John XXII., a native of Cahors, founded there a university, which afterwards numbered Jacques Cujas among its teachers and François Fénelon among its students. It flourished till 1751, when it was united to its rival the university of Toulouse. During the Hundred Years' War, Cahors, like the rest of Quercy, consistently resisted the English occupation, from which it was relieved in 1428. In the 16th century it belonged to the viscounts of Béarn, but remained Catholic and rose against Henry of Navarre who took it by assault in 1580. On his accession Henry IV. punished the town by depriving it of its privileges as a wine-market; the loss of these was the chief cause of its decline.

CAIATIA (mod. *Caiazzo*), an ancient city of Campania, on the right bank of the Volturnus, 11 m. N.E. of Capua, on the road between it and Telesia. It was already in the hands of the Romans in 306 B.C., and since in the 3rd century B.C. it issued copper coins with a Latin legend it must have had the *civitas sine suffragio*. In the Social War it rebelled from Rome, and its territory was added to that of Capua by Sulla. In the imperial period, however, we find it once more a *municipium*. Caiatia has remains of Cyclopean walls, and under the Piazza del Mercato is a large Roman cistern, which still provides a good water supply. The episcopal see was founded in A.D. 966. The place is frequently confused with Calatia (*q.v.*).

CAIETAE PORTUS (mod. *Gaeta*), an ancient harbour of *Latium adiectum*, Italy, in the territory of Formiae, from which it is 5 m. S.W. The name (originally Αἰήτη) is generally derived from the nurse of Aeneas. The harbour, owing to its fine anchorage, was much in use, but the place was never a separate town, but always dependent on Formiae. Livy mentions a temple of Apollo. The coast of the Gulf not only between Caietae Portus and Formiae, but E. of the latter also, as far as the modern Monte Scauri, was a favourite summer resort (see Formia). Cicero may have had villas both at Portus Caietae and at Formiae[1] proper, and the emperors certainly possessed property at both places. After the destruction of Formiae in A.D. 847 it became one of the most important seaports of central Italy (see Gaeta). In the town are scanty remains of an amphitheatre and theatre: near the church of La Trinità, higher up, are remains of a large reservoir. There are also traces of an aqueduct. The promontory (548 ft.) is crowned by the tomb of Munatius Plancus, founder of Lugudunum (mod. Lyons), who died after 22 B.C. It is a circular structure of blocks of travertine 160 ft. high and 180 ft. in diameter. Further inland is the so-called tomb of L. Atratinus, about 100 ft. in diameter. Caietae Portus was no doubt connected with the Via Appia (which passed through Formiae) by a *deverticulum*. There seems also to have been a road running W.N.W. along the precipitous coast to Speluncae (mod. Sperlonga).

See E. Gesualdo *Osservazioni critiche sopra la storia della Via Appia di Pratilli* p. 7 (Naples, 1754).

(T. As.)

[1] The two places are sufficiently close for the one villa to have borne both names; but Mommsen (*Corp. Inscrip. Lat.* x., Berlin, 1883, p. 603) prefers to differentiate them.

CAILLIÉ (or Caillé), **RENÉ AUGUSTE** (1799-1838), French explorer, was born at Mauzé, Poitou, in 1799, the son of a baker. The reading of *Robinson Crusoe* kindled in him a love of travel and adventure, and at the age of sixteen he made a voyage to Senegal whence he went to Guadeloupe. Returning to Senegal in 1818 he made a journey to Bondu to carry supplies to a British expedition then in that country. Ill with

fever he was obliged to go back to France, but in 1824 was again in Senegal with the fixed idea of penetrating to Timbuktu. He spent eight months with the Brakna "Moors" living north of Senegal river, learning Arabic and being taught, as a convert, the laws and customs of Islam. He laid his project of reaching Timbuktu before the governor of Senegal, but receiving no encouragement went to Sierra Leone where the British authorities made him superintendent of an indigo plantation. Having saved £80 he joined a Mandingo caravan going inland. He was dressed as a Mussulman, and gave out that he was an Arab from Egypt who had been carried off by the French to Senegal and was desirous of regaining his own country. Starting from Kakundi near Boké on the Rio Nunez on 19th of April 1827, he travelled east along the hills of Futa Jallon, passing the head streams of the Senegal and crossing the Upper Niger at Kurussa. Still going east he came to the Kong highlands, where at a place called Timé he was detained five months by
[v.04 p.0949] illness. Resuming his journey in January 1828 he went north-east and gained the city of Jenné, whence he continued his journey to Timbuktu by water. After spending a fortnight (20th April-4th May) in Timbuktu he joined a caravan crossing the Sahara to Morocco, reaching Fez on the 12th of August. From Tangier he returned to France. He had been preceded at Timbuktu by a British officer, Major Gordon Laing, but Laing had been murdered (1826) on leaving the city and Caillié was the first to accomplish the journey in safety. He was awarded the prize of £400 offered by the Geographical Society of Paris to the first traveller who should gain exact information of Timbuktu, 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 Temboctou et à Jenne dans l'Afrique Centrale*, etc. (edited by E.F. Jomard) was published in three volumes in 1830. Caillié died at Badère in 1838 of a malady contracted during his African travels. For the greater part of his life he spelt his name Caillié, afterwards omitting the second "i."

See Dr Robert Brown's *The Story of Africa*, vol. i. chap. xii. (London, 1892); Goepp and Cordier, *Les Grands Hommes de France, voyageurs: René Caillé* (Paris, 1885); E.F. Jomard, *Notice historique sur la vie et les voyages de R. Caillié* (Paris, 1839). An English version of Caillié's *Journal* was published in London in 1830 in two volumes under the title of *Travels through Central Africa to Timbuctoo*, &c.

CAIN, in the Bible, the eldest son of Adam and Eve (Gen. iv.), was a tiller of the ground, whilst his younger brother, Abel, was a keeper of sheep. Enraged because the Lord accepted Abel's offering, and rejected his own, he slew his brother in the field (see Abel). For this a curse was pronounced upon him, and he was condemned to be a "fugitive and a wanderer" 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 ("wandering") 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 early commentators sought to solve with more ingenuity than success. But when it is granted that the ancient Hebrews, like other primitive peoples, had their own mythical and traditional figures, the story of Cain becomes less obscure. The mark set upon Cain is usually regarded as some tribal mark or sign analogous to the cattle marks of Bedouin and the related usages in Europe. Such marks had often a religious significance, and denoted that the bearer was a follower of a particular deity. The suggestion has been made that the name Cain is the eponym of the Kenites, and although this clan has a good name almost everywhere in the Old Testament, yet in Num. xxiv. 22 its destruction is foretold, and the Amalekites, of whom they formed a division, are consistently represented as the inveterate enemies of Yahweh and of his people Israel. The story of Cain and Abel, which appears to represent the nomad life as a curse, may be an attempt to explain the origin of an existence which in the eyes of the settled agriculturist was one of continual restlessness, whilst at the same time it endeavours to find a reason for the institution of blood-revenge on the theory that at some remote age a man (or tribe) had killed his brother (or brother tribe). Cain's subsequent founding of a city finds a parallel in the legend of the origin of Rome through the swarms of outlaws and broken men of all kinds whom Romulus attracted thither. The list of Cain's descendants reflects the old view of the beginnings of civilization; it is thrown into the form of a genealogy and is parallel to Gen. v. (see Genesis). It finds its analogy in the Phoenician account of the origin of different inventions which Eusebius (*Praep. Evang.* i. 10) quotes from Philo of Byblus (Gebal), and probably both go back to a common Babylonian origin.

On this question, see Driver, *Genesis* (Westminster Comm., London, 1904), p. 80 seq.; A. Jeremias, *Alte Test. im Lichte d. Alten Orients* (Leipzig, 1906), pp. 220 seq.; also Enoch, Lamech. On the story of Cain, see especially Stade, *Akademische Reden*, pp. 229-273; Ed. Meyer, *Israeliten*, pp. 395 sqq.; A.R. Gordon, *Early Trad. Genesis* (Index). Literary criticism (see Cheyne, *Encycl. Bib.* col. 620-628, and 4411-4417) has made it extremely probable that Cain the nomad and outlaw (Gen. iv. 1-16) was originally distinct from Cain the city-builder (vv. 17 sqq.). The latter was perhaps regarded as a "smith," cp. v. 22 where Tubal-cain is the "father" of those who work in bronze (or copper). That the Kenites, too, were a race of metal-workers is quite uncertain, although even at the present day the smiths in Arabia form a distinct nomadic class. Whatever be the meaning of the name, the words put into Eve's mouth (v. 1) probably are not an etymology, but an assonance (Driver). It is noteworthy that Kenan, son of Enosh ("man," Gen. v. 9), appears in Sabaean inscriptions of South Arabia as the name of a tribal-god.

A Gnostic sect of the 2nd century was known by the name of Cainites. They are first mentioned by Irenaeus, 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.

(S. A. C.)

CAINE, THOMAS HENRY HALL (1853-), British novelist and dramatist, was born of mixed Manx and Cumberland parentage at Runcorn, Cheshire, on the 14th of May 1853. He was educated with a view to becoming an architect, but turned to journalism, becoming a leader-writer on the *Liverpool Mercury*. He came up to London at the suggestion of D.G. Rossetti, with whom he had had some correspondence, and lived with the poet for some time before his death. He published a volume of *Recollections of Rossetti* (1882), and also some critical work; but in 1885 he began an extremely successful career as a novelist of a melodramatic type with *The Shadow of a Crime*, followed by *The Son of Hagar* (1886), *The Deemster* (1887), *The Bondman* (1890), *The Scapegoat* (1891), *The Manxman* (1894), *The Christian* (1897), *The Eternal City* (1901), and *The Prodigal Son* (1904). His writings on Manx subjects were acknowledged by his election in 1901 to represent Ramsey in the House of Keys. *The Deemster*, *The Manxman* and *The Christian* had already been produced in dramatic form, when *The Eternal City* was staged with magnificent accessories by Mr Beerbohm Tree in 1902, and in 1905 *The Prodigal Son* had a successful run

at Drury Lane.

See C.F. Kenyon, *Hall Caine*; *The Man and the Novelist* (1901); and the novelist's autobiography, *My Story* (1908).

CA'ING WHALE (*Globicephalus melas*), a large representative of the dolphin tribe frequenting the coasts of Europe, the Atlantic coast of North America, the Cape and New Zealand. From its nearly uniform black colour it is also called the "black-fish." Its maximum length is about 20 ft. These cetaceans are gregarious and inoffensive in disposition and feed chiefly on cuttle-fish. Their sociable character constantly leads to their destruction, as when attacked they instinctively rush together, and blindly follow the leaders of the herd, whence the names pilot-whale and ca'ing (or driving) whale. Many hundreds at a time are thus frequently driven ashore and killed, when a herd enters one of the bays or fiords of the Faeroe Islands or north of Scotland. The ca'ing whale of the North Pacific has been distinguished as *G. scammoni*, while one from the Atlantic coast, south of New Jersey, and another from the bay of Bengal, are possibly also distinct. (See CETACEA.)

CAINOZOIC (from the Gr. καινός, recent, ζωή, life), also written Cenozoic (American), *Kainozoisch*, *Cänozoisch* (German), *Cénozoaire* (Renevier), in geology, the name given to the youngest of the three great eras of geological time, the other two being the Mesozoic and Palaeozoic eras. Some authors have employed the term "Neozoic" (*Neozoisch*) with the same significance, others have restricted its application to the Tertiary epoch (*Néozoique*, De Lapparent). The "Neogene" of Hörnes (1853) included the Miocene and Pliocene periods; Renevier subsequently modified its form to *Néogénique*. The remaining Tertiary periods were classed as Paléogaen by Naumaun in 1866. The word "Neocene" has been used in place of Neozoic, but its employment is open to objection.

Some confusion has been introduced by the use of the term Cainozoic to include, on the one hand, the Tertiary period alone, and on the other hand, to make it include both the Tertiary and the post-Tertiary or Quaternary epochs; and in order that it may bear a relationship to the concepts of time and faunal development similar to those indicated by the terms Mesozoic and Palaeozoic it is advisable to restrict its use to the latter alternative. Thus the Cainozoic era would embrace all the geological periods from Eocene to Recent. (See TERTIARY and PLEISTOCENE.)

(J. A. H.)

[v.04 p.0950] **CAÏQUE** (from Turk. *Kaik*), a light skiff or rowing-boat used by the Turks, having from one to twelve rowers; also a Levantine sailing vessel of considerable size.

ÇA IRA, a song of the French Revolution, with the refrain:—

"*Ah! ça ira, ça ira, ça ira!*
Les aristocrates à la lanterne."

The words, written by one Ladré, a street singer, were put to an older tune, called "Le Carillon National," and the song rivalled the "Carmagnole" (*q.v.*) during the Terror. It was forbidden by the Directory.

CAIRD, EDWARD (1835-1908), British philosopher and theologian, brother of John Caird (*q.v.*), was born at Greenock on the 22nd of March 1835, and educated at Glasgow University and Balliol College, Oxford. He took a first class in moderations in 1862 and in *Literae humaniores* in 1863, and was Pusey and Ellerton scholar in 1861. From 1864 to 1866 he was fellow and tutor of Merton College. In 1866 he became professor of moral philosophy in the university of Glasgow, and in 1893 succeeded Benjamin Jowett as master of Balliol. With Thomas Hill Green he founded in England a school of orthodox neo-Hegelianism (see HEGEL, *ad fin.*), and through his pupils he exerted a far-reaching influence on English philosophy and theology. Owing to failing health he gave up his lectures in 1904, and in May 1906 resigned his mastership, in which he was succeeded by James Leigh Strachan-Davidson, who had previously for some time, as senior tutor and fellow, borne the chief burden of college administration. Dr Caird received the honorary degree of D.C.L. in 1892; he was made a corresponding member of the French Academy of Moral and Political Science and a fellow of the British Academy. His publications include *Philosophy of Kant* (1878); *Critical Philosophy of Kant* (1889); *Religion and Social Philosophy of Comte* (1885); *Essays on Literature and Philosophy* (1892); *Evolution of Religion* (Gifford Lectures, 1891-1892); *Evolution of Theology in the Greek Philosophers* (1904); and he is represented in this encyclopaedia by the article on CARTESIANISM. He died on the 1st of November 1908.

For a criticism of Dr Caird's theology, see A.W. Benn, *English Rationalism in the 19th Century* (London, 1906).

CAIRD, JOHN (1820-1898), Scottish divine and philosopher, was born at Greenock on the 15th of December 1820. In his sixteenth year he entered the office of his father, who was partner and manager of a firm of engineers. Two years later, however, he obtained leave to continue his studies at Glasgow University. After a year of academic life he tried business again, but in 1840 he gave it up finally and returned to college. In 1845 he entered the ministry of the Church of Scotland, and after holding several livings accepted the chair of divinity at Glasgow in 1862. During these years he won a foremost place among the preachers of Scotland. In theology he was a Broad Churchman, seeking always to emphasize the permanent elements in religion, and ignoring technicalities. In 1873 he was appointed vice-chancellor and principal of Glasgow University. He delivered the Gifford Lectures in 1892-1893 and in 1895-1896. His *Introduction to the Philosophy of Religion* (1880) is an attempt to show the essential rationality of religion. It is idealistic in character, being in fact a reproduction of Hegelian teaching in clear and melodious language. His argument for the Being of God is based on the hypothesis that thought—not individual but universal—is the reality of all things, the existence of this Infinite Thought being demonstrated by the limitations of finite thought. Again his Gifford Lectures are devoted to the proof of the truth of Christianity on grounds of right reason alone. Caird wrote also an excellent study of Spinoza, in which he showed the latent Hegelianism of the great Jewish philosopher. He died on the 30th of July 1898.

CAIRN (in Gaelic and Welsh, *Carn*), 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. The *Duan Eireanach*, an ancient Irish poem, describes the erection of a family cairn; and the *Senchus Mor*, a collection of ancient Irish laws, 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 medieval 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), granting the lands of Burgyn to the monks of Kinloss, 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 "rested" 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 BARROW.)

CAIRNES, JOHN ELLIOTT (1823-1875), British political economist, was born at Castle Bellingham, Ireland, in 1823. After leaving school he spent some years in the counting-house of his father, a brewer. His tastes, however, lay altogether in the direction of study, and he was permitted to enter Trinity College, Dublin, where he took the degree of B.A. in 1848, and six years later that of 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 felt no 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. He devoted most attention to 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*. It follows up and expands J.S. Mill's treatment in the *Essays on some Unsettled Questions in Political Economy*, and forms an 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 increased supply of gold attendant on the Australian and Californian gold discoveries were analysed with great skill and ability. And a critical article on M. Chevalier's work *On the Probable Fall in the Value of Gold* appeared in the *Edinburgh Review* for July 1860.

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 were exposed with great fulness and ability, and the conclusions arrived at have taken their place among the recognized doctrines of political economy. The opinions expressed by Cairnes as to the probable issue of the war in America were largely verified by the actual course of events, and the appearance of the book had a marked influence on the attitude taken by serious political thinkers in England towards the southern states.

[v.04 p.0951] During the remainder of his residence at Galway Professor Cairnes published nothing beyond some fragments and pamphlets mainly upon Irish questions. The most valuable of these papers are the series devoted to the consideration of university education. His health, at no time very good, was still further weakened in 1865 by a fall from his horse. 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 1868-1869 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. He died at Blackheath, near London, on the 8th of July 1875.

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 his 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*.

Taken as a whole the works of Cairnes formed the most important contribution to economical science made by the English school since the publication of J.S. Mill's *Principles*. 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 beside 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 connexions 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 Bagehot called 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 necessary 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 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*, had been relinquished by him, but Cairnes still undertook to defend it. He certainly succeeded in removing from the theory much that had tended to obscure its real meaning and in placing it in its very best aspect. He also showed the sense in which, when treating the problem of wages, we must refer to some fund devoted to the payment of wages, and pointed out the conditions under which the wages fund may increase or decrease. It may be added that his *Leading Principles* contain admirable discussions on trade 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. The *Logical Method* contains about the best exposition and defence of Ricardo's theory of rent; and the *Essays* contain a very clear and formidable criticism of Bastiat's economic doctrines.

Professor Cairnes's son, Captain W.E. Cairnes (1862-1906), was an able writer on military subjects, being author of *An Absent-minded War* (1900), *The Coming Waterloo* (1905), &c.

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CAIRNGORM, a yellow or brown variety of quartz, named from Cairngorm or Cairngorum, one of the peaks of the Grampian Mountains in Banffshire, Scotland. According to Mr E.H. Cunningham-Craig, the mineral occurs in crystals lining cavities in highly-inclined veins of a fine-grained granite running through the coarser granite of the main mass: Shallow pits were formerly dug in the kaolinized granite for sake of the cairngorm and the mineral was also found as pebbles in the bed of the river Avon. Cairngorm is a favourite ornamental stone in Scotland, being set in the lids of snuff-mulls, in the handles of dirks and in brooches for Highland costume. A rich sherry-yellow colour is much esteemed. Quartz of yellow and brown colour is often known in trade as "false topaz," or simply "topaz." Such quartz is found at many localities in Brazil, Russia and Spain. Much of the yellow quartz used in jewellery is said to be "burnt amethyst"; that is, it was originally amethystine quartz, the colour of which has been modified by heat (see Amethyst). Yellow quartz is sometimes known as citrine; when the quartz presents a pale brown tint it is called "smoky quartz"; and when the brown is so deep that the stone appears almost black it is termed morion. The brown colour has been referred to the presence of titanium.

CAIRNS, HUGH MCCALMONT CAIRNS, 1st Earl (1819-1885), Irish statesman, and lord chancellor of England, was born at Cultra, Co. Down, Ireland, on the 27th of December 1819. His father, William Cairns, formerly a captain in the 47th regiment, came of a family[1] of Scottish origin, which migrated to Ireland in the time of James I. Hugh Cairns was his second son, and was educated at Belfast academy and at Trinity College, Dublin, graduating with a senior moderatorship in classics in 1838. In 1844 he was called to the bar at the Middle Temple, to which he had migrated from Lincoln's Inn. During his first years at the chancery bar, Cairns showed little promise of the eloquence which afterwards distinguished him. Never a rapid speaker, he was then so slow and diffident, that he feared that this defect might interfere with his legal career. Fortunately he was soon able to rid himself of the idea that he was only fit for practice as a conveyancer. In 1852 he entered parliament as member for Belfast, and his Inn, on his becoming a Q.C. in 1856, made him a bencher.

In 1858 Cairns was appointed solicitor-general, and was knighted, and in May of that year made two of his most brilliant and best-remembered speeches in the House of Commons. In the first, he defended the action of Lord Ellenborough, who, as president of the board of control, had not only censured Lord

Canning for a proclamation issued by him as governor-general of India but had made public the despatch in which the censure was conveyed. On the other occasion referred to, Sir Hugh Cairns spoke in opposition to Lord John Russell's amendment to the motion for the second reading of the government Reform Bill, winning the most cordial commendation of Disraeli. Disraeli's appreciation found an opportunity for displaying itself some years later, when in 1868 he invited him to be lord chancellor in the brief Conservative administration which followed Lord Derby's resignation of the leadership of his party. Meanwhile, Cairns had maintained his reputation in many other debates, both when his party was in power and when it was in opposition. In 1866 Lord Derby, returning to office, had made him attorney-general, and in the same year he had availed himself of a vacancy to seek the comparative rest of the court of appeal. While a lord justice he had been offered a peerage, and though at first unable to accept it, he had finally done so on a relative, a member of the wealthy family of McCalmont, providing the means necessary for the endowment of a title.

The appointment of Baron Cairns of Garmoyle as lord chancellor in 1868 involved the superseding of Lord Chelmsford, an act which apparently was carried out by Disraeli with less tact than might have been expected of him. Lord Chelmsford bitterly declared that he had been sent away with less courtesy than if he had been a butler, but the testimony of Lord Malmesbury is strong that the affair was the result of an understanding arrived at when Lord Chelmsford took office. Disraeli held office on this occasion for a few months only, and when Lord Derby died in 1869, Lord Cairns became the leader of the Conservative opposition in the House of Lords. He had distinguished himself in the Commons by his resistance to the Roman Catholics' Oath Bill brought in in 1865; in the Lords, his efforts on behalf of the Irish Church were equally strenuous. His speech on Gladstone's Suspensory Bill was afterwards published as a pamphlet, but the attitude which he and the peers who followed him had taken up, in insisting on their amendments to the preamble of the bill, was one difficult to maintain, and Lord Cairns made terms with Lord Granville in circumstances which precluded his consulting his party first. He issued a circular to explain his action in taking a course for which many blamed him. Viewed dispassionately, the incident appears to have exhibited his statesmanlike qualities in a marked degree, for he secured concessions which would have been irretrievably lost by continued opposition. Not long after this, Lord Cairns resigned the leadership of his party in the upper house, but he had to resume it in 1870 and took a strong part in opposing the Irish Land Bill in that year. On the Conservatives coming into power in 1874, he again became lord chancellor; in 1878 he was made Viscount Garmoyle and Earl Cairns; and in 1880 his party went out of office. In opposition he did not take as prominent a part as previously, but when Lord Beaconsfield died in 1881, there were some Conservatives who considered that his title to lead the party was better than that of Lord Salisbury. His health, however, never robust, had for many years shown intermittent signs of failing. He had periodically made enforced retirements to the Riviera, and for many years had had a house at Bournemouth, and it was here that he died on the 2nd of April 1885.

Cairns was a great lawyer, with an immense grasp of first principles and the power to express them; his judgments taking the form of luminous expositions or treatises upon the law governing the case before him, rather than of controversial discussions of the arguments adduced by counsel or of analysis of his own reasons. Lucidity and logic were the leading characteristics of his speeches in his professional capacity and in the political arena. In an eloquent tribute to his memory in the House of Lords, Lord Chief Justice Coleridge expressed the high opinion of the legal profession upon his merits and upon the severe integrity and single-minded desire to do his duty, which animated him in his selections for the bench. His piety was reflected by that of his great opponent, rival and friend, Lord Selborne. Like Lord Selborne and Lord Hatherley, Cairns found leisure at his busiest for teaching in the Sunday-school, but it is not recorded of them (as of him) that they refused to undertake work at the bar on Saturdays, in order to devote that day to hunting. He used to say that his great incentive to hard work at his profession in early days was his desire to keep hunters, and he retained his keenness as a sportsman as long as he was able to indulge it. Of his personal characteristics, it may be said that he was a spare man, with a Scottish, not an Irish, cast of countenance. He was scrupulously neat in his personal appearance, faultless in bands and necktie, and fond of wearing a flower in his button-hole. His chilly manner, coupled with his somewhat austere religious principles, had no doubt much to do with the fact that he was never a popular man. His friends claimed for him a keen sense of humour, but it was not to be detected by those whose knowledge of him was professional rather than personal. Probably he thought the exhibition of humour incompatible with the dignity of high judicial position. Of his legal attainments there can be no doubt. His influence upon the legislation of the day was largely felt where questions affecting religion and the Church were involved and in matters peculiarly affecting his own profession. His power was felt, as has been said, both when he was in office and when his party was in opposition. He had been chairman of the committee on judicature reform, and although he was not in office when the Judicature Act was passed, all the reforms in the legal procedure of his day owed much to him. He took part, when out of office, in the passing of the Married
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Women's Property Act, and was directly responsible for the Conveyancing Acts of 1881-1882, and for the Settled Land Act. Many other statutes in which he was largely concerned might be quoted. His judgments are to be found in the Law Reports and those who wish to consider his oratory should read the speeches above referred to, or that delivered in the House of Lords on the Compensation for Disturbance Bill in 1880, and his memorable criticism of Mr Gladstone's policy in the Transvaal, after Majuba Hill. (See Hansard and *The Times*, 1st of April 1881.) His style of delivery was, as a rule, cold to a marked degree. The term "frozen oratory" has been applied to his speeches, and it has been said of them that they flowed "like water from a glacier.... The several stages of his speech are like steps cut out in ice, as sharply defined, as smooth and as cold." Lord Caims married in 1856 Mary Harriet, eldest daughter of John McNeill, of Parkmount, Co. Antrim, by whom he had issue five sons and two daughters. He was succeeded in the earldom by his second but eldest surviving son, Arthur William (1861-1890), who left one daughter, and from whom the title passed to his two next younger brothers in succession, Herbert John, third earl (1863-1905), and Wilfrid Dallas, fourth earl (b. 1865).

AUTHORITIES.—See *The Times*, 3rd and 14th of April 1885; *Law Journal, Law Times, Solicitors' Journal*, 11th of April 1885; the *Law Magazine*, vol. xi. p. 133; the *Law Quarterly*, vol. i. p. 365; *Earl Russell's Recollections; Memoirs of Lord Malmesbury*; Sir Theodore Martin, *The Life of the Prince Consort*; E. Manson, *Builders of our Law*; J.B. Atlay, *Victorian Chancellors*, vol. ii.

[1] See *History of the family of Cairnes or Cairns*, by H.C. Lawlor (1907).

CAIRNS, JOHN (1818-1892), Scottish Presbyterian divine, was born at Ayton Hill, Berwickshire, on the 23rd of August 1818, the son of a shepherd. He went to school at Ayton and Oldcambus, Berwickshire, and

was then for three years a herd boy, but kept up his education. In 1834 he entered Edinburgh University, but during 1836 and 1837, owing to financial straits, taught in a school at Ayton. In November 1837 he returned to Edinburgh, where he became the most distinguished student of his time, graduating M.A. in 1841, first in classics and philosophy and bracketed first in mathematics. While at Edinburgh he organized the Metaphysical Society along with A. Campbell Fraser and David Masson. He entered the Presbyterian Secession Hall in 1840, and in 1843 wrote an article in the *Secession Magazine* on the Free Church movement, which aroused the interest of Thomas Chalmers. The years 1843-1844 he spent at Berlin studying German philosophy and theology. He was licensed as preacher on the 3rd of February 1845, and on the 6th of August ordained as minister of Golden Square Church, Berwick-on-Tweed. There his preaching was distinguished by its impressiveness and by a broad and unaffected humanity. He had many "calls" to other churches, but chose to remain at Berwick. In 1857 he was one of the representatives at the meeting of the Evangelical Alliance in Berlin, and in 1858 Edinburgh University conferred on him an honorary D.D. In the following year he declined an invitation to become principal of Edinburgh University. In 1872 he was elected moderator of the United Presbyterian Synod and represented his church in Paris at the first meeting of the Reformed Synod of France. In May 1876, he was appointed joint professor of systematic theology and apologetics with James Harper, principal of the United Presbyterian Theological College, whom he succeeded as principal in 1879. He was an indefatigable worker and speaker, and in order to facilitate his efforts in other countries and other literatures he learnt Arabic, Norse, Danish and Dutch. In 1890 he visited Berlin and Amsterdam to acquaint himself with the ways of younger theologians, especially with the Ritschlians, whose work he appreciated but did not accept as final. On his return he wrote a long article on "Recent Scottish Theology" for the *Presbyterian and Reformed Review*, for which he read over every theological work of note published in Scotland during the preceding half-century. He died on the 12th of March, 1892, at Edinburgh. Among his principal publications are *An Examination of Ferrier's "Knowing and Being," and the Scottish Philosophy*—(a work which gave him the reputation of being an independent Hamiltonian in philosophy); *Memoir of John Brown, D.D.* (1860); *Romanism and Rationalism* (1863); *Outlines of Apologetical Theology* (1867); *The Doctrine of the Presbyterian Church* (1876); *Unbelief in the 18th Century* (1881); *Doctrinal Principles of the United Presbyterian Church* (Dr Blair's Manual, 1888).

See MacEwen's *Life and Letters of John Cairns* (1895).

(D. Mn.)

CAIRNS, a seaport of Nares county, Queensland, Australia, 890 m. direct N.N.W. of Brisbane. Pop. (1901) 3557. The town lies parallel with the sea, on the western shore of Trinity Bay, with an excellent harbour, and a long beach, finely timbered. Cairns is the natural outlet for the gold-fields, tin-mines and silver-fields of the district and for the rich copper district of Chillagoe. A government railway, 48 m. long, runs to Mareeba, whence a private company's line continues to Mungana, 100 m. W. There is also a line belonging to a private company connecting Chillagoe with Mareeba. In the vicinity of Cairns are extensive sugar plantations, with sugar mills and refineries; the culture of coffee and tobacco has rapidly extended; bananas, pine-apples and other fruits are exported in considerable quantities and there is a large industry in cedar. The Barron Falls, among the finest in Australia, are near Kuranda, 19 m. from Cairns. Cairns became a municipality in 1885.

CAIRO (Arabic *Misr-al-Kahira*, or simply *Misr*), the capital of modern Egypt and the most populous city in Africa, on the Nile, 12 m. S. of the apex of the Delta, in 30° 3′ N. and 31° 21′ E. It is 130 m. S.E. of Alexandria, and 148 E. of Suez by rail, though only 84 m. from the last-named port by the overland route across the desert, in use before the opening of the Suez Canal. Cairo occupies a length of 5 m. on the east bank of the Nile, stretching north from the old Roman fortress of Babylon, and covers an area of about 8 sq. m. It is built partly on the alluvial plain of the Nile valley and partly on the rocky slopes of the Mokattam hills, which rise 550 ft. above the town.

The citadel, which is built on a spur of the Mokattam hills, occupies the S.E. angle of the city. The prospect from the ramparts of this fortress is one of striking picturesqueness and beauty. Below lies the city with its ancient walls and lofty towers, its gardens and squares, its palaces and its mosques, with 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, and on the east the barren cliffs, backed by a waste of sand. Since the middle of the 19th century the city has more than doubled in size and population. The newer quarters, situated near the river, are laid out in the fashion of French cities, but the eastern parts of the town retain, almost unimpaired, their Oriental aspect, and in scores of narrow, tortuous streets, and busy bazaars it is easy to forget that there has been any change from the Cairo of medieval times. Here the line of fortifications still marks the eastern limits of the city, though on the north large districts have grown up beyond the walls. Neither on the south nor towards the river are there any fortifications left.

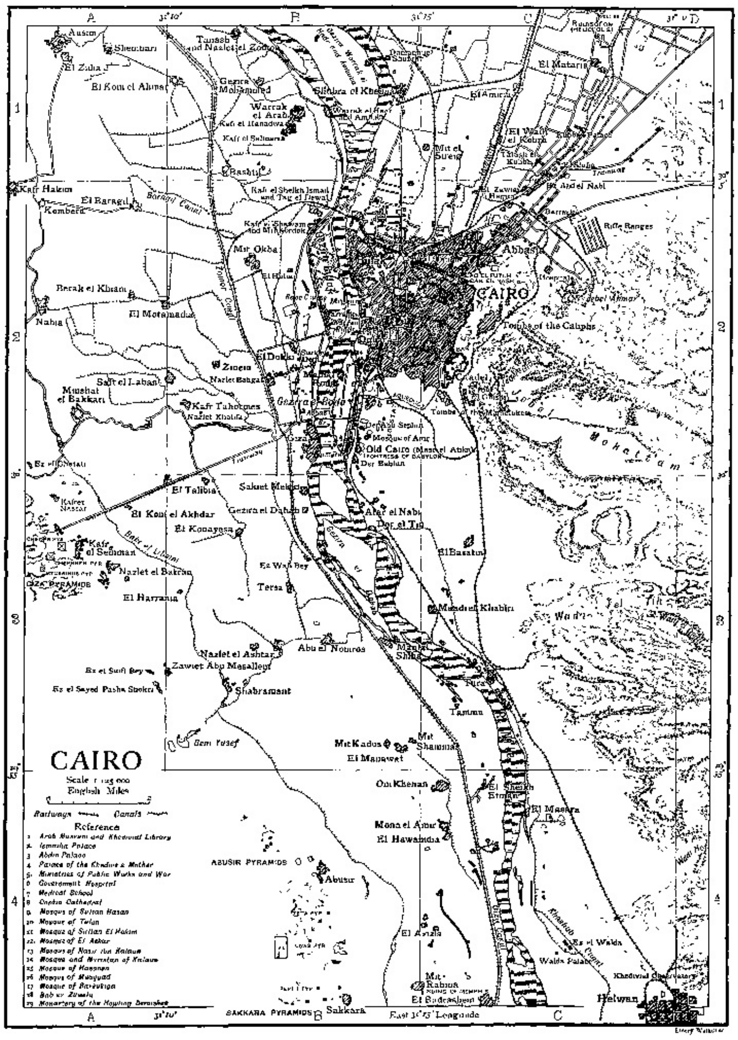
Principal Quarters and Modern Buildings.—From the citadel a straight road, the Sharia Mehemet Ali, runs N. to the Ezbekia (Ezbekiyeh) Gardens, which cover over 20 acres, and form the central point of the foreign colony. North and west of the Ezbekia runs the Ismailia canal, and on the W. side of the canal, about half a mile N. of the Gardens, is the Central railway station, approached by a broad road, the Sharia Clot Bey. The Arab city and the quarters of the Copts and Jews lie E. of the two streets named. West of the Ismailia canal lies the Bulak quarter, the port or riverside district. At Bulak are the arsenal, foundry and railway works, a paper manufactory and the government printing press, founded by Mehemet Ali. A little distance S.E. of the Ezbekia is the Place Atabeh, the chief point of intersection of the electric tramways which serve the newer parts of the town. From the Place Atabeh a narrow street, the Muski, leads E. into the heart of the Arab city. Another street leads S.W. to the Nile, at the point where the Kasr en Nil or Great Nile bridge spans the river, leading to Gezira Bulak, an island whereon is a palace, now turned into a hotel, polo, cricket and tennis grounds, and a racecourse. The districts between the bridge, the Ezbekia and the Ismailia canal, are known as the Ismailia and Tewfikia quarters, after the khedives in whose reigns they were laid out. The district immediately south of the bridge is called the Kasr el-Dubara quarter. Abdin Square, which occupies a central position, is connected with Ezbekia Gardens by a straight road. The narrow canal, El Khalig, which branched from the Nile at Old Cairo and traversed the city from S.W. to N.E., was filled up in 1897, and an electric tramway runs along the road thus made. With the filling up of the channel the ancient festival of the cutting of the canal came to an end.

The government offices and other modern public buildings are nearly all in the western half of the city. On the south side of the Ezbekia are the post office, the courts of the International Tribunals, and the opera house. On the east side are the bourse and the Crédit Lyonnais, on the north the buildings of the American mission. On or near the west side of the gardens are most of the large and luxurious hotels which the city contains for the accommodation of Europeans. Facing the river immediately north of the Great Nile bridge are the large barracks, called Kasr-en-Nil, and the new museum of Egyptian antiquities (opened in 1902). South of the bridge are the Ismailia palace (a khedivial residence), the British consulate general, the palace of the khedive's mother, the medical school and the government hospital. Farther removed from the river are the offices of the ministries of public works and of war—a large building surrounded by gardens—and of justice and finance. On the east side of Abdin Square is Abdin palace, an unpretentious building used for official receptions. Adjoining the palace are barracks. N.E. of Abdin Square, in the Sharia Mehemet Ali, is the Arab museum and khedivial library. Near this building are the new courts of the native tribunals. Private houses in these western districts consist chiefly of residential flats, though in the Kasr el-Dubara quarter are many detached residences.

The Oriental City.—The eastern half of Cairo is divided into many quarters. These quarters were formerly closed at night by massive gates. A few of these gates remain. In addition to the Mahommedan quarters, usually called after the trade of the inhabitants or some notable building, there are the Copt or Christian quarter, the Jews' quarter and the old "Frank" quarter. The last is the Muski district where, since the days of Saladin, "Frank" merchants have been permitted to live and trade. Some of the principal European shops are still to be found in this street. The Copt and Jewish quarters lie north of the Muski. The Coptic cathedral, dedicated to St Mark, is a modern building in the basilica style. The oldest Coptic church in Cairo is, probably, the Keniset-el-Adra, or Church of the Virgin, which is stated to preserve the original type of Coptic basilica. The Coptic churches in the city are not, however, of so much interest as those in Old Cairo (see below). In the Copt quarter are also Armenian, Syrian, Maronite, Greek and Roman Catholic churches. In the Copt and Jewish quarters the streets, as in the Arab quarters, are winding and narrow. In them the projecting upper stories of the houses nearly meet. Sebils or public fountains are numerous. These fountains are generally two-storeyed, the lower chamber enclosing a well, the upper room being often used for scholastic purposes. Many of the fountains are fine specimens of Arab architecture. While the houses of the poorer classes are mean and too often dirty, in marked contrast are the houses of the wealthier citizens, built generally in a style of elaborate arabesque, the windows shaded with projecting cornices of graceful woodwork (*mushrebiya*) and ornamented with stained glass. A winding passage leads through the ornamental 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, while round the sides are richly inlaid cabinets and windows of stained glass; and in a recess is the *divan*, a low, narrow, cushioned seat. The basement storey is generally built of the soft calcareous stone of the neighbouring hills, and the upper storey, which contains the harem, of painted brick. The shops of the merchants are small and open to the street. The greater part of the trade is done, however, in the bazaars or markets, which are held in large *khans* or storehouses, of two storeys and of considerable size. Access to them is gained from the narrow lanes which usually surround them. The khans often possess fine gateways. The principal bazaar, the Khan-el-Khalil, marks the site of the tombs of the Fatimite caliphs.

The Citadel and the Mosques.—Besides the citadel, the principal edifices in the Arab quarters are the mosques and the ancient gates. The citadel or El-Kala 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 (based on the model of the mosques at Constantinople) founded by the same pasha on the site of "Joseph's Hall," so named after the prenomen of Saladin. The dome and the two slender minarets of this mosque form one of the most picturesque features of Cairo, and are visible from a great distance. In the centre is a well called Joseph's Well, sunk in the solid rock to the level of the Nile. There are four other mosques within the citadel walls, the chief being that of Ibn Kalaun, built in A.D. 1317 by Sultan Nasir ibn Kalaun. The dome has fallen in. After having been used as a prison, and, later, as a military storehouse, it has been cleared and its fine colonnades are again visible. The upper parts of the minarets are covered with green tiles. They are furnished with bulbous cupolas. The most magnificent of the city mosques is that of Sultan Hasan, standing in the immediate vicinity of the citadel. It dates from A.D. 1357, and is celebrated for the grandeur of its porch and cornice and the delicate stalactite vaulting which adorns them. The restoration of parts of the mosque which had fallen into decay was begun in 1904. Besides it there is the mosque of Tulun (c. A.D. 879) exhibiting very ancient specimens of the pointed arch; the mosque of Sultan El Hakim (A.D. 1003), the mosque el Azhar (the splendid), which dates from about A.D. 970, and is the seat of a Mahommedan university; and the mosque of Sultan Kalaun, which is attached to the hospital or madhouse (*muristan*) begun by Kalaun in A.D. 1285. The whole forms a large group of buildings, now partially in ruins, in a style resembling the contemporaneous medieval work in Europe, with pointed arches in several orders. Besides the mosque proper there is a second mosque containing the fine mausoleum of Kalaun. Adjacent to the *muristan* on the north is the tomb mosque of al Nasir, completed 1303, with a fine portal. East of the Khan-el-Khalil is the mosque of El Hasanēn, which is invested with peculiar sanctity as containing relics of Hosain and Hasan, grandsons of the Prophet. This mosque was rebuilt in the 19th century and is of no architectural importance. In all Cairo contains over 260 mosques, and nearly as many *zawias* or chapels. Of the gates the finest are the Bab-en-Nasr, in the north wall of the city, and the Bab-ez-Zuwēla, the only surviving part of the southern fortifications.

Tombs of the Caliphs and Mamelukes.—Beyond the eastern wall of the city are the splendid mausolea erroneously known to Europeans as the tombs of the caliphs; they really are tombs of the Circassian or Burji Mamelukes, a race extinguished by Mehemet Ali. Their lofty gilt domes and fanciful network or arabesque tracery are partly in ruins, and the mosques attached to them are also partly ruined. The chief tomb mosques are those of Sultan Barkuk, with two domes and two minarets, completed AD. 1410, and that of Kait Bey (c. 1470), with a slender minaret 135 ft. high. This mosque was carefully restored in 1898. South of the citadel is another group of tomb-mosques known as the tombs of the Mamelukes. They are architecturally of less interest than those of the "caliphs". Southwest of the Mameluke tombs is the much-venerated tomb-mosque of the Imam esh-Shafih or Shaf'i, founder of one of the four orthodox sects of Islam. Near the imam's mosque is a family burial-place built by Mehemet Ali.



Old Cairo: the Fortress of Babylon and the Nilometer.—About a mile south of the city is Masr-el-Atika, called by Europeans Old Cairo. Between Old Cairo and the newer city are large mounds of débris marking [v.04 p.0955] the site of Fostat (see below, *History*). The road to Old Cairo by the river leads past the monastery of the "Howling" Dervishes, and the head of the aqueduct which formerly supplied the citadel with water. Farther to the east is the mosque of Amr, a much-altered building dating from A.D. 643 and containing the tomb of the Arab conqueror of Egypt. Most important of the quarters of Masr-el-Atika is that of Kasr-esh-Shama (Castle of the Candle), built within the outer walls of the Roman fortress of Babylon. Several towers of this fortress remain, and in the south wall is a massive gateway, uncovered in 1901. In the quarter are five Coptic churches, a Greek convent and two churches, and a synagogue. The principal Coptic church is that of Abu Serga (St Sergius). The crypt dates from about the 6th century and is dedicated to Sitt Miriam (the Lady Mary), from a tradition that in the flight into Egypt the Virgin and Child rested at this spot. The upper church is basilican in form, the nave being, as customary in Coptic churches, divided into three sections by wooden screens, which are adorned by carvings in ivory and wood. The wall above the high altar is faced with beautiful mosaics of marbles, blue glass and mother-of-pearl. Of the other churches in Kasr-esh-Shama the most noteworthy is that of El Adra (the Virgin), also called El Moallaka, or The Suspended, being built in one of the towers of the Roman gateway. It contains fine wooden and ivory screens. The pulpit is supported on fifteen columns, which rest on a slab of white marble. The patriarch of the Copts was formerly consecrated in this church. The other buildings in Old Cairo, or among the mounds of rubbish which adjoin it, include several fort-like *ders* or convents. One, south of the Kasr-esh-Shama, is called Der Bablun, thus preserving the name of the ancient fortress. In the Der Abu Sephin, to the north of Babylon, is a Coptic church of the 10th century, possessing magnificent carved screens, a pulpit with fine mosaics and a semi-circle of marble steps.

Opposite Old Cairo lies the island of Roda, where, according to Arab tradition, Pharaoh's daughter found Moses in the bulrushes. Two bridges, opened in 1908, connect Old Cairo with Roda, and a third bridge joins Roda to Giza on the west bank of the river. Roda Island contains a mosque built by Kait Bey, and at its southern extremity is the Nilometer, by which the Cairenes have for over a thousand years measured the rise of the river. It is a square well with an octagonal pillar marked in cubits in the centre.

Northern and Western Suburbs.—Two miles N.E. of Cairo and on the edge of the desert is the suburb of Abbasia (named after the viceroy Abbas), connected with the city by a continuous line of houses. Abbasia is now largely a military colony, the cavalry barracks being the old palace of Abbas Pasha. In these barracks Arabi Pasha surrendered to the British on the 14th of September 1882, the day after the battle of Tel el-Kebir. Mataria, a village 3 m. farther to the N.E., is the site of the defeat of the Mamelukes by the Turks in 1517, and of the defeat of the Turks by the French under General Kleber in 1800. At Mataria was a sycamore-tree, the successor of a tree which decayed in 1665, venerated as being that beneath which the Holy Family, rested on their flight into Egypt. This tree was blown down in July 1906 and its place taken by a cutting made from the tree some years previously. Less than a mile N.E. of Mataria are the scanty remains of the ancient city of On or Heliopolis. The chief monument is an obelisk, about 66 ft. high, erected by Usertesen I. of the XIIth dynasty. A residential suburb, named Heliopolis, containing many fine buildings, was laid out between Mataria and Abbasia during 1905-10.

On the west bank of the Nile, opposite the southern end of Roda Island, is the small town of Giza or Gizeh, a fortified place of considerable importance in the times of the Mamelukes. In the viceregal palace here the museum of Egyptian antiquities was housed for several years (1889-1902). The grounds of this palace have been converted into zoological gardens. A broad, tree-bordered, macadamized road, along which run electric trams, leads S.S.W. across the plain to the Pyramids of Giza, 5 m. distant, built on the edge of the desert.

Helwan.—Fourteen miles S. of Cairo and connected with it by railway is the town of Helwan, built in the desert 3 m. E. of the Nile, and much frequented by invalids on account of its sulphur baths, which are owned by the Egyptian government. A khedivial astronomical observatory was built here in 1903-1904, to take the place of that at Abbasia, that site being no longer suitable in consequence of the northward extension of the city. The ruins of Memphis are on the E. bank of the Nile opposite Helwan.

Inhabitants.—The inhabitants are of many diverse races, the various nationalities being frequently distinguishable by differences in dress as well as in physiognomy and colour. In the oriental quarters of the city the curious shops, the markets of different trades (the shops of each trade being generally congregated in one street or district), the easy merchant sitting before his shop, the musical and quaint street-cries of the picturesque vendors of fruit, sherbet, water, &c., with the ever-changing and many-coloured throng of passengers, all render the streets a delightful study for the lover of Arab life, nowhere else to be seen in such perfection, or with so fine a background of magnificent buildings. The Cairenes, or native citizens, differ from the fellahin in having a much larger mixture of Arab blood, and are at once keener witted and more conservative than the peasantry. The Arabic spoken by the middle and higher classes is generally inferior in grammatical correctness and pronunciation to that of the Bedouins of Arabia, but is purer than that of Syria or the dialect spoken by the Western Arabs. Besides the Cairenes proper, who are largely engaged in trade or handicrafts, the inhabitants include Arabs, numbers of Nubians and Negroes—mostly labourers or domestics in nominal slavery—and many Levantines, there being considerable colonies of Syrians and Armenians. The higher classes of native society are largely of Turkish or semi-Turkish descent. Of other races the most numerous are Greeks, Italians, British, French and Jews. Bedouins from the desert frequent the bazaars.

At the beginning of the 19th century the population was estimated at about 200,000, made up of 120,000 Moslems, 60,000 Copts, 4000 Jews and 16,000 Greeks, Armenians and "Franks." In 1882 the population had risen to 374,000, in 1897 to 570,062, and in 1907, including Helwan and Mataria, the total population was 654,476, of whom 46,507 were Europeans.

Climate and Health.—In consequence of its insanitary condition, Cairo used to have a heavy death-rate. Since the British occupation in 1882 much has been done to better this state of things, notably by a good water-supply and a proper system of drainage. The death-rate of the native population is about 35 per 1000. The climate of the city is generally healthy, with a mean temperature of about 68° F. Though rain seldom falls, exhalations from the river, especially when the flood has begun to subside, render the districts near the Nile damp during September, October and November, and in winter early morning fogs are not uncommon. The prevalent north wind and the rise of the water tend to keep the air cool in summer.

Commerce.—The commerce of Cairo, of considerable extent and variety, consists mainly in the transit of goods. Gum, ivory, hides, and ostrich feathers from the Sudan, 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 cotton and woollen goods, are the more important articles. The traffic in slaves ceased in 1877. In Bulak are several factories founded by Mehemet Ali for spinning, weaving and printing cotton, and a paper-mill established by the khedive Ismail in 1870. Various kinds of paper are manufactured, and especially a fine quality for use in the government offices. In the Island of Roda 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 octroi duty of 9% *ad valorem* formerly levied on all food stuffs entering the city was abolished in 1903. It used to produce about £150,000 per annum.

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Mahommedan Architecture.—Architecturally considered Cairo is still the most remarkable and characteristic of Arab cities. The edifices raised by the Moorish kings of Spain and the Moslem rulers of India may have been more splendid in their materials, and more elaborate in their details; the houses of the great men of Damascus may be more costly than were those of the Mameluke beys; but for purity of taste and elegance of design both are far excelled by many of the mosques and houses of Cairo. These mosques have suffered much in the beauty of their appearance from the effects of time and neglect; but their colour has been often thus softened, and their outlines rendered the more picturesque. What is most to be admired in their style of architecture is its extraordinary freedom from restraint, shown in the wonderful variety of its forms, and the skill in design which has made the most intricate details to harmonize with grand outlines. Here the student may best learn the history of Arab art. Like its contemporary Gothic, it has three great periods, those of growth, maturity and decline. Of the first, the mosque of Ahmed Ibn-Tulun in the southern part of Cairo, and the three great gates of the city, the Bab-en-Nasr, Bab-el-Futuh and Bab-Zuwela, are splendid examples. The design of these entrance gateways is extremely simple and massive, depending for their effect on the fine ashlar masonry in which they are built, the decoration being more or less confined to ornamental disks. The mosque of Tulun was built entirely in brick, and is the earliest instance of the employment of the pointed arch in Egypt. The curve of the arch turns in slightly below the springing, giving a horse-shoe shape. Built in brick, it was found necessary to give a more monumental appearance to the walls by a casing of stucco, which remains in fair preservation to the present day. This led to the enrichment of the archivolts and imposts with that peculiar type of conventional foliage which characterizes Mahommedan work, and which in this case was carried out by Coptic craftsmen. The attached angle-shafts of piers are found here for the first time, and their capitals are enriched, as also the frieze surmounting the walls, with other conventional patterns. The second period passes from the highest point to which this art attained to a luxuriance promising decay. The mosque of sultan Hasan, below the citadel, those of Muayyad and Kalaun, with the Barkukiya and the mosque of Barkuk in the cemetery of Kait Bey, are instances of the second and more matured style of the period. The simple plain ashlar masonry still predominates, but the wall surface is broken up with sunk panels, sometimes with geometrical patterns in them. The principal characteristics of this second period are the magnificent portals, rising sometimes, as in the mosque of sultan Hasan, to 80 or 90 ft., with

elaborate stalactite vaulting at the top, and the deep stalactite cornices which crown the summit of the building. The decoration of the interior consists of the casing of the walls with marble with enriched borders, and (about 20 ft. above the ground) friezes 3 to 5 ft. in height in which the precepts of the Koran are carved in relief, with a background of conventional foliage. Of the last style of this period the Ghuriya and the mosque of Kait Bey in his cemetery are beautiful specimens. They show an elongation of forms and an excess of decoration in which the florid qualities predominate. Of the age of decline the finest monument is the mosque of Mahommad Bey Abu-Dahab. The forms are now poor, though not lacking in grandeur, and the details are not as well adjusted as before, with a want of mastery of the most suitable decoration. The usual plan of a congregational mosque is a large, square, open court, surrounded by arcades of which the chief, often several bays deep, and known as the Manksura, or prayer-chamber, faces Mecca (eastward), and has inside its outer wall a decorated niche to mark the direction of prayer. In the centre of the court is a fountain for ablutions, often surmounted by a dome, and in the prayer-chamber a pulpit and a desk for readers. When a mosque is also the founder's tomb, it has a richly ornamented sepulchral chamber always covered by a dome (see further MOSQUE, which contains plans of the mosques of Amr and sultan Hasan, and of the tomb mosque of Kait Bey).

After centuries of neglect efforts are now made to preserve the monuments of Arabic art, a commission with that object having been appointed in 1881. To this commission the government makes an annual grant of £4000. The careful and syste-matic work accomplished by this commission has preserved much of interest and beauty which would otherwise have gone utterly to ruin. Arrangements were made in 1902 for the systematic repair and preservation of Coptic monuments.

Museums and Library.—The museum of Egyptian antiquities was founded at Bulak in 1863, being then housed in a mosque, by the French savant Auguste Mariette. In 1889 the collection was transferred to the Giza (Ghezireh) palace, and in 1902 was removed to its present quarters, erected at a cost of over £250,000. A statue of Mariette was unveiled in 1904. The museum is entirely devoted to antiquities of Pharaonic times, and, except in historical papyri, in which it is excelled by the British Museum, is the most valuable collection of such antiquities in existence.

The Arab museum and khedivial library are housed in a building erected for the purpose, at a cost of £66,000, and opened in 1903. In the museum are preserved treasures of Saracenic art, including many objects removed from the mosques for their better security. The khedivial library contains some 64,000 volumes, over two-thirds being books and MSS. in Arabic, Persian, Turkish, Amharic and Syriac. The Arabic section includes a unique collection of 2677 korans. The Persian section is rich in illuminated MSS. The numismatic collection, as regards the period of the caliphs and later dynasties, is one of the richest in the world.

History.—Before the Arab conquest of Egypt the site of Cairo appears to have been open country. Memphis was some 12 m. higher up on the opposite side of the Nile, and Heliopolis was 5 or 6 m. distant on the N.E. The most ancient known settlement in the immediate neighbourhood of the present city was the town called Babylon. From its situation it may have been a north suburb of Memphis, which was still inhabited in the 7th century A.D. Babylon is said by Strabo to have been founded by emigrants from the ancient city of the same name in 525 B.C., *i.e.* at the time of the Persian conquest of Egypt. Here the Romans built a fortress and made it the headquarters of one of the three legions which garrisoned the country. The church of Babylon mentioned in 1 Peter v. 13 has been thought by some writers to refer to this town—an improbable supposition. Amr, the conqueror of Egypt for the caliph Omar, after taking the town besieged the fortress for the greater part of a year, the garrison surrendering in April A.D. 641. The town of Babylon disappeared, but the strong walls of the fortress in part remain, and the name survived, "Babylon of Egypt," or "Babylon" simply, being frequently used in medieval writings as synonymous with Cairo or as denoting the successive Mahommedan dynasties of Egypt.

Cairo itself is the fourth Moslem capital of Egypt; the site of one of those that had preceded it is, for the most part, included within its walls, while the other two were a little to the south. Amr founded El-Fostat, the oldest of these, close to the fortress which he had besieged. Fostat signifies "the tent," the town being built where Amr had pitched his tent. The new town speedily became a place of importance, and was the residence of the náibs, or lieutenants, appointed by the orthodox and Omayyad caliphs. It received the name of Masr, properly Misr, which was also applied by the Arabs to Memphis and to Cairo, and is to-day, with the Roman town which preceded it, represented by Masr el-Atika, or "Old Cairo." Shortly after the overthrow of the Omayyad dynasty, and the establishment of the Abbasids, the city of El-'Askar was founded (A.D. 750) by Suleiman, the general who subjugated the country, and became the capital and the residence of the successive lieutenants of the Abbasid caliphs. El-'Askar was a small town N.E. of and adjacent to El-Fostat, of which it was a kind of suburb. Its site is now entirely desolate. The third capital, El-Katai, was founded about A.D. 873 by Ahmed Ibn Tulun, as his capital. It continued the royal residence of his successors; but was sacked not long after the fall of the dynasty and rapidly decayed. A part of the present Cairo occupies its site and contains its great mosque, that of Ahmed Ibn Tulun.

[v.04 p.0957] Jauhar (Gohar) el-Kaid, the conqueror of Egypt for the Fatimite caliph El-Moizz, founded a new capital, A.D. 968, which was named El-Kāhira, that is, "the Victorious," a name corrupted into Cairo. The new city, like that founded by Amr, was originally the camp of the conqueror. This town occupied about a fourth part, the north-eastern, of the present metropolis. By degrees it became greater than El-Fostāt, and took from it the name of Misr, or Masr, which is applied to it by the modern Egyptians. With its rise Fostāt, which had been little affected by the establishment of Askar and Katai, declined. It continually increased so as to include the site of El-Katai to the south. In A.D. 1176 Cairo was unsuccessfully attacked by the Crusaders; shortly afterwards Saladin built the citadel on the lowest point of the mountains to the east, which immediately overlooked El-Katai, and he partly walled round the towns and large gardens within the space now called Cairo. Under the prosperous rule of the Mameluke sultans this great tract was filled with habitations; a large suburb to the north, the Hoseynia, was added; and the town of Bulak was founded. After the Turkish conquest (A.D. 1517) the metropolis decayed, but its limits were the same. In 1798 the city was captured by the French, who were driven out in 1801 by the Turkish and English forces, the city being handed over to the Turks. Mehemet Ali, originally the Turkish viceroy, by his massacre of the Mamelukes in 1811, in a narrow street leading to the citadel, made himself master of the country, and Cairo again became the capital of a virtually independent kingdom. Under Mehemet and his successors all the western part of the city has grown up. The khedive Ismail, in making the straight road from the citadel to the Ezbekia gardens, destroyed many of the finest houses of the old town. In 1882 Cairo was occupied

by the British, and British troops continue to garrison the citadel.

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CAIRO, a city and the county-seat of Alexander county, Illinois, U.S.A., in the S. part of the state, at the confluence of the Ohio and Mississippi rivers, 365 m. S. of Chicago. Pop. (1890) 10,324; (1900) 12,566, of whom 5000 were negroes; (1910 census) 14,548. Cairo is served by the Illinois Central, the Mobile & Ohio, the Cleveland, Cincinnati, Chicago & St Louis, the St Louis, Iron Mountain & Southern, and the St Louis South-Western railways, and by river steamboat lines. The city, said to be the "Eden" of Charles Dickens's *Martin Chuzzlewit*, is built on a tongue of land between the rivers, and has suffered many times from inundations, notably in 1858. It is now protected by great levees. A fine railway bridge (1888) spans the Ohio. The city has a large government building, a U.S. marine hospital (1884), and the A.B. Safford memorial library (1882), and is the seat of St Joseph's Loretto Academy (Roman Catholic, 1864). In one of the squares there is a bronze statue, "The Hewer," by G.G. Barnard. In the N. part of the city is St Mary's park (30 acres). At Mound City (pop. in 1910, 2837), 5 m. N. of Cairo, there is a national cemetery. Lumber and flour are Cairo's principal manufactured products, and the city is an important hardwood and cotton-wood market; the Singer Manufacturing Co. has veneer mills here, and there are large box factories. In 1905 the value of the city's factory products was $4,381,465, an increase of 40.6% since 1900. Cairo is a shipping-point for the surrounding agricultural country. The city owes its origin to a series of commercial experiments. In 1818 a charter was secured from the legislature of the territory of Illinois incorporating the city and bank of Cairo. The charter was soon forfeited, and the land secured by it reverted to the government. In 1835 a new charter was granted to a second company, and in 1837 the Cairo City & Canal Co. was formed. By 1842, however, the place was practically abandoned. A successful settlement was made in 1851-1854 under the auspices of the New York Trust Co.; the Illinois Central railway was opened in 1856; and Cairo was chartered as a city in 1857. During the Civil War Cairo was an important strategic point, and was a military centre and depot of supplies of considerable importance for the Federal armies in the west. In 1862 Admiral Andrew H. Foote established at Mound City a naval depot, which was the basis of his operations on the Mississippi.

CAIROLI, BENEDETTO (1825-1889), Italian statesman, was born at Pavia on the 28th of January 1825. From 1848 until the completion of Italian unity in 1870, his whole activity was devoted to the Risorgimento, as Garibaldian officer, political refugee, anti-Austrian conspirator and deputy to parliament. He commanded a volunteer company under Garibaldi in 1859 and 1860, being wounded slightly at Calatafimi and severely at Palermo in the latter year. In 1866, with the rank of colonel, he assisted Garibaldi in Tirol, in 1867 fought at Mentana, and in 1870 conducted the negotiations with Bismarck, during which the German chancellor is alleged to have promised Italy possession of Rome and of her natural frontiers if the Democratic party could prevent an alliance between Victor Emmanuel and Napoleon. The prestige personally acquired by Benedetto Cairoli was augmented by that of his four brothers, who fell during the wars of Risorgimento, and by the heroic conduct of their mother. His refusal of all compensation or distinction further endeared him to the Italian people. When in 1876 the Left came into power, Cairoli, then a deputy of sixteen years' standing, became parliamentary leader of his party, and, after the fall of Depretis, Nicotera and Crispi, formed his first cabinet in March 1878 with a Francophil and Irredentist policy. After his marriage with the countess Elena Sizzo of Trent, he permitted the Irredentist agitation to carry the country to the verge of a war with Austria. General irritation was caused by his and Count Corti's policy of "clean hands" at the Berlin Congress, where Italy obtained nothing, while Austria-Hungary secured a European mandate to occupy Bosnia and the Herzegovina. A few months later the attempt of Passanante to assassinate King Humbert at Naples (12th of December 1878) caused his downfall, in spite of the courage displayed and the severe wound received by him in protecting the king's person on that occasion. On the 3rd of July 1879 Cairoli returned to power, and in the following November formed with Depretis a coalition ministry, in which he retained the premiership and the foreign office. Confidence in French assurances, and belief that Great Britain would never permit the extension of French influence in North Africa, prevented him from foreseeing the French occupation of Tunis (11th of May 1881). In view of popular indignation he resigned in order to avoid making inopportune declarations to the chamber. Thenceforward he practically disappeared from political life. In 1887 he received the knighthood of the Annunziata, the highest Italian decoration, and on the 8th of August 1889 died while a guest of King Humbert in the royal palace of Capodimonte near Naples. Cairoli was one of the most conspicuous representatives of that type of Italian public men who, having conspired and fought for a generation in the cause of national unity, were despite their valour little fitted for the responsible parliamentary and official positions they subsequently attained; and who by their ignorance of foreign affairs and of internal administration unwittingly impeded the political development of their country.

CAISSON (from the Fr. *caisse*, the variant form "cassoon" being adapted from the Ital. *casone*), a chest or case. When employed as a military term, it denotes an ammunition wagon or chest; in architecture it is the term used for a sunk panel or coffer in a ceiling, or in the soffit of an arch or a vault.

In civil engineering, however, the word has attained a far wider signification, and has been adopted in connexion with a considerable variety of hydraulic works. A caisson in this sense implies a case or enclosure of wood or iron, generally employed for keeping out water during the execution of foundations and other works in water-bearing strata, at the side of or under rivers, and also in the sea. There are two distinct forms of this type of caisson:—(1) A caisson open at the top, whose sides, when it is sunk in position, emerge above the water-level, and which is either provided with a water-tight bottom or is carried down, by being weighted at the top and having a cutting edge round the bottom, into a water-tight stratum, aided frequently by excavation inside; (2) A bottomless caisson, serving as a sort of diving-bell, in which men can work when compressed air is introduced to keep out the water in proportion to the depth below the water-level, which is gradually carried down to an adequately firm foundation by excavating at

the bottom of the caisson, and building up a quay-wall or pier out of water on the top of its roof as it descends. An example of a caisson with a water-tight bottom is furnished by the quays erected alongside the Seine at Rouen, where open-timber caissons were sunk on to bearing-piles down to a depth of 9¾ ft. below low-water, the brick and concrete lower portions of the quay-wall being built inside them out of water (see Dock). At Bilbao, Zeebrugge and Scheveningen harbours, large open metal caissons, built inland, ballasted with concrete, floated out into position, and then sunk and filled with concrete, have been employed for forming very large foundation blocks for the breakwaters (see Breakwater). Open iron caissons are frequently employed for enclosing the site of river piers for bridges, where a water-tight stratum can be reached at a moderate depth, into which the caisson can be taken down, so that the water can be pumped out of the enclosure and the foundations laid and the pier carried up in the open air. Thus the two large river piers carrying the high towers, bascules, and machinery of the Tower Bridge, London, were each founded and built within a group of twelve plate-iron caissons open at the top; whilst four of the piers on which the cantilevers of the Forth Bridge rest, were each erected within an open plate-iron caisson fitted at the bottom to the sloping rock, where ordinary cofferdams could not have been adopted.

Where foundations have to be carried down to a considerable depth in water-bearing strata, or through the alluvial bed of a river, to reach a hard stratum, bottomless caissons sunk by excavating under compressed air are employed. The caisson at the bottom, forming the working chamber, is usually provided with a strong roof, round the top of which, when the caisson is floated into a river, plate-iron sides are erected forming an upper open caisson, inside which the pier or quay-wall is built up out of water, on the top of the roof, as the sinking proceeds. Shafts through the roof up to the open air provide access for men and materials to the working chamber, through an air-lock consisting of a small chamber with an air-tight door at each end, enabling locking into and out of the compressed-air portion to be readily effected, on the same principle as a water-lock on a canal. When a sufficiently reliable stratum has been reached, the men leave the working chamber; and it is filled with concrete through the shafts, the bottomless caisson remaining embedded in the work. The foundations for the two river piers of the Brooklyn Suspension Bridge, carried down to the solid rock, 78 and 45 ft. respectively below high-water, by means of bottomless timber caissons with compressed air, were an early instance of this method of carrying out subaqueous foundations; whilst the Antwerp quay-walls, commenced many years ago in the river Scheldt at some distance out from the right bank, and the foundations of six of the piers supporting the cantilevers of the Forth Bridge, carried down to rock between 64 and 89 ft. below high-water, are notable examples of works founded under water within wrought iron bottomless caissons by the aid of compressed air. The foundations of the two piers of the Eiffel Tower adjoining the Seine were carried down through soft water-bearing strata to a depth of 33 ft. by means of wrought iron bottomless caissons sunk by the help of compressed air; and the deep foundations under the sills of the new large Florida lock at Havre (see Dock) were laid underneath the water logged alluvial strata close to the Seine estuary by similar means. Workmen, after emerging from such caissons, sometimes exhibit symptoms of illness which is known as *caisson disease* (*q.v.*).

As in the above system, significantly termed by French engineers *par caisson perdu*, the materials of the bottomless caisson have to be left in the work, a more economical system has been adapted for carrying out similar foundations, at moderate depths, by using movable caissons, which, after the lowest portions of the foundations have been laid, are raised by screw-jacks for constructing the next portions. In this way, instead of building the pier or wall on the roof of the caisson, the work is carried out under water in successive stages, by raising the bottomless caisson as the work proceeds; and by this arrangement, the caisson, having completed the subaqueous portion of the structure, is available for work elsewhere. This movable system has been used with advantage for the foundations for some piers of river bridges, some breakwater foundations, and, at the Florida lock, Havre, for founding portions of the side walls.

Closed iron caissons, termed ship-caissons, and sliding or rolling caissons, are generally employed for closing graving-docks, especially the former (so called from their resemblance in shape to a vessel) on account of their simplicity, being readily floated into and out of position; whilst sliding caissons are sometimes used instead of lock-gates at docks, but require a chamber at the side to receive them when drawn back. They possess the advantage, particularly for naval dockyards where heavy weights are transported, of providing in addition a strong movable bridge, thereby dispensing with a swing-bridge across the opening.

The term caisson is sometimes applied to flat air-tight constructions used for raising vessels out of water for cleaning or repairs, by being sunk under them and then floated; but these floating caissons are more commonly known as pontoons, or, when air-chambers are added at the sides, as floating dry-docks.

(L. F. V.-H.)

CAISSON DISEASE. In order to exclude the water, the air pressure within a caisson used for subaqueous works must be kept in excess of the pressure due to the superincumbent water; that is, it must be increased by one atmosphere, or 15 lb per sq. in. for every 33½ ft. that the caisson is submerged below the surface. Hence at a depth of 100 ft. a worker in a caisson, or a diver in a diving-dress, must be subjected to a pressure of four atmospheres or 60 lb per sq. in. Exposure to such pressures is apt to be followed by disagreeable and even dangerous physiological effects, which are commonly referred to as caisson disease or compressed air illness. The symptoms are of a very varied character, including pains in the muscles and joints (the "bends"), deafness, embarrassed breathing, vomiting, paralysis ("divers' palsy"), fainting and sometimes even sudden death. At the St Louis bridge, where a pressure was employed equal to 4¼ atmospheres, out of 600 workmen, 119 were affected and 14 died. At one time the symptoms were attributed to congestion produced by the mechanical effects of the pressure on the internal organs of the body, but this explanation is seen to be untenable when it is remembered that the pressure is immediately transmitted by the fluids of the body equally to all parts. They do not appear during the time that the pressure is being raised nor so long as it is continued, but only after it has been removed; and the view now generally accepted is that they are due to the rapid effervescence of the gases which are absorbed in the body-fluids during exposure to pressure. Experiment has proved that in animals exposed to compressed air nitrogen is dissolved in the fluids in accordance with Dalton's law, to the extent of roughly 1% for each atmosphere of pressure, and also that when the pressure is suddenly relieved the gas is liberated in bubbles within the body. It is these bubbles that do the mischief. Set free in the spinal cord, for instance, they may give rise to partial paralysis, in the labyrinth of the ear to auditory vertigo, or in the heart to stoppage of the circulation; on the other hand, they may be liberated in positions where they do

no harm. But if the pressure is relieved gradually they are not formed, because the gas comes out of solution slowly and is got rid of by the heart and lungs. Paul Bert exposed 24 dogs to pressure of 7-9½ atmospheres and "decompressed" them rapidly in 1-4 minutes. The result was that 21 died, while only one showed no symptoms. In one of his cases, in which the apparatus burst while at a pressure of 9½ atmospheres, death was instantaneous and the body was enormously distended, with the right heart full of [v.04 p.0959] gas. But he also found that dogs exposed, for moderate periods, to similar pressures suffered no ill effects provided that the pressure was relieved gradually, in 1-1½ hours; and his results have been confirmed by subsequent investigators. To prevent caisson disease, therefore, the decompression should be slow; Leonard Hill suggests it should be at a rate of not less than 20 minutes for each atmosphere of pressure. Good ventilation of the caisson is also of great importance (though experiment does not entirely confirm the view that the presence of carbonic acid to an amount exceeding 1 or 1¼ parts per thousand exercises a specific influence on the production of compressed air illness), and long shifts should be avoided, because by fatigue the circulatory and respiratory organs are rendered less able to eliminate the absorbed gas. Another reason against long shifts, especially at high pressures, is that a high partial pressure of oxygen acts as a general protoplasmic poison. This circumstance also sets a limit to the pressures that can possibly be used in caissons and therefore to the depths at which they can be worked, though there is reason to think that the maximum pressure (4¾ atmospheres) so far used in caisson work might be considerably exceeded with safety, provided that proper precautions were observed in regard to slow decompression, the physique of the workmen, and the hours of labour. As to the remedy for the symptoms after they have appeared, satisfactory results have been obtained by replacing the sufferers in a compressed air chamber ("recompression"), when the gas is again dissolved by the body fluids, and then slowly "decompressing" them.

See Paul Bert, *La Pression barométrique* (1878); and Leonard Hill, *Recent Advances in Physiology and Biochemistry* (1906), (both these works contain bibliographies); also a lecture by Leonard Hill delivered at the Royal Institution of Great Britain on the 25th of May 1906; "Diving and Caisson Disease," a summary of recent investigations, by Surgeon Howard Mummery, *British Medical Journal*, June 27th, 1908; *Diseases of Occupation*, by T. Oliver (1908); *Diseases of Workmen*, by T. Luson and R. Hyde (1908).

CAITHNESS, a county occupying the extreme north-east of Scotland, bounded W. and S. by Sutherlandshire, E. by the North Sea, and N. by the Pentland Firth. Its area is 446,017 acres, or nearly 697 sq. m. The surface generally is flat and tame, consisting for the most part of barren moors, almost destitute of trees. It presents a gradual slope from the north and east up to the heights in the south and west, where the chief mountains are Morven (2313 ft.), Scaraben (2054 ft.) and Maiden Pap (1587 ft.). The principal rivers are the Thurso ("Thor's River"), which, rising in Cnoc Crom Uillt (1199 ft.) near the Sutherlandshire border, pursues a winding course till it reaches the sea in Thurso Bay; the Forss, which, emerging from Loch Shurrery, follows a generally northward direction and enters the sea at Crosskirk, a fine cascade about a mile from its mouth giving the river its name (*fors*, Scandinavian, "waterfall;" in English the form is *force*); and Wick Water, which, draining Loch Watten, flows into the sea at Wick. There are many other smaller streams well stocked with fish. Indeed, the county offers fine sport for rod and gun. The lochs are numerous, the largest being Loch Watten, 2¾ m. by ¾ m., and Loch Calder, 2¼ by 1 m., and Lochs Colam, Hempriggs, Heilen, Ruard, Scarmclate, St John's, Toftingale and Wester. So much of the land is low-lying and boggy that there are no glens, except in the mountainous south-west, although towards the centre of the county are Strathmore and Strathbeg (the great and little valleys). Most of the coast-line is precipitous and inhospitable, particularly at the headlands of the Ord, Noss, Skirsa, Duncansbay, St John's Point, Dunnet Head (346 ft.), the most northerly point of Scotland, Holburn and Brims Ness. From Berriedale at frequent intervals round the coast occur superb "stacks," or detached pillars of red sandstone, which add much to the grandeur of the cliff scenery.

Caithness is separated from the Orkneys by the Pentland Firth, a strait about 14 miles long and from 6 to 8 miles broad. Owing to the rush of the tide, navigation is difficult, and, in rough weather, dangerous. The tidal wave races at a speed which varies from 6 to 12 m. an hour. At the meeting of the western and eastern currents the waves at times rise into the air like a waterspout, but the current does not always nor everywhere flow at a uniform rate, being broken up at places into eddies as perilous as itself. The breakers caused by the sunken reefs off Duncansbay Head create the Bores of Duncansbay, and eddies off St John's Point are the origin of the Merry Men of Mey, while off the island of Stroma occurs the whirlpool of the Swalchie, and off the Orcadian Swona is the vortex of the Wells of Swona. Nevertheless, as the most direct road from Scandinavian ports to the Atlantic the Firth is used by at least 5000 vessels every year. In the eastern entrance to the Firth lies the group of islands known as the Pentland Skerries. They are four in number—Muckle Skerry, Little Skerry, Clettack Skerry and Louther Skerry—and the nearest is 4½ m. from the mainland. On Muckle Skerry, the largest (½ m. by ⅓ m.), stands a lighthouse with twin towers, 100 ft. apart. The island of Stroma, 1½ m. from the mainland (pop. 375), belongs to Caithness and is situated in the parish of Canisbay. It is 2¼ m. long by 1¼ m. broad. In 1862 a remarkable tide climbed the cliffs (200 ft.) and swept across the island.

Geology.—Along the western margin of the county from Reay on the north coast to the Scaraben Hills there is a narrow belt of country which is occupied by metamorphic rocks of the types found in the east of Sutherland. They consist chiefly of granulitic quartzose schists and felspathic gneisses, permeated in places by strings and veins of pegmatite. On the Scaraben Hills there is a prominent development of quartz-schists the age of which is still uncertain. These rocks are traversed by a mass of granite sometimes foliated, trending north and south, which is traceable from Reay southwards by Aultnabreac station to Kinbrace and Strath Helmsdale in Sutherland. Excellent sections of this rock, showing segregation veins, are exposed in the railway cuttings between Aultnabreac and Forsinard. A rock of special interest described by Professor Judd occurs on Achvarasdale Moor, near Loch Scye, and hence named Scyelite. It forms a small isolated boss, its relations to the surrounding rocks not being apparent. Under the microscope, the rock consists of biotite, hornblende, serpentinous pseudo-morphs after olivine and possibly after enstatite and magnetite, and may be described as a mica-hornblende-picrite. The remainder of the county is occupied by strata of Old Red Sandstone age, the greater portion being grouped with the Middle or Orcadian division of that system, and a small area on the promontory of Dunnet Head being provisionally placed in the upper division. By means of the fossil fishes, Dr Traquair has arranged the Caithness flagstone series in three groups, the Achanarras beds at the base, the Thurso flagstones in the middle, and the John o' Groats beds at the top. In the extreme south of the county certain minor subdivisions appear which probably underlie the lowest fossiliferous beds containing the Achanarras

fauna. These comprise (1) the coarse basement conglomerate, (2) dull chocolate-red sandstones, shales and clays around Braemore in the Berriedale Water, (3) the brecciated conglomerate largely composed of granite detritus seen at Badbea, (4) red sandstones, shales and conglomeratic bands found in the Berriedale Water and further northwards in the direction of Strathmore. Morven, the highest hill in Caithness, is formed of gently inclined sandstones and conglomerates resting on an eroded platform of quartz-schists and quartz-mica-granulites. The flagstones yielding the fishes of the lowest division of the Orcadian series appear on Achanarras Hill about three miles south of Halkirk. The members of the overlying Thurso group have a wide distribution as they extend along the shore on either side of Thurso and spread across the county by Castletown and Halkirk to Sinclairs Bay and Wick. They are thrown into folds which are traversed by faults some of which run in a north and south direction. They consist of dark grey and cream-coloured flagstones, sometimes thick-bedded with grey and blue shales and thin limestones and occasional intercalations of sandstone. In the north-west of the county the members of the Thurso group appear to overlap the Achanarras beds and to rest directly on the platform of crystalline [v.04 p.0960] schists. In the extreme north-east there is a passage upwards into the John o' Groats group with its characteristic fishes, the strata consisting of sandstones, flagstones with thin impure limestones. The rocks of Dunnet Head, which are provisionally classed with the upper Old Red Sandstone, are composed of red and yellow sandstones, marls and mudstones. Hitherto no fossils have been obtained from these beds save some obscure plant-like markings, but they are evidently a continuation southwards of the sandstones of Hoy, which there rest unconformably on the flagstone series of Orkney. This patch of Upper Old Red strata is faulted against the Caithness flagstones to the south. For many years the flagstones have been extensively quarried for pavement purposes, as for instance near Thurso, at Castletown and Achanarras. Two instances of volcanic necks occur in Caithness, one piercing the red sandstones at the Ness of Duncansbay and the other the sandstones of Dunnet Head north of Brough. They point to volcanic activity subsequent to the deposition of the John o' Groats beds and of the Dunnet sandstones. The materials filling these vents consist of agglomerate charged with blocks of diabase, sandstone, flagstone and limestone.

An interesting feature connected with the geology of Caithness is the deposit of shelly boulder clay which is distributed over the low ground, being deepest in the valleys and in the cliffs surrounding the bays on the east coast. Apart from the shell fragments, many of which are striated, the deposit contains blocks foreign to the county, as for instance chalk and chalk-flints, fragments of Jurassic rocks with fossils and pieces of jet. The transport of local boulders shows that the ice must have moved from the south-east towards the north-west, which coincides with the direction indicated by the striae. The Jurassic blocks may have been derived from the strip of rocks of that age on the east coast of Sutherland. The shell fragments, many of which are striated, include arctic, boreal and southern forms, only a small number being characteristic of the littoral zone.

Climate and Agriculture.—The climate is variable, and though the winter storms fall with great severity on the coast, yet owing to proximity to a vast 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. Only about two-fifths of the arable land is good. In spite of this and the cold, wet and windy climate, progressive landlords and tenants keep a considerable part of the acreage of large farms successfully tilled. In 1824 James Traill of Ratter, near Dunnet, recognizing that it was impossible to expect tenants to reclaim and improve the land on a system of short leases, advocated large holdings on long terms, so that farmers might enjoy a substantial return on their capital and labour. Thanks to this policy and the farmers' skill and enterprise, the county has acquired a remarkable reputation for its produce; notably oats and barley, turnips, potatoes and beans. Sheep—chiefly Leicester and Cheviots—of which the wool is in especial request in consequence of its fine quality, cattle, horses and pigs are raised for southern markets.

Other Industries.—The great source of profit to the inhabitants is to be found in the fisheries of cod, ling, lobster and herring. The last is the most important, beginning about the end of July and lasting for six weeks, the centre of operations being at Wick. Besides those more immediately engaged in manning the boats, the fisheries give employment to a large number of coopers, curers, packers and helpers. The salmon fisheries on the coast and at the mouths of rivers are let at high prices. The Thurso is one of the best salmon streams in the north. The flagstone quarries, mostly situated in the Thurso, Olrig and Halkirk districts, are another important source of revenue. Of manufactures there is little beyond tweeds, ropes, agricultural implements and whisky, and the principal imports consist of coal, wood, manure, flour and lime.

The only railway in the county is the Highland railway, which, from a point some four miles to the south-west of Aultnabreac station, crosses the shire in a rough semicircle, via Halkirk, to Wick, with a branch from Georgemas Junction to Thurso. There is also, however, frequent communication by steamer between Wick and Thurso and the Orkneys and Shetlands, Aberdeen, Leith and other ports. The deficiency of railway accommodation is partly made good by coach services between different places.

Population and Government.—The population of Caithness in 1891 was 33,177, and in 1901, 33,870, of whom twenty-four persons spoke Gaelic only, and 2876 Gaelic and English. The chief towns are Wick (pop. in 1901, 7911) and Thurso (3723). The county returns one member to parliament. Wick is the only royal burgh and one of the northern group of parliamentary burghs which includes Cromarty, Dingwall, Dornoch, Kirkwall and Tain. Caithness unites with Orkney and Shetland to form a sheriffdom, and there is a resident sheriff-substitute at Wick, who sits also at Thurso and Lybster. The county is under school-board jurisdiction, and there are academies at Wick and Thurso. The county council subsidizes elementary schools and cookery classes and provides apparatus for technical classes.

History.—The early history of Caithness may, to some extent, be traced in the character of its remains and its local nomenclature. Picts' houses, still fairly numerous, Norwegian names and Danish mounds attest that these peoples displaced each other in turn, and the number and strength of the fortified keeps show that its annals include the usual feuds, assaults and reprisals. Circles of standing stones, as at Stemster Loch and Bower, and the ruins of Roman Catholic chapels and places of pilgrimage in almost every district, illustrate the changes which have come over its ecclesiastical condition. The most important remains are those of Bucholie Castle, Girnigo Castle, and the tower of Keiss; and, on the S.E. coast, the castles of Clyth, Swiney, Forse, Laveron, Knockinnon, Berriedale, Achastle and Dunbeath, the last of which is romantically situated on a detached stack of sandstone rock. About six miles from Thurso stand the ruins of Braal Castle, the residence of the ancient bishops of Caithness. On the coast of the Pentland Firth, 1½

miles west of Dunscansbay Head, is the site of John o' Groat's house.

See S. Laing, *Prehistoric Remains of Caithness* (London and Edinburgh, 1866); James T. Calder, *History of Caithness* (2nd edition, Wick); John Home, *In and About Wick* (Wick); Thomas Sinclair, *Caithness Events* (Wick, 1899); *History of the Clan Gunn* (Wick, 1890); J. Henderson, *Caithness Family History* (Edinburgh, 1884); Harvie-Brown, *Fauna of Caithness* (Edinburgh, 1887); Principal Miller, *Our Scandinavian Forefathers* (Thurso, 1872); Smiles, *Robert Dick, Botanist and Geologist* (London, 1878); H. Morrison, *Guide to Sutherland and Caithness* (Wick, 1883); A. Auld, *Ministers and Men in the Far North* (Edinburgh, 1891).

CAIUS or Gaius, pope from 283 to 296, was the son of Gaius, or of Concordius, a relative of the emperor Diocletian, and became pope on the 17th of December 283. His tomb, with the original epitaph, was discovered in the cemetery of Calixtus and in it the ring with which he used to seal his letters (see Arringhi, *Roma subterr.*, *l.* iv. *c.* xlviii. p. 426). He died in 296.

CAIUS [*Anglice* Kees, Keys, etc.], **JOHN** (1510-1573), English physician, and second founder of the present Gonville and Caius College, Cambridge, was born at Norwich on the 6th of October 1510. He was admitted a student at what was then Gonville Hall, Cambridge, where he seems to have mainly studied divinity. After graduating in 1533, he visited Italy, where he studied under the celebrated Montanus and Vesalius at Padua; and in 1541 he took his degree in physic at Padua. In 1543 he visited several parts of Italy, Germany and France; and returned to England. He was a physician in London in 1547, and was admitted fellow of the College of Physicians, of which he was for many years president. In 1557, being then physician to Queen Mary, he enlarged the foundation of his old college, changed the name from "Gonville Hall" to "Gonville and Caius College," and endowed it with several considerable estates, adding an entire new court at the expense of £1834. Of this college he accepted the mastership (24th of January 1558/9) on the death of Dr Bacon, and held it till about a month before his death. He was physician to Edward VI., Queen Mary and Queen Elizabeth. He returned to Cambridge from London for a few days in June 1573, about a month before his death, and resigned the mastership to Dr Legge, a tutor at Jesus College. He died
[v.04 p.0961] at his London House, in St Bartholomew's, on the 29th of July, 1573, but his body was brought to Cambridge, and buried in the chapel under the well-known monument which he had designed. Dr Caius was a learned, active and benevolent man. In 1557 he erected a monument in St Paul's to the memory of Linacre. In 1564 he obtained a grant for Gonville and Caius College to take the bodies of two malefactors annually for dissection; he was thus an important pioneer in advancing the science of anatomy. He probably devised, and certainly presented, the silver caduceus now in the possession of Caius College as part of its *insignia*; he first gave it to the College of Physicians, and afterwards presented the London College with another.

His works are: *Annals of the College from 1555 to 1572*; translation of several of Galen's works, printed at different times abroad. *Hippocrates de Medicamenlis*, first discovered and published by Dr Caius; also *De Ratione Victus* (Lov. 1556, 8vo). *De Mendeti Methodo* (Basel, 1554; London, 1556, 8vo). *Account of the Sweating Sickness in England* (London, 1556, 1721), (it is entitled *De Ephemera Britannica*). *History of the University of Cambridge* (London, 1568, 8vo; 1574, 4to, in Latin). *De Thermis Britannicis*; but it is doubtful whether this work was ever printed. *Of some Rare Plants and Animals* (London, 1570). *De Canibus Britannicis* (1570, 1729). *De Pronunciatione Graecae et Latinae Linguae* (London, 1574); *De Libris propriis* (London, 1570). He also wrote numerous other works which were never printed.

For further details see the *Biographical History of Caius College*, an admirable piece of historical work, by Dr John Venn (1897).

CAJAMARCA, or Caxamarca, a city of northern Peru, capital of a department and province of the same name, 90 m. E. by N. of Pacasmayo, its port on the Pacific coast. Pop. (1906, estimate) of the department, 333,310; of the city, 9000. The city is situated in an elevated valley between the Central and Western Cordilleras, 9400 ft. above sea level, and on the Eriznejas, a small tributary of the Marañon. The streets are wide and cross at right angles; the houses are generally low and built of clay. Among the notable public buildings are the old parish church built at the expense of Charles II. of Spain, the church of San Antonio, a Franciscan monastery, a nunnery, and the remains of the palace of Atahualpa, the Inca ruler whom Pizarro treacherously captured and executed in this place in 1533. The hot sulphur springs of Pultamarca, called the Baños del Inca (Inca's baths) are a short distance east of the city and are still frequented. Cajamarca is an important commercial and manufacturing town, being the distributing centre for a large inland region, and having long-established manufactures of woollen and linen goods, and of metal work, leather, etc. It is the seat of one of the seven superior courts of the republic, and is connected with the coast by telegraph and telephone. A railway has been undertaken from Pacasmayo, on the coast, to Cajamarca, and by 1908 was completed as far as Yonán, 60 m. from its starting-point.

The department of Cajamarca lies between the Western and Central Cordilleras and extends from the frontier of Ecuador S. to about 7° S. lat., having the departments of Piura and Lambayeque on the W. and Amazonas on the E. Its area according to official returns is 12,542 sq. m. The upper Marañon traverses the department from S. to N. The department is an elevated region, well watered with a large number of small streams whose waters eventually find their way through the Amazon into the Atlantic. Many of its productions are of the temperate zone, and considerable attention is given to cattle-raising. Coal is found in the province of Hualgayoc at the southern extremity of the department, which is also one of the rich silver-mining districts of Peru. Next to its capital the most important town of the department is Cajamarquilla, whose population was about 6000 in 1906.

CAJATAMBO, or Caxatambo, a town and province of the department of Ancachs, Peru, on the western slope of the Andes. Since 1896 the population of the town has been estimated at 6000, but probably it does not exceed 4500. The town is 110 m. N. by E. of Lima, in lat. 9° 53′ S., long. 76° 57′ W. The principal industries of the province are the raising of cattle and sheep, and the cultivation of cereals. Cochineal is a product of this region. Near the town there are silver mines, in which a part of its population is employed.

CAJETAN (Gaetanus), Cardinal (1470-1534), was born at Gaeta in the kingdom of Naples. His proper name was Tommaso[1] de Vio, but he adopted that of Cajetan from his birthplace. He entered the order of the Dominicans at the age of sixteen, and ten years later became doctor of theology at Padua, where he was subsequently professor of metaphysics. A public disputation at Ferrara (1494) with Pico della Mirandola gave him a great reputation as a theologian, and in 1508 he became general of his order. For his zeal in

defending the papal pretensions against the council of Pisa, in a series of works which were condemned by the Sorbonne and publicly burnt by order of King Louis XII., he obtained the bishopric of Gaeta, and in 1517 Pope Leo X. made him a cardinal and archbishop of Palermo. The year following he went as legate into Germany, to quiet the commotions raised by Luther. It was before him that the Reformer appeared at the diet of Augsburg; and it was he who, in 1519, helped in drawing up the bull of excommunication against Luther. Cajetan was employed in several other negotiations and transactions, being as able in business as in letters. In conjunction with Cardinal Giulio de' Medici in the conclave of 1521-1522, he secured the election of Adrian Dedel, bishop of Tortosa, as Adrian VI. Though as a theologian Cajetan was a scholastic of the older Thomist type, his general position was that of the moderate reformers of the school to which Reginald Pole, archbishop of Canterbury, also belonged; *i.e.* he desired to retain the best elements of the humanist revival in harmony with Catholic orthodoxy illumined by a revived appreciation of the Augustinian doctrine of justification. Nominated by Clement VII. a member of the committee of cardinals appointed to report on the "Nuremberg Recess," he recommended, in opposition to the majority, certain concessions to the Lutherans, notably the marriage of the clergy as in the Greek Church, and communion in both kinds according to the decision of the council of Basel. In this spirit he wrote commentaries upon portions of Aristotle, and upon the *Summa* of Aquinas, and towards the end of his life made a careful translation of the Old and New Testaments, excepting Solomon's Song, the Prophets and the Revelation of St John. In contrast to the majority of Italian cardinals of his day, Cajetan was a man of austere piety and fervent zeal; and if, from the standpoint of the Dominican idea of the supreme necessity of maintaining ecclesiastical discipline, he defended the extremist claims of the papacy, he also proclaimed that the pope should be "the mirror of God on earth." He died at Rome on the 9th of August 1534.

See "Aktenstücke über das Verhalten der römischen Kurie zur Reformation, 1524-1531," in *Quellen und Forschungen* (Kön. Preuss. Hist. Inst., Rome), vol. iii. p. 1-20; T.M. Lindsay, *History of the Reformation*, vol. i. (Edinburgh, 1906).

[1] He was christened Giacomo, but afterwards took the name of Tommaso in honour of Thomas Aquinas.

CAJUPUT OIL, a volatile oil obtained by distillation from the leaves of the myrtaceous tree *Melaleuca leucadendron*, and probably other species. The trees yielding the oil are found throughout the Indian Archipelago, the Malay Peninsula and over the hotter parts of the Australian continent; but the greater portion of the oil is produced from Celebes Island. The name cajuput is derived from the native *Kayuputi* or white wood. The oil is prepared from leaves collected on a hot dry day, which are macerated in water, and distilled after fermenting for a night. This oil is extremely pungent to the taste, and has the odour of a mixture of turpentine and camphor. It consists mainly of cineol (see TERPENES), from which cajuputene having a hyacinthine odour can be obtained by distillation with phosphorus pentoxide. The drug is a typical volatile oil, and is used internally in doses of ½ to 3 minims, for the same purposes as, say, clove oil. It is frequently employed externally as a counter-irritant.

CAKCHIQUEL, a tribe of Central American Indians of Mayan stock, inhabiting parts of Guatemala. Their name is said to be that of a native tree. At the conquest they were found to be in a much civilized condition.

See D.G. Brinton, *Annals of the Cakchiquels*.

[v.04 p.0962]

CALABAR (or OLD CALABAR), a seaport of West Africa in the British protectorate of Southern Nigeria, on the left bank of the Calabar river in 4° 56′ N., 8° 18′ E., 5 m. above the point where the river falls into the Calabar estuary of the Gulf of Guinea. Pop. about 15,000. It is the capital of the eastern province of the protectorate, and is in regular steamship and telegraphic communication with Europe. From the beach, where are the business houses and customs office, rise cliffs of moderate elevation, and on the sides or summits of the hills are the principal buildings, such as Government House, the European hospital and the church of the Presbyterian mission. The valley between the hills is occupied by the native quarter, called Duke Town. Here are several fine houses in bungalow style, the residences of the chiefs or wealthy natives. Along the river front runs a tramway connecting Duke Town with Queen Beach, which is higher up and provided with excellent quay accommodation. Among the public institutions are government botanical gardens, primary schools and a high school. Palms, mangos and other trees grow luxuriantly in the gardens and open spaces, and give the town a picturesque setting. The trade is very largely centred in the export of palm oil and palm kernels and the import of cotton goods and spirits, mostly gin. (See NIGERIA for trade returns.)

Calabar was the name given by the Portuguese discoverers of the 15th century to the tribes on this part of the Guinea coast at the time of their arrival, when as yet the present inhabitants were unknown in the district. It was not till the early part of the 18th century that the Efik, owing to civil war with their kindred and the Ibibio, migrated from the neighbourhood of the Niger to the shores of the river Calabar, and established themselves at Ikoritungko or Creek Town, a spot 4 m. higher up the river. To get a better share in the European trade at the mouth of the river a body of colonists migrated further down and built Obutöng or Old Town, and shortly afterwards a rival colony established itself at Aqua Akpa or Duke Town, which thus formed the nucleus of the existing town. The native inhabitants are still mainly Efik. They are pure negroes. They have been for several generations the middle men between the white traders on the coast and the inland tribes of the Cross river and Calabar district. Christian missions have been at work among the Efiks since the middle of the 19th century. Many of the natives are well educated, profess Christianity and dress in European fashion. A powerful bond of union among the Efik, and one that gives them considerable influence over other tribes, is the secret society known as the Egbo (*q.v.*). The chiefs of Duke Town and other places in the neighbourhood placed themselves in 1884 under British protection. From that date until 1906 Calabar was the headquarters of the European administration in the Niger delta. In 1906 the seat of government was removed to Lagos.

Until 1904 Calabar was generally, and officially, known as Old Calabar, to distinguish it from New Calabar, the name of a river and port about 100 m. to the east. Since the date mentioned the official style is Calabar simply. Calabar estuary is mainly formed by the Cross river (*q.v.*), but receives also the waters of the Calabar and other streams. The Rio del Rey creek at the eastern end of the estuary marks the boundary between (British) Nigeria and (German) Cameroon. The estuary is 10 to 12 m. broad at its mouth and maintains the same breadth for about 30 m.

CALABAR BEAN, the seed of a leguminous plant, *Physostigma venenosum*, a native of tropical Africa. It derives its scientific name from a curious beak-like appendage at the end of the stigma, in the centre of the flower; this appendage though solid was supposed to be hollow (hence the name from φῦσα, a bladder, and *stigma*). The plant has a climbing habit like the scarlet runner, and attains a height of about 50 ft. with a stem an inch or two in thickness. The seed pods, which contain two or three seeds or beans, are 6 or 7 in. in length; and the beans are about the size of an ordinary horse bean but much thicker, with a deep chocolate-brown colour. They constitute the E-ser-e or ordeal beans of the negroes of Old Calabar, being administered to persons accused of witchcraft or other crimes. In cases where the poisonous material did its deadly work, it was held at once to indicate and rightly to punish guilt; but when it was rejected by the stomach of the accused, innocence was held to be satisfactorily established. A form of duelling with the seeds is also known among the natives, in which the two opponents divide a bean, each eating one-half; that quantity has been known to kill both adversaries. Although thus highly poisonous, the bean has nothing in external aspect, taste or smell to distinguish it from any harmless leguminous seed, and very disastrous effects have resulted from its being incautiously left in the way of children. The beans were first introduced into England in the year 1840; but the plant was not accurately described till 1861, and its physiological effects were investigated in 1863 by Sir Thomas R. Fraser.

The bean usually contains a little more than 1% of alkaloids. Of these two have been identified, one called *calabarine*, and the other, now a highly important drug, known as *physostigmine*—or occasionally as *eserine*. The British pharmacopoeia contains an alcoholic extract of the bean, intended for internal administration; but the alkaloid is now always employed. This is used as the sulphate, which has the empirical formula of $(C_{15}H_{21}N_3O_2)_2$, H_2SO_4, plus an unknown number of molecules of water. It occurs in small yellowish crystals, which are turned red by exposure to light or air. They are readily soluble in water or alcohol and possess a bitter taste. The dose is 1/60-1/30 grain, and should invariably be administered by hypodermic injection. For the use of the oculist, who constantly employs this drug, it is also prepared in *lamellae* for insertion within the conjunctival sac. Each of these contains one-thousandth part of a grain of physostigmine sulphate, a quantity which is perfectly efficient.

Physostigmine has no action on the unbroken skin. When swallowed it rapidly causes a great increase in the salivary secretion, being one of the most powerful *sialogogues* known. It has been shown that the action is due to a direct influence on the secreting gland-cells themselves. After a few minutes the salivation is arrested owing to the constricting influence of the drug upon the blood-vessels that supply the glands. There is also felt a sense of constriction in the pharynx, due to the action of the drug on its muscular fibres. A similar stimulation of the non-striped muscle in the alimentary canal results in violent vomiting and purging, if a large dose has been taken. Physostigmine, indeed, stimulates nearly all the non-striped muscles in the body, and this action upon the muscular coats of the arteries, and especially of the arterioles, causes a great rise in blood-pressure shortly after its absorption, which is very rapid. The terminals of the vagus nerve are also stimulated, causing the heart to beat more slowly. Later in its action, the drug depresses the intra-cardiac motor ganglia, causing prolongation of diastole and finally arrest of the heart in dilatation. A large lethal dose kills by this action, but the minimum lethal dose by its combined action on the respiration and the heart. The respiration is at first accelerated by a dose of physostigmine, but is afterwards slowed and ultimately arrested. The initial hastening is due to a stimulation of the vagus terminals in the lung, as it does not occur if these nerves are previously divided. The final arrest is due to paralysis of the respiratory centre in the medulla oblongata, hastened by a quasi-asthmatic contraction of the non-striped muscular tissue in the bronchial tubes, and by a "water-logging" of the lungs due to an increase in the amount of bronchial secretion. It may here be stated that the non-striped muscular tissue of the bladder, the uterus and the spleen is also stimulated, as well as that of the iris (see below). It is only in very large doses that the voluntary muscles are poisoned, there being induced in them a tremor which may simulate ordinary convulsions. The action is a direct one upon the muscular tissue (cf. the case of the gland-cells), since it occurs in an animal whose motor nerves have been paralysed by curare.

[v.04 p.0963]

Consciousness is entirely unaffected by physostigmine, there being apparently no action on any part of the brain above the medulla oblongata. But the influence of the alkaloid upon the spinal cord is very marked and characteristic. The reflex functions of the cord are entirely abolished, and it has been experimentally shown that this is due to a direct influence upon the cells in the anterior cornua. It is precisely the reverse of the typical action of strychnine. Near the termination of a fatal case there is a paralysis of the sensory columns of the cord, so that general sensibility is lowered. The alkaloid calabarine is, on the other hand, a stimulant of the motor and reflex functions of the cord, so that only the pure alkaloid physostigmine and not any preparation of Calabar bean itself should be used when it is desired to obtain this action.

Besides the secretions already mentioned as being stimulated, the bile, the tears and the perspiration are increased by the exhibition of this drug.

There remains only to consider its highly important action upon the eye. Whether administered in the form of the official lamella or by subcutaneous injection, physostigmine causes a contraction of the pupil more marked than in the case of any other known drug. That this action is a direct and not a nervous one is shown by the fact that if the eye be suddenly shaded the pupil will dilate a little, showing that the nerves which cause dilatation are still competent after the administration of physostigmine. Besides the *sphincter pupillae*, the fibres of the ciliary muscle are stimulated. There is consequently spasm of accommodation, so that clear vision of distant objects becomes impossible. The intra-ocular tension is markedly lowered. This action, at first sight somewhat obscure, is due to the extreme pupillary contraction which removes the mass of the iris from pressing upon the spaces of Fontana, through which the intraocular fluids normally make a very slow escape from the eye into its efferent lymphatics.

There is a marked antagonism in nearly all important particulars between the actions of physostigmine and of atropine. The details of this antagonism, as well as nearly all our knowledge of this valuable drug, we owe to Sir Thomas Fraser, who introduced it into therapeutics.

The clinical uses of physostigmine are based upon the facts of its pharmacology, as above detailed. It has been recommended in cases of chronic constipation, and of want of tone in the muscular wall of the urinary bladder. It has undoubtedly been of value in many cases of tetanus, in which it must be given in maximal doses. (The tetanus antitoxin should invariably be employed as well.) Sir Thomas Fraser differs from nearly all other authorities in regarding the drug as useless in cases of strychnine poisoning, and the question must be left open. There is some doubtful evidence of the value of the alkaloid in chorea. The

oculist uses it for at least six purposes. Its stimulant action on the iris and ciliary muscle is employed when they are weak or paralysed. It is used in all cases where one needs to reduce the intra-ocular tension, and for this and other reasons in glaucoma. It is naturally the most efficient agent in relieving the discomfort or intolerable pain of photophobia; and it is the best means of breaking down adhesions of the iris, and of preventing prolapse of the iris after injuries to the cornea. In fact it is hardly possible to over-estimate its value in ophthalmology. The drug has been highly and widely recommended in general paralysis, but there remains grave doubt as to its utility in this disease.

Toxicology.—The symptoms of Calabar bean poisoning have all been stated above. The obvious antidote is atropine, which may often succeed; and the other measures are those usually employed to stimulate the circulation and respiration. Unfortunately the antagonism between physostigmine and atropine is not perfect, and Sir Thomas Fraser has shown that in such cases there comes a time when, if the action of the two drugs be summated, death results sooner than from either alone. Thus atropine will save life after three and a half times the fatal dose of physostigmine has been taken, but will hasten the end if four or more times the fatal dose has been ingested. Thus it would be advisable to use the physiological antidote only when the dose of the poison—assuming estimation to be possible—was known to be comparatively small.

CALABASH (from the Span. *calabaza*, a gourd or pumpkin, possibly derived from the Pers. *kharlunza*, a melon), the shell of a gourd or pumpkin made into a vessel for holding liquids; also a vessel of similar shape made of other materials. It is the name of a tree (*Crescentia Cujete*) of tropical America, whose gourd-like fruit is so hard that vessels made of it can be used over a fire many times before being burned.

CALABASH TREE, a native of the West Indies and South America, known botanically as *Crescentia Cujete* (natural order, Bignoniaceae). The fruit resembles a gourd, and has a woody rind, which after removal of the pulp forms a calabash.

CALABOZO, or Calaboso, an inland town of Venezuela, once capital of the province of Caracas in the colonial period, and now capital of the state of Guárico. Pop. (1891) 5618. Calabozo is situated in the midst of an extensive *llano* on the left bank of the Guárico river, 325 ft. above sea-level and 123 m. S.S.W. of Caracas. The plain lies slightly above the level of intersecting rivers and is frequently flooded in the rainy season; in summer the heat is most oppressive, the average temperature being 88°F. The town is regularly laid out with streets crossing at right angles, and possesses several fine old churches, a college and public school. It is also a bishop's see, and a place of considerable commercial importance because of its situation in the midst of a rich cattle-raising country. It is said to have been an Indian town originally, and was made one of the trading stations of the Compañia Guipuzcoana in 1730. However, like most Venezuelan towns, Calabozo made little growth during the 19th century. In 1820 the Spanish forces under Morales were defeated here by the revolutionists under Bolívar and Paez.

CALABRESELLA (sometimes spelt Calabrasella), an Italian card-game ("the little Calabrian game") for three players. All the tens, nines and eights are removed from an ordinary pack; the order of the cards is three, two, ace, king, queen, &c. In scoring the ace counts 3; the three 2; king, queen and knave 1 each. The last trick counts 3. Each separate hand is a whole game. One player plays against the other two, paying to each or receiving from each the difference between the number of points that he and they hold. Each player receives twelve cards, dealt two at a time. The remainder form the stock, which is left face downwards. There are no trumps. The player on the dealer's left declares first: he can either play or pass. The dealer has the last option. If one person announces that he plays, the others combine against him. If all decline to play, the deal passes, the hands being abandoned. The single player may demand any "three" he chooses, giving a card in exchange. If the three demanded is in the stock, no other card may be asked for. If a player hold all the threes, he may demand a two. The single player must take one card from the stock, in exchange for one of his own (which is never exposed) and may take more. He puts out the cards he wishes to exchange face downwards, and selects what he wishes from the stock, which is now exposed; the rejected cards and cards left in the stock form the "discard." The player on the dealer's left then leads. The highest card wins the trick, there being no trumps. Players must follow suit, if they can. The single player and the allies collect all the tricks they win respectively. The winner of the last trick, besides scoring three, adds the discard to his heap. The heaps are then searched for the scoring cards, the scores are compared and the stakes paid. It is important to remember that the value and the order of the cards are not the same, thus the ace, whose value is 3, is only third as a trick-winner; also that it is highly important to win the last trick. Thirty-five is the full score.

CALABRIA, a territorial district of both ancient and modern Italy.

(1) The ancient district consisted of the peninsula at its southeast extremity, between the Adriatic Sea and the Gulf of Tarentum, ending in the lapygian promontory (Lat. *Promunturium Sallentinum*; the village upon it was called Leuca—Gr. Λευκά, white, from its colour—and is still named S. Maria di Leuca) and corresponding in the main with the modern province of Lecce, Brundisium and Tarentum being its most
[v.04 p.0964] north-westerly cities, though the boundary of the latter extends somewhat farther west. It is a low terrace of limestone, the highest parts of which seldom reach 1500 ft.; the cliffs, though not high, are steep, and it has no rivers of any importance, but despite lack of water it was (and is) remarkably fertile. Strabo mentions its pastures and trees, and its olives, vines and fruit trees (which are still the principal source of prosperity) are frequently spoken of by the ancients. The wool of Tarentum and Brundisium was also famous, and at the former place were considerable dye-works. These two towns acquired importance in very early times owing to the excellence of their harbours. Traces of a prehistoric population of the stone and early bronze age are to be found all over Calabria. Especially noticeable are the menhirs (*pietre fitte*) and the round tower-like *specchie* or *truddhi*, which are found near Lecce, Gallipolli and Muro Leccese (and only here in Italy); they correspond to similar monuments, the *perdas fittas* and the *nuraghi*, of Sardinia, and the inter-relation between the two populations which produced them requires careful study. In 272-266 B.C. we find six triumphs recorded in the Roman *fasti* over the Tarentini, Sallentini and Messapii, while the name Calabria does not occur; but after the foundation of a colony at Brundisium in 246-245 B.C., and the final subjection of Tarentum in 209 B.C., Calabria became the general name for the peninsula. The population declined to some extent; Strabo (vi. 281) tells us that in earlier days Calabria had been extremely populous and had had thirteen cities, but that in his time all except Tarentum and Brundisium, which retained their commercial importance, had dwindled down to villages. The Via Appia, prolonged to Brundisium perhaps as early as 190 B.C., passed through Tarentum; the shorter route by

Canusium, Barium and Gnathia was only made into a main artery of communication by Trajan (see APPIA, VIA). The only other roads were the two coast roads, the one from Brundisium by Lupiae, the other from Tarentum by Manduria, Neretum, Aletium (with a branch to Callipolis) and Veretum (hence a branch to Leuca), which met at Hydruntum. Augustus joined Calabria to Apulia and the territory of the Hirpini to form the second region of Italy. From the end of the second century we find Calabria for juridical purposes associated either with Apulia or with Lucania and the district of the Bruttii, while Diocletian placed it under one *corrector* with Apulia. The loss of the name Calabria came with the Lombard conquest of this district, when it was transferred to the land of the Bruttii, which the Byzantine empire still held.

(2) The modern Calabria consists of the south extremity of Italy (the "toe of the boot" in the popular simile, while the ancient Calabria, with which the present province of Lecce more or less coincides, is the "heel"), bounded on the N. by the province of Potenza (Basilicata) and on the other three sides by the sea. Area 5819 sq. m. The north boundary is rather farther north than that of the ancient district of the Bruttii (*q.v.*). Calabria acquired its present name in the time of the Byzantine supremacy, after the ancient Calabria had fallen into the hands of the Lombards and been lost to the Eastern empire about A.D. 668. The name is first found in the modern sense in Paulus Diaconus's *Historia Langobardorum* (end of the 8th century). It is mainly mountainous; at the northern extremity of the district the mountains still belong to the Apennines proper (the highest point, the Monte Pollino, 7325 ft., is on the boundary between Basilicata and Calabria), but after the plain of Sibari, traversed by the Crati (anc. Crathis, a river 58 m. long, the only considerable one in Calabria), the granite mountains of Calabria proper (though still called Apennines in ordinary usage) begin. They consist of two groups. The first extends as far as the isthmus, about 22 m. wide, formed by the gulfs of S. Eufemia and Squillace; its highest point is the Botte Donato (6330 ft.). It is in modern times generally called the Sila, in contradistinction to the second (southern) group, the Aspromonte (6420 ft.); the ancients on the other hand applied the name Sila to the southern group. The rivers in both parts of the chain are short and unimportant. The mountain districts are in parts covered with forest (though less so than in ancient times), still largely government property, while in much of the rest there is good pasture. The scenery is fine, though the country is hardly at all visited by travellers. The coast strip is very fertile, and though some parts are almost deserted owing to malaria, others produce wine, olive-oil and fruit (oranges and lemons, figs, &c.) in abundance, the neighbourhood of Reggio being especially fertile. The neighbourhood of Cosenza is also highly cultivated; and at the latter place a school of agriculture has been founded, though the methods used in many parts of Calabria are still primitive. Wheat, rice, cotton, liquorice, saffron and tobacco are also cultivated. The coast fisheries are important, especially in and near the straits of Messina. Commercial organization is, however, wanting. The climate is very hot in summer, while snow lies on the mountain-tops for at least half the year. Earthquakes are frequent and have done great damage: that of the autumn of 1905 was very disastrous (O. Malagodi, *Calabria Desolata*, Rome, 1905), but it was surpassed in its effects by the terrible earthquake of 1908, by which Messina (*q.v.*) was destroyed, and in Calabria itself Reggio and numerous smaller places ruined. The railway communications are sufficient for the coast districts; there are lines along both the east and west coasts (the latter forms part of the through route by land from Italy to Sicily, ferry-boats traversing the Strait of Messina with the through trains on board) which meet at Reggio di Calabria. They are connected by a branch from Marina di Catanzaro passing through Catanzaro to S. Eufemia; and there is also a line from Sibari up the valley of the Crati to Cosenza and Pietrafitta. The interior is otherwise untouched by railways; indeed many of the villages in the interior can only be approached by paths; and this is one of the causes of the economic difficulties of Calabria. Another is the unequal distribution of wealth, there being practically no middle class; a third is the injudicious disforestation which has been carried on without regard to the future. The natural check upon torrents is thus removed, and they sometimes do great damage. The Calabrian costumes are still much worn in the remoter districts: they vary considerably in the different villages. There is, and has been, considerable emigration to America, but many of the emigrants return, forming a slightly higher class, and producing a rise in the rate of payment to cultivators, which has increased the difficulties of the small proprietors. The smallness and large number of the communes, and the consequently large number of the professional classes and officials, are other difficulties, which, noticeable throughout Italy, are especially felt in Calabria. The population of Calabria was 1,439,329 in 1901. The chief towns of the province of Catanzaro were in 1901:—Catanzaro (32,005), Nicastro (18,150), Monteleone (13,481), Cotrone (9545), total of province (1871) 412,226; (1901) 498,791; number of communes, 152; of the province of Cosenza, Cosenza (20,857), Corigliano Calabro (15,379), Rossano (13,354), S. Giovanni in Fiore (13,288), Castrovillari (9945), total of province (1871) 440,468; (1901) 503,329, number of communes, 151; of the province of Reggio, Reggio di Calabria (44,569), Palmi (13,346), Cittanova (11,782), Gioiosa Ionica(11,200), Bagnara Calabra (11,136), Siderno Marina (10,775), Gerace (10,572), Polistena (10,112); number of communes 106; total of province (1871) 353,608; (1901) 437,209. A feature of modern Calabria is the existence of several Albanian colonies, founded in the 15th century by Albanians expelled by the Turks, who still speak their own language, wear their national costume, and worship according to the Greek rite. Similar colonies exist in Sicily, notably at Piana dei Greci near Palermo.

(T. As.)

CALAFAT, a town of Rumania in the department of Doljiu; on the river Danube, opposite the Bulgarian fortress of Vidin. Pop. (1900) 7113. Calafat is an important centre of the grain trade, and is connected by a branch line with the principal Walachian railways, and by a steam ferry with Vidin. It was founded in the 14th century by Genoese colonists, who employed large numbers of workmen (*Calfats*) in repairing ships—which industry gave its name to the place. In 1854 a Russian force was defeated at Calafat by the Turks under Ahmed Pasha, who surprised the enemy's camp.

[v.04 p.0965]

CALAH (so in the Bible; *Kalah* in the Assyrian inscriptions), an ancient city situated in the angle formed by the Tigris and the upper Zab, 19 m. S. of Nineveh, and one of the capitals of Assyria. According to the inscriptions, it was built by Shalmaneser I. about 1300 B.C., as a residence city in place of the older Assur. After that it seems to have fallen into decay or been destroyed, but was restored by Assur-nasir-pal, about 880 B.C., and from that time to the overthrow of the Assyrian power it remained a residence city of the Assyrian kings. It shared the fate of Nineveh, was captured and destroyed by the Medes and Babylonians toward the close of the 7th century, and from that time has remained a ruin. The site was discovered by Sir A.H. Layard, in 1845, in the *tel* of Nimrud. Hebrew tradition (in the J narrative, Genesis x. 11, 12) mentions Calah as built by Nimrod. Modern Arabic tradition likewise ascribes the ruins, like those of Birs Nimrud, near Babylon, to Nimrod, because they are the most prominent ruins of that region. Similarly the

ancient dike in the river Tigris at this point is ascribed to Nimrod. The ruin mounds of Nimrud consist of an oblong enclosure, formed by the walls of the ancient city, of which fifty-eight towers have been traced on the N. and about fifty on the E. In the S.W. corner of this oblong is an elevated platform in the form of a rectangular parallelogram, some 600 yds. from N. to S. and 400 yds. from E. to W., raised on an average about 40 ft. above the plain, with a lofty cone 140 ft. high in the N.W. corner. This is the remains of the raised platform of unbaked brick, faced with baked bricks and stone, on which stood the principal palaces and temples of the city, the cone at the N.W. representing the *ziggurat*, or stage-tower, of the principal temple. Originally on the banks of the Tigris, this platform now stands some distance E. of the river. Here Layard conducted excavations from 1845 to 1847, and again from 1849 to 1851. The means at his disposal were inadequate, his excavations were incomplete and also unscientific in that his prime object was the discovery of inscriptions and museum objects; but he was wonderfully successful in achieving the results at which he aimed, and the numerous statues, monuments, inscribed stones, bronze objects and the like found by him in the ruins of Calah are among the most precious possessions of the British Museum. Excavations were also conducted by Hormuzd Rassan in 1852-1854, and again in 1878, and by George Smith in 1873. But while supplementing in some important respects Layard's excavations, this later work added relatively little to his discoveries whether of objects or of facts. The principal buildings discovered at Calah are:—(*a*) the North-West palace, south of the *ziggurat*, one of the most complete and perfect Assyrian buildings known, about 350 ft. square, consisting of a central court, 129 ft. by 90 ft., surrounded by a number of halls and chambers. This palace was originally constructed by Assur-nasir-pal I. (885-860 B.C.), and restored and reoccupied by Sargon (722-705 B.C.). In it were found the winged lions, now in the British Museum, the fine series of sculptured bas-reliefs glorifying the deeds of Assur-nasir-pal in war and peace, and the large collection of bronze vessels and implements, numbering over 200 pieces; (*b*) the Central palace, in the interior of the mound, toward its southern end, erected by Shalmaneser II. (860-825 B.C.) and rebuilt by Tiglath-pileser III. (745-727 B.C.). Here were found the famous black obelisk of Shalmaneser, now in the British Museum, in the inscription on which the tribute of Jehu, son of Omri, is mentioned, the great winged bulls, and also a fine series of slabs representing the battles and sieges of Tiglath-pileser; (*c*) the South-West palace, in the S.W. corner of the platform, an uncompleted building of Esarhaddon (681-668 B.C.), who robbed the North-West and Central palaces, effacing the inscriptions of Tiglath-pileser, to obtain material for his construction; (*d*) the smaller West palace, between the South-West and the North-West palaces, a construction of Hadad-nirari or Adadnirari III. (812-783 B.C.); (*e*) the South-East palace, built by Assur-etil-ilani, after 626 B.C., for his harem, in the S.E. corner of the platform, above the remains of an older similar palace of Shalmaneser; (*f*) two small temples of Assur-nasir-pal, in connexion with the *ziggurat* in the N.W. corner; and (*g*) a temple called E-Zida, and dedicated to Nebo, near the South-East palace. From the number of colossal figures of Nebo discovered here it would appear that the cult of Nebo was a favourite one, at least during the later period. The other buildings on the E. side of the platform had been ruined by the post-Assyrian use of the mound for a cemetery, and for tunnels for the storage and concealment of grain. While the ruins of Calah were remarkably rich in monumental material, enamelled bricks, bronze and ivory objects and the like, they yielded few of the inscribed clay tablets found in such great numbers at Nineveh and various Babylonian sites. Not a few of the astrological and omen tablets in the Kuyunjik collection of the British Museum, however, although found at Nineveh, were executed, according to their own testimony, at Calah for the *rab-dup-šarrē* or principal librarian during the reigns of Sargon and Sennacherib (716-684 B.C.). From this it would appear that there was at that time at Calah a library or a collection of archives which was later removed to Nineveh. In the prestige of antiquity and religious renown, Calah was inferior to the older capital, Assur, while in population and general importance it was much inferior to the neighbouring Nineveh. There is no proper ground for regarding it, as some Biblical scholars of a former generation did, through a false interpretation of the book of Jonah, as a part or suburb of Nineveh.

See A.H. Layard, *Nineveh and its Remains* (London, 1849); George Smith, *Assyrian Discoveries* (London, 1883); Hormuzd Rassam, *Ashur and the Land of Nimrod* (London and New York, 1897).

(J. P. PE.)

CALAHORRA (anc. *Calagurris*), a city of northern Spain, in the province of Logroño; on the left bank of the river Cidacos, which enters the Ebro 3 m. E., and on the Bilbao-Saragossa railway. Pop. (1900) 9475. Calahorra is built on the slope of a hill overlooking the wide Ebro valley, which supplies its markets with an abundance of grain, wine, oil and flax. Its cathedral, which probably dates from the foundation of the see of Calahorra in the 5th century, was restored in 1485, and subsequently so much altered that little of the original Gothic structure survives. The Casa Santa, annually visited by many thousands of pilgrims on the 31st of August, is said to contain the bodies of the martyrs Emeterius and Celedonius, who were beheaded in the 3rd or 4th century, on the site now occupied by the cathedral. Their heads, according to local legend, were cast into the Ebro, and, after floating out to sea and rounding the Iberian peninsula, are now preserved at Santander.

The chief remains of the Roman Calagurris are the vestiges of an aqueduct and an amphitheatre. Calagurris became famous in 76 B.C., when it was successfully defended against Pompey by the adherents of Sertorius. Four years later it was captured by Pompey's legate, Afranius, after starvation had reduced the garrison to cannibalism. Under Augustus (31 B.C.-A.D. 14) Calagurris received the privileges of Roman citizenship, and at a later date it was given the additional name of *Nassica* to distinguish it from the neighbouring town of *Calagurris Fibularensis*, the exact site of which is uncertain. The rhetorician Quintilian was born at Calagurris Nassica about A.D. 35.

CALAIS, a seaport and manufacturing town of northern France, in the department of Pas-de-Calais, 18 m. E.S.E. of Dover, and 185 m. N. of Paris by the Northern railway. Pop. (1906) 59,623. Calais, formerly a celebrated fortress, is defended by four forts, not of modern construction, by a citadel built in 1560, which overlooks it on the west, and by batteries. The old town stands on an island hemmed in by the canal and the harbour basins, which divide it from the much more extensive manufacturing quarter of St Pierre, enveloping it on the east and south. The demolition of the ramparts of Old Calais was followed by the construction of a new circle of defences, embracing both the old and new quarters, and strengthened by a deep moat. In the centre of the old town is the Place d'Armes, in which stands the former hôtel-de-ville (rebuilt in 1740, restored in 1867), with busts of Eustache de St Pierre, Francis, duke of Guise, and Cardinal Richelieu. The belfry belongs to the 16th and early 17th century. Close by is the Tour du Guet, or watch-tower, used as a lighthouse until 1848. The church of Notre-Dame, built during the English

occupancy of Calais, has a fine high altar of the 17th century; its lofty tower serves as a landmark for sailors. A gateway flanked by turrets (14th century) is a relic of the Hôtel de Guise, built as a gild hall for the English woolstaplers, and given to the duke of Guise as a reward for the recapture of Calais. The modern town-hall and a church of the 19th century are the chief buildings of the quarter of St Pierre. Calais has a board of trade-arbitrators, a tribunal and a chamber of commerce, a commercial and industrial school, and a communal college.

The harbour is entered from the roads by way of a channel leading to the outer harbour which communicates with a floating basin 22 acres in extent, on the east, and with the older and less commodious portion of the harbour to the north and west of the old town. The harbour is connected by canals with the river Aa and the navigable waterways of the department.

Calais is the principal port for the continental passenger traffic with England carried on by the South-Eastern & Chatham and the Northern of France railways. The average number of passengers between Dover and Calais for the years 1902-1906 inclusive was 315,012. Trade is chiefly with the United Kingdom. The principal exports are wines, especially champagne, spirits, hay, straw, wool, potatoes, woven goods, fruit, glass-ware, lace and metal-ware. Imports include cotton and silk goods, coal, iron and steel, petroleum, timber, raw wool, cotton yarn and cork. During the five years 1901-1905 the average annual value of exports was £8,388,000 (£6,363,000 in the years 1896-1900), of imports £4,145,000 (£3,759,000 in 1896-1900). In 1905, exclusive of passenger and mail boats, there entered the port 848 vessels of 312,477 tons and cleared 857 of 305,284 tons, these being engaged in the general carrying trade of the port. The main industry of Calais is the manufacture of tulle and lace, for which it is the chief centre in France. Brewing, saw-milling, boat-building, and the manufacture of biscuits, soap and submarine cables are also carried on. Deep-sea and coast fishing for cod, herring and mackerel employ over 1000 of the inhabitants.

Calais was a petty fishing-village, with a natural harbour at the mouth of a stream, till the end of the 10th century. It was first improved by Baldwin IV., count of Flanders, in 997, and afterwards, in 1224, was regularly fortified by Philip Hurepel, count of Boulogne. It was besieged in 1346, after the battle of Crécy, by Edward III. and held out resolutely by the bravery of Jean de Vienne, its governor, till after nearly a year's siege famine forced it to surrender. Its inhabitants were saved from massacre by the devotion of Eustache de St Pierre and six of the chief citizens, who were themselves spared at the prayer of Queen Philippa. The city remained in the hands of the English till 1558, when it was taken by Francis, duke of Guise, at the head of 30,000 men from the ill-provided English garrison, only 800 strong, after a siege of seven days. From this time the *Calaisis* or territory of Calais was known as the *Pays Reconquis*. It was held by the Spaniards from 1595 to 1598, but was restored to France by the treaty of Vervins.

CALAIS, a city and sub-port of entry of Washington county, Maine, U.S.A., on the Saint Croix river, 12 m. from its mouth, opposite Saint Stephens, New Brunswick, with which it is connected by bridges. Pop. (1890) 7290;(1900) 7655 (1908 being foreign-born); (1910) 6116. It is served by the Washington County railway (102.5 m. to Washington Junction, where it connects with the Maine Central railway), and by steamboat lines to Boston, Portland and Saint Johns. In the city limits are the post-offices of Calais, Milltown and Red Beach. The city has a small public library. The valley here is wide and deep, the banks of the river bold and picturesque, and the tide rises and falls about 25 ft. The city has important interests in lumber, besides foundries, machine shops, granite works—there are several granite (notably red granite) quarries in the vicinity—a tannery, and manufactories of shoes and calcined plaster. Big Island, now in the city of Calais, was visited in the winter of 1604-1605 by Pierre du Guast, sieur de Monts. Calais was first settled in 1779, was incorporated as a town in 1809, and was chartered as a city in 1851.

CALAÏS and **ZETES** (the Boreadae), in Greek mythology, the winged twin sons of Boreas and Oreithyia. On their arrival with the Argonauts at Salmydessus in Thrace, they liberated their sister Cleopatra, who had been thrown into prison with her two sons by her husband Phineus, the king of the country (Sophocles, *Antigone*, 966; Diod. Sic. iv. 44). According to another story, they delivered Phineus from the Harpies (*q.v.*), in pursuit of whom they perished (Apollodorus i. 9; iii. 15). Others say that they were slain by Heracles near the island of Tenos, in consequence of a quarrel with Tiphys, the pilot of the Argonauts, or because they refused to wait during the search for Hylas, the favourite of Heracles (Hyginus, *Fab.*, 14. 273; schol. on Apollonius Rhodius i. 1304). They were changed by the gods into winds, and the pillars over their tombs in Tenos were said to wave whenever the wind blew from the north. Like the Harpies, Calaïs and Zetes are obvious personifications of winds. Legend attributed the foundation of Cales in Campania to Calaïs (Silius Italicus viii. 512).

CALAMINE, a mineral species consisting of zinc carbonate, $ZnCO_3$, and forming an important ore of zinc. It is rhombohedral in crystallization and isomorphous with calcite and chalybite. Distinct crystals are somewhat rare; they have the form of the primitive rhombohedron ($rr' = 72° 20'$), the faces of which are generally curved and rough. Botryoidal and stalactitic masses are more common, or again the mineral may be compact and granular or loose and earthy. As in the other rhombohedral carbonates, the crystals possess perfect cleavages parallel to the faces of the rhombohedron. The hardness is 5; specific gravity, 4.4. The colour of the pure mineral is white; more often it is brownish, sometimes green or blue: a bright-yellow variety containing cadmium has been found in Arkansas, and is known locally as "turkey-fat ore." The pure material contains 52% of zinc, but this is often partly replaced isomorphously by small amounts of iron and manganese, traces of calcium and magnesium, and sometimes by copper or cadmium.

Calamine is found in beds and veins in limestone rocks, and is often associated with galena and blende. It is a product of alteration of blende, having been formed from this by the action of carbonated waters; or in many cases the zinc sulphide may have been first oxidized to sulphate, which in solution acted on the surrounding limestone, producing zinc carbonate. The latter mode of origin is suggested by the frequent occurrence of calamine pseudomorphous after calcite, that is, having the form of calcite crystals. Deposits of calamine have been extensively mined in the limestones of the Mendip Hills, in Derbyshire, and at Alston Moor in Cumberland. It also occurs in large amount in the province of Santander in Spain, in Missouri, and at several other places where zinc ores are mined. The best crystals of the mineral were found many years ago at Chessy near Lyons; these are rhombohedra of a fine apple-green colour. A translucent botryoidal calamine banded with blue and green is found at Laurion in Greece, and has sometimes been cut and polished for small ornaments such as brooches.

The name calamine (German, *Galmei*), from *lapis calaminaris*, a Latin corruption of cadmia (καδμία), the old name for zinc ores in general (G. Agricola in 1546 derived it from the Latin *calamus*, a reed), was early used indiscriminately for the carbonate and the hydrous silicate of zinc, and even now both species are included by miners under the same term. The two minerals often closely resemble each other in appearance, and can usually only be distinguished by chemical analysis; they were first so distinguished by James Smithson in 1803. F.S. Beudant in 1832 restricted the name calamine to the hydrous silicate and proposed the name "smithsonite" for the carbonate, and these meanings of the terms are now adopted by Dana and many other mineralogists. Unfortunately, however, in England (following Brooke and Miller, 1852) these designations have been reversed, calamine being used for the carbonate and smithsonite for the silicate. This unfortunate confusion is somewhat lessened by the use of the terms zinc-spar and hemimorphite (*q.v.*) for the carbonate and silicate respectively.

(L. J. S.)

[v.04 p.0967]

CALAMIS, an Athenian sculptor of the first half of the 5th century B.C. He made statues of Apollo the averter of ill, Hermes the ram-bearer, Aphrodite and other deities, as well as part of a chariot group for Hiero, king of Syracuse. His works are praised by ancient critics for delicacy and grace, as opposed to breadth and force. Archaeologists are disposed to regard the bronze charioteer recently found at Delphi as a work of Calamis; but the evidence is not conclusive (see Greek Art).

CALAMY, EDMUND, known as "the elder" (1600-1666), English Presbyterian divine, was born of Huguenot descent in Walbrook, London, in February 1600, and educated at Pembroke Hall, Cambridge, where his opposition to the Arminian party, then powerful in that society, excluded him from a fellowship. Nicholas Felton, bishop of Ely, however, made him his chaplain, and gave him the living of St Mary, Swaffham Prior, which he held till 1626. He then removed to Bury St Edmunds, where he acted as lecturer for ten years, retiring when his bishop (Wren) insisted on the observance of certain ceremonial articles. In 1636 he was appointed rector (or perhaps only lecturer) of Rochford in Essex, which was so unhealthy that he had soon to leave it, and in 1639 he was elected to the perpetual curacy of St Mary Aldermanbury in London, where he had a large following. Upon the opening of the Long Parliament he distinguished himself in defence of the Presbyterian cause, and had a principal share in writing the conciliatory work known as *Smectymnuus*, against Bishop Joseph Hall's presentation of episcopacy. The initials of the names of the several contributors formed the name under which it was published, viz., S. Marshal, E. Calamy, T. Young, M. Newcomen and W. Spurstow. Calamy was an active member in the Westminster assembly of divines, and, refusing to advance to Congregationalism, found in Presbyterianism the middle course which best suited his views of theology and church government. He opposed the execution of Charles I., lived quietly under the Commonwealth, and was assiduous in promoting the king's return; for this he was afterwards offered the bishopric of Coventry and Lichfield, but declined it, it is said, on his wife's persuasion. He was made one of Charles's chaplains, and vainly tried to secure the legal ratification of Charles's declaration of the 25th of October 1660. He was ejected for Nonconformity in 1662, and was so affected by the sight of the devastation caused by the great fire of London that he died shortly afterwards, on the 29th of October 1666. He was buried in the ruins of his church, near the place where the pulpit had stood. His publications are almost entirely sermons. His eldest son (Edmund), known as "the younger," was educated at Cambridge, and was ejected from the rectory of Moreton, Essex, in 1662. He was of a retiring disposition and moderate views, and died in 1685.

CALAMY, EDMUND (1671-1732), English Nonconformist divine, the only son of Edmund Calamy "the younger," was born in London, in the parish of St Mary Aldermanbury, on the 5th of April 1671. He was sent to various schools, including Merchant Taylors', and in 1688 proceeded to the university of Utrecht. While there, he declined an offer of a professor's chair in the university of Edinburgh made to him by the principal, William Carstares, who had gone over on purpose to find suitable men for such posts. After his return to England in 1691 he began to study divinity, and on Baxter's advice went to Oxford, where he was much influenced by Chillingworth. He declined invitations from Andover and Bristol, and accepted one as assistant to Matthew Sylvester at Blackfriars (1692). In June 1694 he was publicly ordained at Annesley's meeting-house in Little St Helen's, and soon afterwards was invited to become assistant to Daniel Williams in Hand Alley, Bishopsgate. In 1702 he was chosen one of the lecturers in Salters' Hall, and in 1703 he succeeded Vincent Alsop as pastor of a large congregation in Westminster. In 1709 Calamy made a tour through Scotland, and had the degree of doctor of divinity conferred on him by the universities of Edinburgh, Aberdeen and Glasgow. Calamy's forty-one publications are mainly sermons, but his fame rests on his nonconformist biographies. His first essay was a table of contents to Baxter's *Narrative* of his life and times, which was sent to the press in 1696; he made some remarks on the work itself and added to it an index, and, reflecting on the usefulness of the book, he saw the expediency of continuing it, as Baxter's history came no further than the year 1684. Accordingly, he composed an abridgment of it, with an account of many other ministers who were ejected after the restoration of Charles II.; their apology, containing the grounds of their nonconformity and practice as to stated and occasional communion with the Church of England; and a continuation of their history until the year 1691. This work was published in 1702. The most important chapter (ix.) is that which gives a detailed account of the ministers ejected in 1662; it was afterwards published as a distinct volume. He afterwards published a moderate defence of Nonconformity, in three tracts, in answer to some tracts of Benjamin, afterwards Bishop, Hoadly. In 1713 he published a second edition (2 vols.) of his *Abridgment of Baxter's History*, in which, among various additions, there is a continuation of the history through the reigns of William and Anne, down to the passing of the Occasional Bill. At the end is subjoined the reformed liturgy, which was drawn up and presented to the bishops in 1661. In 1718 he wrote a vindication of his grandfather and several other persons against certain reflections cast upon them by Laurence Echard in his *History of England*. In 1719 he published *The Church and the Dissenters Compar'd as to Persecution*, and in 1728 appeared his *Continuation of the Account* of the ejected ministers and teachers, a volume which is really a series of emendations of the previously published account. He died on the 3rd of June 1732, having been married twice and leaving six of his thirteen children to survive him. Calamy was a kindly man, frankly self-conscious, but very free from jealousy. He was an able diplomatist and generally secured his ends. His great hero was Baxter, of whom he wrote three distinct memoirs. His eldest son Edmund (the fourth) was a Presbyterian minister in London and died 1755; another son (Edmund, the fifth) was a barrister who died in 1816; and this one's son (Edmund, the sixth) died in 1850, his younger brother Michael, the last of the direct Calamy line, surviving till 1876.

CALARASHI (*Călărasi*), the capital of the Jalomitza department, Rumania, situated on the left bank of the Borcea branch of the Danube, amid wide fens, north of which extends the desolate Baragan Steppe. Pop. (1900) 11,024. Calarashi has a considerable transit trade in wheat, linseed, hemp, timber and fish from a broad mere on the west or from the Danube. Small vessels carry cargo to Braila and Galatz, and a branch railway from Calarashi traverses the Steppe from south to north, and meets the main line between Bucharest and Constantza.

CALAS, JEAN (1698-1762), a Protestant merchant at Toulouse, whose legal murder is a celebrated case in French history. His wife was an Englishwoman of French extraction. They had three sons and three daughters. His son Louis had embraced the Roman Catholic faith through the persuasions of a female domestic who had lived thirty years in the family. In October 1761 another son, Antoine, hanged himself in his father's warehouse. The crowd, which collected on so shocking a discovery, took up the idea that he had been strangled by the family to prevent him from changing his religion, and that this was a common practice among Protestants. The officers of justice adopted the popular tale, and were supplied by the mob with what they accepted as conclusive evidence of the fact. The fraternity of White Penitents buried the body with great ceremony, and performed a solemn service for the deceased as a martyr; the Franciscans followed their example; and these formalities led to the popular belief in the guilt of the unhappy family. Being all condemned to the rack in order to extort confession, they appealed to the parlement; but this body, being as weak as the subordinate magistrates, sentenced the father to the torture, ordinary and extraordinary, to be broken alive upon the wheel, and then to be burnt to ashes; which decree was carried into execution on the 9th of March 1762. Pierre Calas, the surviving son, was banished for life; the rest were acquitted. The distracted widow, however, found some friends, and among them Voltaire, who laid
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her case before the council of state at Versailles. For three years he worked indefatigably to procure justice, and made the Calas case famous throughout Europe (see VOLTAIRE). Finally the king and council unanimously agreed to annul the proceeding of the parlement of Toulouse; Calas was declared to have been innocent, and every imputation of guilt was removed from the family.

See *Causes célèbres*, tome iv.; Raoul Allier, *Voltaire et Calas, une erreur judiciaire au XVIII*e *siècle* (Paris, 1898); and biographies of Voltaire.

CALASH (from Fr. *calèche*, derived from Polish *kolaska*, a wheeled carriage), a light carriage with a folding hood; the Canadian calash is two-wheeled and has a seat for the driver on the splash-board. The word is also used for a kind of hood made of silk stretched over hoops, formerly worn by women.

CALASIAO, a town of the province of Pangasinán, Luzon, Philippine Islands, on a branch of the Agno river, about 4 m. S. by E. of Dagupan, the N. terminal of the Manila & Dagupan railway. Pop. (1903) 16,539. In 1903, after the census had been taken, the neighbouring town of Santa Barbara (pop. 10,367) was annexed to Calasiao. It is in the midst of a fertile district and has manufactures of hats and various woven fabrics.

CALASIO, MARIO DI (1550-1620), Italian Minorite friar, was born at a small town in the Abruzzi whence he took his name. Joining the Franciscans at an early age, he devoted himself to Oriental languages and became an authority on Hebrew. Coming to Rome he was appointed by Paul V., whose confessor he was, to the chair of Scripture at Ara Coeli, where he died on the 1st of February 1620. Calasio is known by his *Concordantiae sacrorum Bibliorum hebraicorum*, published in 4 vols. (Rome, 1622), two years after his death, a work which is based on Nathan's *Hebrew Concordance* (Venice, 1523). For forty years Calasio laboured on this work, and he secured the assistance of the greatest scholars of his age. The *Concordance* evinces great care and accuracy. All root-words are treated in alphabetical order and the whole Bible has been collated for every passage containing the word, so as to explain the original idea, which is illustrated from the cognate usages of the Chaldee, Syrian, Rabbinical Hebrew and Arabic. Calasio gives under each Hebrew word the literal Latin translation, and notes any existing differences from the Vulgate and Septuagint readings. An incomplete English translation of the work was published in London by Romaine in 1747. Calasio also wrote a Hebrew grammar, *Canones generates linguae sanctatae* (Rome, 1616), and the *Dictionarium hebraicum* (Rome, 1617).

CALATAFIMI, a town of the province of Trapani, Sicily, 30 m. W.S.W. of Palermo direct (51½ m. by rail). Pop. (1901) 11,426. The name of the town is derived from the Saracenic castle of *Kalat-al-Fimi* (castle of Euphemius), which stands above it. The principal church contains a fine Renaissance reredos in marble. Samuel Butler, the author of *Erewhon*, did much of his work here. The battlefield where Garibaldi won his first victory over the Neapolitans on the 15th of May 1860, lies 2 m. S.W.

CALATAYÚD, a town of central Spain, in the province of Saragossa, at the confluence of the rivers Jalón and Jiloca, and on the Madrid-Saragossa and Calatayúd-Sagunto railways. Pop. (1900) 11,526. Calatayúd consists of a lower town, built on the left bank of the Jalón, and an upper or Moorish town, which contains many dwellings hollowed out of the rock above and inhabited by the poorer classes. Among a number of ecclesiastical buildings, two collegiate churches are especially noteworthy. Santa Maria, originally a mosque, has a lofty octagonal tower and a fine Renaissance doorway, added in 1528; while Santo Sepulcro, built in 1141, and restored in 1613, was long the principal church of the Spanish Knights Templar. In commercial importance Calatayúd ranks second only to Saragossa among the Aragonese towns, for it is the central market of the exceptionally fertile expanse watered by the Jalón and Jiloca. About 2 m. E. are the ruins of the ancient *Bilbilis*, where the poet Martial was born *c.* A.D. 40. It was celebrated for its breed of horses, its armourers, its gold and its iron; but Martial also mentions its unhealthy climate, due to the icy winds which sweep down from the heights of Moncayo (7705 ft.) on the north. In the middle ages the ruins were almost destroyed to provide stone for the building of Calatayúd, which was founded by a Moorish amir named Ayub and named *Kalat Ayub*, "Castle of Ayub." Calatayúd was captured by Alphonso I. of Aragon in 1119.

CALATIA, an ancient town of Campania, Italy, 6 m. S.E. of Capua, on the Via Appia, near the point where the Via Popillia branches off from it. It is represented by the church of St. Giacomo alle Galazze. The Via Appia here, as at Capua, abandons its former S.E. direction for a length of 2000 Oscan ft. (1804½ English ft.), for which it runs due E. and then resumes its course S.E. There are no ruins, but a considerable quantity of débris; and the pre-Roman necropolis was partially excavated in 1882. Ten shafts lined with slabs of tufa which were there found may have been the approaches to tombs or may have served as wells. The history of Calatia is practically that of its more powerful neighbour Capua, but as it lay near the point

where the Via Appia turns east and enters the mountains, it had some strategic importance. In 313 B.C. it was taken by the Samnites and recaptured by the dictator Q. Fabius; the Samnites captured it again in 311, but it must have been retaken at an unknown date. In the 3rd century we find it issuing coins with an Oscan legend, but in 211 B.C. it shared the fate of Capua. In 174 we hear of its walls being repaired by the censors. In 59 B.C. a colony was established here by Caesar.

See Ch. Hülsen in Pauly-Wissowa, *Realencyclopädie*, iii. 1334 (Stuttgart, 1899).

CALAVERAS SKULL, a famous fossil cranium, reported by Professor J.D. Whitney as found (1886) in the undisturbed auriferous gravels of Calaveras county, California. The discovery at once raised the still discussed question of "tertiary man" in the New World. Doubt has been thrown on the genuineness of the find, as the age of the gravels is disputed and the skull is of a type corresponding exactly with that of the present Indian inhabitants of the district. Whitney assigns the fossil to late Tertiary (Pliocene) times, and concludes that "man existed in California previous to the cessation of volcanic activity in the Sierra Nevada, to the epoch of the greatest extension of the glaciers in that region and to the erosion of the present river cañons and valleys, at a time when the animal and vegetable creation differed entirely from what they now are...." The specimen is preserved in the Peabody museum, Cambridge, Mass.

CALBÁYOG, a town of the province of Sámar, Philippine Islands, on the W. coast at the mouth of the Calbáyog river, about 30 m. N.W. of Catbalogan, the capital, in lat. 12° 3′ N. Pop. (1903) 15,895. Calbáyog has an important export trade in hemp, which is shipped to Manila. Copra is also produced in considerable quantity, and there is fine timber in the vicinity. There are hot springs near the town. The neighbouring valleys of the Gándara and Hippatan rivers are exceedingly fertile, but in 1908 were uncultivated. The climate is very warm, but healthy. The language is Visayan.

CALBE, or KALBE, a town of Germany, on the Saale, in Prussian Saxony. It is known as Calbe-an-der-Saale, to distinguish it from the smaller town of Calbe on the Milde in the same province. Pop. (1905) 12,281. It is a railway junction, and among its industries are wool-weaving and the manufacture of cloth, paper, stoves, sugar and bricks. Cucumbers and onions are cultivated, and soft coal is mined in the neighbourhood.

CALCAR (or KALCKER), **JOHN DE** (1499-1546), Italian painter, was born at Calcar, in the duchy of Cleves. He was a disciple of Titian at Venice, and perfected himself by studying Raphael. He imitated those masters so closely as to deceive the most skilful critics. Among his various pieces is a Nativity, representing the angels around the infant Christ, which he arranged so that the light emanated wholly from the child. He died at Naples.

CALCEOLARIA, in botany, a genus belonging to the natural order Scrophulariaceae, containing about 150 species of herbaceous or shrubby plants, chiefly natives of the South American Andes of Peru and Chile. [v.04 p.0969] The calceolaria of the present day has been developed into a highly decorative plant, in which the herbaceous habit has preponderated. The plants are now very generally raised annually from seed, which is sown about the end of June in a mixture of loam, leaf-mould and sand, and, being very small, must be only slightly covered. When the plants are large enough to handle they are pricked out an inch or two apart into 3-inch or 5-inch pots; when a little more advanced they are potted singly. They should be wintered in a greenhouse with a night temperature of about 40°, occupying a shelf near the light. By the end of February they should be moved into 8-inch or 10-inch pots, using a compost of three parts good turfy loam, one part leaf-mould, and one part thoroughly rotten manure, with a fair addition of sand. They need plenty of light and air, but must not be subjected to draughts. When the pots get well filled with roots, they must be liberally supplied with manure water. In all stages of growth the plants are subject to the attacks of the green-fly, for which they must be fumigated.

The so-called shrubby calceolarias used for bedding are increased from cuttings, planted in autumn in cold frames, where they can be wintered, protected from frost by the use of mats and a good layer of litter placed over the glass and round the sides.

CALCHAQUI, a tribe of South American Indians, now extinct, who formerly occupied northern Argentina. Stone and other remains prove them to have reached a high degree of civilization. They offered a vigorous resistance to the first Spanish colonists coming from Chile.

CALCHAS, of Mycenae or Megara, son of Thestor, the most famous soothsayer among the Greeks at the time of the Trojan war. He foretold the duration of the siege of Troy, and, when the fleet was detained by adverse winds at Aulis, he explained the cause and demanded the sacrifice of Iphigeneia. When the Greeks were visited with pestilence on account of Chryseis, he disclosed the reasons of Apollo's anger. It was he who suggested that Neoptolemus and Philoctetes should be fetched from Scyros and Lemnos to Troy, and he was one of those who advised the construction of the wooden horse. When the Greeks, on their journey home after the fall of Troy, were overtaken by a storm, Calchas is said to have been thrown ashore at Colophon. According to another story, he foresaw the storm and did not attempt to return by sea. It had been predicted that he should die when he met his superior in divination; and the prophecy was fulfilled in the person of Mopsus, whom Calchas met in the grove of the Clarian Apollo near Colophon. Having been beaten in a trial of soothsaying, Calchas died of chagrin or committed suicide. He had a temple and oracle in Apulia.

Ovid, *Metam.* xii. 18 ff.; Homer, *Iliad* i. 68, ii. 322; Strabo vi. p. 284, xiv. p. 642.

CALCITE, a mineral consisting of naturally occurring calcium carbonate, $CaCO_3$, crystallizing in the rhombohedral system. With the exception of quartz, it is the most widely distributed of minerals, whilst in the beautiful development and extraordinary variety of form of its crystals it is surpassed by none. In the massive condition it occurs as large rock-masses (marble, limestone, chalk) which are often of organic origin, being formed of the remains of molluscs, corals, crinoids, &c., the hard parts of which consist largely of calcite.

The name calcite (Lat. *calx*, *calcis*, meaning burnt lime) is of comparatively recent origin, and was first applied, in 1836, to the "barleycorn" pseudomorphs of calcium carbonate after celestite from Sangerhausen in Thuringia; it was not until about 1843 that the name was used in its present sense. The mineral had, however, long been known under the names calcareous spar and calc-spar, and the beautifully transparent variety called Iceland-spar had been much studied. The strong double refraction and perfect cleavages of Iceland-spar were described in detail by Erasmus Bartholinus in 1669 in his book

Experimenta Crystalli Islandici disdiaclastici; the study of the same mineral led Christiaan Huygens to discover in 1690 the laws of double refraction, and E.L. Malus in 1808 the polarization of light.

An important property of calcite is the great ease with which it may be cleaved in three directions; the three perfect cleavages are parallel to the faces of the primitive rhombohedron, and the angle between them was determined by W.H. Wollaston in 1812, with the aid of his newly invented reflective goniometer, to be 74° 55′. The cleavage is of great help in distinguishing calcite from other minerals of similar appearance. The hardness of 3 (it is readily scratched with a knife), the specific gravity of 2.72, and the fact that it effervesces briskly in contact with cold dilute acids are also characters of determinative value.

Crystals of calcite are extremely varied in form, but, as a rule, they may be referred to four distinct habits, namely: rhombohedral, prismatic, scalenohedral and tabular. The primitive rhombohedron, *r* {100} (fig. 1), is comparatively rare except in combination with other forms. A flatter rhombohedron, *e* {110}, is shown in fig. 2, and a more acute one, *f* {11$\bar{1}$}, in fig. 3. These three rhombohedra are related in such a manner that, when in combination, the faces of *r* truncate the polar edges of *f*, and the faces of *e* truncate the edges of *r*. The crystal of prismatic habit shown in fig. 4 is a combination of the prism *m* {2$\bar{1}\bar{1}$} and the rhombohedron *e* {110}; fig. 5 is a combination of the scalenohedron *v* {20$\bar{1}$} and the rhombohedron *r* {100}; and the crystal of tabular habit represented in fig. 6 is a combination of the basal pinacoid *c* {111}, prism *m* {2$\bar{1}\bar{1}$}, and rhombohedron *e* {110}. In these figures only six distinct forms (*r*, *e*, *f*, *m*, *v*, *c*) are represented, but more than 400 have been recorded for calcite, whilst the combinations of them are almost endless.

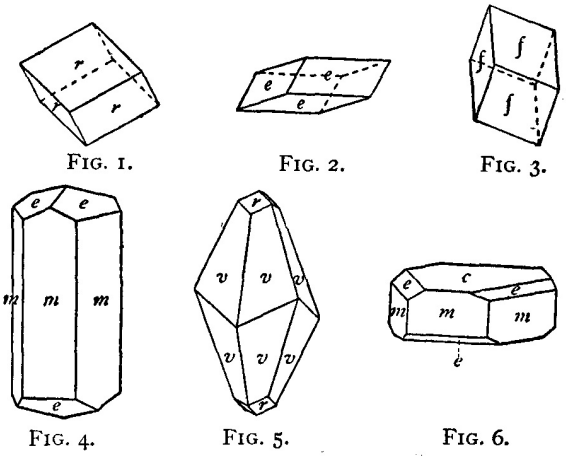

Fig. 1. Fig. 2. Fig. 3. Fig. 4. Fig. 5. Fig. 6.

Figs. 1-6.—Crystals of Calcite.

Depending on the habits of the crystals, certain trivial names have been used, such, for example, as dog-tooth-spar for the crystals of scalenohedral habit, so common in the Derbyshire lead mines and limestone caverns; nail-head-spar for crystals terminated by the obtuse rhombohedron *e*, which are common in the lead mines of Alston Moor in Cumberland; slate-spar (German *Schieferspath*) for crystals of tabular habit, and sometimes as thin as paper: cannon-spar for crystals of prismatic habit terminated by the basal pinacoid *c*.

Calcite is also remarkable for the variety and perfection of its twinned crystals. Twinned crystals, though not of infrequent occurrence, are, however, far less common than simple (untwinned) crystals. No less than four well-defined twin-laws are to be distinguished:—

i. Twin-plane *c* (111).—Here there is rotation of one portion with respect to the other through 180° about the principal (trigonal) axis, which is perpendicular to the plane *c* (111); or the same result may be obtained by reflection across this plane. Fig. 7 shows a prismatic crystal (like fig. 4) twinned in this manner, and fig. 8 represents a twinned scalenohedron *v* {20$\bar{1}$}.

ii. Twin-plane *e* (110).—The principal axes of the two portions are inclined at an angle of 52° 30½′. Repeated twinning on this plane is very common, and the twin-lamellae (fig. 9) to which it gives rise are often to be observed in the grains of calcite of crystalline limestones which have been subjected to pressure. This lamellar twinning is of secondary origin; it may be readily produced artificially by pressure, for example, by pressing a knife into the edge of a cleavage rhombohedron.

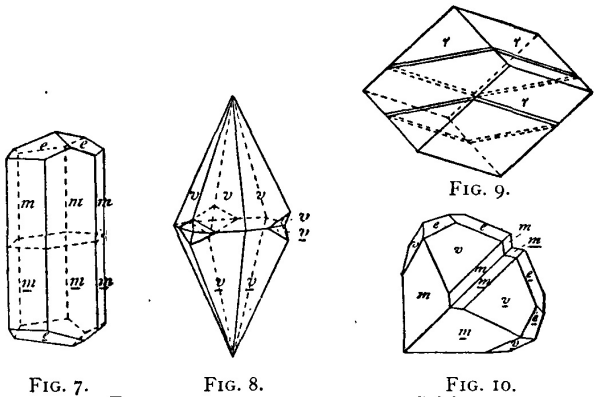

Fig. 7. Fig. 8. Fig. 9. Fig. 10.

Fig. 7-10.—Twinned Crystals of Calcite.

[v.04 p.0970] iii. Twin-plane *r* (100).—Here the principal axes of the two portions are nearly at right angles (89° 14′), and one of the directions of cleavage in both portions is parallel to the twin-plane. Fine crystals of prismatic habit twinned according to this law were formerly found in considerable numbers at Wheal Wrey in Cornwall, and of scalenohedral habit at Eyam in Derbyshire and Cleator Moor in Cumberland; those from the last two localities are known as "butterfly twins" or "heart-shaped twins" (fig. 10), according to their shape.

iv. Twin-plane *f* (11$\bar{1}$).—The principal axes are here inclined at 53° 46′. This is the rarest twin-law of calcite.

Calcite when pure, as in the well-known Iceland-spar, is perfectly transparent and colourless. The lustre is vitreous. Owing to the presence of various impurities, the transparency and colour may vary considerably. Crystals are often nearly white or colourless, usually with a slight yellowish tinge. The yellowish colour is in most cases due to the presence of iron, but in some cases it has been proved to be due to organic matter (such as apocrenic acid) derived from the humus overlying the rocks in which the crystals were formed. An opaque calcite of a grass-green colour, occurring as large cleavage masses in central India and known as hislopite, owes its colour to enclosed "green-earth" (glauconite and celadonite). A stalagmitic calcite of a beautiful purple colour, from Reichelsdorf in Hesse, is coloured by cobalt.

Optically, calcite is uniaxial with negative bi-refringence, the index of refraction for the ordinary ray being greater than for the extraordinary ray; for sodium-light the former is 1.6585 and the latter 1.4862. The

difference, 0.1723, between these two indices gives a measure of the bi-refringence or double refraction.

Although the double refraction of some other minerals is greater than that of calcite (*e.g.* for cinnabar it is 0.347, and for calomel 0.683), yet this phenomenon can be best demonstrated in calcite, since it is a mineral obtainable in large pieces of perfect transparency. Owing to the strong double refraction and the consequent wide separation of the two polarized rays of light traversing the crystal, an object viewed through a cleavage rhombohedron of Iceland-spar is seen double, hence the name doubly-refracting spar. Iceland-spar is extensively used in the construction of Nicol's prisms for polariscopes, polarizing microscopes and saccharimeters, and of dichroscopes for testing the pleochroism of gem-stones.

Chemically, calcite has the same composition as the orthorhombic aragonite (*q.v.*), these minerals being dimorphous forms of calcium carbonate. Well-crystallized material, such as Iceland-spar, usually consists of perfectly pure calcium carbonate, but at other times the calcium may be isomorphously replaced by small amounts of magnesium, barium, strontium, manganese, zinc or lead. When the elements named are present in large amount we have the varieties dolomitic calcite, baricalcite, strontianocalcite, ferrocalcite, manganocalcite, zincocalcite and plumbocalcite, respectively.

Mechanically enclosed impurities are also frequently present, and it is to these that the colour is often due. A remarkable case of enclosed impurities is presented by the so-called Fontainbleau limestone, which consists of crystals of calcite of an acute rhombohedral form (fig. 3) enclosing 50 to 60% of quartz-sand. Similar crystals, but with the form of an acute hexagonal pyramid, and enclosing 64% of sand, have recently been found in large quantity over a wide area in South Dakota, Nebraska and Wyoming. The case of hislopite, which encloses up to 20% of "green earth," has been noted above.

In addition to the varieties of calcite noted above, some others, depending on the state of aggregation of the material, are distinguished. A finely fibrous form is known as satin-spar (*q.v.*), a name also applied to fibrous gypsum: the most typical example of this is the snow-white material, often with a rosy tinge and a pronounced silky lustre, which occurs in veins in the Carboniferous shales of Alston Moor in Cumberland. Finely scaly varieties with a pearly lustre are known as argentine and aphrite (German *Schaumspath*); soft, earthy and dull white varieties as agaric mineral, rock-milk, rock-meal, &c.—these form a transition to marls, chalk, &c. Of the granular and compact forms numerous varieties are distinguished (see Limestone and Marble). In the form of stalactites calcite is of extremely common occurrence. Each stalactite usually consists of an aggregate of radially arranged crystalline individuals, though sometimes it may consist of a single individual with crystal faces developed at the free end. Onyx-marbles or Oriental alabaster (see Alabaster) and other stalagmitic deposits also consist of calcite, and so do the allied deposits of travertine, calc-sinter or calc-tufa.

The modes of occurrence of calcite are very varied. It is a common gangue mineral in metalliferous deposits, and in the form of crystals is often associated with ores of lead, iron, copper and silver. It is a common product of alteration in igneous rocks, and frequently occurs as well-developed crystals in association with zeolites lining the amygdaloidal cavities of basaltic and other rocks. Veins and cavities in limestones are usually lined with crystals of calcite. The wide distribution, under various conditions, of crystallized calcite is readily explained by the solubility of calcium carbonate in water containing carbon dioxide, and the ease with which the material is again deposited in the crystallized state when the carbon dioxide is liberated by evaporation. On this also depends the formation of stalactites and calc-sinter.

Localities at which beautifully crystallized specimens of calcite are found are extremely numerous. For beauty of crystals and variety of forms the haematite mines of the Cleator Moor district in west Cumberland and the Furness district in north Lancashire are unsurpassed. The lead mines of Alston in Cumberland and of Derbyshire, and the silver mines of Andreasberg in the Harz and Guanajuato in Mexico have yielded many fine specimens. From the zinc mines of Joplin in Missouri enormous crystals of golden-yellow and amethystine colours have been recently obtained. At all the localities here mentioned the crystals occur with metalliferous ores. In Iceland the mode of occurrence is quite distinct, the mineral being here found in a cavity in basalt.

The quarry, which since the 19th century has supplied the famous Iceland-spar, is in a cavity in basalt, the cavity itself measuring 12 by 5 yds. in area and about 10 ft. in height. It is situated quite close to the farm Helgustadir, about an hour's ride from the trading station of Eskifjordur on Reydar Fjordur, on the east coast of Iceland. This cavity when first found was filled with pure crystallized masses and enormous crystals. The crystals measure up to a yard across, and are rhombohedral or scalenohedral in habit; their faces are usually dull and corroded or coated with stilbite. In recent years much of the material taken out has not been of sufficient transparency for optical purposes, and this, together with the very limited supply, has caused a considerable rise in price. Only very occasionally has calcite from any locality other than Iceland been used for the construction of a Nicol's prism.

(L. J. S.)

[v.04 p.0971]

CALCIUM [symbol Ca, atomic weight 40.0 (O=16)], a metallic chemical element, so named by Sir Humphry Davy from its occurrence in chalk (Latin *calx*). It does not occur in nature in the free state, but in combination it is widely and abundantly diffused. Thus the sulphate constitutes the minerals anhydrite, alabaster, gypsum, and selenite; the carbonate occurs dissolved in most natural waters and as the minerals chalk, marble, calcite, aragonite; also in the double carbonates such as dolomite, bromlite, barytocalcite; the fluoride as fluorspar; the fluophosphate constitutes the mineral apatite; while all the more important mineral silicates contain a proportion of this element.

Extraction.—Calcium oxide or lime has been known from a very remote period, and was for a long time considered to be an elementary or undecomposable earth. This view was questioned in the 18th century, and in 1808 Sir Humphry Davy (*Phil. Trans.*, 1808, p. 303) was able to show that lime was a combination of a metal and oxygen. His attempts at isolating this metal were not completely successful; in fact, metallic calcium remained a laboratory curiosity until the beginning of the 20th century. Davy, inspired by his successful isolation of the metals sodium and potassium by the electrolysis of their hydrates, attempted to decompose a mixture of lime and mercuric oxide by the electric current; an amalgam of calcium was obtained, but the separation of the mercury was so difficult that even Davy himself was not sure as to whether he had obtained pure metallic calcium. Electrolysis of lime or calcium chloride in contact with mercury gave similar results. Bunsen (*Ann.*, 1854, 92, p. 248) was more successful when he electrolysed

calcium chloride moistened with hydrochloric acid; and A. Matthiessen (*Jour. Chem. Soc.*, 1856, p. 28) obtained the metal by electrolysing a mixture of fused calcium and sodium chlorides. Henri Moissan obtained the metal of 99% purity by electrolysing calcium iodide at a low red heat, using a nickel cathode and a graphite anode; he also showed that a more convenient process consisted in heating the iodide with an excess of sodium, forming an amalgam of the product, and removing the sodium by means of absolute alcohol (which has but little action on calcium), and the mercury by distillation.

The electrolytic isolation of calcium has been carefully investigated, and this is the method followed for the commercial production of the metal. In 1902 W. Borchers and L. Stockem (*Zeit. für Electrochemie,* 1902, p. 8757) obtained the metal of 90% purity by electrolysing calcium chloride at a temperature of about 780°, using an iron cathode, the anode being the graphite vessel in which the electrolysis was carried out. In the same year, O. Ruff and W. Plato (*Ber.* 1902, 35, p. 3612) employed a mixture of calcium chloride (100 parts) and fluorspar (16.5 parts), which was fused in a porcelain crucible and electrolysed with a carbon anode and an iron cathode. Neither of these processes admitted of commercial application, but by a modification of Ruff and Plato's process, W. Ruthenau and C. Suter have made the metal commercially available. These chemists electrolyse either pure calcium chloride, or a mixture of this salt with fluorspar, in a graphite vessel which serves as the anode. The cathode consists of an iron rod which can be gradually raised. On electrolysis a layer of metallic calcium is formed at the lower end of this rod on the surface of the electrolyte; the rod is gradually raised, the thickness of the layer increases, and ultimately a rod of metallic calcium, forming, as it were, a continuation of the iron cathode, is obtained. This is the form in which calcium is put on the market.

An idea as to the advance made by this method is recorded in the variation in the price of calcium. At the beginning of 1904 it was quoted at 5s. per gram, £250 per kilogram or £110 per pound; about a year later the price was reduced to 21s. per kilogram, or 12s. per kilogram in quantities of 100 kilograms. These quotations apply to Germany; in the United Kingdom the price (1905) varied from 27s. to 30s. per kilogram (12s. to 13s. per lb.).

Properties.—A freshly prepared surface of the metal closely resembles zinc in appearance, but on exposure to the air it rapidly tarnishes, becoming yellowish and ultimately grey or white in colour owing to the information of a surface layer of calcium hydrate. A faint smell of acetylene may be perceived during the oxidation in moist air; this is probably due to traces of calcium carbide. It is rapidly acted on by water, especially if means are taken to remove the layer of calcium hydrate formed on the metal; alcohol acts very slowly. In its chemical properties it closely resembles barium and strontium, and to some degree magnesium; these four elements comprise the so-called metals of the "alkaline earths." It combines directly with most elements, including nitrogen; this can be taken advantage of in forming almost a perfect vacuum, the oxygen combining to form the oxide, CaO, and the nitrogen to form the nitride, Ca_3N_2. Several of its physical properties have been determined by K. Arndt (*Ber.*, 1904, 37, p. 4733). The metal as prepared by electrolysis generally contains traces of aluminium and silica. Its specific gravity is 1.54, and after remelting 1.56; after distillation it is 1.52. It melts at about 800°, but sublimes at a lower temperature.

Compounds.—Calcium hydride, obtained by heating electrolytic calcium in a current of hydrogen, appears in commerce under the name hydrolite. Water decomposes it to give hydrogen free from ammonia and acetylene, 1 gram yielding about 100 ccs. of gas (Prats Aymerich, *Abst. J.C.S.*, 1907, ii p. 460). Calcium forms two oxides—the monoxide, CaO, and the dioxide, CaO_2. The monoxide and its hydrate are more familiarly known as lime (*q.v.*) and slaked-lime. The dioxide was obtained as the hydrate, $CaO_2{\cdot}8H_2O$, by P. Thénard (*Ann. Chim. Phys.*, 1818, 8, p. 213), who precipitated lime-water with hydrogen peroxide. It is permanent when dry; on heating to 130° C. it loses water and gives the anhydrous dioxide as an unstable, pale buff-coloured powder, very sparingly soluble in water. It is used as an antiseptic and oxidizing agent.

Whereas calcium chloride, bromide, and iodide are deliquescent solids, the fluoride is practically insoluble in water; this is a parallelism to the soluble silver fluoride, and the insoluble chloride, bromide and iodide. *Calcium fluoride*, CaF_2, constitutes the mineral fluor-spar (*q.v.*), and is prepared artificially as an insoluble white powder by precipitating a solution of calcium chloride with a soluble fluoride. One part dissolves in 26,000 parts of water. *Calcium chloride*, $CaCl_2$, occurs in many natural waters, and as a by-product in the manufacture of carbonic acid (carbon dioxide), and potassium chlorate. Aqueous solutions deposit crystals containing 2, 4 or 6 molecules of water. Anhydrous calcium chloride, prepared by heating the hydrate to 200° (preferably in a current of hydrochloric acid gas, which prevents the formation of any oxychloride), is very hygroscopic, and is used as a desiccating agent. It fuses at 723°. It combines with gaseous ammonia and forms crystalline compounds with certain alcohols. The crystallized salt dissolves very readily in water with a considerable absorption of heat; hence its use in forming "freezing mixtures." A temperature of -55°C. is obtained by mixing 10 parts of the hexahydrate with 7 parts of snow. A saturated solution of calcium chloride contains 325 parts of $CaCl_2$ to 100 of water at the boiling point (179.5°). Calcium iodide and bromide are white deliquescent solids and closely resemble the chloride.

Chloride of lime or "bleaching powder" is a calcium chlor-hypochlorite or an equimolecular mixture of the chloride and hypochlorite (see Alkali Manufacture and Bleaching).

Calcium carbide, CaC_2, a compound of great industrial importance as a source of acetylene, was first prepared by F. Wohler. It is now manufactured by heating lime and carbon in the electric furnace (see Acetylene). Heated in chlorine or with bromine, it yields carbon and calcium chloride or bromide; at a dull red heat it burns in oxygen, forming calcium carbonate, and it becomes incandescent in sulphur vapour at 500°, forming calcium sulphide and carbon disulphide. Heated in the electric furnace in a current of air, it yields calcium cyanamide (see Cyanamide).

Calcium carbonate, $CaCO_3$, is of exceptionally wide distribution in both the mineral and animal kingdoms. It constitutes the bulk of the chalk deposits and limestone rocks; it forms over one-half of the mineral dolomite and the rock magnesium limestone; it occurs also as the dimorphous minerals aragonite (*q.v.*) and calcite (*q.v.*). Tuff (*q.v.*) and travertine are calcareous deposits found in volcanic districts. Most natural waters contain it dissolved in carbonic acid; this confers "temporary hardness" on the water. The dissipation of the dissolved carbon dioxide results in the formation of "fur" in kettles or boilers, and if the solution is falling, as from the roof of a cave, in the formation of stalactites and stalagmites. In the animal

kingdom it occurs as both calcite and aragonite in the tests of the foraminifera, echinoderms, brachiopoda, and mollusca; also in the skeletons of sponges and corals. Calcium carbonate is obtained as a white precipitate, almost insoluble in water (1 part requiring 10,000 of water for solution), by mixing solutions of a carbonate and a calcium salt. Hot or dilute cold solutions deposit minute orthorhombic crystals of aragonite, cold saturated or moderately strong solutions, hexagonal (rhombohedral) crystals of calcite. Aragonite is the least stable form; crystals have been found altered to calcite.

Calcium nitride, Ca_3N_2, is a greyish-yellow powder formed by heating calcium in air or nitrogen; water decomposes it with evolution of ammonia (see H. Moissan, *Compt. Rend.*, 127, p. 497).

[v.04 p.0972] *Calcium nitrate*, $Ca(NO_3)_2{\cdot}4H_2O$, is a highly deliquescent salt, crystallizing in monoclinic prisms, and occurring in various natural waters, as an efflorescence in limestone caverns, and in the neighbourhood of decaying nitrogenous organic matter. Hence its synonyms, "wall-saltpetre" and "lime-saltpetre"; from its disintegrating action on mortar, it is sometimes referred to as "saltpetre rot." The anhydrous nitrate, obtained by heating the crystallized salt, is very phosphorescent, and constitutes "Baldwin's phosphorus." A basic nitrate, $Ca(NO_3)_2{\cdot}Ca(OH)_2{\cdot}3H_2O$, is obtained by dissolving calcium hydroxide in a solution of the normal nitrate.

Calcium phosphide, Ca_3P_2, is obtained as a reddish substance by passing phosphorus vapour over strongly heated lime. Water decomposes it with the evolution of spontaneously inflammable hydrogen phosphide; hence its use as a marine signal fire ("Holmes lights"), (see L. Gattermann and W. Haussknecht, *Ber.*, 1890, 23, p. 1176, and H. Moissan, *Compt. Rend.*, 128, p. 787).

Of the calcium orthophosphates, the normal salt, $Ca_3(PO_4)_2$, is the most important. It is the principal inorganic constituent of bones, and hence of the "bone-ash" of commerce (see Phosphorus); it occurs with fluorides in the mineral apatite (*q.v.*); and the concretions known as coprolites (*q.v.*) largely consist of this salt. It also constitutes the minerals ornithite, $Ca_3(PO_4)_2{\cdot}2H_2O$, osteolite and sombrerite. The mineral brushite, $CaHPO_4{\cdot}2H_2O$, which is isomorphous with the acid arsenate pharmacolite, $CaHAsO_4{\cdot}2H_2O$, is an acid phosphate, and assumes monoclinic forms. The normal salt may be obtained artificially, as a white gelatinous precipitate which shrinks greatly on drying, by mixing solutions of sodium hydrogen phosphate, ammonia, and calcium chloride. Crystals may be obtained by heating di-calcium pyrophosphate, $Ca_2P_2O_7$, with water under pressure. It is insoluble in water; slightly soluble in solutions of carbonic acid and common salt, and readily soluble in concentrated hydrochloric and nitric acid. Of the acid orthophosphates, the mono-calcium salt, $CaH_4(PO_4)_2$, may be obtained as crystalline scales, containing one molecule of water, by evaporating a solution of the normal salt in hydrochloric or nitric acid. It dissolves readily in water, the solution having an acid reaction. The artificial manure known as "superphosphate of lime" consists of this salt and calcium sulphate, and is obtained by treating ground bones, coprolites, &c., with sulphuric acid. The di-calcium salt, $Ca_2H_2(PO_4)_2$, occurs in a concretionary form in the ureters and cloaca of the sturgeon, and also in guano. It is obtained as rhombic plates by mixing dilute solutions of calcium chloride and sodium phosphate, and passing carbon dioxide into the liquid. Other phosphates are also known.

Calcium monosulphide, CaS, a white amorphous powder, sparingly soluble in water, is formed by heating the sulphate with charcoal, or by heating lime in a current of sulphuretted hydrogen. It is particularly noteworthy from the phosphorescence which it exhibits when heated, or after exposure to the sun's rays; hence its synonym "Canton's phosphorus," after John Canton (1718-1772), an English natural philosopher. The sulphydrate or hydrosulphide, $Ca(SH)_2$, is obtained as colourless, prismatic crystals of the composition $Ca(SH)_2{\cdot}6H_2O$, by passing sulphuretted hydrogen into milk of lime. The strong aqueous solution deposits colourless, four-sided prisms of the hydroxy-hydrosulphide, Ca(OH)(SH). The disulphide, CaS_2 and pentasulphide, CaS_5, are formed when milk of lime is boiled with flowers of sulphur. These sulphides form the basis of Balmain's luminous paint. An oxysulphide, $2CaS{\cdot}CaO$, is sometimes present in "soda-waste," and orange-coloured, acicular crystals of $4CaS{\cdot}CaSO_4{\cdot}18H_2O$ occasionally settle out on the long standing of oxidized "soda- or alkali-waste" (see Alkali Manufacture).

Calcium sulphite, $CaSO_3$, a white substance, soluble in water, is prepared by passing sulphur dioxide into milk of lime. This solution with excess of sulphur dioxide yields the "bisulphite of lime" of commerce, which is used in the "chemical" manufacture of wood-pulp for paper making.

Calcium sulphate, $CaSO_4$, constitutes the minerals anhydrite (*q.v.*), and, in the hydrated form, selenite, gypsum (*q.v.*), alabaster (*q.v.*), and also the adhesive plaster of Paris (see Cement). It occurs dissolved in most natural waters, which it renders "permanently hard." It is obtained as a white crystalline precipitate, sparingly soluble in water (100 parts of water dissolve 24 of the salt at 15°C.), by mixing solutions of a sulphate and a calcium salt; it is more soluble in solutions of common salt and hydrochloric acid, and especially of sodium thiosulphate.

Calcium silicates are exceptionally abundant in the mineral kingdom. Calcium metasilicate, $CaSiO_3$, occurs in nature as monoclinic crystals known as tabular spar or wollastonite; it may be prepared artificially from solutions of calcium chloride and sodium silicate. H. Le Chatelier (*Annales des mines*, 1887, p. 345) has obtained artificially the compounds: $CaSiO_3$, Ca_2SiO_4, $Ca_3Si_2O_7$, and Ca_3SiO_5. (See also G. Oddo, *Chemisches Centralblatt*, 1896, 228.) Acid calcium silicates are represented in the mineral kingdom by gyrolite, $H_2Ca_2(SiO_3)_3{\cdot}H_2O$, a lime zeolite, sometimes regarded as an altered form of apophyllite (*q.v.*), which is itself an acid calcium silicate containing an alkaline fluoride, by okenite, $H_2Ca(SiO_3)_2{\cdot}H_2O$, and by xonalite $4CaSiO_3{\cdot}H_2O$. Calcium silicate is also present in the minerals: olivine, pyroxenes, amphiboles, epidote, felspars, zeolites, scapolites (*qq.v.*).

Detection and Estimation.—Most calcium compounds, especially when moistened with hydrochloric acid, impart an orange-red colour to a Bunsen flame, which when viewed through green glass appears to be finch-green; this distinguishes it in the presence of strontium, whose crimson coloration is apt to mask the orange-red calcium flame (when viewed through green glass the strontium flame appears to be a very faint yellow). In the spectroscope calcium exhibits two intense lines—an orange line (α), (λ 6163), a green line

(β), (λ 4229), and a fainter indigo line. Calcium is not precipitated by sulphuretted hydrogen, but falls as the carbonate when an alkaline carbonate is added to a solution. Sulphuric acid gives a white precipitate of calcium sulphate with strong solutions; ammonium oxalate gives calcium oxalate, practically insoluble in water and dilute acetic acid, but readily soluble in nitric or hydrochloric acid. Calcium is generally estimated by precipitation as oxalate which, after drying, is heated and weighed as carbonate or oxide, according to the degree and duration of the heating.

CALCULATING MACHINES. Instruments for the mechanical performance of numerical calculations, have in modern times come into ever-increasing use, not merely for dealing with large masses of figures in banks, insurance offices, &c., but also, as cash registers, for use on the counters of retail shops. They may be classified as follows:—(i.) Addition machines; the first invented by Blaise Pascal (1642). (ii.) Addition machines modified to facilitate multiplication; the first by G.W. Leibnitz (1671). (iii.) True multiplication machines; Léon Bollés (1888), Steiger (1894). (iv.) Difference machines; Johann Helfrich von Müller (1786), Charles Babbage (1822). (v.) Analytical machines; Babbage (1834). The number of distinct machines of the first three kinds is remarkable and is being constantly added to, old machines being improved and new ones invented; Professor R. Mehmke has counted over eighty distinct machines of this type. The fullest published account of the subject is given by Mehmke in the *Encyclopädie der mathematischen Wissenschaften*, article "Numerisches Rechnen," vol. i., Heft 6 (1901). It contains historical notes and full references. Walther von Dyck's *Catalogue* also contains descriptions of various machines. We shall confine ourselves to explaining the principles of some leading types, without giving an exact description of any particular one.

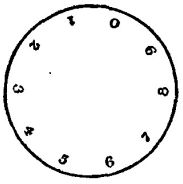

Fig. 1.

Addition machines.

Practically all calculating machines contain a "counting work," a series of "figure disks" consisting in the original form of horizontal circular disks (fig. 1), on which the figures 0, 1, 2, to 9 are marked. Each disk can turn about its vertical axis, and is covered by a fixed plate with a hole or "window" in it through which one figure can be seen. On turning the disk through one-tenth of a revolution this figure will be changed into the next higher or lower. Such turning may be called a "step," *positive* if the next higher and *negative* if the next lower figure appears. Each positive step therefore adds one unit to the figure under the window, while two steps add two, and so on. If a series, say six, of such figure disks be placed side by side, their windows lying in a row, then any number of six places can be made to appear, for instance 000373. In order to add 6425 to this number, the disks, counting from right to left, have to be turned 5, 2, 4 and 6 steps respectively. If this is done the sum 006798 will appear. In case the sum of the two figures at any disk is greater than 9, if for instance the last figure to be added is 8 instead of 5, the sum for this disk is 11 and the 1 only will appear. Hence an arrangement for "carrying" has to be introduced. This may be done as follows. The axis of a figure disk contains a wheel with ten teeth. Each figure disk has, besides, one long tooth which when its 0 passes the window turns the next wheel to the left, one tooth forward, and hence the figure disk one step. The actual mechanism is not quite so simple, because the long teeth as described would gear also into the wheel to the right, and besides would interfere with each other. They must therefore be replaced by a somewhat more complicated arrangement, which has been done in various ways not necessary to describe more fully. On the way in which this is done, however, depends to a great extent the durability and trustworthiness of any arithmometer; in fact, it is often its weakest point. If to the series of figure disks arrangements are added for turning each disk through a required number of steps, we have an addition machine, essentially of Pascal's type. In it each disk had to be turned by hand. This operation has been simplified in various ways by mechanical means. For pure addition machines key-boards have been added, say for each disk nine keys marked 1 to 9. On pressing the key marked 6 the disk turns six steps and so on. These have been introduced by Stettner (1882), Max Mayer (1887), and in the comptometer by Dorr Z. Felt of Chicago. In the comptograph by Felt and also in "Burrough's Registering Accountant" the result is printed.

[v.04 p.0973]

Modified addition machines.

These machines can be used for multiplication, as repeated addition, but the process is laborious, depending for rapid execution essentially on the skill of the operator.[1] To adapt an addition machine, as described, to rapid multiplication the turnings of the separate figure disks are replaced by one motion, commonly the turning of a handle. As, however, the different disks have to be turned through different steps, a contrivance has to be inserted which can be "set" in such a way that by one turn of the handle each disk is moved through a number of steps equal to the number of units which is to be added on that disk. This may be done by making each of the figure disks receive on its axis a ten-toothed wheel, called hereafter the A-wheel, which is acted on either directly or indirectly by another wheel (called the B-wheel) in which the number of teeth can be varied from 0 to 9. This variation of the teeth has been effected in different ways. Theoretically the simplest seems to be to have on the B-wheel nine teeth which can be drawn back into the body of the wheel, so that at will any number from 0 to 9 can be made to project. This idea, previously mentioned by Leibnitz, has been realized by Bohdner in the "Brunsviga." Another way, also due to Leibnitz, consists in inserting between the axis of the handle bar and the A-wheel a "stepped" cylinder. This may be considered as being made up of ten wheels large enough to contain about twenty teeth each; but most of these teeth are cut away so that these wheels retain in succession 9, 8, ... 1, 0 teeth. If these are made as one piece they form a cylinder with teeth of lengths from 9, 8 ... times the length of a tooth on a single wheel.

In the diagrammatic vertical section of such a machine (fig. 2) FF is a figure disk with a conical wheel A on its axis. In the covering plate HK is the window W. A stepped cylinder is shown at B. The axis Z, which runs along the whole machine, is turned by a handle, and itself turns the cylinder B by aid of conical wheels. Above this cylinder lies an axis EE with square section along which a wheel D can be moved. The same axis carries at E′ a pair of conical wheels C and C′, which can also slide on the axis so that either can be made to drive the A-wheel. The covering plate MK has a slot above the axis EE allowing a rod LL′ to be moved by aid of a button L, carrying the wheel D

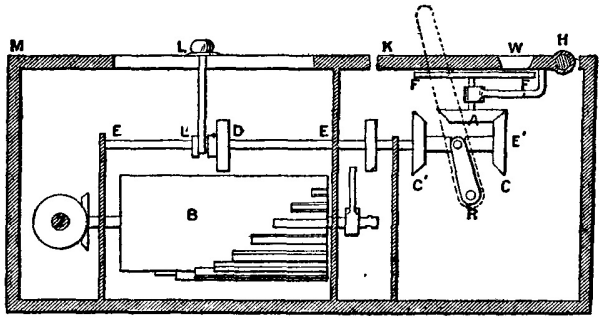

Fig. 2.

with it. Along the slot is a scale of numbers 0 1 2 ... 9 corresponding with the number of teeth on the cylinder B, with which the wheel D will gear in any given position. A series of such slots is shown in the top middle part of Steiger's machine (fig. 3). Let now the handle driving the axis Z be turned once round, the button being set to 4. Then four teeth of the B-wheel will turn D and with it the A-wheel, and consequently the figure disk will be moved four steps. These steps will be positive or forward if the wheel C gears in A, and consequently four will be added to the figure showing at the window W. But if the wheels CC′ are moved to the right, C′ will gear with A moving backwards, with the result that four is subtracted at the window. This motion of all the wheels C is done simultaneously by the push of a lever which appears at the top plate of the machine, its two positions being marked "addition" and "subtraction." The B-wheels are in fixed positions below the plate MK. Level with this, but separate, is the plate KH with the window. On it the figure disks are mounted.

This plate is hinged at the back at H and can be lifted up, thereby throwing the A-wheels out of gear. When thus raised the figure disks can be set to any figures; at the same time it can slide to and fro so that an A-wheel can be put in gear with any C-wheel forming with it one "element." The number of these varies with the size of the machine. Suppose there are six B-wheels and twelve figure disks. Let these be all set to zero with the exception of the last four to the right, these showing 1 4 3 2, and let these be placed opposite the last B-wheels to the right. If now the buttons belonging to the latter be set to 3 2 5 6, then on turning the B-wheels all once round the latter figures will be added to the former, thus showing 4 6 8 8 at the windows. By aid of the axis Z, this turning of the B-wheels is performed simultaneously by the movement of one handle. We have thus an addition machine. If it be required to multiply a number, say 725, by any number up to six figures, say 357, the buttons are set to the figures 725, the windows all showing zero. The handle is then turned, 725 appears at the windows, and successive turns add this number to the first. Hence seven turns show the product seven times 725. Now the plate with the A-wheels is lifted and moved one step to the right, then lowered and the handle turned five times, thus adding fifty times 725 to the product obtained. Finally, by moving the piate again, and turning the handle three times, the required product is obtained. If the machine has six B-wheels and twelve disks the product of two six-figure numbers can be obtained. Division is performed by repeated subtraction. The lever regulating the C-wheel is set to subtraction, producing negative steps at the disks. The dividend is set up at the windows and the divisor at the buttons. Each turn of the handle subtracts the divisor once. To count the number of turns of the handle a second set of windows is arranged with number disks below. These have no carrying arrangement, but one is turned one step for each turn of the handle. The machine described is essentially that of Thomas of Colmar, which was the first that came into practical use. Of earlier machines those of Leibnitz, Müller (1782), and Hahn (1809) deserve to be mentioned (see Dyck, *Catalogue*). Thomas's machine has had many imitations, both in England and on the Continent, with more or less important alterations. Joseph Edmondson of Halifax has given it a circular form, which has many advantages.

The accuracy and durability of any machine depend to a great extent on the manner in which the carrying mechanism is constructed. Besides, no wheel must be capable of moving in any other way than that required; hence every part must be locked and be released only when required to move. Further, any disk must carry to the next only after the carrying to itself has been completed. If all were to carry at the same time a considerable force would be required to turn the handle, and serious strains would be introduced. It is for this reason that the B-wheels or cylinders have the greater part of the circumference free from teeth. Again, the carrying acts generally as in the machine described, in one sense only, and this involves that the handle be turned always in the same direction. Subtraction therefore cannot be done by turning it in the opposite way, hence the two wheels C and C′ are introduced. These are moved all at once by one lever acting on a bar shown at R in section (fig. 2).

In the Brunsviga, the figure disks are all mounted on a common horizontal axis, the figures being placed on the rim. On the side of each disk and rigidly connected with it lies its A-wheel with which it can turn independent of the others. The B-wheels, all fixed on another horizontal axis, gear directly on the A-wheels. By an ingenious contrivance the teeth are made to appear from out of the rim to any desired number. The carrying mechanism, too, is different, and so arranged that the handle can be turned either way, no special setting being required for subtraction or division. It is extremely handy, taking up much less room than the others. Professor Eduard Selling of Würzburg has invented an altogether different machine, which has been made by Max Ott, of Munich. The B-wheels are replaced by lazy-tongs. To the joints of these the ends of racks are pinned; and as they are stretched out the racks are moved forward 0 to 9 steps, according to the joints they are pinned to. The racks gear directly in the A-wheels, and the figures are placed on cylinders as in the Brunsviga. The carrying is done continuously by a train of epicycloidal wheels. The working is thus rendered very smooth, without the jerks which the ordinary carrying tooth produces; but the arrangement has the disadvantage that the resulting figures do not appear in a straight line, a figure followed by a 5, for instance, being already carried half a step forward. This is not a serious matter in the hands of a mathematician or an operator using the machine constantly, but it is serious for casual work. Anyhow, it has prevented the machine from being a commercial success, and it is not any longer made. For ease and rapidity of working it surpasses all others. Since the lazy-tongs allow of an extension equivalent to five turnings of the handle, if the multiplier is 5 or under, one push forward will do the same as five (or less) turns of the handle, and more than two pushes are never required.

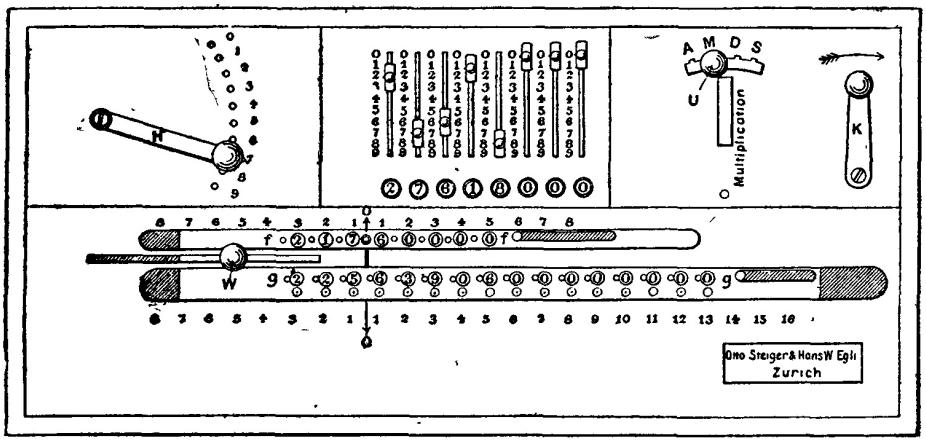

FIG. 3.

Multiplication machines.

The *Steiger-Egli* machine is a multiplication machine, of which fig. 3 gives a picture as it appears to the manipulator. The lower part of the figure contains, under the covering plate, a carriage with two rows of windows for the figures marked *ff* and *gg*. On pressing down the button W the carriage can be moved to right or left. Under each window is a figure disk, as in the Thomas machine. The upper part has three sections. The one to the right contains the handle K for working the machine, and a button U for setting the machine for addition, multiplication, division, or subtraction. In the middle section a number of parallel slots are seen, with indices which can each be set to one of the numbers 0 to 9. Below each slot, and parallel to it, lies a shaft of square section on which a toothed wheel, the A-wheel, slides to and fro with the index in the slot. Below these wheels again lie 9 toothed racks at right angles to the slots. By setting the index in any slot the wheel below it comes into gear with one of these racks. On moving the rack, the wheels turn their shafts and the figure disks *gg* opposite to them. The dimensions are such that a motion of a rack through 1 cm. turns the figure disk through one "step" or adds 1 to the figure under the window. The racks are moved by an arrangement contained in the section to the left of the slots. There is a vertical plate called the multiplication table block, or more shortly, the *block*. From it project rows of horizontal rods of lengths varying from 0 to 9 centimetres. If one of these rows is brought opposite the row of racks and then pushed forward to the right through 9 cm., each rack will move and add to its figure disk a number of units equal to the number of centimetres of the rod which operates on it. The block has a square face divided into a hundred squares. Looking at its face from the right—*i.e.* from the side where the racks lie—suppose the horizontal rows of these squares numbered from 0 to 9, beginning at the top, and the columns numbered similarly, the 0 being to the right; then the multiplication table for numbers 0 to 9 can be placed on these squares. The row 7 will therefore contain the numbers 63, 56, ... 7, 0. Instead of these numbers, each square receives two "rods" perpendicular to the plate, which may be called the units-rod and the tens-rod. Instead of the number 63 we have thus a tens-rod 6 cm. and a units-rod 3 cm. long. By aid of a lever H the block can be raised or lowered so that any row of the block comes to the level of the racks, the units-rods being opposite the ends of the racks.

The action of the machine will be understood by considering an example. Let it be required to form the product 7 times 385. The indices of three consecutive slots are set to the numbers 3, 8, 5 respectively. Let the windows *gg* opposite these slots be called *a*, *b*, *c*. Then to the figures shown at these windows we have to add 21, 56, 35 respectively. This is the same thing as adding first the number 165, formed by the units of each place, and next 2530 corresponding to the tens; or again, as adding first 165, and then moving the carriage one step to the right, and adding 253. The first is done by moving the block with the units-rods opposite the racks forward. The racks are then put out of gear, and together with the block brought back to their normal position; the block is moved sideways to bring the tens-rods opposite the racks, and again moved forward, adding the tens, the carriage having also been moved forward as required. This complicated movement, together with the necessary carrying, is actually performed by one turn of the handle. During the first quarter-turn the block moves forward, the units-rods coming into operation. During the second quarter-turn the carriage is put out of gear, and moved one step to the right while the necessary carrying is performed; at the same time the block and the racks are moved back, and the block is shifted so as to bring the tens-rods opposite the racks. During the next two quarter-turns the process is repeated, the block ultimately returning to its original position. Multiplication by a number with more places is performed as in the Thomas. The advantage of this machine over the Thomas in saving time is obvious. Multiplying by 817 requires in the Thomas 16 turns of the handle, but in the Steiger-Egli only 3 turns, with 3 settings of the lever H. If the lever H is set to 1 we have a simple addition machine like the Thomas or the Brunsviga. The inventors state that the product of two 8-figure numbers can be got in 6-7 seconds, the quotient of a 6-figure number by one of 3 figures in the same time, while the square root to 5 places of a 9-figure number requires 18 seconds.

Machines of far greater powers than the arithmometers mentioned have been invented by Babbage and by Scheutz. A description is impossible without elaborate drawings. The following account will afford some idea of the working of Babbage's difference machine. Imagine a number of striking clocks placed in a row, each with only an hour hand, and with only the striking apparatus retained. Let the hand of the first clock be turned. As it comes opposite a number on the dial the clock strikes that number of times. Let this clock be connected with the second in such a manner that by each stroke of the first the hand of the second is moved from one number to the next, but can only strike when the first comes to rest. If the second hand stands at 5 and the first strikes 3, then when this is done the second will strike 8; the second will act similarly on the third, and so on. Let there be four such clocks with hands set to the numbers 6, 6, 1, 0 respectively. Now set the third clock striking 1, this sets the hand of the fourth clock to 1; strike the second (6), this puts the third to 7 and the fourth to 8. Next strike the first (6); this moves the other hands to 12, 19, 27 respectively, and now repeat the striking of the first. The hand of the fourth clock will then give in succession the numbers 1, 8, 27, 64, &c., being the cubes of the natural numbers. The numbers

thus obtained on the last dial will have the differences given by those shown in succession on the dial before it, their differences by the next, and so on till we come to the constant difference on the first dial. A function

$$y = a + bx + cx^2 + dx^3 + ex^4$$

gives, on increasing x always by unity, a set of values for which the fourth difference is constant. We can, by an arrangement like the above, with five clocks calculate y for x = 1, 2, 3, ... to any extent. This is the principle of Babbage's difference machine. The clock dials have to be replaced by a series of dials as in the arithmometers described, and an arrangement has to be made to drive the whole by turning one handle by hand or some other power. Imagine further that with the last clock is connected a kind of typewriter which prints the number, or, better, impresses the number in a soft substance from which a stereotype casting can be taken, and we have a machine which, when once set for a given formula like the above, will automatically print, or prepare stereotype plates for the printing of, tables of the function without any copying or typesetting, thus excluding all possibility of errors. Of this "Difference engine," as Babbage called it, a part was finished in 1834, the government having contributed £17,000 towards the cost. This great expense was chiefly due to the want of proper machine tools.

Meanwhile Babbage had conceived the idea of a much more powerful machine, the "analytical engine," intended to perform any series of possible arithmetical operations. Each of these was to be communicated to the machine by aid of cards with holes punched in them into which levers could drop. It was long taken for granted that Babbage left complete plans; the committee of the British Association appointed to consider this question came, however, to the conclusion (*Brit. Assoc. Report*, 1878, pp. 92-102) that no detailed working drawings existed at all; that the drawings left were only diagrammatic and not nearly sufficient to put into the hands of a draughtsman for making working plans; and "that in the present state of the design it is not more than a theoretical possibility." A full account of the work done by Babbage in connexion with calculating machines, and much else published by others in connexion therewith, is contained in a work published by his son, General Babbage.

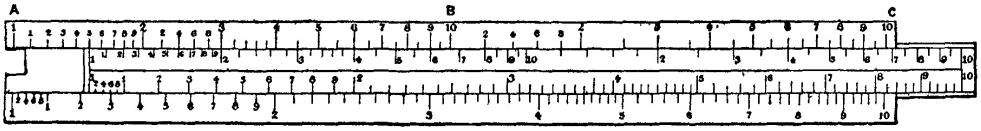

Fig. 4.

Slide rules.

Slide rules are instruments for performing logarithmic calculations mechanically, and are extensively used, especially where only rough approximations are required. They are almost as old as logarithms themselves. Edmund Gunter drew a "logarithmic line" on his "Scales" as follows (fig. 4):—On a line AB lengths are set off to scale to represent the common logarithms of the numbers 1 2 3 ... 10, and the points thus obtained are marked with these numbers. As log 1 = 0, the beginning A has the number 1 and B the number 10, hence the unit of length is AB, as log 10 = 1. The same division is repeated from B to C. The distance 1,2 thus represents log 2, 1,3 gives log 3, the distance between 4 and 5 gives log 5 - log 4 = log 5/4, and so for others. In order to multiply two numbers, say 2 and 3, we have log 2 × 3 = log 2 + log 3. Hence, setting off the distance 1,2 from 3 forward by the aid of a pair of compasses will give the distance log 2 + log 3, and will bring us to 6 as the required product. Again, if it is required to find 4/5 of 7, set off the distance between 4 and 5 from 7 backwards, and the required number will be obtained. In the actual scales the spaces between the numbers are subdivided into 10 or even more parts, so that from two to three figures may be read. The numbers 2, 3 ... in the interval BC give the logarithms of 10 times the same numbers in the interval AB; hence, if the 2 in the latter means 2 or .2, then the 2 in the former means 20 or 2.

[v.04 p.0975]

Soon after Gunter's publication (1620) of these "logarithmic lines," Edmund Wingate (1672) constructed the slide rule by repeating the logarithmic scale on a tongue or "slide," which could be moved along the first scale, thus avoiding the use of a pair of compasses. A clear idea of this device can be formed if the scale in fig. 4 be copied on the edge of a strip of paper placed against the line A C. If this is now moved to the right till its 1 comes opposite the 2 on the first scale, then the 3 of the second will be opposite 6 on the top scale, this being the product of 2 and 3; and in this position every number on the top scale will be twice that on the lower. For every position of the lower scale the ratio of the numbers on the two scales which coincide will be the same. Therefore multiplications, divisions, and simple proportions can be solved at once.

Dr John Perry added log log scales to the ordinary slide rule in order to facilitate the calculation of a^x or e^x according to the formula log loga^x = log log$a$ + log$x$. These rules are manufactured by A.G. Thornton of Manchester.

Many different forms of slide rules are now on the market. The handiest for general use is the Gravet rule made by Tavernier-Gravet in Paris, according to instructions of the mathematician V.M.A. Mannheim of the École Polytechnique in Paris. It contains at the back of the slide scales for the logarithms of sines and tangents so arranged that they can be worked with the scale on the front. An improved form is now made by Davis and Son of Derby, who engrave the scales on white celluloid instead of on box-wood, thus greatly facilitating the readings. These scales have the distance from one to ten about twice that in fig. 4. Tavernier-Gravet makes them of that size and longer, even ½ metre long. But they then become somewhat unwieldy, though they allow of reading to more figures. To get a handy long scale Professor G. Fuller has constructed a spiral slide rule drawn on a cylinder, which admits of reading to three and four figures. The handiest of all is perhaps the "Calculating Circle" by Boucher, made in the form of a watch. For various purposes special adaptations of the slide rules are met with—for instance, in various exposure meters for photographic purposes. General Strachey introduced slide rules into the Meteorological Office for performing special calculations. At some blast furnaces a slide rule has been used for determining the amount of coke and flux required for any weight of ore. Near the balance a large logarithmic scale is fixed with a slide which has three indices only. A load of ore is put on the scales, and the first index of the slide

is put to the number giving the weight, when the second and third point to the weights of coke and flux required.

By placing a number of slides side by side, drawn if need be to different scales of length, more complicated calculations may be performed. It is then convenient to make the scales circular. A number of rings or disks are mounted side by side on a cylinder, each having on its rim a log-scale.

The "Callendar Cable Calculator," invented by Harold Hastings and manufactured by Robert W. Paul, is of this kind. In it a number of disks are mounted on a common shaft, on which each turns freely unless a button is pressed down whereby the disk is clamped to the shaft. Another disk is fixed to the shaft. In front of the disks lies a fixed zero line. Let all disks be set to zero and the shaft be turned, with the first disk clamped, till a desired number appears on the zero line; let then the first disk be released and the second clamped and so on; then the fixed disk will add up all the turnings and thus give the product of the numbers shown on the several disks. If the division on the disks is drawn to different scales, more or less complicated calculations may be rapidly performed. Thus if for some purpose the value of say $ab^3\sqrt{c}$ is required for many different values of a, b, c, three movable disks would be needed with divisions drawn to scales of lengths in the proportion 1: 3: ½. The instrument now on sale contains six movable disks.

Curvometers.

Continuous Calculating Machines or Integrators.—In order to measure the length of a curve, such as the road on a map, a wheel is rolled along it. For one revolution of the wheel the path described by its point of contact is equal to the circumference of the wheel. Thus, if a cyclist counts the number of revolutions of his front wheel he can calculate the distance ridden by multiplying that number by the circumference of the wheel. An ordinary cyclometer is nothing but an arrangement for counting these revolutions, but it is graduated in such a manner that it gives at once the distance in miles. On the same principle depend a number of instruments which, under various fancy names, serve to measure the length of any curve; they are in the shape of a small meter chiefly for the use of cyclists. They all have a small wheel which is rolled along the curve to be measured, and this sets a hand in motion which gives the reading on a dial. Their accuracy is not very great, because it is difficult to place the wheel so on the paper that the point of contact lies exactly over a given point; the beginning and end of the readings are therefore badly defined. Besides, it is not easy to guide the wheel along the curve to which it should always lie tangentially. To obviate this defect more complicated curvometers or kartometers have been devised. The handiest seems to be that of G. Coradi. He uses two wheels; the tracing-point, halfway between them, is guided along the curve, the line joining the wheels being kept normal to the curve. This is pretty easily done by eye; a constant deviation of 8° from this direction produces an error of only 1%. The sum of the two readings gives the length. E. Fleischhauer uses three, five or more wheels arranged symmetrically round a tracer whose point is guided along the curve; the planes of the wheels all pass through the tracer, and the wheels can only turn in one direction. The sum of the readings of all the wheels gives approximately the length of the curve, the approximation increasing with the number of the wheels used. It is stated that with three wheels practically useful results can be obtained, although in this case the error, if the instrument is consistently handled so as always to produce the greatest inaccuracy, may be as much as 5%.

Planimeters.

Planimeters are instruments for the determination by mechanical means of the area of any figure. A pointer, generally called the "tracer," is guided round the boundary of the figure, and then the area is read off on the recording apparatus of the instrument. The simplest and most useful is Amsler's (fig. 5). It consists of two bars of metal OQ and QT, which are hinged together at Q. At O is a needle-point which is driven into the drawing-board, and at T is the tracer. As this is guided round the boundary of the figure a wheel W mounted on QT rolls on the paper, and the turning of this wheel measures, to some known scale, the area. We shall give the theory of this instrument fully in an elementary manner by aid of geometry. The theory of other planimeters can then be easily understood.

[v.04 p.0976]

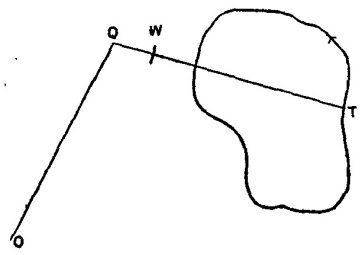

FIG. 5.

Consider the rod QT with the wheel W, without the arm OQ. Let it be placed with the wheel on the paper, and now moved perpendicular to itself from AC to BD (fig. 6). The rod sweeps over, or generates, the area of the rectangle ACDB = lp, where l denotes the length of the rod and p the distance AB through which it has been moved. This distance, as measured by the rolling of the wheel, which acts as a curvometer, will be called the "roll" of the wheel and be denoted by w. In this case $p = w$, and the area P is given by $P = wl$. Let the circumference of the wheel be divided into say a hundred equal parts u; then w registers the number of u's rolled over, and w therefore gives the number of areas lu contained in the rectangle. By suitably selecting the radius of the wheel and the length l, this area lu may be any convenient unit, say a square inch or square centimetre. By changing l the unit will be changed.

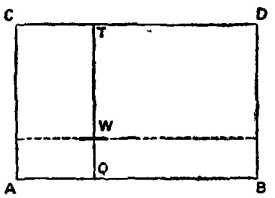

FIG. 6.

Again, suppose the rod to turn (fig. 7) about the end Q, then it will describe an arc of a circle, and the rod will generate an area $\frac{1}{2}l^2\theta$, where θ is the angle AQB through which the rod has turned. The wheel will roll over an arc $c\theta$, where c is the distance of the wheel from Q. The "roll" is now $w = c\theta$; hence the area generated is

$$P = \frac{1}{2}\frac{l^2}{c}w$$

and is again determined by w.

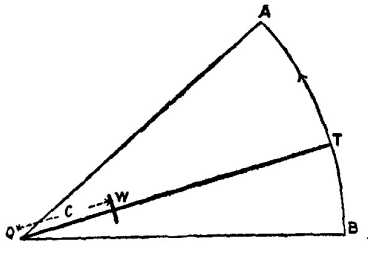

FIG. 7.

Next let the rod be moved parallel to itself, but in a direction not perpendicular to itself (fig. 8). The wheel will now not simply roll. Consider a *small* motion of the rod from QT to Q′T′. This may be resolved into the motion to RR′ perpendicular to the rod, whereby the rectangle QTR′R is generated, and the sliding of the rod along itself from RR′ to Q′T′. During this second step no area

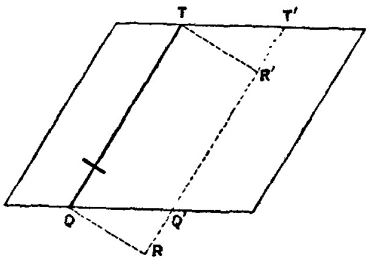

FIG. 8.

will be generated. During the first step the roll of the wheel will be QR, whilst during the second step there will be no roll at all. The roll of the wheel will therefore measure the area of the rectangle which equals the parallelogram QTT′Q′. If the whole motion of the rod be considered as made up of a very great number of small steps, each resolved as stated, it will be seen that the roll again measures the area generated. But it has to be noticed that now the wheel does not only roll, but also slips, over the paper. This, as will be pointed out later, may introduce an error in the reading.

We can now investigate the most general motion of the rod. We again resolve the motion into a number of small steps. Let (fig. 9) AB be one position, CD the next after a step so small that the arcs AC and BD over which the ends have passed may be considered as straight lines. The area generated is ABDC. This motion we resolve into a step from AB to CB′, parallel to AB and a turning about C from CB′ to CD, steps such as have been investigated. During the first, the "roll" will be p the altitude of the parallelogram; during the second will be $c\theta$. Therefore

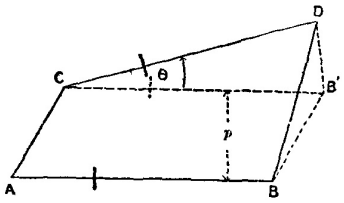

FIG. 9.

$$w = p + c\theta.$$

The area generated is $lp + \frac{1}{2} l^2\theta$, or, expressing p in terms of w, $lw + (\frac{1}{2}l^2 - lc)\theta$. For a finite motion we get the area equal to the sum of the areas generated during the different steps. But the wheel will continue rolling, and give the whole roll as the sum of the rolls for the successive steps. Let then w denote the whole roll (in fig. 10), and let α denote the sum of all the small turnings θ; then the area is

$$P = lw + (\tfrac{1}{2}l^2 - lc)\alpha \quad . \ . \ . \ (1)$$

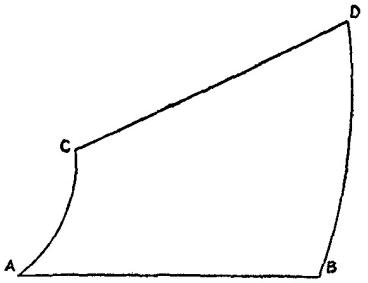

FIG. 10.

Here α is the angle which the last position of the rod makes with the first. In all applications of the planimeter the rod is brought back to its original position. Then the angle α is either zero, or it is 2π if the rod has been once turned quite round.

Hence in the first case we have

$$P = lw \quad . \ . \ . \ (2a)$$

and w gives the area as in case of a rectangle.

In the other case

$$P = lw + lC \quad . \ . \ . \ (2b)$$

where $C = (\frac{1}{2}l\text{-}c)2\pi$, if the rod has once turned round. The number C will be seen to be always the same, as it depends only on the dimensions of the instrument. Hence now again the area is determined by w if C is known.

Thus it is seen that the area generated by the motion of the rod can be measured by the roll of the wheel; it remains to show how any given area can be generated by the rod. Let the rod move in any manner but return to its original position. Q and T then describe closed curves. Such motion may be called cyclical. Here the theorem holds:—*If a rod QT performs a cyclical motion, then the area generated equals the difference of the areas enclosed by the paths of T and Q respectively.* The truth of this proposition will be seen from a figure. In fig. 11 different positions of the moving rod QT have been marked, and its motion can be easily followed. It will be seen that every part of the area TT′BB′ will be passed over once and always by a *forward motion* of the rod, whereby the wheel will *increase* its roll. The area AA′QQ′ will also be swept over once, but with a *backward* roll; it must therefore be counted as negative. The area between the curves is passed over twice, once with a forward and once with a backward roll; it therefore counts once positive and once negative; hence not at all. In more complicated figures it may happen that the area within one of the curves, say TT′BB′, is passed over several times, but then it will be passed over once more in the forward direction than in the backward one, and thus the theorem will still hold.

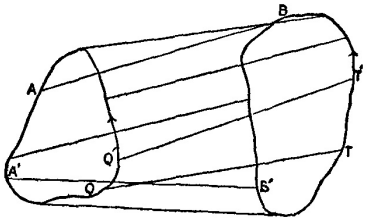

FIG. 11.

To use Amsler's planimeter, place the pole O on the paper *outside* the figure to be measured. Then the area generated by QT is that of the figure, because the point Q moves on an arc of a circle to and fro enclosing no area. At the same time the rod comes back without making a complete rotation. We have therefore in formula (1), $\alpha = 0$; and hence

$$P = lw,$$

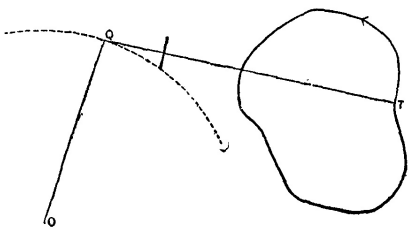

FIG. 12.

[v.04 p.0977]

which is read off. But if the area is too large the pole O may be placed within the area. The rod describes the area between the boundary of the figure and the circle with radius r = OQ, whilst the rod turns once completely round, making $\alpha = 2\pi$. The area measured by the wheel is by formula (1), $lw + (\frac{1}{2}l^2\text{-}lc)\ 2\pi$.

To this the area of the circle πr^2 must be added, so that now

$$P = lw + (\tfrac{1}{2}l^2 - lc)2\pi + \pi r^2,$$

or

$$P = lw + C,$$

where

$$C = (\tfrac{1}{2}l^2 - lc)2\pi + \pi r^2,$$

is a constant, as it depends on the dimensions of the instrument alone. This constant is given with each instrument.

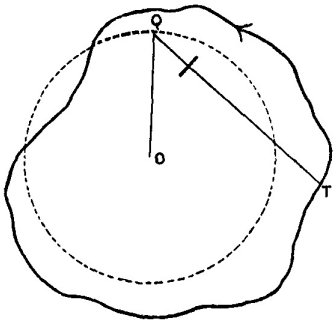

Fig. 13.

Amsler's planimeters are made either with a rod QT of fixed length, which gives the area therefore in terms of a fixed unit, say in square inches, or else the rod can be moved in a sleeve to which the arm OQ is hinged (fig. 13). This makes it possible to change the unit *lu*, which is proportional to *l*.

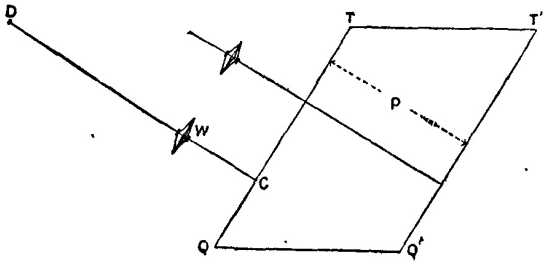

Fig. 14.

In the planimeters described the recording or integrating apparatus is a smooth wheel rolling on the paper or on some other surface. Amsler has described another recorder, viz. a wheel with a sharp edge. This will roll on the paper but not slip. Let the rod QT carry with it an arm CD perpendicular to it. Let there be mounted on it a wheel W, which can slip along and turn about it. If now QT is moved parallel to itself to Q′T′, then W will roll without slipping parallel to QT, and slip along CD. This amount of slipping will equal the perpendicular distance between QT and Q′T′, and therefore serve to measure the area swept over like the wheel in the machine already described. The turning of the rod will also produce slipping of the wheel, but it will be seen without difficulty that this will cancel during a cyclical motion of the rod, provided the rod does not perform a whole rotation.

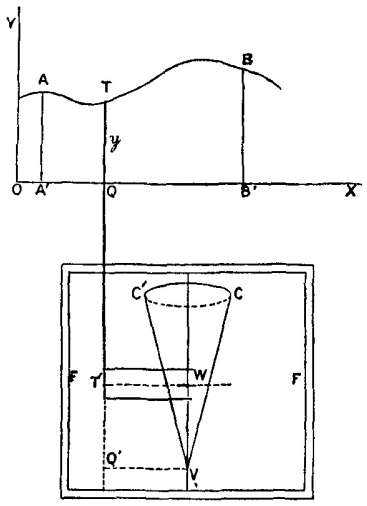

Fig. 15.

Early forms.

The first planimeter was made on the following principles:—A frame FF (fig. 15) can move parallel to OX. It carries a rod TT movable along its own length, hence the tracer T can be guided along any curve ATB. When the rod has been pushed back to Q′Q, the tracer moves along the axis OX. On the frame a cone VCC′ is mounted with its axis sloping so that its top edge is horizontal and parallel to TT′, whilst its vertex V is opposite Q′. As the frame moves it turns the cone. A wheel W is mounted on the rod at T′, or on an axis parallel to and rigidly connected with it. This wheel rests on the top edge of the cone. If now the tracer T, when pulled out through a distance *y* above Q, be moved parallel to OX through a distance *dx*, the frame moves through an equal distance, and the cone turns through an angle $d\theta$ proportional to *dx*. The wheel W rolls on the cone to an amount again proportional to *dx*, and also proportional to *y*, its distance from V. Hence the roll of the wheel is proportional to the area *ydx* described by the rod QT. As T is moved from A to B along the curve the roll of the wheel will therefore be proportional to the area AA′B′B. If the curve is closed, and the tracer moved round it, the roll will measure the area independent of the position of the axis OX, as will be seen by drawing a figure. The cone may with advantage be replaced by a horizontal disk, with its centre at V; this allows of *y* being negative. It may be noticed at once that the roll of the wheel gives at every moment the area A′ATQ. It will therefore allow of registering a set of values of $\int_a^x ydx$ for any values of *x*, and thus of tabulating the values of any indefinite integral. In this it differs from Amsler's planimeter. Planimeters of this type were first invented in 1814 by the Bavarian engineer Hermann, who, however, published nothing. They were reinvented by Prof. Tito Gonnella of Florence in 1824, and by the Swiss engineer Oppikofer, and improved by Ernst in Paris, the astronomer Hansen in Gotha, and others (see Henrici, *British Association Report*, 1894). But all were driven out of the field by Amsler's simpler planimeter.

Fig. 16.

Altogether different from the planimeters described is the hatchet planimeter, invented by Captain Prytz, a Dane, and made by Herr Cornelius Knudson in Copenhagen. It consists of a single rigid piece like fig. 16. The one end T is the tracer, the other Q has a sharp hatchet-like edge. If this is placed with QT on the paper and T is moved along any curve, Q will follow, describing a "curve of pursuit." In consequence of the sharp edge, Q can only move in the direction of QT, but the whole can turn about Q. Any small step forward can therefore be considered as made up of a motion along QT, together with a turning about Q.

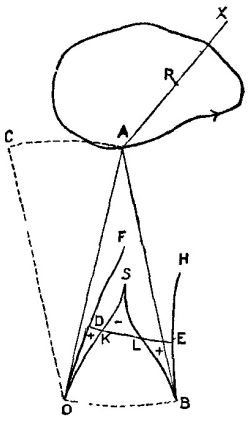

FIG. 17.

Hatchet planimeters.

The latter motion alone generates an area. If therefore a line OA = QT is turning about a fixed point O, always keeping parallel to QT, it will sweep over an area equal to that generated by the more general motion of QT. Let now (fig. 17) QT be placed on OA, and T be guided round the closed curve in the sense of the arrow. Q will describe a curve OSB. It may be made visible by putting a piece of "copying paper" under the hatchet. When T has returned to A the hatchet has the position BA. A line turning from OA about O kept parallel to QT will describe the circular sector OAC, which is equal in magnitude and sense to AOB. This therefore measures the area generated by the motion of QT. To make this motion cyclical, suppose the hatchet turned about A till Q comes from B to O. Hereby the sector AOB is again described, and again in the positive sense, if it is remembered that it turns about the tracer T fixed at A. The whole area now generated is therefore twice the area of this sector, or equal to OA. OB, where OB is measured along the arc. According to the theorem given above, this area also equals the area of the given curve less the area OSBO. To make this area disappear, a slight modification of the motion of QT is required. Let the tracer T be moved, both from the first position OA and the last BA of the rod, along some straight line AX. Q describes curves OF and BH respectively. Now begin the motion with T at some point R on AX, and move it along this line to A, round the curve and back to R. Q will describe the curve DOSBED, if the motion is again made cyclical by turning QT with T fixed at A. If R is properly selected, the path of Q will cut itself, and parts of the area will be positive, parts negative, as marked in the figure, and may therefore be made to vanish. When this is done the area of the curve will equal twice the area of the sector RDE. It is therefore equal to the arc DE multiplied by the length QT; if the latter equals 10 in., then 10 times the number of inches contained in the arc DE gives the number of square inches contained within the given figure. If the area is not too large, the arc DE may be replaced by the straight line DE.

To use this simple instrument as a planimeter requires the possibility of selecting the point R. The geometrical theory here given has so far failed to give any rule. In fact, every line through any point in the curve contains such a point. The analytical theory of the inventor, which is very similar to that given by F.W. Hill (*Phil. Mag.* 1894), is too complicated to repeat here. The integrals expressing the area generated by QT have to be expanded in a series. By retaining only the most important terms a result is obtained which comes to this, that if the mass-centre of the area be taken as R, then A may be any point on the curve. This is only approximate. Captain Prytz gives the following instructions:—Take a point R as near as you can guess to the mass-centre, put the tracer T on it, the knife-edge Q outside; make a mark on the paper by pressing the knife-edge into it; guide the tracer from R along a straight line to a point A on the boundary, round the boundary, and back from A to R; lastly, make again a mark with the knife-edge, and measure the distance c between the marks; then the area is nearly cl, where l = QT. A nearer approximation is obtained by repeating the operation after turning QT through 180° from the original position, and using the mean of the two values of c thus obtained. The greatest dimension of the area should not exceed $\frac{1}{2}l$, otherwise the area must be divided into parts which are determined separately. This condition being fulfilled, the instrument gives very satisfactory results, especially if the figures to be measured, as in the case of indicator diagrams, are much of the same shape, for in this case the operator soon learns where to put the point R.

[v.04 p.0978]

Integrators.

Integrators serve to evaluate a definite integral $\int_a^b f(x)dx$. If we plot out the curve whose equation is $y = f(x)$, the integral $\int ydx$ between the proper limits represents the area of a figure bounded by the curve, the axis of x, and the ordinates at $x=a$, $x=b$. Hence if the curve is drawn, any planimeter may be used for finding the value of the integral. In this sense planimeters are integrators. In fact, a planimeter may often be used with advantage to solve problems more complicated than the determination of a mere area, by converting the one problem graphically into the other. We give an example:—

Let the problem be to determine for the figure ABG (fig. 18), not only the area, but also the first and second moment with regard to the axis XX. At a distance a draw a line, C′D′, parallel to XX. In the figure draw a number of lines parallel to AB. Let CD be one of them. Draw C and D vertically upwards to C′D′, join these points to some point O in XX, and mark the points C_1D_1 where OC′ and OD′ cut CD. Do this for a sufficient number of lines, and join the points C_1D_1 thus obtained. This gives a new curve, which may be called the first derived curve. By the same process get a new curve from this, the second derived curve. By aid of a planimeter determine the areas P, P_1, P_2, of these three curves. Then, if $\bar{x}$ is the distance of the mass-centre of the given area from XX; $\bar{x}_1$ the same quantity for the first derived figure, and $I = Ak^2$ the moment of inertia of the first figure, k its radius of gyration, with regard to XX as axis, the following relations are easily proved:—

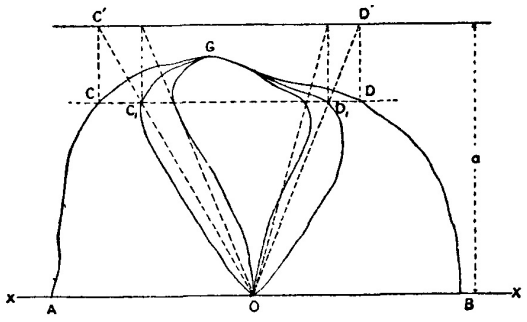

FIG. 18.

$$P\bar{x} = aP_1;\ P_1\bar{x}_1 = aP_2;\ I = aP_1\bar{x}_1 = a^2P_1P_2;\ k^2 = \overline{xx}_1,$$

which determine P, $\bar{x}$ and I or k. Amsler has constructed an integrator which serves to determine these quantities by guiding a tracer once round the boundary of the given figure (see below). Again, it may be required to find the value of an integral $\int y\varphi(x)dx$ between given limits where $\varphi(x)$ is a simple function like $\sin nx$, and where y is given as the ordinate of a curve. The harmonic analysers described below are examples of instruments for evaluating such integrals.

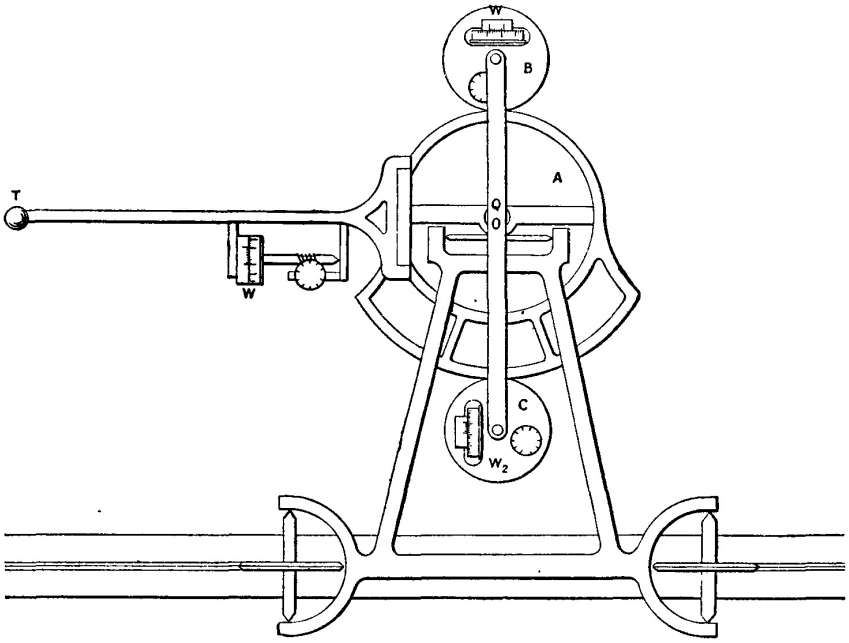

FIG. 19.

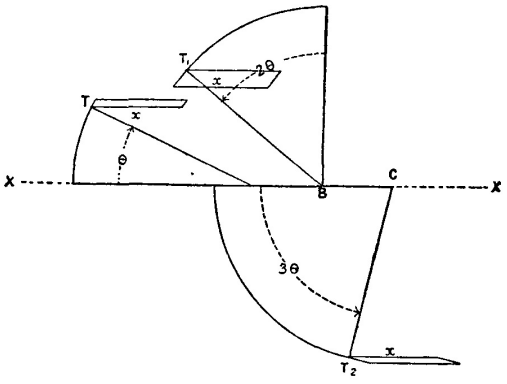

FIG. 20.

Amsler's Integrator.

Amsler has modified his planimeter in such a manner that instead of the area it gives the first or second moment of a figure about an axis in its plane. An instrument giving all three quantities simultaneously is known as Amsler's integrator or moment-planimeter. It has one tracer, but three recording wheels. It is mounted on a carriage which runs on a straight rail (fig. 19). This carries a horizontal disk A, movable about a vertical axis Q. Slightly more than half the circumference is circular with radius $2a$, the other part with radius $3a$. Against these gear two disks, B and C, with radii a; their axes are fixed in the carriage. From the disk A extends to the left a rod OT of length l, on which a recording wheel W is mounted. The disks B and C have also recording wheels, W_1 and W_2, the axis of W_1 being perpendicular, that of W_2 parallel to OT. If now T is guided round a figure F, O will move to and fro in a straight line. This part is therefore a simple planimeter, in which the one end of the arm moves in a straight line instead of in a circular arc. Consequently, the "roll" of W will record the area of the figure. Imagine now that the disks B and C also receive arms of length l from the centres of the disks to points T_1 and T_2, and in the direction of the axes of the wheels. Then these arms with their wheels will again be planimeters. As T is guided round the given figure F, these points T_1 and T_2 will describe closed curves, F_1 and F_2, and the "rolls" of W_1 and W_2 will give their areas A_1 and A_2. Let XX (fig. 20) denote the line, parallel to the rail, on which O moves; then when T lies on this line, the arm BT_1 is perpendicular to XX, and CT_2 parallel to it. If OT is turned through an angle θ, clockwise, BT_1 will turn counter-clockwise through an angle 2θ, and CT_2 through an angle 3θ, also counter-clockwise. If in this position T is moved through a distance x parallel to the axis XX, the points T_1 and T_2 will move parallel to it through an equal distance. If now the first arm is turned through a small angle $d\theta$, moved back through a distance x, and lastly turned back through the angle $d\theta$, the tracer T will have described the boundary of a small strip of area. We divide the given figure into such strips. Then to every such strip will correspond a strip of equal length x of the figures described by T_1 and T_2.

[v.04 p.0979]

The distances of the points, T, T_1, T_2, from the axis XX may be called y, y_1, y_2. They have the values

$$y = l \sin\theta,\ y_1 = l \cos 2\theta,\ y_2 = -l \sin 3\theta,$$

from which

$$dy = l \cos\theta . d\theta,\ dy_1 = -2l \sin 2\theta . d\theta,\ dy_2 = -3l \cos 3\theta . d\theta.$$

The areas of the three strips are respectively

$$dA = x\,dy,\ dA_1 = x\,dy_1,\ dA_2 = x\,dy_2.$$

Now dy_1 can be written $dy_1 = -4l \sin\theta \cos\theta\, d\theta = -4 \sin\theta\, dy$; therefore

$$dA_1 = -4 \sin\theta . dA = -\frac{4}{l} y\,dA;$$

whence

$$A_1 = -\frac{4}{l}\int y\,dA = -\frac{4}{l}A\bar{y},$$

where A is the area of the given figure, and $\bar{y}$ the distance of its mass-centre from the axis XX. But A_1 is the area of the second figure F_1, which is proportional to the reading of W_1. Hence we may say

$$A\bar{y} = C_1 w_1,$$

where C_1 is a constant depending on the dimensions of the instrument. The negative sign in the expression for A_1 is got rid of by numbering the wheel W_1 the other way round.

Again

$$dy_2 = -3l\cos\theta\,\{4\cos^2\theta - 3\}\,d\theta = -3\,\{4\cos^2\theta - 3\}\,dy$$

$$= -3\left\{\frac{4}{l^2}y^2 - 3\right\}dy,$$

which gives

$$dA_2 = -\frac{12}{l^2}y^2\,dA + 9\,dA,$$

and

$$A_2 = -\frac{12}{l^2}\int y^2\,dA + 9A.$$

But the integral gives the moment of inertia I of the area A about the axis XX. As A_2 is proportional to the roll of W_2, A to that of W, we can write

$$I = C w - C_2 w_2,$$
$$A\bar{y} = C_1 w_1,$$
$$A = C_c w.$$

If a line be drawn parallel to the axis XX at the distance $\bar{y}$, it will pass through the mass-centre of the given figure. If this represents the section of a beam subject to bending, this line gives for a proper choice of XX the neutral fibre. The moment of inertia for it will be $I + A\bar{y}^2$. Thus the instrument gives at once all those quantities which are required for calculating the strength of the beam under bending. One chief use of this integrator is for the calculation of the displacement and stability of a ship from the drawings of a number of sections. It will be noticed that the length of the figure in the direction of XX is only limited by the length of the rail.

This integrator is also made in a simplified form without the wheel W_2. It then gives the area and first moment of any figure.

Integraphs.

While an integrator determines the value of a definite integral, hence a mere constant, an integraph gives the value of an indefinite integral, which is a function of *x*. Analytically if *y* is a given function *f*(*x*) of *x* and

$$Y = \int_c^x y\,dx \text{ or } Y = \int y\,dx + \text{const.}$$

the function Y has to be determined from the condition

$$\frac{dY}{dx} = y.$$

Graphically $y = f(x)$ is either given by a curve, or the graph of the equation is drawn: *y*, therefore, and similarly Y, is a length. But dY/dx is in this case a mere number, and cannot equal a length *y*. Hence we introduce an arbitrary constant length *a*, the unit to which the integraph draws the curve, and write

$$\frac{dY}{dx} = \frac{y}{a} \text{ and } aY = \int y\,dx$$

Now for the Y-curve $dY/dx = \tan\varphi$, where φ is the angle between the tangent to the curve, and the axis of *x*. Our condition therefore becomes

$$\tan\varphi = \frac{y}{a}.$$

This φ is easily constructed for any given point on the y-curve:—From the foot B′ (fig. 21) of the ordinate *y* = B′B set off, as in the figure, B′D = *a*, then angle BDB′ = φ. Let now DB′ with a perpendicular B′B move along the axis of *x*, whilst B follows the *y*-curve, then a pen P on B′B will describe the Y-curve provided it moves at every moment in a direction parallel to BD. The object of the integraph is to draw this new curve when the tracer of the instrument is guided along the *y*-curve.

The first to describe such instruments was Abdank-Abakanowicz, who in 1889 published a book in which a

variety of mechanisms to obtain the object in question are described. Some years later G. Coradi, in Zürich, carried out his ideas. Before this was done, C.V. Boys, without knowing of Abdank-Abakanowicz's work, actually made an integraph which was exhibited at the Physical Society in 1881. Both make use of a sharp edge wheel. Such a wheel will not slip sideways; it will roll forwards along the line in which its plane intersects the plane of the paper, and while rolling will be able to turn gradually about its point of contact. If then the angle between its direction of rolling and the *x*-axis be always equal to φ, the wheel will roll along the Y-curve required. The axis of *x* is fixed only in direction; shifting it parallel to itself adds a constant to Y, and this gives the arbitrary constant of integration.

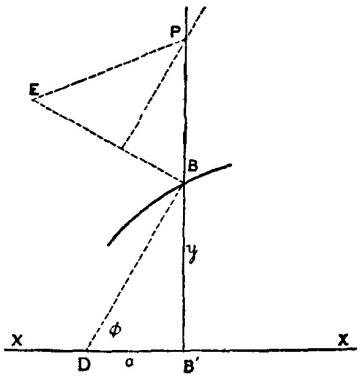

FIG. 21.

In fact, if Y shall vanish for $x = c$, or if

$$Y = \int_c^x y dx,$$

then the axis of *x* has to be drawn through that point on the *y*-curve which corresponds to $x = c$.

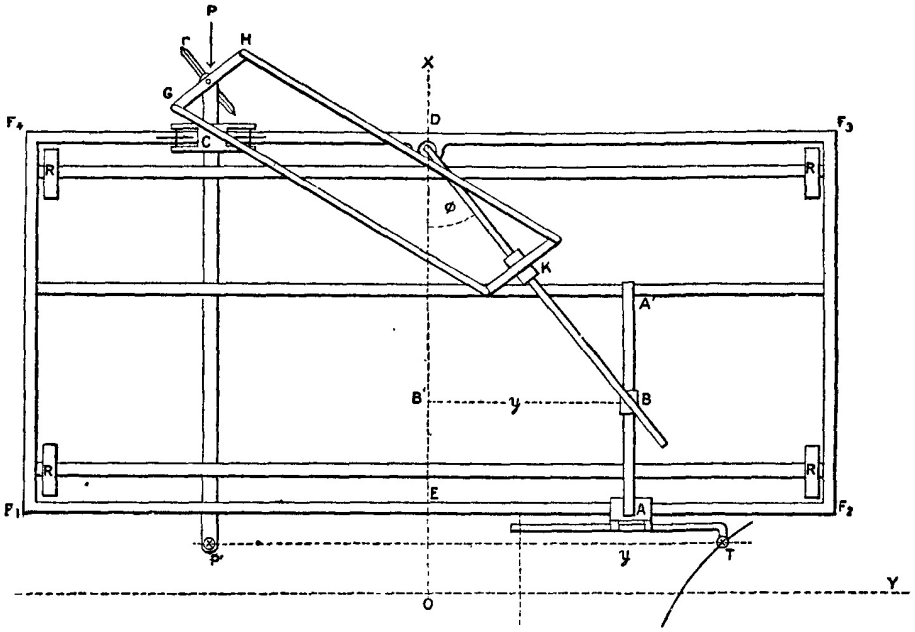

FIG. 22.

In Coradi's integraph a rectangular frame $F_1F_2F_3F_4$ (fig. 22) rests with four rollers R on the drawing board, and can roll freely in the direction OX, which will be called the axis of the instrument. On the front edge F_1F_2 travels a carriage AA′ supported at A′ on another rail. A bar DB can turn about D, fixed to the frame in its axis, and slide through a point B fixed in the carriage AA′. Along it a block K can slide. On the back edge F_3F_4 of the frame another carriage C travels. It holds a vertical spindle with the knife-edge wheel at the bottom. At right angles to the plane of the wheel, the spindle has an arm GH, which is kept
[v.04 p.0980] parallel to a similar arm attached to K perpendicular to DB. The plane of the knife-edge wheel *r* is therefore always parallel to DB. If now the point B is made to follow a curve whose *y* is measured from OX, we have in the triangle BDB′, with the angle φ at D,

$$\tan \varphi = y/a,$$

where a = DB′ is the constant base to which the instrument works. The point of contact of the wheel *r* or any point of the carriage C will therefore always move in a direction making an angle φ with the axis of *x*, whilst it moves in the *x*-direction through the same distance as the point B on the *y*-curve—that is to say, it will trace out the integral curve required, and so will any point rigidly connected with the carriage C. A pen P attached to this carriage will therefore draw the integral curve. Instead of moving B along the *y*-curve, a tracer T fixed to the carriage A is guided along it. For using the instrument the carriage is placed on the drawing-board with the front edge parallel to the axis of *y*, the carriage A being clamped in the central position with A at E and B at B′ on the axis of *x*. The tracer is then placed on the *x*-axis of the *y*-curve and clamped to the carriage, and the instrument is ready for use. As it is convenient to have the integral curve placed directly opposite to the *y*-curve so that corresponding values of *y* or Y are drawn on the same line, a pen P′ is fixed to C in a line with the tracer.

Boys' integraph was invented during a sleepless night, and during the following days carried out as a working model, which gives highly satisfactory results. It is ingenious in its simplicity, and a direct realization as a mechanism of the principles explained in connexion with fig. 21. The line B′B is represented by the edge of an ordinary T-square sliding against the edge of a drawing-board. The points B and P are connected by two rods BE and EP, jointed at E. At B, E and P are small pulleys of equal diameters. Over these an endless string runs, ensuring that the pulleys at B and P always turn through equal angles. The pulley at B is fixed to a rod which passes through the point D, which itself is fixed in the T-square. The pulley at P carries the knife-edge wheel. If then B and P are kept on the edge of the T-square, and B is guided along the curve, the wheel at P will roll along the Y-curve, it having been originally set parallel to BD. To give the wheel at P sufficient grip on the paper, a small loaded three-wheeled carriage, the knife-edge wheel P being one of its wheels, is added. If a piece of copying paper is inserted between the wheel P and the drawing paper the Y-curve is drawn very sharply.

Integraphs have also been constructed, by aid of which ordinary differential equations, especially linear ones, can be solved, the solution being given as a curve. The first suggestion in this direction was made by Lord Kelvin. So far no really useful instrument has been made, although the ideas seem sufficiently developed to enable a skilful instrument-maker to produce one should there be sufficient demand for it. Sometimes a combination of graphical work with an integraph will serve the purpose. This is the case if the variables are separated, hence if the equation

$$X dx + Y dy = 0$$

has to be integrated where $X = p(x)$, $Y = \varphi(y)$ are given as curves. If we write

$$a u = \int X dx,\ a v = \int Y dy,$$

then u as a function of x, and v as a function of y can be graphically found by the integraph. The general solution is then

$$u + v = c$$

with the condition, for the determination for c, that $y = y_0$, for $x = x_0$. This determines $c = u_0 + v_0$, where u_0 and v_0 are known from the graphs of u and v. From this the solution as a curve giving y a function of x can be drawn:—For any x take u from its graph, and find the y for which $v = c - u$, plotting these y against their x gives the curve required.

If a periodic function y of x is given by its graph for one period c, it can, according to the theory of Fourier's Series, be expanded in a series.

Harmonic analysers.

$$y = A_0 + A_1 \cos\theta + A_2 \cos 2\theta + \ldots + A_n \cos n\theta + \ldots$$
$$+ B_1 \sin\theta + B_2 \sin 2\theta + \ldots + B_n \sin n\theta + \ldots$$

where $\theta = 2\pi x / c$.

The absolute term A_0 equals the mean ordinate of the curve, and can therefore be determined by any planimeter. The other co-efficients are

$$A_n = \frac{1}{\pi}\int_0^{2\pi} y \cos n\theta . d\theta;\ B_n = \frac{1}{\pi}\int_0^{2\pi} y \sin n\theta . d\theta.$$

A harmonic analyser is an instrument which determines these integrals, and is therefore an integrator. The first instrument of this kind is due to Lord Kelvin (*Proc. Roy Soc.*, vol xxiv., 1876). Since then several others have been invented (see Dyck's *Catalogue*; Henrici, *Phil. Mag.*, July 1894; *Phys. Soc.*, 9th March; Sharp, *Phil. Mag.*, July 1894; *Phys. Soc.*, 13th April). In Lord Kelvin's instrument the curve to be analysed is drawn on a cylinder whose circumference equals the period c, and the sine and cosine terms of the integral are introduced by aid of simple harmonic motion. Sommerfeld and Wiechert, of Konigsberg, avoid this motion by turning the cylinder about an axis perpendicular to that of the cylinder. Both these machines are large, and practically fixtures in the room where they are used. The first has done good work in the Meteorological Office in London in the analysis of meteorological curves. Quite different and simpler constructions can be used, if the integrals determining A_n and B_n be integrated by parts. This gives

$$n A_n = -\frac{1}{\pi}\int_0^{2\pi} \sin n\theta . dy;\ n B_n = \frac{1}{\pi}\int_0^{2\pi} \cos n\theta . dy.$$

An analyser presently to be described, based on these forms, has been constructed by Coradi in Zurich (1894). Lastly, a most powerful analyser has been invented by Michelson and Stratton (U.S.A.) (*Phil Mag.*, 1898), which will also be described.

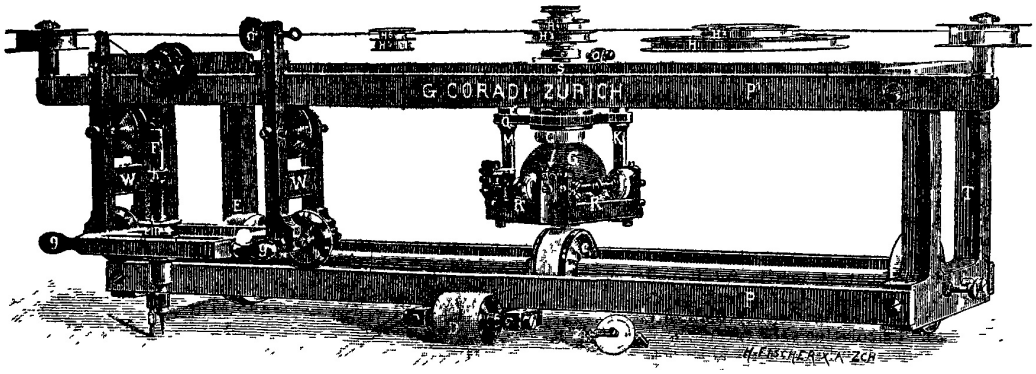

Fig. 23.

The *Henrici-Coradi* analyser has to add up the values of $dy.\sin n\theta$ and $dy.\cos n\theta$. But these are the components of dy in two directions perpendicular to each other, of which one makes an angle $n\theta$ with the axis of x or of θ. This decomposition can be performed by Amsler's registering wheels. Let two of these be mounted, perpendicular to each other, in one horizontal frame which can be turned about a vertical axis, the wheels resting on the paper on which the curve is drawn. When the tracer is placed on the curve at the point $\theta = 0$ the one axis is parallel to the axis of θ. As the tracer follows the curve the frame is made to turn through an angle $n\theta$. At the same time the frame moves with the tracer in the direction of y. For a small motion the two wheels will then register just the components required, and during the continued

motion of the tracer along the curve the wheels will add these components, and thus give the values of $n\mathrm{A}_n$ and $n\mathrm{B}_n$. The factors $1/\pi$ and $-1/\pi$ are taken account of in the graduation of the wheels. The readings have then to be divided by n to give the coefficients required. Coradi's realization of this idea will be understood from fig. 23. The frame PP′ of the instrument rests on three rollers E, E′, and D. The first two drive an axis with a disk C on it. It is placed parallel to the axis of x of the curve. The tracer is attached to a carriage WW which runs on the rail P. As it follows the curve this carriage moves through a distance x whilst the whole instrument runs forward through a distance y. The wheel C turns through an angle proportional, during each small motion, to dy. On it rests a glass sphere which will therefore also turn about its horizontal axis proportionally, to dy. The registering frame is suspended by aid of a spindle S, having a disk H. It is turned by aid of a wire connected with the carriage WW, and turns n times round as the tracer describes the whole length of the curve. The registering wheels R, R′ rest against the glass sphere and give the values $n\mathrm{A}_n$ and $n\mathrm{B}_n$. The value of n can be altered by changing the disk H into one of different diameter. It is also possible to mount on the same frame a number of spindles with registering wheels and glass spheres, each of the latter resting on a separate disk C. As many as five have been introduced. One guiding of the tracer over the curve gives then at once the ten coefficients A_n and B_n for $n = 1$ to 5.

All the calculating machines and integrators considered so far have been kinematic. We have now to describe a most remarkable instrument based on the equilibrium of a rigid body under the action of springs. The body itself for rigidity's sake is made a hollow cylinder H, shown in fig. 24 in end view. It can turn about its axis, being supported on knife-edges O. To it springs are attached at the prolongation of a horizontal diameter; to the left a series of n small springs s, all alike, side by side at equal intervals at a distance a from the axis of the knife-edges; to the right a single spring S at distance b. These springs are supposed to follow Hooke's law. If the elongation beyond the natural length of a spring is λ, the force asserted by it is $p = k\lambda$. Let for the position of equilibrium l, L be respectively the elongation of a small and the large spring, k, K their constants, then

[v.04 p.0981]

Michelson and Stratton analyzer

$$nkla = \mathrm{KL}b.$$

The position now obtained will be called the *normal* one. Now let the top ends C of the small springs be raised through distances y_1, y_2, ... y_n. Then the body H will turn; B will move down through a distance z and A up through a distance $(a/b)z$. The new forces thus introduced will be in equilibrium if

$$ak\left(\sum y - n\frac{a}{b}z\right) = b\mathrm{K}z.$$

Or

$$z = \frac{\sum y}{\frac{a}{n\frac{a}{b} + \frac{b\,\mathrm{K}}{a\,k}}} = \frac{\sum y}{n\left(\frac{a}{b} + \frac{l}{\mathrm{L}}\right)}.$$

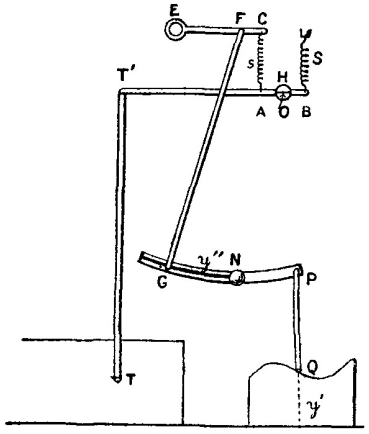

FIG. 24.

This shows that the displacement z of B is proportional to the sum of the displacements y of the tops of the small springs. The arrangement can therefore be used for the addition of a number of displacements. The instrument made has eighty small springs, and the authors state that from the experience gained there is no impossibility of increasing their number even to a thousand. The displacement z, which necessarily must be small, can be enlarged by aid of a lever OT′. To regulate the displacements y of the points C (fig. 24) each spring is attached to a lever EC, fulcrum E. To this again a long rod FG is fixed by aid of a joint at F. The lower end of this rod rests on another lever GP, fulcrum N, at a changeable distance y'' = NG from N. The elongation y of any spring s can thus be produced by a motion of P. If P be raised through a distance y', then the displacement y of C will be proportional to $y'y''$; it is, say, equal to $\mu y'y''$ where μ is the same for all springs. Now let the points C, and with it the springs s, the levers, &c., be numbered C_0, C_1, C_2 ... There will be a zero-position for the points P all in a straight horizontal line. When in this position the points C will also be in a line, and this we take as axis of x. On it the points C_0, C_1, C_2 ... follow at equal distances, say each equal to h. The point C_k lies at the distance kh which gives the x of this point. Suppose now that the rods FG are all set at unit distance NG from N, and that the points P be raised so as to form points in a continuous curve $y' = \varphi(x)$, then the points C will lie in a curve $y = \mu\varphi(x)$. The area of this curve is

$$\mu \int_0^c \varphi(x)\,dx.$$

Approximately this equals $\sum hy = h\sum y$. Hence we have

$$\int_0^c \varphi(x)\,dx = \frac{h}{\mu}\sum y = \frac{\lambda h}{\mu}z,$$

where z is the displacement of the point B which can be measured. The curve $y' = \varphi(x)$ may be supposed cut out as a templet. By putting this under the points P the area of the curve is thus determined—the instrument is a simple integrator.

The integral can be made more general by varying the distances NG = y''. These can be set to form another curve $y'' = f(x)$. We have now $y = \mu y'y'' = \mu f(x)\,\varphi(x)$, and get as before

$$\int_0^c f(x)\,\varphi(x)\,dx = \frac{\lambda h}{\mu}z,$$

These integrals are obtained by the addition of ordinates, and therefore by an approximate method. But the ordinates are numerous, there being 79 of them, and the results are in consequence very accurate. The displacement z of B is small, but it can be magnified by taking the reading of a point T′ on the lever AB. The actual reading is done at point T connected with T′ by a long vertical rod. At T either a scale can be placed or a drawing-board, on which a pen at T marks the displacement.

If the points G are set so that the distances NG on the different levers are proportional to the terms of a numerical series

$$u_0 + u_1 + u_2 + \ldots$$

and if all P be moved through the same distance, then z will be proportional to the sum of this series up to 80 terms. We get an *Addition Machine*.

The use of the machine can, however, be still further extended. Let a templet with a curve $y' = \varphi(\xi)$ be set under each point P at right angles to the axis of x hence parallel to the plane of the figure. Let these templets form sections of a continuous surface, then each section parallel to the axis of x will form a curve like the old $y' = \varphi(x)$, but with a variable parameter ξ, or $y' = \varphi(\xi, x)$. For each value of ξ the displacement of T will give the integral

$$Y = \int_0^c f(x)\,\varphi(\xi x)\,dx = F(\xi), \quad \ldots \quad (1)$$

where Y equals the displacement of T to some scale dependent on the constants of the instrument.

If the whole block of templets be now pushed under the points P and if the drawing-board be moved at the same rate, then the pen T will draw the curve $Y = F(\xi)$. The instrument now is an *integraph* giving the value of a definite integral as function of a *variable parameter*.

Having thus shown how the lever with its springs can be made to serve a variety of purposes, we return to the description of the actual instrument constructed. The machine serves first of all to sum up a series of harmonic motions or to draw the curve

$$Y = a_1 \cos x + a_2 \cos 2x + a_3 \cos 3x + \ldots \quad (2)$$

The motion of the points $P_1P_2 \ldots$ is here made harmonic by aid of a series of excentric disks arranged so that for one revolution of the first the other disks complete 2, 3, ... revolutions. They are all driven by one handle. These disks take the place of the templets described before. The distances NG are made equal to the amplitudes a_1, a_2, a_3, ... The drawing-board, moved forward by the turning of the handle, now receives a curve of which (2) is the equation. If all excentrics are turned through a right angle a sine-series can be added up.

It is a remarkable fact that the same machine can be used as a harmonic analyser of a given curve. Let the curve to be analysed be set off along the levers NG so that in the old notation it is

$$y' = f(x),$$

whilst the curves $y' = \varphi(x\xi)$ are replaced by the excentrics, hence ξ by the angle θ through which the first excentric is turned, so that $y'_k = \cos k\theta$. But $kh = x$ and $nh = \pi$, n being the number of springs s, and π taking the place of c. This makes

$$k\theta = \frac{n}{\pi}\theta.x.$$

Hence our instrument draws a curve which gives the integral (1) in the form

$$y = \frac{2}{\pi}\int_0^{\pi} f(x)\cos\left(\frac{n}{\pi}\theta x\right)dx$$

as a function of θ. But this integral becomes the coefficient a_m in the cosine expansion if we make

$$\theta n/\pi = m \text{ or } \theta = m\pi/n.$$

The ordinates of the curve at the values $\theta = \pi/n$, $2\pi/n$, ... give therefore all coefficients up to $m = 80$. The curve shows at a glance which and how many of the coefficients are of importance.

The instrument is described in *Phil. Mag.*, vol. xlv., 1898. A number of curves drawn by it are given, and also examples of the analysis of curves for which the coefficients a_m are known. These indicate that a remarkable accuracy is obtained.

(O. H.)

[1] For a fuller description of the manner in which a mere addition machine can be used for multiplication and division, and even for the extraction of square roots, see an article by C.V. Boys in *Nature*, 11th July 1901.

CALCUTTA, the capital of British India and also of the province of Bengal. It is situated in 22° 34′ N. and 88° 24′ E., on the left or east bank of the Hugli, about 80 m. from the sea. Including its suburbs it covers an area of 27,267 acres, and contains a population (1901) of 949,144. Calcutta and Bombay have long contested the position of the premier city of India in population and trade; but during the decade 1891-1901 the prevalence of plague in Bombay gave a considerable advantage to Calcutta, which was comparatively free from that disease. Calcutta lies only some 20 ft. above sea-level, and extends about 6 m. along the Hugli, and is bounded elsewhere by the Circular Canal and the Salt Lakes, and by suburbs which form separate municipalities. Fort William stands in its centre.

Public Buildings.—Though Calcutta was called by Macaulay "the city of palaces," its modern public buildings cannot compare with those of Bombay. Its chief glory is the Maidan or park, which is large enough to embrace the area of Fort William and a racecourse. Many monuments find a place on the Maidan, among them being modern equestrian statues of Lord Roberts and Lord Lansdowne, which face one another on each side of the Red Road, where the rank and fashion of Calcutta take their evening drive. [v.04 p.0982] In the north-eastern corner of the Maidan the Indian memorial to Queen Victoria, consisting of a marble hall, with a statue and historical relics, was opened by the prince of Wales in January 1906. The government acquired Metcalfe Hall, in order to convert it into a public library and reading-room worthy of the capital of India; and also the country-house of Warren Hastings at Alipur, for the entertainment of Indian princes. Lord Curzon restored, at his own cost, the monument which formerly commemorated the massacre of the Black Hole, and a tablet let into the wall of the general post office indicates the position of the Black Hole in the north-east bastion of Fort William, now occupied by the roadway. Government House, which is situated near the Maidan and Eden Gardens, is the residence of the viceroy; it was built by Lord Wellesley in 1799, and is a fine pile situated in grounds covering six acres, and modelled upon Kedleston Hall in Derbyshire, one of the Adam buildings. Belvedere House, the official residence of the lieutenant-governor of Bengal, is situated close to the botanical gardens in Alipur, the southern suburb of Calcutta. Facing the Maidan for a couple of miles is the Chowringhee, one of the famous streets of the world, once a row of palatial residences, but now given up almost entirely to hotels, clubs and shops.

Commerce.—Calcutta owes its commercial prosperity to the fact that it is situated near the mouth of the two great river systems of the Ganges and Brahmaputra. It thus receives the produce of these fertile river valleys, while the rivers afford a cheaper mode of conveyance than any railway. In addition Calcutta is situated midway between Europe and the Far East and thus forms a meeting-place for the commerce and peoples of the Eastern and Western worlds. The port of Calcutta is one of the busiest in the world, and the banks of the Hugli rival the port of London in their show of shipping. The total number of arrivals and departures during 1904-1905 was 3027 vessels with an average tonnage of 3734. But though the city is such a busy commercial centre, most of its industries are carried on outside municipal limits. Howrah, on the opposite side of the Hugli, is the terminus of three great railway systems, and also the headquarters of the jute industry and other large factories. It is connected with Calcutta by an immense floating bridge, 1530 ft. in length, which was constructed in 1874. Other railways have their terminus at Sealdah, an eastern suburb. The docks lie outside Calcutta, at Kidderpur, on the south; and at Alipur are the zoological gardens, the residence of the lieutenant-governor of Bengal, cantonments for a native infantry regiment, the central gaol and a government reformatory. The port of Calcutta stretches about 10 m. along the river. It is under the control of a port trust, whose jurisdiction extends to the mouth of the Hugli and also over the floating bridge. New docks were opened in 1892, which cost upwards of two millions sterling. The figures for the sea-borne trade of Calcutta are included in those of Bengal. Its inland trade is carried on by country boat, inland steamer, rail and road, and amounted in 1904-1905 to about four and three quarter millions sterling. More than half the total is carried by the East Indian railway, which serves the United Provinces. Country boats hold their own against inland steamers, especially in imports.

Municipality.—The municipal government of Calcutta was reconstituted by an act of the Bengal legislature, passed in 1899. Previously, the governing body consisted of seventy-five commissioners, of whom fifty were elected. Under the new system modelled upon that of the Bombay municipality, this body, styled the corporation, remains comparatively unaltered; but a large portion of their powers is transferred to a general committee, composed of twelve members, of whom one-third are elected by the corporation, one-third by certain public bodies and one-third are nominated by the government. At the same time, the authority of the chairman, as supreme executive officer, is considerably strengthened. The two most important works undertaken by the old municipality were the provision of a supply of filtered water and the construction of a main drainage system. The water-supply is derived from the river Hugli, about 16 m. above Calcutta, where there are large pumping-stations and settling-tanks. The drainage-system consists of underground sewers, which are discharged by a pumping-station into a natural depression to the eastward, called the Salt Lake. Refuse is also removed to the Salt Lake by means of a municipal railway.

Education.—The Calcutta University was constituted in 1857, as an examining body, on the model of the university of London. The chief educational institutions are the Government Presidency College; three aided missionary colleges, and four unaided native colleges; the Sanskrit College and the Mahommedan Madrasah; the government medical college, the government engineering college at Sibpur, on the opposite bank of the Hugli, the government school of art, high schools for boys, the Bethune College and high schools for girls.

Population.—The population of Calcutta in 1710 was estimated at 12,000, from which figure it rose to about 117,000 in 1752. In the census of 1831 it was 187,000, in 1839 it had become 229,000 and in 1901, 949,144. Thus in the century between 1801 and 1901 it increased sixfold, while during the same period London only increased fivefold. Out of the total population of town and suburbs in 1901, 615,000 were Hindus, 286,000 Mahommedans and 38,000 Christians.

Climate and Health.—The climate of the city was originally very unhealthy, but it has improved greatly of recent years with modern sanitation and drainage. The climate is hot and damp, but has a pleasant cold season from November to March. April, May and June are hot; and the monsoon months from June to October are distinguished by damp heat and malaria. The mean annual temperature is 79° F., with a range from 85° in the hot season and 83° in the rains to 72° in the cool season, a mean maximum of 102° in May and a mean minimum of 48° in January. Calcutta has been comparatively fortunate in escaping the plague. The disease manifested itself in a sporadic form in April 1898, but disappeared by September of that year. Many of the Marwari traders fled the city, and some trouble was experienced in shortage of labour in the factories and at the docks. The plague returned in 1899 and caused a heavy mortality during the early months of the following year; but the population was not demoralized, nor was trade interfered with. A yet more serious outbreak occurred in the early months of 1901, the number of deaths being 7884. For three following years the totals were (1902-1903) 7284; (1903-1904) 8223; and (1904-1905) 4689; but these numbers compared very favourably with the condition of Bombay at the same time.

History.—The history of Calcutta practically dates from the 24th of August 1690, when it was founded by Job Charnock (*q.v.*) of the English East India Company. In 1596 it had obtained a brief entry as a rent-paying village in the survey of Bengal executed by command of the emperor Akbar. But it was not till ninety years later that it emerged into history. In 1686 the English merchants at Hugli under Charnock's

leadership, finding themselves compelled to quit their factory in consequence of a rupture with the Mogul authorities, retreated about 26 m. down the river to Sutanati, a village on the banks of the Hugli, now within the boundaries of Calcutta. They occupied Sutanati temporarily in December 1686, again in November 1687 and permanently on the 24th of August 1690. It was thus only at the third attempt that Charnock was able to obtain the future capital of India for his centre and the subsequent prosperity of Calcutta is due entirely to his tenacity of purpose. The new settlement soon extended itself along the river bank to the then village of Kalikata, and by degrees the cluster of neighbouring hamlets grew into the present town. In 1696 the English built the original Fort William by permission of the nawab, and in 1698 they formally purchased the three villages of Sutanati, Kalikata and Govindpur from Prince Azim, son of the emperor Aurangzeb.

[v.04 p.0983]

The site thus chosen had an excellent anchorage and was defended by the river from the Mahrattas, who harried the districts on the other side. The fort, subsequently rebuilt on the Vauban principle, and a moat, designed to form a semicircle round the town, and to be connected at both ends with the river, but never completed, combined with the natural position of Calcutta to render it one of the safest places for trade in India during the expiring struggles of the Mogul empire. It grew up without any fixed plan, and with little regard to the sanitary arrangements required for a town. Some parts of it lay below high-water mark on the Hugli, and its low level throughout rendered its drainage a most difficult problem. Until far on in the 18th century the malarial jungle and paddy fields closely hemmed in the European mansions; the vast plain (*maidán*), now covered with gardens and promenades, was then a swamp during three months of each year; the spacious quadrangle known as Wellington Square was built upon a filthy creek. A legend relates how one-fourth of the European inhabitants perished in twelve months, and during seventy years the mortality was so great that the name of Calcutta, derived from the village of Kalikata, was identified by mariners with Golgotha, the place of a skull.

The chief event in the history of Calcutta is the sack of the town, and the capture of Fort William in 1756, by Suraj-ud-Dowlah, the nawab of Bengal. The majority of the English officials took ship and fled to the mouth of the Hugli river. The Europeans, under John Zephaniah Holwell, who remained were compelled, after a short resistance, to surrender themselves to the mercies of the young prince. The prisoners, numbering 146 persons, were forced into the guard-room, a chamber measuring only 18 ft. by 14 ft. 10 in., with but two small windows, where they were left for the night. It was the 20th of June; the heat was intense; and next morning only 23 were taken out alive, among them Holwell, who left an account of the awful sufferings endured in the "Black Hole." The site of the Black Hole is now covered with a black marble slab, and the incident is commemorated by a monument erected by Lord Curzon in 1902. The Mahommedans retained possession of Calcutta for about seven months, and during this brief period the name of the town was changed in official documents to Alinagar. In January 1757 the expedition despatched from Madras, under the command of Admiral Watson and Colonel Clive, regained possession of the city. They found many of the houses of the English residents demolished and others damaged by fire. The old church of St John lay in ruins. The native portion of the town had also suffered much. Everything of value had been swept away, except the merchandise of the Company within the fort, which had been reserved for the nawab. The battle of Plassey was fought on the 23rd of June 1757, exactly twelve months after the capture of Calcutta. Mir Jafar, the nominee of the English, was created nawab of Bengal, and by the treaty which raised him to this position he agreed to make restitution to the Calcutta merchants for their losses. The English received £500,000, the Hindus and Mahommedans £200,000, and the Armenians £70,000. By another clause in this treaty the Company was permitted to establish a mint, the visible sign in India of territorial sovereignty, and the first coin, still bearing the name of the Delhi emperor, was issued on the 19th of August 1757. The restitution money was divided among the sufferers by a committee of the most respectable inhabitants. Commerce rapidly revived and the ruined city was rebuilt. Modern Calcutta dates from 1757. The old fort was abandoned, and its site devoted to the custom-house and other government offices. A new fort, the present Fort William, was begun by Clive a short distance lower down the river, and is thus the second of that name. It was not finished till 1773, and is said to have cost two millions sterling. At this time also the *maidán*, the park of Calcutta, was formed; and the healthiness of its position induced the European inhabitants gradually to shift their dwellings eastward, and to occupy what is now the Chowringhee quarter.

Up to 1707, when Calcutta was first declared a presidency, it had been dependent upon the older English settlement at Madras. From 1707 to 1773 the presidencies were maintained on a footing of equality; but in the latter year the act of parliament was passed, which provided that the presidency of Bengal should exercise a control over the other possessions of the Company; that the chief of that presidency should be styled governor-general; and that a supreme court of judicature should be established at Calcutta. In the previous year, 1772, Warren Hastings had taken under the immediate management of the Company's servants the general administration of Bengal, which had hitherto been left in the hands of the old Mahommedan officials, and had removed the treasury from Murshidabad to Calcutta. The latter town thus became the capital of Bengal and the seat of the supreme government in India. In 1834 the governor-general of Bengal was created governor-general of India, and was permitted to appoint a deputy-governor to manage the affairs of Lower Bengal during his occasional absence. It was not until 1854 that a separate head was appointed for Bengal, who, under the style of lieutenant-governor, exercises the same powers in civil matters as those vested in the governors in council of Madras or Bombay, although subject to closer supervision by the supreme government. Calcutta is thus at present the seat both of the supreme and the local government, each with an independent set of offices. (See BENGAL.)

See A.K. Ray, *A Short History of Calcutta* (Indian Census, 1901); H.B. Hyde, *Parochial Annals of Bengal* (1901); K. Blechynden, *Calcutta, Past and Present* (1905); H.E. Busteed, *Echoes from Old Calcutta* (1897); G.W. Forrest, *Cities of India* (1903); C.R. Wilson, *Early Annals of the English in Bengal* (1895); and *Old Fort William in Bengal* (1906); *Imperial Gazetteer of India* (Oxford, 1908), *s.v.* "Calcutta."

CALDANI, LEOPOLDO MARCO ANTONIO (1725-1813), Italian anatomist and physician, was born at Bologna in 1725. After studying under G.B. Morgagni at Padua, he began to teach practical medicine at Bologna, but in consequence of the intrigues of which he was the object he returned to Padua, where in 1771 he succeeded Morgagni in the chair of anatomy. He continued to lecture until 1805 and died at Padua in 1813. His works include *Institutiones pathologicae* (1772), *Institutiones physiologicae* (1773) and *Icones anatomicae* (1801-1813).

His brother, PETRONIO MARIA CALDANI (1735-1808), was professor of mathematics at Bologna, and was

described by J. le R. D'Alembert as the "first geometer and algebraist of Italy."

CALDECOTT, RANDOLPH (1846-1886), English artist and illustrator, was born at Chester on the 22nd of March 1846. From 1861 to 1872 he was a bank clerk, first at Whitchurch in Shropshire, afterwards at Manchester; but devoted all his spare time to the cultivation of a remarkable artistic faculty. In 1872 he migrated to London, became a student at the Slade School and finally adopted the artist's profession. He gained immediately a wide reputation as a prolific and original illustrator, gifted with a genial, humorous faculty, and he succeeded also, though in less degree, as a painter and sculptor. His health gave way in 1876, and after prolonged suffering he died in Florida on the 12th of February 1886. His chief book illustrations are as follows:—*Old Christmas* (1876) and *Bracebridge Hall* (1877), both by Washington Irving; *North Italian Folk* (1877), by Mrs Comyns Carr; *The Harz Mountains* (1883); *Breton Folk* (1879), by Henry Blackburn; picture-books (*John Gilpin, The House that Jack Built*, and other children's favourites) from 1878 onwards; *Some Aesop's Fables with Modern Instances, &c.* (1883). He held a roving commission for the *Graphic*, and was an occasional contributor to *Punch*. He was a member of the Royal Institute of Painters in Water-colours.

See Henry Blackburn, *Randolph Caldecott, Personal Memoir of his Early Life* (London, 1886).

CALDER, SIR ROBERT, Bart. (1745-1818), British admiral, was born at Elgin, in Scotland, on the 2nd of July 1745 (o.s.). He belonged to a very ancient family of Morayshire, and was the second son of Sir Thomas Calder of Muirton. He was educated at the grammar school of Elgin, and at the age of fourteen entered the British navy as midshipman. In 1766 he was serving as lieutenant of the "Essex," under Captain the Hon. George Faulkner, in the West Indies. Promotion came slowly, and it was not till 1782 that he attained the rank of post-captain. He acquitted himself honourably in the various services to which he was called, [v.04 p.0984] but for a long time had no opportunity of distinguishing himself. In 1796 he was named captain of the fleet by Sir John Jervis, and took part in the great battle off Cape St Vincent (February 14, 1797). He was selected as bearer of the despatches announcing the victory, and on that occasion was knighted by George III. He also received the thanks of parliament, and in the following year was created a baronet. In 1799 he became rear-admiral; and in 1801 he was despatched with a small squadron in pursuit of a French force, under Admiral Gantheaume, conveying supplies to the French in Egypt. In this pursuit he was not successful, and returning home at the peace he struck his flag. When the war again broke out he was recalled to service, was promoted vice-admiral in 1804, and was employed in the following year in the blockade of the ports of Ferrol and Corunna, in which (amongst other ports) ships were preparing for the invasion of England by Napoleon I. He held his position with a force greatly inferior to that of the enemy, and refused to be enticed out to sea. On its becoming known that the first movement directed by Napoleon was the raising of the blockade of Ferrol, Rear-Admiral Stirling was ordered to join Sir R. Calder and cruise with him to intercept the fleets of France and Spain on their passage to Brest. The approach of the enemy was concealed by a fog; but on the 22nd of July 1805 their fleet came in sight. It still outnumbered the British force; but Sir Robert entered into action. After a combat of four hours, during which he captured two Spanish ships, he gave orders to discontinue the action. He offered battle again on the two following days, but the challenge was not accepted. The French admiral Villeneuve, however, did not pursue his voyage, but took refuge in Ferrol. In the judgment of Napoleon, his scheme of invasion was baffled by this day's action; but much indignation was felt in England at the failure of Calder to win a complete victory. In consequence of the strong feeling against him at home he demanded a court-martial. This was held on the 23rd of December, and resulted in a severe reprimand of the vice-admiral for not having done his utmost to renew the engagement, at the same time acquitting him of both cowardice and disaffection. False expectations had been raised in England by the mutilation of his despatches, and of this he indignantly complained in his defence. The tide of feeling, however, turned again; and in 1815, by way of public testimony to his services, and of acquittal of the charge made against him, he was appointed commander of Portsmouth. He died at Holt, near Bishop's Waltham, in Hampshire, on the 31st of August 1818.

See *Naval Chronicle*, xvii.; James, *Naval History*, iii. 356-379 (1860).

CALDER, an ancient district of Midlothian, Scotland. It has been divided into the parishes of Mid-Calder (pop. in 1901 3132) and West-Calder (pop. 8092), East-Calder belonging to the parish of Kirknewton (pop. 3221). The whole locality owes much of its commercial importance and prosperity to the enormous development of the mineral oil industry. Coal-mining is also extensively pursued, sandstone and limestone are worked, and paper-mills flourish. Mid-Calder, a town on the Almond (pop. 703), has an ancient church, and John Spottiswood (1510-1585), the Scottish reformer, was for many years minister. His sons—John, archbishop of St Andrews, and James (1567-1645), bishop of Clogher—were both born at Mid-Calder. West-Calder is situated on Breich Water, an affluent of the Almond, 15½ m. S.W. of Edinburgh by the Caledonian railway, and is the chief centre of the district. Pop. (1901) 2652. At Addiewell, about 1½ m. S.W., the manufacture of ammonia, naphtha, paraffin oil and candles is carried on, the village practically dating from 1866, and having in 1901 a population of 1591. The Highland and Agricultural Society have an experimental farm at Pumpherston (pop. 1462). The district contains several tumuli, old ruined castles and a Roman camp in fair preservation.

CALDERÓN, RODRIGO (d. 1621), Count of Oliva and Marques de las Siete Iglesias, Spanish favourite and adventurer, was born at Antwerp. His father, Francisco Calderón, a member of a family ennobled by Charles V., was a captain in the army who became afterwards *comendador mayor* of Aragon, presumably by the help of his son. The mother was a Fleming, said by Calderón to have been a lady by birth and called by him Maria Sandelin. She is said by others to have been first the mistress and then the wife of Francisco Calderón. Rodrigo is said to have been born out of wedlock. In 1598 he entered the service of the duke of Lerma as secretary. The accession of Philip III. in that year made Lerma, who had unbounded influence over the king, master of Spain. Calderón, who was active and unscrupulous, made himself the trusted agent of Lerma. In the general scramble for wealth among the worthless intriguers who governed in the name of Philip III., Calderón was conspicuous for greed, audacity and insolence. He was created count of Oliva, a knight of Santiago, commendador of Ocaña in the order, secretary to the king (*secretario de cámara*), was loaded with plunder, and made an advantageous marriage with Ines de Vargas. As an insolent upstart he was peculiarly odious to the enemies of Lerma. Two religious persons, Juan de Santa Mariá, a Franciscan, and Mariana de San José, prioress of La Encarnacion, worked on the queen Margarita, by whose influence Calderón was removed from the secretaryship in 1611. He, however, retained the favour of Lerma, an indolent man to whom Calderón's activity was indispensable. In 1612 he

was sent on a special mission to Flanders, and on his return was made marques de las Siete Iglesias in 1614. When the queen Margarita died in that year in childbirth, Calderón was accused of having used witchcraft against her. Soon after it became generally known that he had ordered the murder of one Francisco de Juaras. When Lerma was driven from court in 1618 by the intrigues of his own son, the duke of Uceda, and the king's confessor, the Dominican Aliaga, Calderón was seized upon as an expiatory victim to satisfy public clamour. He was arrested, despoiled, and on the 7th of January 1620 was savagely tortured to make him confess to the several charges of murder and witchcraft brought against him. Calderón confessed to the murder of Juaras, saying that the man was a pander, and adding that he gave the particular reason by word of mouth since it was more fit to be spoken than written. He steadfastly denied all the other charges of murder and the witchcraft. Some hope of pardon seems to have remained in his mind till he heard the bells tolling for Philip III. in March 1621. "He is dead, and I too am dead" was his resigned comment. One of the first measures of the new reign was to order his execution. Calderón met his fate firmly and with a show of piety on the 21st of October 1621, and this bearing, together with his broken and prematurely aged appearance, turned public sentiment in his favour. The magnificent devotion of his wife helped materially to placate the hatred he had aroused. Lord Lytton made Rodrigo Calderón the hero of his story *Calderon the Courtier*.

See Modests de la Fuente, *Historia General España* (Madrid, 1850-1867), vol. xv. pp. 452 et seq.; Quevedo, *Obras* (Madrid, 1794), vol. x.—*Grandes Anales de Quince Dias*. A curious contemporary French pamphlet on him, *Histoire admirable et declin pitoyable advenue en la personne d'unfawory de la Cour d'Espagne,* is reprinted by M.E. Fournier in *Variétés historiques* (Paris, 1855), vol. i.

(D. H.)

CALDERÓN DE LA BARCA, PEDRO (1600-1681), Spanish dramatist and poet, was born at Madrid on the 17th of January 1600. His mother, who was of Flemish descent, died in 1610; his father, who was secretary to the treasury, died in 1615. Calderón was educated at the Jesuit College in Madrid with a view to taking orders and accepting a family living; abandoning this project, he studied law at Salamanca, and competed with success at the literary fêtes held in honour of St Isaidore at Madrid (1620-1632). According to his biographer, Vera Tassis, Calderón served with the Spanish army in Italy and Flanders between 1625 and 1635; but this statement is contradicted by numerous legal documents which prove that Calderón resided at Madrid during these years. Early in 1629 his brother Diego was stabbed by an actor who took sanctuary in the convent of the Trinitarian nuns; Calderón and his friends broke into the cloister and attempted to seize the offender. This violation was denounced by the fashionable preacher, Hortensio Félix
[v.04 p.0985] Paravicino (*q.v.*), in a sermon preached before Philip IV.; Calderón retorted by introducing into *El Príncipe constante* a mocking reference (afterwards cancelled) to Paravicino's gongoristic verbiage, and was committed to prison. He was soon released, grew rapidly in reputation as a playwright, and, on the death of Lope de Vega in 1635, was recognized as the foremost Spanish dramatist of the age. A volume of his plays, edited by his brother José in 1636, contains such celebrated and diverse productions as *La Vida es sueño, El Purgatorío de San Patricia, La Devoción de la cruz, La Dama duende* and *Peor está que estaba*. In 1636-1637 he was made a knight of the order of Santiago by Philip IV., who had already commissioned from him a series of spectacular plays for the royal theatre in the Buen Retiro. Calderón was almost as popular with the general public as Lope de Vega had been in his zenith; he was, moreover, in high favour at court, but this royal patronage did not help to develop the finer elements of his genius. On the 28th of May 1640 he joined a company of mounted cuirassiers recently raised by Olivares, took part in the Catalonian campaign, and distinguished himself by his gallantry at Tarragona; his health failing, he retired from the army in November 1642, and three years later was awarded a special military pension in recognition of his services in the field. The history of his life during the next few years is obscure. He appears to have been profoundly affected by the death of his mistress—the mother of his son Pedro José—about the year 1648-1649; his long connexion with the theatre had led him into temptations, but it had not diminished his instinctive spirit of devotion, and he now sought consolation in religion. He became a tertiary of the order of St Francis in 1650, and finally reverted to his original intention of joining the priesthood. He was ordained in 1651, was presented to a living in the parish of San Salvador at Madrid, and, according to his statement made a year or two later, determined to give up writing for the stage. He did not adhere to this resolution after his preferment to a prebend at Toledo in 1653, though he confined himself as much as possible to the composition of *autos sacramentales*—allegorical pieces in which the mystery of the Eucharist was illustrated dramatically, and which were performed with great pomp on the feast of Corpus Christi and during the weeks immediately ensuing. In 1662 two of Calderón's *autos—Las órdenes militares* and *Místicay real Babilonia*—were the subjects of an inquiry by the Inquisition; the former was censured, the manuscript copies were confiscated, and the condemnation was not rescinded till 1671. Calderón was appointed honorary chaplain to Philip IV, in 1663, and the royal favour was continued to him in the next reign. In his eighty-first year he wrote his last secular play, *Hado y Divisa de Leonido y Marfisa*, in honour of Charles II.'s marriage to Marie-Louise de Bourbon. Notwithstanding his position at court and his universal popularity throughout Spain, his closing years seem to have been passed in poverty. He died on the 25th of May 1681.

Like most Spanish dramatists, Calderón wrote too much and too speedily, and he was too often content to recast the productions of his predecessors. His *Saber del mal y del bien* is an adaptation of Lope de Vega's play, *Las Mudanzas de la fortuna y sucesos de Don Beltran de Aragón*; his *Selva confusa* is also adapted from a play of Lope's which bears the same title; his *Encanto sin encanto* derives from Tirso de Molina's *Amar par señas*, and, to take an extreme instance, the second act of his *Cabellos de Absalón* is transferred almost bodily from the third act of Tirso's *Venganza de Tamar*. It would be easy to add other examples of Calderón's lax methods, but it is simple justice to point out that he committed no offence against the prevailing code of literary morality. Many of his contemporaries plagiarized with equal audacity, but with far less success. Sometimes, as in *El Alcalde de Zalamea*, the bold procedure is completely justified by the result; in this case by his individual treatment he transforms one of Lope de Vega's rapid improvisations into a finished masterpiece. It was not given to him to initiate a great dramatic movement; he came at the end of a literary revolution, was compelled to accept the conventions which Lope de Vega had imposed on the Spanish stage, and he accepted them all the more readily since they were peculiarly suitable to the display of his splendid and varied gifts. Not a master of observation nor an expert in invention, he showed an unexampled skill in contriving ingenious variants on existing themes; he had a keen dramatic sense, an unrivalled dexterity in manipulating the mechanical resources of the stage, and in addition to these minor indispensable talents he was endowed with a lofty philosophic imagination and a wealth of poetic diction.

Naturally, he had the defects of his great qualities; his ingenuity is apt to degenerate into futile embellishment; his employment of theatrical devices is the subject of his own good-humoured satire in *No hay burlas con el amor*; his philosophic intellect is more interested in theological mysteries than in human passions; and the delicate beauty of his style is tinged with a wilful preciosity. Excelling Lope de Vega at many points, Calderón falls below his great predecessor in the delineation of character. Yet in almost every department of dramatic art Calderón has obtained a series of triumphs. In the symbolic drama he is best represented by *El Principe constante*, by *El Mágico prodigioso* (familiar to English readers in Shelley's free translation), and by *La Vida es sueño*, perhaps the most profound and original of his works. His tragedies are more remarkable for their acting qualities than for their convincing truth, and the fact that in *La Niña de Gomez Arias* he interpolates an entire act borrowed from Velez de Guevara's play of the same title seems to indicate that this kind of composition awakened no great interest in him; but in *El Médico de sa honra* and *El Mayor monstruo los celos* the theme of jealousy is handled with sombre power, while *El Alcalde de Zalamea* is one of the greatest tragedies in Spanish literature. Calderón is seen to much less advantage in the spectacular plays—*dramas de tramoya*—which he wrote at the command of Philip IV.; the dramatist is subordinated to the stage-carpenter, but the graceful fancy of the poet preserves even such a mediocre piece as *Los Tres Mayores prodigies* (which won him his knighthood) from complete oblivion. A greater opportunity is afforded in the more animated *comedias palaciegas*, or melodramatic pieces destined to be played before courtly audiences in the royal palace: *La Banda y la flor* and *El Galán fantasma* are charming illustrations of Calderón's genial conception and refined artistry. His historical plays (*La Gran Cenobia, Las armas de la hermosura*, &c.) are the weakest of all his formal dramatic productions; *El Golfo de la sirenas* and *La Púrpura de la rosa* are typical *zarzuelas*, to be judged by the standard of operatic libretti, and the *entremeses* are lacking in the lively humour which should characterize these dramatic interludes. On the other hand, Calderón's faculty of ingenious stagecraft is seen at its best in his "cloak-and-sword" plays (*comedias de capa y espada*) which are invaluable pictures of contemporary society. They are conventional, no doubt, in the sense that all representations of a specially artificial society must be conventional; but they are true to life, and are still as interesting as when they first appeared. In this kind *No siempre lo peor es cierto, La Dama duende, Una casa con dos puertas mala es de guardar* and *Guárdate del agua mansa* are almost unsurpassed. But it is as a writer of *autos sacramentales* that Calderón defies rivalry: his intense devotion, his subtle intelligence, his sublime lyrism all combine to produce such marvels of allegorical poetry as *La Cena del rey Baltasar, La Viña del Senor* and *La Serpiente de metal*. The *autos* lingered on in Spain till 1765, but they may be said to have died with Calderón, for his successors merely imitated him with a tedious fidelity. Almost alone among Spanish poets, Calderón had the good fortune to be printed in a fairly correct and readable edition (1682-1691), thanks to the enlightened zeal of his admirer, Juan de Vera Tassis y Villaroel, and owing to this happy accident he came to be regarded generally as the first of Spanish dramatists. The publication of the plays of Lope de Vega and of Tirso de Molina has affected the critical estimate of Calderón's work; he is seen to be inferior to Lope de Vega in creative power, and inferior to Tirso de Molina in variety of conception. But, setting aside the extravagances of his admirers, he is admittedly an exquisite poet, an expert in the dramatic form, and a typical representative of the devout, chivalrous, patriotic and artificial society in which he moved.

[v.04 p.0986]

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(J. F.-K.)

CALDERWOOD, DAVID (1575-1650), Scottish divine and historian, was born in 1575. He was educated at Edinburgh, where he took the degree of M.A. in 1593. About 1604 he became minister of Crailing, near Jedburgh, where he became conspicuous for his resolute opposition to the introduction of Episcopacy. In 1617, while James was in Scotland, a Remonstrance, which had been drawn up by the Presbyterian clergy, was placed in Calderwood's hands. He was summoned to St Andrews and examined before the king, but neither threats nor promises could make him deliver up the roll of signatures to the Remonstrance. He was deprived of his charge, committed to prison at St Andrews and afterwards removed to Edinburgh. The privy council ordered him to be banished from the kingdom for refusing to acknowledge the sentence of the High Commission. He lingered in Scotland, publishing a few tracts, till the 27th of August 1619, when he sailed for Holland. During his residence in Holland he published his *Altare Damascenum*. Calderwood appears to have returned to Scotland in 1624, and he was soon afterwards appointed minister of Pencaitland, in the county of Haddington. He continued to take an active part in the affairs of the church, and introduced in 1649 the practice, now confirmed by long usage, of dissenting from the decision of the Assembly, and requiring the protest to be entered in the record. His last years were devoted to the preparation of a *History of the Church of Scotland*. In 1648 the General Assembly urged him to complete the work he had designed, and voted him a yearly pension of £800. He left behind him a historical work of great extent and of great value as a storehouse of authentic materials for history. An abridgment, which appears to have been prepared by himself, was published after his death. An excellent edition of the complete work was published by the Wodrow Society, 8 vols., 1842-1849. The manuscript, which belonged to General Calderwood Durham, was presented to the British Museum. Calderwood died at Jedburgh on the 29th of October 1650.

CALDERWOOD, HENRY (1830-1897), Scottish philosopher and divine, was born at Peebles on the 10th of May 1830. He was educated at the Royal High school, and later at the university of Edinburgh. He studied for the ministry of the United Presbyterian Church, and in 1856 was ordained pastor of the Greyfriars church, Glasgow. He also examined in mental philosophy for the university of Glasgow from 1861 to 1864, and from 1866 conducted the moral philosophy classes at that university, until in 1868 he

became professor of moral philosophy at Edinburgh. He was made LL.D. of Glasgow in 1865. He died on the 19th of November 1897. His first and most famous work was *The Philosophy of the Infinite* (1854), in which he attacked the statement of Sir William Hamilton that we can have no knowledge of the Infinite. Calderwood maintained that such knowledge, though imperfect, is real and ever-increasing; that Faith implies Knowledge. His moral philosophy is in direct antagonism to Hegelian doctrine, and endeavours to substantiate the doctrine of divine sanction. Beside the data of experience, the mind has pure activity of its own whereby it apprehends the fundamental realities of life and combat. He wrote in addition *A Handbook of Moral Philosophy, On the Relations of Mind and Brain, Science and Religion, The Evolution of Man's Place in Nature*. Among his religious works the best-known is his *Parables of Our Lord*, and just before his death he finished a *Life of David Hume* in the "Famous Scots" series. His interests were not confined to religious and intellectual matters; as the first chairman of the Edinburgh school board, he worked hard to bring the Education Act into working order. He published a well-known treatise on education. In the cause of philanthropy and temperance he was indefatigable. In politics he was at first a Liberal, but became a Liberal Unionist at the time of the Home Rule Bill.

A biography of Calderwood was published in 1900 by his son W.C. Calderwood and the Rev. David Woodside, with a special chapter on his philosophy by Professor A.S. Pringle-Pattison.

CALEB (Heb. *kēleb*, "dog"), in the Bible, one of the spies sent by Moses from Kadesh in South Palestine to spy out the land of Canaan. For his courage and confidence he alone was rewarded by the promise that he and his seed should obtain a possession in it (Num. xiii. seq.). The later tradition includes Joshua, the hero of the conquest of the land. Subsequently Caleb settled in Kirjath-Arba (Hebron), but the account of the occupation is variously recorded. Thus (*a*) Caleb by himself drove out the Anakites, giants of Hebron, and promised to give his daughter Achsah to the hero who could take Kirjath-Sepher (Debir). This was accomplished by Othniel, the brother of Caleb (Josh. xv. 14-19). Both are "sons" of Kenaz, and Kenaz is an Edomite clan (Gen. xxxvi. 11, 15, 42). Elsewhere (*b*) Caleb the Kenizzite reminds Joshua of the promise at Kadesh; he asks that he may have the "mountain whereof Yahweh spake," and hopes to drive out the giants from its midst. Joshua blesses him and thus Hebron becomes the inheritance of Caleb (Josh. xiv. 6-15). Further (*c*) the capture of Hebron and Debir is ascribed to Judah who gives them to Caleb (Judg. i. 10 seq. 20); and finally (*d*) these cities are taken by Joshua himself in the course of a great and successful campaign against South Canaan (Josh. x. 36-39). Primarily the clan Caleb was settled in the south of Judah but formed an independent unit (i Sam. xxv., xxx. 14). Its seat was at Carmel, and Abigail, the wife of the Calebite Nabal, was taken by David after her husband's death. Not until later are the small divisions of the south united under the name Judah, and this result is reflected in the genealogies where the brothers Caleb and Jerahmeel are called "sons of Hezron" (the name typifies nomadic life) and become descendants of Judah.

Similarly in Num. xiii. 6, xxxiv. 19 (post-exilic), Caleb becomes the representative of the tribe of Judah, and also in *c* (above) Caleb's enterprise was later regarded as the work of the tribe with which it became incorporated, *b* and *d* are explained in accordance with the aim of the book to ascribe to the initiation or the achievements of one man the conquest of the whole of Canaan (see Joshua). The mount or hill-country in *b* appears to be that which the Israelites unsuccessfully attempted to take (Num. xiv. 41-45), but according to another old fragment Hormah was the scene of a victory (Num. xxi. 1-3), and it seems probable that Caleb, at least, was supposed to have pushed his way northward to Hebron. (See Jerahmeel, Kenites, Simeon.)

The genealogical lists place the earliest seats of Caleb in the south of Judah (1 Chron. ii. 42 sqq.; Hebron, Maon, &c.). Another list numbers the more northerly towns of Kirjath-jearim, Bethlehem, &c., and adds the "families of the scribes," and the Kenites (ii. 50 seq.). This second move is characteristically expressed by the statements that Caleb's first wife was Azūbah ("abandoned," desert region)—Jerīōth ("tent curtains") appears to have been another—and that after the death of Hezron he united with Ephrath (p. 24 Bethlehem). On the details in 1 Chron. ii., iv., see further, J. Wellhausen, *De Gent. et Famil. Judaeorum* (1869); S. Cook, *Critical Notes on O.T. History, Index*, s.v.; E. Meyer, *Israeliten*, pp. 400 sqq.; and the commentaries on Chronicles (*q.v.*).

(S. A. C.)

CALEDON (1) a town of the Cape Province, 81 m. by rail E.S.E. of Cape Town. Pop. (1904) 3508. The town is 15 m. N. of the sea at Walker Bay and is built on a spur of the Zwartberg, 800 ft. high. The streets are lined with blue gums and oaks. From the early day of Dutch settlement at the Cape Caledon has been noted for the curative value of its mineral springs, which yield 150,000 gallons daily. There are seven springs, six with a natural temperature of 120° F., the seventh being cold. The district is rich in flowering heaths and everlasting flowers. The name Caledon was given to the town and district in honour of the 2nd earl of Caledon, governor of the Cape 1807-1811. (2) A river of South Africa, tributary to the Orange (*q.v.*), also named after Lord Caledon.

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CALEDONIA, the Roman name of North Britain, still used especially in poetry for Scotland. It occurs first in the poet Lucan (A.D. 64), and then often in Roman literature. There were (1) a district Caledonia, of which the southern border must have been on or near the isthmus between the Clyde and the Forth, (2) a Caledonian Forest (possibly in Perthshire), and (3) a tribe of Caledones or Calidones, named by the geographer Ptolemy as living within boundaries which are now unascertainable. The Romans first invaded Caledonia under Agricola (about A.D. 83). They then fortified the Forth and Clyde Isthmus with a line of forts, two of which, those at Camelon and Barhill, have been identified and excavated, penetrated into Perthshire, and fought the decisive battle of the war (according to Tacitus) on the slopes of Mons Graupius.[1] The site—quite as hotly contested among antiquaries as between Roman and Caledonian—may have been near the Roman encampment of Inchtuthill (in the policies of Delvine, 10 m. N. of Perth near the union of Tay and Isla), which is the most northerly of the ascertained Roman encampments in Scotland and seems to belong to the age of Agricola. Tacitus represents the result as a victory. The home government, whether averse to expensive conquests of barren hills, or afraid of a victorious general, abruptly recalled Agricola, and his northern conquests—all beyond the Tweed, if not all beyond Cheviot—were abandoned. The next advance followed more than fifty years later. About A.D. 140 the district up to the Firth of Forth was definitely annexed, and a rampart with forts along it, the Wall of Antoninus Pius, was drawn from sea to sea (see Britain: *Roman*; and Graham's Dyke). At the same time the Roman forts at Ardoch, north of Dunblane, Carpow near Abernethy, and perhaps one or two more, were occupied. But the

conquest was stubbornly disputed, and after several risings, the land north of Cheviot seems to have been lost about A.D. 180-185. About A.D. 208 the emperor Septimius Severus carried out an extensive punitive expedition against the northern tribes, but while it is doubtful how far he penetrated, it is certain that after his death the Roman writ never again ran north of Cheviot. Rome is said, indeed, to have recovered the whole land up to the Wall of Pius in A.D. 368 and to have established there a province, Valentia. A province with that name was certainly organized somewhere. But its site and extent is quite uncertain and its duration was exceedingly brief. Throughout, Scotland remained substantially untouched by Roman influences, and its Celtic art, though perhaps influenced by Irish, remained free from Mediterranean infusion. Even in the south of Scotland, where Rome ruled for half a century (A.D. 142-180), the occupation was military and produced no civilizing effects. Of the actual condition of the land during the period of Roman rule in Britain, we have yet to learn the details by excavation. The curious carvings and ramparts, at Burghead on the coast of Elgin, and the underground stone houses locally called "wheems," in which Roman fragments have been found, may represent the native forms of dwelling, &c., and some of the "Late Celtic" metal-work may belong to this age. But of the political divisions, the boundaries and capitals of the tribes, and the like, we know nothing. Ptolemy gives a list of tribe and place-names. But hardly one can be identified with any approach to certainty, except in the extreme south. Nor has any certainty been reached about the ethnological problems of the population, the Aryan or non-Aryan character of the Picts and the like. That the Caledonians, like the later Scots, sometimes sought their fortunes in the south, is proved by a curious tablet of about A.D. 220, found at Colchester, dedicated to an unknown equivalent of Mars, Medocius, by one "Lossio Veda, nepos [= kin of] Vepogeni, Caledo." The name Caledonia is said to survive in the second syllable of Dunkeld and in the mountain name Schiehallion (Sith-chaillinn).

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(F. J. H.)

[1] This, not Grampius, is the proper spelling, though Grampius was at one time commonly accepted and indeed gave rise to the modern name Grampian.

CALEDONIAN CANAL. The chain of fresh-water lakes—Lochs Ness, Oich and Lochy—which stretch along the line of the Great Glen of Scotland in a S.W. direction from Inverness early suggested the idea of connecting the east and west coasts of Scotland by a canal which would save ships about 400 m. of coasting voyage round the north of Great Britain through the stormy Pentland Firth. In 1773 James Watt was employed by the government to make a survey for such a canal, which again was the subject of an official report by Thomas Telford in 1801. In 1803 an act of parliament was passed authorizing the construction of the canal, which was begun forthwith under Telford's direction, and traffic was started in 1822. From the northern entrance on Beauly Firth to the southern, near Fort William, the total length is about 60 m., that of the artificial portion being about 22 m. The number of locks is 28, and their standard dimensions are:—length 160 ft, breadth 38 ft., water-depth 15 ft. Their lift is in general about 8 ft., but some of them are for regulating purposes only. A flight of 8 at Corpach, with a total lift of 64 ft., is known as "Neptune's Staircase." The navigation is vested in and managed by the commissioners of the Caledonian Canal, of whom the speaker of the House of Commons is *ex officio* chairman. Usually the income is between £7000 and £8000 annually, and exceeds the expenditure by a few hundred pounds; but the commissioners are not entitled to make a profit, and the credit balances, though sometimes allowed to accumulate, must be expended on renewals and improvements of the canal. They have not, however, always proved sufficient for their purposes, and parliament is occasionally called upon to make special grants. In the commissioners is also vested the Crinan Canal, which extends from Ardrishaig on Loch Gilp to Crinan on Loch Crinan. This canal was made by a company incorporated by act of parliament in 1793, and was opened for traffic in 1801. At various times it received grants of public money, and ultimately in respect of these it passed into the hands of the government. In 1848 it was vested by parliament in the commissioners of the Caledonian Canal (who had in fact administered it for many years previously); the act contained a proviso that the company might take back the undertaking on repayment of the debt within 20 years, but the power was not exercised. The length of the canal is 9 m., and it saves vessels sailing from the Clyde a distance of about 85 m. as compared with the alternative route round the Mull of Kintyre. Its highest reach is 64 ft. above sea level, and its locks, 15 in number, are 96 ft. long, by 24 ft. wide, the depth of water being such as to admit vessels up to a draught of 9½ ft. The revenue is over £6000 a year, and there is usually a small credit balance which, as with the Caledonian Canal, must be applied to the purposes of the undertaking.

CALENBERG, or KALENBERG, the name of a district, including the town of Hanover, which was formerly part of the duchy of Brunswick. It received its name from a castle near Schulenburg, and is traversed by the rivers Weser and Leine, its area being about 1050 sq. m. The district was given to various cadets of the ruling house of Brunswick, one of these being Ernest Augustus, afterwards elector of Hanover, and the ancestor of the Hanoverian kings of Great Britain and Ireland.

CALENDAR, so called from the Roman Calends or Kalends, a method of distributing time into certain periods adapted to the purposes of civil life, as hours, days, weeks, months, years, &c.

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Of all the periods marked out by the motions of the celestial bodies, the most conspicuous, and the most intimately connected with the affairs of mankind, are the *solar day*, which is distinguished by the diurnal revolution of the earth and the alternation of light and darkness, and the *solar year*, which completes the circle of the seasons. But in the early ages of the world, when mankind were chiefly engaged in rural occupations, the phases of the moon must have been objects of great attention and interest,—hence the *month*, and the practice adopted by many nations of reckoning time by the motions of the moon, as well as the still more general practice of combining lunar with solar periods. The solar day, the solar year, and the lunar month, or lunation, may therefore be called the *natural* divisions of time. All others, as the hour, the week, and the civil month, though of the most ancient and general use, are only arbitrary and conventional.

Day.—The subdivision of the day (*q.v.*) into twenty-four parts, or hours, has prevailed since the remotest ages, though different nations have not agreed either with respect to the epoch of its commencement or

the manner of distributing the hours. Europeans in general, like the ancient Egyptians, place the commencement of the civil day at midnight, and reckon twelve morning hours from midnight to midday, and twelve evening hours from midday to midnight. Astronomers, after the example of Ptolemy, regard the day as commencing with the sun's culmination, or noon, and find it most convenient for the purposes of computation to reckon through the whole twenty-four hours. Hipparchus reckoned the twenty-four hours from midnight to midnight. Some nations, as the ancient Chaldeans and the modern Greeks, have chosen sunrise for the commencement of the day; others, again, as the Italians and Bohemians, suppose it to commence at sunset. In all these cases the beginning of the day varies with the seasons at all places not under the equator. In the early ages of Rome, and even down to the middle of the 5th century after the foundation of the city, no other divisions of the day were known than sunrise, sunset, and midday, which was marked by the arrival of the sun between the Rostra and a place called Graecostasis, where ambassadors from Greece and other countries used to stand. The Greeks divided the natural day and night into twelve equal parts each, and the hours thus formed were denominated *temporary hours*, from their varying in length according to the seasons of the year. The hours of the day and night were of course only equal at the time of the equinoxes. The whole period of day and night they called νυχθήμερον.

Week.—The week is a period of seven days, having no reference whatever to the celestial motions,—a circumstance to which it owes its unalterable uniformity. Although it did not enter into the calendar of the Greeks, and was not introduced at Rome till after the reign of Theodosius, it has been employed from time immemorial in almost all eastern countries; and as it forms neither an aliquot part of the year nor of the lunar month, those who reject the Mosaic recital will be at a loss, as Delambre remarks, to assign it to an origin having much semblance of probability. It might have been suggested by the phases of the moon, or by the number of the planets known in ancient times, an origin which is rendered more probable from the names universally given to the different days of which it is composed. In the Egyptian astronomy, the order of the planets, beginning with the most remote, is Saturn, Jupiter, Mars, the Sun, Venus, Mercury, the Moon. Now, the day being divided into twenty-four hours, each hour was consecrated to a particular planet, namely, one to Saturn, the following to Jupiter, the third to Mars, and so on according to the above order; and the day received the name of the planet which presided over its first hour. If, then, the first hour of a day was consecrated to Saturn, that planet would also have the 8th, the 15th, and the 22nd hour; the 23rd would fall to Jupiter, the 24th to Mars, and the 25th, or the first hour of the second day, would belong to the Sun. In like manner the first hour of the 3rd day would fall to the Moon, the first of the 4th day to Mars, of the 5th to Mercury, of the 6th to Jupiter, and of the 7th to Venus. The cycle being completed, the first hour of the 8th day would return to Saturn, and all the others succeed in the same order. According to Dio Cassius, the Egyptian week commenced with Saturday. On their flight from Egypt, the Jews, from hatred to their ancient oppressors, made Saturday the last day of the week.

The English names of the days are derived from the Saxon. The ancient Saxons had borrowed the week from some Eastern nation, and substituted the names of their own divinities for those of the gods of Greece. In legislative and justiciary acts the Latin names are still retained.

Latin.	English.	Saxon.
Dies Solis.	Sunday.	Sun's day.
Dies Lunae.	Monday.	Moon's day.
Dies Martis.	Tuesday.	Tiw's day.
Dies Mercurii.	Wednesday.	Woden's day.
Dies Jovis.	Thursday.	Thor's day.
Dies Veneris.	Friday.	Frigg's day.
Dies Saturni.	Saturday.	Seterne's day.

Month.—Long before the exact length of the year was determined, it must have been perceived that the synodic revolution of the moon is accomplished in about 29½ days. Twelve lunations, therefore, form a period of 354 days, which differs only by about 11¼ days from the solar year. From this circumstance has arisen the practice, perhaps universal, of dividing the year into twelve *months*. But in the course of a few years the accumulated difference between the solar year and twelve lunar months would become considerable, and have the effect of transporting the commencement of the year to a different season. The difficulties that arose in attempting to avoid this inconvenience induced some nations to abandon the moon altogether, and regulate their year by the course of the sun. The month, however, being a convenient period of time, has retained its place in the calendars of all nations; but, instead of denoting a synodic revolution of the moon, it is usually employed to denote an arbitrary number of days approaching to the twelfth part of a solar year.

Among the ancient Egyptians the month consisted of thirty days invariably; and in order to complete the year, five days were added at the end, called supplementary days. They made use of no intercalation, and by losing a fourth of a day every year, the commencement of the year went back one day in every period of four years, and consequently made a revolution of the seasons in 1461 years. Hence 1461 Egyptian years are equal to 1460 Julian years of 365¼ days each. This year is called *vague*, by reason of its commencing sometimes at one season of the year, and sometimes at another.

The Greeks divided the month into three decades, or periods of ten days,—a practice which was imitated by the French in their unsuccessful attempt to introduce a new calendar at the period of the Revolution. This division offers two advantages: the first is, that the period is an exact measure of the month of thirty days; and the second is, that the number of the day of the decade is connected with and suggests the number of the day of the month. For example, the 5th of the decade must necessarily be the 5th, the 15th, or the 25th of the month; so that when the day of the decade is known, that of the month can scarcely be mistaken. In reckoning by weeks, it is necessary to keep in mind the day of the week on which each month begins.

The Romans employed a division of the month and a method of reckoning the days which appear not a little extraordinary, and must, in practice, have been exceedingly inconvenient. As frequent allusion is made by classical writers to this embarrassing method of computation, which is carefully retained in the ecclesiastical calendar, we here give a table showing the correspondence of the Roman months with those of modern Europe.

Instead of distinguishing the days by the ordinal numbers first, second, third, &c., the Romans counted *backwards* from three fixed epochs, namely, the *Calends*, the *Nones* and the *Ides*. The Calends (or Kalends) were invariably the first day of the month, and were so denominated because it had been an ancient custom of the pontiffs to call the people together on that day, to apprize them of the festivals, or days that were to be kept sacred during the month. The Ides (from an obsolete verb *iduare*, to divide) were at the middle of the month, either the 13th or the 15th day; and the Nones were the *ninth* day before the
[v.04 p.0989] Ides, counting inclusively. From these three terms the days received their denomination in the following manner:—Those which were comprised between the Calends and the Nones were called *the days before the Nones*; those between the Nones and the Ides were called *the days before the Ides*; and, lastly, all the days after the Ides to the end of the month were called *the days before the Calends* of the succeeding month. In the months of March, May, July and October, the Ides fell on the 15th day, and the Nones consequently on the 7th; so that each of these months had six days named from the Nones. In all the other months the Ides were on the 13th and the Nones on the 5th; consequently there were only four days named from the Nones. Every month had eight days named from the Ides. The number of days receiving their denomination from the Calends depended on the number of days in the month and the day on which the Ides fell. For example, if the month contained 31 days and the Ides fell on the 13th, as was the case in January, August and December, there would remain 18 days after the Ides, which, added to the first of the following month, made 19 days of Calends. In January, therefore, the 14th day of the month was called the *nineteenth before the Calends of February* (counting inclusively), the 15th was the 18th before the Calends and so on to the 30th, which was called the third before the Calend (*tertio Calendas*), the last being the second of the Calends, or the day before the Calends (*pridie Calendas*).

Days of the Month.	March. May. July. October.	January. August. December.	April. June. September. November.	February.
1	Calendae.	Calendae.	Calendae.	Calendae.
2	6	4	4	4
3	5	3	3	3
4	4	Prid. Nonas.	Prid. Nonas.	Prid. Nonas.
5	3	Nonae.	Nonae.	Nonae.
6	Prid. Nonas.	8	8	8
7	Nonae.	7	7	7
8	8	6	6	6
9	7	5	5	5
10	6	4	4	4
11	5	3	3	3
12	4	Prid. Idus.	Prid. Idus.	Prid. Idus.
13	3	Idus.	Idus.	Idus.
14	Prid. Idus.	19	18	16
15	Idus.	18	17	15
16	17	17	16	14
17	16	16	15	13
18	15	15	14	12
19	14	14	13	11
20	13	13	12	10
21	12	12	11	9
22	11	11	10	8
23	10	10	9	7
24	9	9	8	6
25	8	8	7	5
26	7	7	6	4
27	6	6	5	3
28	5	5	4	Prid. Calen.
29	4	4	3	Mart.
30	3	3	Prid. Calen.	
31	Prid. Calen.	Prid. Calen.		

Year.—The year is either astronomical or civil. The solar astronomical year is the period of time in which the earth performs a revolution in its orbit about the sun, or passes from any point of the ecliptic to the same point again; and consists of 365 days 5 hours 48 min. and 46 sec. of mean solar time. The civil year is that which is employed in chronology, and varies among different nations, both in respect of the season at which it commences and of its subdivisions. When regard is had to the sun's motion alone, the regulation of the year, and the distribution of the days into months, may be effected without much trouble; but the difficulty is greatly increased when it is sought to reconcile solar and lunar periods, or to make the subdivisions of the year depend on the moon, and at the same time to preserve the correspondence between the whole year and the seasons.

Of the Solar Year.—In the arrangement of the civil year, two objects are sought to be accomplished,—first, the equable distribution of the days among twelve months; and secondly, the preservation of the beginning of the year at the same distance from the solstices or equinoxes. Now, as the year consists of 365 days and a fraction, and 365 is a number not divisible by 12, it is impossible that the months can all be of the same length and at the same time include all the days of the year. By reason also of the fractional excess of the length of the year above 365 days, it likewise happens that the years cannot all contain the same number of days if the epoch of their commencement remains fixed; for the day and the civil year must necessarily be considered as beginning at the same instant; and therefore the extra hours cannot be included in the year till they have accumulated to a whole day. As soon as this has taken place, an additional day must be given to the year.

The civil calendar of all European countries has been borrowed from that of the Romans. Romulus is said

to have divided the year into ten months only, including in all 304 days, and it is not very well known how the remaining days were disposed of. The ancient Roman year commenced with March, as is indicated by the names September, October, November, December, which the last four months still retain. July and August, likewise, were anciently denominated Quintilis and Sextilis, their present appellations having been bestowed in compliment to Julius Caesar and Augustus. In the reign of Numa two months were added to the year, January at the beginning and February at the end; and this arrangement continued till the year 452 B.C., when the Decemvirs changed the order of the months, and placed February after January. The months now consisted of twenty-nine and thirty days alternately, to correspond with the synodic revolution of the moon, so that the year contained 354 days; but a day was added to make the number odd, which was considered more fortunate, and the year therefore consisted of 355 days. This differed from the solar year by ten whole days and a fraction; but, to restore the coincidence, Numa ordered an additional or intercalary month to be inserted every second year between the 23rd and 24th of February, consisting of twenty-two and twenty-three days alternately, so that four years contained 1465 days, and the mean length of the year was consequently 366¼ days. The additional month was called *Mercedinus* or *Mercedonius*, from *merces*, wages, probably because the wages of workmen and domestics were usually paid at this season of the year. According to the above arrangement, the year was too long by one day, which rendered another correction necessary. As the error amounted to twenty-four days in as many years, it was ordered that every third period of eight years, instead of containing four intercalary months, amounting in all to ninety days, should contain only three of those months, consisting of twenty-two days each. The mean length of the year was thus reduced to 365¼ days; but it is not certain at what time the octennial periods, borrowed from the Greeks, were introduced into the Roman calendar, or whether they were at any time strictly followed. It does not even appear that the length of the intercalary month was regulated by any certain principle, for a discretionary power was left with the pontiffs, to whom the care of the calendar was committed, to intercalate more or fewer days according as the year was found to differ more or less from the celestial motions. This power was quickly abused to serve political objects, and the calendar consequently thrown into confusion. By giving a greater or less number of days to the intercalary month, the pontiffs were enabled to prolong the term of a magistracy or hasten the annual elections; and so little care had been taken to regulate the year, that, at the time of Julius Caesar, the civil equinox differed from the astronomical by three months, so that the winter months were carried back into autumn and the autumnal into summer.

In order to put an end to the disorders arising from the negligence or ignorance of the pontiffs, Caesar abolished the use of the lunar year and the intercalary month, and regulated the civil year entirely by the sun. With the advice and assistance of Sosigenes, he fixed the mean length of the year at 365¼ days, and
[v.04 p.0990] decreed that every fourth year should have 366 days, the other years having each 365. In order to restore the vernal equinox to the 25th of March, the place it occupied in the time of Numa, he ordered two extraordinary months to be inserted between November and December in the current year, the first to consist of thirty-three, and the second of thirty-four days. The intercalary month of twenty-three days fell into the year of course, so that the ancient year of 355 days received an augmentation of ninety days; and the year on that occasion contained in all 445 days. This was called the last year of confusion. The first Julian year commenced with the 1st of January of the 46th before the birth of Christ, and the 708th from the foundation of the city.

In the distribution of the days through the several months, Caesar adopted a simpler and more commodious arrangement than that which has since prevailed. He had ordered that the first, third, fifth, seventh, ninth and eleventh months, that is January, March, May, July, September and November, should have each thirty-one days, and the other months thirty, excepting February, which in common years should have only twenty-nine, but every fourth year thirty days. This order was interrupted to gratify the vanity of Augustus, by giving the month bearing his name as many days as July, which was named after the first Caesar. A day was accordingly taken from February and given to August; and in order that three months of thirty-one days might not come together, September and November were reduced to thirty days, and thirty-one given to October and December. For so frivolous a reason was the regulation of Caesar abandoned, and a capricious arrangement introduced, which it requires some attention to remember.

The additional day which occured every fourth year was given to February, as being the shortest month, and was inserted in the calendar between the 24th and 25th day. February having then twenty-nine days, the 25th was the 6th of the calends of March, *sexto calendas*; the preceding, which was the additional or intercalary day, was called *bis-sexto calendas*,—hence the term *bissextile*, which is still employed to distinguish the year of 366 days. The English denomination of *leap-year* would have been more appropriate if that year had differed from common years in *defect*, and contained only 364 days. In the modern calendar the intercalary day is still added to February, not, however, between the 24th and 25th, but as the 29th.

The regulations of Caesar were not at first sufficiently understood; and the pontiffs, by intercalating every third year instead of every fourth, at the end of thirty-six years had intercalated twelve times, instead of nine. This mistake having been discovered, Augustus ordered that all the years from the thirty-seventh of the era to the forty-eighth inclusive should be common years, by which means the intercalations were reduced to the proper number of twelve in forty-eight years. No account is taken of this blunder in chronology; and it is tacitly supposed that the calendar has been correctly followed from its commencement.

Although the Julian method of intercalation is perhaps the most convenient that could be adopted, yet, as it supposes the year too long by 11 minutes 14 seconds, it could not without correction very long answer the purpose for which it was devised, namely, that of preserving always the same interval of time between the commencement of the year and the equinox. Sosigenes could scarcely fail to know that this year was too long; for it had been shown long before, by the observations of Hipparchus, that the excess of 365¼ days above a true solar year would amount to a day in 300 years. The real error is indeed more than double of this, and amounts to a day in 128 years; but in the time of Caesar the length of the year was an astronomical element not very well determined. In the course of a few centuries, however, the equinox sensibly retrograded towards the beginning of the year. When the Julian calendar was introduced, the equinox fell on the 25th of March. At the time of the council of Nice, which was held in 325, it fell on the 21st; and when the reformation of the calendar was made in 1582, it had retrograded to the 11th. In order to restore the equinox to its former place, Pope Gregory XIII. directed ten days to be suppressed in the calendar; and as the error of the Julian intercalation was now found to amount to three days in 400 years,

he ordered the intercalations to be omitted on all the centenary years excepting those which are multiples of 400. According to the Gregorian rule of intercalation, therefore, every year of which the number is divisible by four without a remainder is a leap year, excepting the centurial years, which are only leap years when divisible by four after omitting the two ciphers. Thus 1600 was a leap year, but 1700, 1800 and 1900 are common years; 2000 will be a leap year, and so on.

As the Gregorian method of intercalation has been adopted in all Christian countries, Russia excepted, it becomes interesting to examine with what degrees of accuracy it reconciles the civil with the solar year. According to the best determinations of modern astronomy (Le Verrier's *Solar Tables*, Paris, 1858, p. 102), the mean geocentric motion of the sun in longitude, from the mean equinox during a Julian year of 365.25 days, the same being brought up to the present date, is 360° + 27″.685. Thus the mean length of the solar year is found to be 360°/(360° + 27".685) × 365.25 = 365.2422 days, or 365 days 5 hours 48 min. 46 sec. Now the Gregorian rule gives 97 intercalations in 400 years; 400 years therefore contain 365 × 400 + 97, that is, 146,097 days; and consequently one year contains 365.2425 days, or 365 days 5 hours 49 min. 12 sec. This exceeds the true solar year by 26 seconds, which amount to a day in 3323 years. It is perhaps unnecessary to make any formal provision against an error which can only happen after so long a period of time; but as 3323 differs little from 4000, it has been proposed to correct the Gregorian rule by making the year 4000 and all its multiples common years. With this correction the rule of intercalation is as follows:—

Every year the number of which is divisible by 4 is a leap year, excepting the last year of each century, which is a leap year only when the number of the century is divisible by 4; but 4000, and its multiples, 8000, 12,000, 16,000, &c. are common years. Thus the uniformity of the intercalation, by continuing to depend on the number four, is preserved, and by adopting the last correction the commencement of the year would not vary more than a day from its present place in two hundred centuries.

In order to discover whether the coincidence of the civil and solar year could not be restored in shorter periods by a different method of intercalation, we may proceed as follows:—The fraction 0.2422, which expresses the excess of the solar year above a whole number of days, being converted into a continued fraction, becomes

$$\cfrac{1}{4+\cfrac{1}{7+\cfrac{1}{1+\cfrac{1}{3+\cfrac{1}{4+\cfrac{1}{1+}}}}}}, \text{ &c.}$$

which gives the series of approximating fractions,

$$\frac{1}{4}, \frac{7}{29}, \frac{8}{33}, \frac{31}{128}, \frac{132}{545}, \frac{163}{673}, \text{ &c.}$$

The first of these, 1/4, gives the Julian intercalation of one day in four years, and is considerably too great. It supposes the year to contain 365 days 6 hours.

The second, 7/29, gives seven intercalary days in twenty-nine years, and errs in defect, as it supposes a year of 365 days 5 hours 47 min. 35 sec.

The third, 8/33, gives eight intercalations in thirty-three years or seven successive intercalations at the end of four years respectively, and the eighth at the end of five years. This supposes the year to contain 365 days 5 hours 49 min. 5.45 sec.

The fourth fraction, 31/128 = (24 + 7) / (99 + 29) = (3 × 8 + 7) / (3 × 33 + 29) combines three periods of thirty-three years with one of twenty-nine, and would consequently be very convenient in application. It supposes the year to consist of 365 days 5 hours 48 min. 45 sec., and is practically exact.

The fraction 8/33 offers a convenient and very accurate method of intercalation. It implies a year differing in excess from the true year only by 19.45 sec., while the Gregorian year is too long by 26 sec. It produces a much nearer coincidence between the civil and solar years than the Gregorian method; and, by reason of its shortness of period, confines the evagations of the mean equinox from the true within much narrower limits. It has been stated by Scaliger, Weidler, Montucla, and others, that the modern Persians actually follow this method, and intercalate eight days in thirty-three years. The statement has, however, been contested on good authority; and it seems proved (see Delambre, *Astronomie Moderne*, tom. i. p.81) that the Persian intercalation combines the two periods 7/29 and 8/33. If they follow the combination (7 + 3 × 8) / (29 + 3 × 33) = 31/128 their determination of the length of the tropical year has been extremely exact. The discovery of the period of thirty-three years is ascribed to Omar Khayyam, one of the eight astronomers appointed by Jelāl ud-Din Malik Shah, sultan of Khorasan, to reform or construct a calendar, about the year 1079 of our era.

[v.04 p.0991]

If the commencement of the year, instead of being retained at the same place in the seasons by a uniform method of intercalation, were made to depend on astronomical phenomena, the intercalations would succeed each other in an irregular manner, sometimes after four years and sometimes after five; and it would occasionally, though rarely indeed, happen, that it would be impossible to determine the day on which the year ought to begin. In the calendar, for example, which was attempted to be introduced in France in 1793, the beginning of the year was fixed at midnight preceding the day in which the true autumnal equinox falls. But supposing the instant of the sun's entering into the sign Libra to be very near midnight, the small errors of the solar tables might render it doubtful to which day the equinox really belonged; and it would be in vain to have recourse to observation to obviate the difficulty. It is therefore infinitely more commodious to determine the commencement of the year by a fixed rule of intercalation; and of the various methods which might be employed, no one perhaps is on the whole more easy of application, or better adapted for the purpose of computation, than the Gregorian now in use. But a system of 31 intercalations in 128 years would be by far the most perfect as regards mathematical accuracy. Its

adoption upon our present Gregorian calendar would only require the suppression of the usual bissextile once in every 128 years, and there would be no necessity for any further correction, as the error is so insignificant that it would not amount to a day in 100,000 years.

Of the Lunar Year and Luni-solar Periods.—The lunar year, consisting of twelve lunar months, contains only 354 days; its commencement consequently anticipates that of the solar year by eleven days, and passes through the whole circle of the seasons in about thirty-four lunar years. It is therefore so obviously ill-adapted to the computation of time, that, excepting the modern Jews and Mahommedans, almost all nations who have regulated their months by the moon have employed some method of intercalation by means of which the beginning of the year is retained at nearly the same fixed place in the seasons.

In the early ages of Greece the year was regulated entirely by the moon. Solon divided the year into twelve months, consisting alternately of twenty-nine and thirty days, the former of which were called *deficient* months, and the latter *full* months. The lunar year, therefore, contained 354 days, falling short of the exact time of twelve lunations by about 8.8 hours. The first expedient adopted to reconcile the lunar and solar years seems to have been the addition of a month of thirty days to every second year. Two lunar years would thus contain 25 months, or 738 days, while two solar years, of 365¼ days each, contain 730½ days. The difference of 7½ days was still too great to escape observation; it was accordingly proposed by Cleostratus of Tenedos, who flourished shortly after the time of Thales, to omit the biennary intercalation every eighth year. In fact, the 7½ days by which two lunar years exceeded two solar years, amounted to thirty days, or a full month, in eight years. By inserting, therefore, three additional months instead of four in every period of eight years, the coincidence between the solar and lunar year would have been exactly restored if the latter had contained only 354 days, inasmuch as the period contains 354 × 8 + 3 × 30 = 2922 days, corresponding with eight solar years of 365¼ days each. But the true time of 99 lunations is 2923.528 days, which exceeds the above period by 1.528 days, or thirty-six hours and a few minutes. At the end of two periods, or sixteen years, the excess is three days, and at the end of 160 years, thirty days. It was therefore proposed to employ a period of 160 years, in which one of the intercalary months should be omitted; but as this period was too long to be of any practical use, it was never generally adopted. The common practice was to make occasional corrections as they became necessary, in order to preserve the relation between the octennial period and the state of the heavens; but these corrections being left to the care of incompetent persons, the calendar soon fell into great disorder, and no certain rule was followed till a new division of the year was proposed by Meton and Euctemon, which was immediately adopted in all the states and dependencies of Greece.

The mean motion of the moon in longitude, from the mean equinox, during a Julian year of 365.25 days (according to Hansen's *Tables de la Lune*, London, 1857, pages 15, 16) is, at the present date, 13 × 360° + 477644″.409; that of the sun being 360° + 27″.685. Thus the corresponding relative mean geocentric motion of the moon from the sun is 12 × 360° + 477616″.724; and the duration of the mean synodic revolution of the moon, or lunar month, is therefore 360° / (12 × 360° + 477616″.724) × 365.25 = 29.530588 days, or 29 days, 12 hours, 44 min. 2.8 sec.

The *Metonic Cycle*, which may be regarded as the *chef-d'œuvre* of ancient astronomy, is a period of nineteen solar years, after which the new moons again happen on the same days of the year. In nineteen solar years there are 235 lunations, a number which, on being divided by nineteen, gives twelve lunations for each year, with seven of a remainder, to be distributed among the years of the period. The period of Meton, therefore, consisted of twelve years containing twelve months each, and seven years containing thirteen months each; and these last formed the third, fifth, eighth, eleventh, thirteenth, sixteenth, and nineteenth years of the cycle. As it had now been discovered that the exact length of the lunation is a little more than twenty-nine and a half days, it became necessary to abandon the alternate succession of full and deficient months; and, in order to preserve a more accurate correspondence between the civil month and the lunation, Meton divided the cycle into 125 full months of thirty days, and 110 deficient months of twenty-nine days each. The number of days in the period was therefore 6940. In order to distribute the deficient months through the period in the most equable manner, the whole period may be regarded as consisting of 235 full months of thirty days, or of 7050 days, from which 110 days are to be deducted. This gives one day to be suppressed in sixty-four; so that if we suppose the months to contain each thirty days, and then omit every sixty-fourth day in reckoning from the beginning of the period, those months in which the omission takes place will, of course, be the deficient months.

The number of days in the period being known, it is easy to ascertain its accuracy both in respect of the solar and lunar motions. The exact length of nineteen solar years is 19 × 365.2422 = 6939.6018 days, or 6939 days 14 hours 26.592 minutes; hence the period, which is exactly 6940 days, exceeds nineteen revolutions of the sun by nine and a half hours nearly. On the other hand, the exact time of a synodic revolution of the moon is 29.530588 days; 235 lunations, therefore, contain 235 × 29.530588 = 6939.68818 days, or 6939 days 16 hours 31 minutes, so that the period exceeds 235 lunations by only seven and a half hours.

After the Metonic cycle had been in use about a century, a correction was proposed by Calippus. At the end of four cycles, or seventy-six years, the accumulation of the seven and a half hours of difference between the cycle and 235 lunations amounts to thirty hours, or one whole day and six hours. Calippus, therefore, proposed to quadruple the period of Meton, and deduct one day at the end of that time by changing one of the full months into a deficient month. The period of Calippus, therefore, consisted of three Metonic cycles of 6940 days each, and a period of 6939 days; and its error in respect of the moon, consequently, amounted only to six hours, or to one day in 304 years. This period exceeds seventy-six true solar years by fourteen hours and a quarter nearly, but coincides exactly with seventy-six Julian years; and in the time of Calippus the length of the solar year was almost universally supposed to be exactly 365¼ days. The Calippic period is frequently referred to as a date by Ptolemy.

Ecclesiastical Calendar.—The ecclesiastical calendar, which is adopted in all the Catholic, and most of the Protestant countries of Europe, is luni-solar, being regulated partly by the solar, and partly by the lunar year,—a circumstance which gives rise to the distinction between the movable and immovable feasts. So early as the 2nd century of our era, great disputes had arisen among the Christians respecting the proper time of celebrating Easter, which governs all the other movable feasts. The Jews celebrated their passover on the 14th day of *the first month*, that is to say, the lunar month of which the fourteenth day either falls on, or next follows, the day of the vernal equinox. Most Christian sects agreed that Easter should be

celebrated on a Sunday. Others followed the example of the Jews, and adhered to the 14th of the moon; but these, as usually happened to the minority, were accounted heretics, and received the appellation of Quartodecimans. In order to terminate dissensions, which produced both scandal and schism in the church, the council of Nicaea, which was held in the year 325, ordained that the celebration of Easter should thenceforth always take place on the Sunday which immediately follows the full moon that happens upon, or next after, the day of the vernal equinox. Should the 14th of the moon, which is regarded as the day of full moon, happen on a Sunday, the celebration Of Easter was deferred to the Sunday following, in order to avoid concurrence with the Jews and the above-mentioned heretics. The observance of this rule renders it necessary to reconcile three periods which have no common measure, namely, the week, the lunar month, and the solar year; and as this can only be done approximately, and within certain limits, the determination of Easter is an affair of considerable nicety and complication. It is to be regretted that the reverend fathers who formed the council of Nicaea did not abandon the moon altogether, and appoint the first or second Sunday of April for the celebration of the Easter festival. The ecclesiastical calendar would in that case have possessed all the simplicity and uniformity of the civil calendar, which only requires the adjustment of the civil to the solar year; but they were probably not sufficiently versed in astronomy to be aware of the practical difficulties which their regulation had to encounter.

Dominical Letter.—The first problem which the construction of the calendar presents is to connect the week with the year, or to find the day of the week corresponding to a given day of any year of the era. As the number of days in the week and the number in the year are prime to one another, two successive years cannot begin with the same day; for if a common year begins, for example, with Sunday, the following year will begin with Monday, and if a leap year begins with Sunday, the year following will begin with Tuesday. For the sake of greater generality, the days of the week are denoted by the first seven letters of the alphabet, A, B, C, D, E, F, G, which are placed in the calendar beside the days of the year, so that A stands opposite the first day of January, B opposite the second, and so on to G, which stands opposite the seventh; after which A returns to the eighth, and so on through the 365 days of the year. Now if one of the days of the week, Sunday for example, is represented by E, Monday will be represented by F, Tuesday by G, Wednesday by A, and so on; and every Sunday through the year will have the same character E, every Monday F, and so with regard to the rest. The letter which denotes Sunday is called the *Dominical Letter*, or the *Sunday Letter*; and when the dominical letter of the year is known, the letters which respectively correspond to the other days of the week become known at the same time.

Solar Cycle.—In the Julian calendar the dominical letters are readily found by means of a short cycle, in which they recut in the same order without interruption. The number of years in the intercalary period being four, and the days of the week being seven, their product is $4 \times 7 = 28$; twenty-eight years is therefore a period which includes all the possible combinations of the days of the week with the commencement of the year. This period is called the *Solar Cycle*, or the *Cycle of the Sun*, and restores the first day of the year to the same day of the week. At the end of the cycle the dominical letters return again in the same order on the same days of the month; hence a table of dominical letters, constructed for twenty-eight years, will serve to show the dominical letter of any given year from the commencement of the era to the Reformation. The cycle, though probably not invented before the time of the council of Nicaea, is regarded as having commenced nine years before the era, so that the year *one* was the tenth of the solar cycle. To find the year of the cycle, we have therefore the following rule:—*Add nine to the date, divide the sum by twenty-eight; the quotient is the number of cycles elapsed, and the remainder is the year of the cycle.* Should there be no remainder, the proposed year is the twenty-eighth or last of the cycle. This rule is conveniently expressed by the formula $((x + 9) / 28)_r$, in which x denotes the date, and the symbol r denotes that the remainder, which arises from the division of $x + 9$ by 28, is the number required. Thus, for 1840, we have $(1840 + 9) / 28 = 66\text{-}1/28$; therefore $((1840 + 9) / 28)_r = 1$, and the year 1840 is the first of the solar cycle. In order to make use of the solar cycle in finding the dominical letter, it is necessary to know that the first year of the Christian era began with Saturday. The dominical letter of that year, which was the tenth of the cycle, was consequently B. The following year, or the 11th of the cycle, the letter was A; then G. The fourth year was bissextile, and the dominical letters were F, E; the following year D, and so on. In this manner it is easy to find the dominical letter belonging to each of the twenty-eight years of the cycle. But at the end of a century the order is interrupted in the Gregorian calendar by the secular suppression of the leap year; hence the cycle can only be employed during a century. In the reformed calendar the intercalary period is four hundred years, which number being multiplied by seven, gives two thousand eight hundred years as the interval in which the coincidence is restored between the days of the year and the days of the week. This long period, however, may be reduced to four hundred years; for since the dominical letter goes back five places every four years, its variation in four hundred years, in the Julian calendar, was five hundred places, which is equivalent to only three places (for five hundred divided by seven leaves three); but the Gregorian calendar suppresses exactly three intercalations in four hundred years, so that after four hundred years the dominical letters must again return in the same order. Hence the following table of dominical letters for four hundred years will serve to show the dominical letter of any year in the Gregorian calendar for ever. It contains four columns of letters, each column serving for a century. In order to find the column from which the letter in any given case is to be taken, strike off the last two figures of the date, divide the preceding figures by four, and the remainder will indicate the column. The symbol X, employed in the formula at the top of the column, denotes the number of centuries, that is, the figures remaining after the last two have been struck off. For example, required the dominical letter of the year 1839? In this case $X = 18$, therefore $(X/4)_r = 2$; and in the second column of letters, opposite 39, in the table we find F, which is the letter of the proposed year.

It deserves to be remarked, that as the dominical letter of the first year of the era was B, the first column of the following table will give the dominical letter of every year from the commencement of the era to the Reformation. For this purpose divide the date by 28, and the letter opposite the remainder, in the first column of figures, is the dominical letter of the year. For example, supposing the date to be 1148. On dividing by 28, the remainder is 0, or 28; and opposite 28, in the first column of letters, we find D, C, the dominical letters of the year 1148.

Lunar Cycle and Golden Number.—In connecting the lunar month with the solar year, the framers of the ecclesiastical calendar adopted the period of Meton, or lunar cycle, which they supposed to be exact. A different arrangement has, however, been followed with respect to the distribution of the months. The lunations are supposed to consist of twenty-nine and thirty days alternately, or the lunar year of 354 days; and in order to make up nineteen solar years, six embolismic or intercalary months, of thirty days each,

are introduced in the course of the cycle, and one of twenty-nine days is added at the end. This gives 19 × 354 + 6 × 30 + 29 = 6935 days, to be distributed among 235 lunar months. But every leap year one day must be added to the lunar month in which the 29th of February is included. Now if leap year happens on the first, second or third year of the period, there will be five leap years in the period, but only four when the first leap year falls on the fourth. In the former case the number of days in the period becomes 6940 and in the latter 6939. The mean length of the cycle is therefore 6939¾ days, agreeing exactly with nineteen Julian years.

TABLE I.—*Dominical Letters.*

Years of the Century.	$\left(\frac{X}{4}\right)_r = 1$	$\left(\frac{X}{4}\right)_r = 2$	$\left(\frac{X}{4}\right)_r = 3$	$\left(\frac{X}{4}\right)_r = 0$
0	C	E	G	B, A
1 29 57 85	B	D	F	G
2 30 58 86	A	C	E	F
3 31 59 87	G	B	D	E
4 32 60 88	F, E	A, G	C, B	D, C
5 33 61 89	D	F	A	B
6 34 62 90	C	E	G	A
7 35 63 91	B	D	F	G
8 36 64 92	A, G	C, B	E, D	F, E
9 37 65 93	F	A	C	D
10 38 66 94	E	G	B	C
11 39 67 95	D	F	A	B
12 40 68 96	C, B	E, D	G, F	A, G
13 41 69 97	A	C	E	F
14 42 70 98	G	B	D	E
15 43 71 99	F	A	C	D
16 44 72	E, D	G, F	B, A	C, B
17 45 73	C	E	G	A
18 46 74	B	D	F	G
19 47 75	A	C	E	F
20 48 76	G, F	B, A	D, C	E, D
21 49 77	E	G	B	C
22 50 78	D	F	A	B
23 51 79	C	E	G	A
24 52 80	B, A	D, C	F, E	G, F
25 53 81	G	B	D	E
26 54 82	F	A	C	D
27 55 83	E	G	B	C
28 56 84	D, C	F, E	A, G	B, A

TABLE II.—*The Day of the Week.*

Month.					Dominical Letter.						
Jan. Oct.					A	B	C	D	E	F	G
Feb. Mar. Nov.					D	E	F	G	A	B	C
April July					G	A	B	C	D	E	F
May					B	C	D	E	F	G	A
June					E	F	G	A	B	C	D
August					C	D	E	F	G	A	B
Sept. Dec.					F	G	A	B	C	D	E
1	8	15	22	29	Sun.	Sat	Frid.	Thur.	Wed.	Tues	Mon.
2	9	16	23	30	Mon.	Sun.	Sat.	Frid.	Thur.	Wed.	Tues.
3	10	17	24	31	Tues.	Mon.	Sun.	Sat.	Frid.	Thur.	Wed.
4	11	18	25		Wed.	Tues.	Mon.	Sun.	Sat.	Frid.	Thur.
5	12	19	26		Thur.	Wed.	Tues.	Mon.	Sun.	Sat.	Frid.
6	13	20	27		Frid.	Thur.	Wed.	Tues.	Mon.	Sun.	Sat.
7	14	21	28		Sat.	Frid.	Thur.	Wed.	Tues.	Mon.	Sun.

By means of the lunar cycle the new moons of the calendar were indicated before the Reformation. As the cycle restores these phenomena to the same days of the civil month, they will fall on the same days in any two years which occupy the same place in the cycle; consequently a table of the moon's phases for 19 years will serve for any year whatever when we know its number in the cycle. This number is called the *Golden Number*, either because it was so termed by the Greeks, or because it was usual to mark it with red letters in the calendar. The Golden Numbers were introduced into the calendar about the year 530, but disposed as they would have been if they had been inserted at the time of the council of Nicaea. The cycle is supposed to commence with the year in which the new moon falls on the 1st of January, which took place the year preceding the commencement of our era. Hence, to find the Golden Number N, for any year *x*, we have $N = ((x + 1) / 19)_r$, which gives the following rule: *Add 1 to the date, divide the sum by 19; the quotient is the number of cycles elapsed, and the remainder is the Golden Number*. When the remainder is 0, the proposed year is of course the last or 19th of the cycle. It ought to be remarked that the new moons, determined in this manner, may differ from the astronomical new moons sometimes as much as two days. The reason is that the sum of the solar and lunar inequalities, which are compensated in the whole period, may amount in certain cases to 10°, and thereby cause the new moon to arrive on the second day before or after its mean time.

Dionysian Period.—The cycle of the sun brings back the days of the month to the same day of the week; the lunar cycle restores the new moons to the same day of the month; therefore 28 × 19 = 532 years, includes all the variations in respect of the new moons and the dominical letters, and is consequently a period after which the new moons again occur on the same day of the month and the same day of the week. This is called the *Dionysian* or Great *Paschal Period*, from its having been employed by Dionysius Exiguus, familiarly styled "Denys the Little," in determining Easter Sunday. It was, however, first proposed by Victorius of Aquitain, who had been appointed by Pope Hilary to revise and correct the church calendar. Hence it is also called the *Victorian Period*. It continued in use till the Gregorian reformation.

Cycle of Indiction.—Besides the solar and lunar cycles, there is a third of 15 years, called the cycle of indiction, frequently employed in the computations of chronologists. This period is not astronomical, like the two former, but has reference to certain judicial acts which took place at stated epochs under the Greek emperors. Its commencement is referred to the 1st of January of the year 313 of the common era. By extending it backwards, it will be found that the first of the era was the fourth of the cycle of indiction. The number of any year in this cycle will therefore be given by the formula $((x + 3) / 15)_r$, that is to say, *add 3 to the date, divide the sum by 15, and the remainder is the year of the indiction*. When the remainder is 0, the proposed year is the fifteenth of the cycle.

Julian Period.—The Julian period, proposed by the celebrated Joseph Scaliger as an universal measure of chronology, is formed by taking the continued product of the three cycles of the sun, of the moon, and of the indiction, and is consequently 28 × 19 × 15 = 7980 years. In the course of this long period no two years can be expressed by the same numbers in all the three cycles. Hence, when the number of any proposed year in each of the cycles is known, its number in the Julian period can be determined by the resolution of a very simple problem of the indeterminate analysis. It is unnecessary, however, in the present case to exhibit the general solution of the problem, because when the number in the period corresponding to any one year in the era has been ascertained, it is easy to establish the correspondence for all other years, without having again recourse to the direct solution of the problem. We shall therefore find the number of the Julian period corresponding to the first of our era.

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We have already seen that the year 1 of the era had 10 for its number in the solar cycle, 2 in the lunar cycle, and 4 in the cycle of indiction; the question is therefore to find a number such, that when it is divided by the three numbers 28, 19, and 15 respectively the three remainders shall be 10, 2, and 4.

Let x, y, and z be the three quotients of the divisions; the number sought will then be expressed by $28\,x + 10$, by $19\,y + 2$, or by $15\,z + 4$. Hence the two equations

$$28\,x + 10 = 19\,y + 2 = 15\,z + 4.$$

To solve the equations $28\,x + 10 = 19\,y + 2$, or $y = x + \frac{9\,x + 8}{19}$, let $m = \frac{9\,x + 8}{19}$, we have then $x = 2\,m + \frac{m - 8}{9}$.

Let $\frac{m - 8}{9} = m'$; then $m = 9\,m' + 8$; hence

$$x = 18\,m' + 16 + m' = 19\,m' + 16 \ldots (1).$$

Again, since $28\,x + 10 = 15\,z + 4$, we have

$$15\,z = 28\,x + 6, \text{ or } z = 2\,x - \frac{2\,x - 6}{15}.$$

Let $\frac{2\,x - 6}{15} = n$; then $2\,x = 15\,n + 6$, and $x = 7\,n + 3 + \frac{n}{2}$.

Let $\frac{n}{2} = n'$; then $n = 2\,n'$; consequently

$$x = 14\,n' + 3 + n' = 15\,n' + 3 \ldots (2).$$

Equating the above two values of x, we have

$$15\,n' + 3 = 19\,m' + 16; \text{ whence } n' = m' + \frac{4\,m' + 13}{15}.$$

Let $\frac{4\,m' + 13}{15} = p$; we have then

$$4\,m' = 15\,p - 13, \text{ and } m' = 4\,p - \frac{p + 13}{4}.$$

Let $\frac{p + 13}{4} = p'$; then $p = 4\,p' - 13$;

$$\text{whence } m' = 16\,p' - 52 - p' = 15\,p' - 52.$$

Now in this equation p' may be any number whatever, provided $15\,p'$ exceed 52. The smallest value of p' (which is the one here wanted) is therefore 4; for $15 \times 4 = 60$. Assuming therefore $p' = 4$, we have $m' = 60 - 52 = 8$; and consequently, since $x = 19\,m' + 16$, $x = 19 \times 8 + 16 = 168$. The number required is

consequently 28 × 168 + 10 = 4714.

Having found the number 4714 for the first of the era, the correspondence of the years of the era and of the period is as follows:—

Era, 1, 2, 3, ... *x*,
Period, 4714, 4715, 4716, ... 4713 + *x*;

from which it is evident, that if we take P to represent the year of the Julian period, and *x* the corresponding year of the Christian era, we shall have

P = 4713 + *x*, and *x* = P - 4713.

With regard to the numeration of the years previous to the commencement of the era, the practice is not uniform. Chronologists, in general, reckon the year preceding the first of the era -1, the next preceding -2, and so on. In this case

Era, -1, -2, -3, ... -*x*,
Period, 4713, 4712, 4711, ... 4714 - *x*;

whence

P = 4714 - *x*, and *x* = 4714 - P.

But astronomers, in order to preserve the uniformity of computation, make the series of years proceed without interruption, and reckon the year preceding the first of the era 0. Thus

Era, 0, -1, -2, ... -*x*,
Period, 4713, 4712, 4711, ... 4713 - *x*;

therefore, in this case

P = 4713 - *x*, and *x* = 4713 - P.

Reformation of the Calendar.—The ancient church calendar was founded on two suppositions, both erroneous, namely, that the year contains 365¼ days, and that 235 lunations are exactly equal to nineteen solar years. It could not therefore long continue to preserve its correspondence with the seasons, or to indicate the days of the new moons with the same accuracy. About the year 730 the venerable Bede had already perceived the anticipation of the equinoxes, and remarked that these phenomena then took place about three days earlier than at the time of the council of Nicaea. Five centuries after the time of Bede, the divergence of the true equinox from the 21st of March, which now amounted to seven or eight days, was pointed out by Johannes de Sacro Bosco (John Holywood, *fl.* 1230) in his *De Anni Ratione*; and by Roger Bacon, in a treatise *De Reformatione Calendarii*, which, though never published, was transmitted to the pope. These works were probably little regarded at the time; but as the errors of the calendar went on increasing, and the true length of the year, in consequence of the progress of astronomy, became better known, the project of a reformation was again revived in the 15th century; and in 1474 Pope Sixtus IV. invited Regiomontanus, the most celebrated astronomer of the age, to Rome, to superintend the reconstruction of the calendar. The premature death of Regiomontanus caused the design to be suspended for the time; but in the following century numerous memoirs appeared on the subject, among the authors of which were Stoffler, Albert Pighius, Johann Schöner, Lucas Gauricus, and other mathematicians of celebrity. At length Pope Gregory XIII. perceiving that the measure was likely to confer a great *éclat* on his pontificate, undertook the long-desired reformation; and having found the governments of the principal Catholic states ready to adopt his views, he issued a brief in the month of March 1582, in which he abolished the use of the ancient calendar, and substituted that which has since been received in almost all Christian countries under the name of the *Gregorian Calendar* or *New Style* The author of the system adopted by Gregory was Aloysius Lilius, or Luigi Lilio Ghiraldi, a learned astronomer and physician of Naples, who died, however, before its introduction; but the individual who most contributed to give the ecclesiastical calendar its present form, and who was charged with all the calculations necessary for its verification, was Clavius, by whom it was completely developed and explained in a great folio treatise of 800 pages, published in 1603, the title of which is given at the end of this article.

It has already been mentioned that the error of the Julian year was corrected in the Gregorian calendar by the suppression of three intercalations in 400 years. In order to restore the beginning of the year to the same place in the seasons that it had occupied at the time of the council of Nicaea, Gregory directed the day following the feast of St Francis, that is to say the 5th of October, to be reckoned the 15th of that month. By this regulation the vernal equinox which then happened on the 11th of March was restored to the 21st. From 1582 to 1700 the difference between the old and new style continued to be ten days; but 1700 being a leap year in the Julian calendar, and a common year in the Gregorian, the difference of the styles during the 18th century was eleven days. The year 1800 was also common in the new calendar, and, consequently, the difference in the 19th century was twelve days. From 1900 to 2100 inclusive it is thirteen days.

The restoration of the equinox to its former place in the year and the correction of the intercalary period, were attended with no difficulty; but Lilius had also to adapt the lunar year to the new rule of intercalation. The lunar cycle contained 6939 days 18 hours, whereas the exact time of 235 lunations, as we have already seen, is 235 × 29.530588 = 6939 days 16 hours 31 minutes. The difference, which is 1 hour 29 minutes, amounts to a day in 308 years, so that at the end of this time the new moons occur one day earlier than they are indicated by the golden numbers. During the 1257 years that elapsed between the council of Nicaea and the Reformation, the error had accumulated to four days, so that the new moons which were marked in the calendar as happening, for example, on the 5th of the month, actually fell on the 1st. It would have been easy to correct this error by placing the golden numbers four lines higher in the new calendar; and the suppression of the ten days had already rendered it necessary to place them ten lines lower, and to carry those which belonged, for example, to the 5th and 6th of the month, to the 15th and 16th. But, supposing this correction to have been made, it would have again become necessary, at the

end of 308 years, to advance them one line higher, in consequence of the accumulation of the error of the cycle to a whole day. On the other hand, as the golden numbers were only adapted to the Julian calendar, every omission of the centenary intercalation would require them to be placed one line lower, opposite the 6th, for example, instead of the 5th of the month; so that, generally speaking, the places of the golden numbers would have to be changed every century. On this account Lilius thought fit to reject the golden numbers from the calendar, and supply their place by another set of numbers called *Epacts*, the use of which we shall now proceed to explain.

[v.04 p.0995]

Epacts.—Epact is a word of Greek origin, employed in the calendar to signify the moon's age at the beginning of the year. The common solar year containing 365 days, and the lunar year only 354 days, the difference is eleven; whence, if a new moon fall on the 1st of January in any year, the moon will be eleven days old on the first day of the following year, and twenty-two days on the first of the third year. The numbers eleven and twenty-two are therefore the epacts of those years respectively. Another addition of eleven gives thirty-three for the epact of the fourth year; but in consequence of the insertion of the intercalary month in each third year of the lunar cycle, this epact is reduced to three. In like manner the epacts of all the following years of the cycle are obtained by successively adding eleven to the epact of the former year, and rejecting thirty as often as the sum exceeds that number. They are therefore connected with the golden numbers by the formula (11 n / 30) in which n is any whole number; and for a whole lunar cycle (supposing the first epact to be 11), they are as follows:—11, 22, 3, 14, 25, 6, 17, 28, 9, 20, 1, 12, 23, 4, 15, 26, 7, 18, 29. But the order is interrupted at the end of the cycle; for the epact of the following year, found in the same manner, would be 29 + 11 = 40 or 10, whereas it ought again to be 11 to correspond with the moon's age and the golden number 1. The reason of this is, that the intercalary month, inserted at the end of the cycle, contains only twenty-nine days instead of thirty; whence, after 11 has been added to the epact of the year corresponding to the golden number 19, we must reject twenty-nine instead of thirty, in order to have the epact of the succeeding year; or, which comes to the same thing, we must add twelve to the epact of the last year of the cycle, and then reject thirty as before.

This method of forming the epacts might have been continued indefinitely if the Julian intercalation had been followed without correction, and the cycle been perfectly exact; but as neither of these suppositions is true, two equations or corrections must be applied, one depending on the error of the Julian year, which is called the solar equation; the other on the error of the lunar cycle, which is called the lunar equation. The solar equation occurs three times in 400 years, namely, in every secular year which is not a leap year; for in this case the omission of the intercalary day causes the new moons to arrive one day later in all the following months, so that the moon's age at the end of the month is one day less than it would have been if the intercalation had been made, and the epacts must accordingly be all diminished by unity. Thus the epacts 11, 22, 3, 14, &c., become 10, 21, 2, 13, &c. On the other hand, when the time by which the new moons anticipate the lunar cycle amounts to a whole day, which, as we have seen, it does in 308 years, the new moons will arrive one day earlier, and the epacts must consequently be increased by unity. Thus the epacts 11, 22, 3, 14, &c., in consequence of the lunar equation, become 12, 23, 4, 15, &c. In order to preserve the uniformity of the calendar, the epacts are changed only at the commencement of a century; the correction of the error of the lunar cycle is therefore made at the end of 300 years. In the Gregorian calendar this error is assumed to amount to one day in 312½ years or eight days in 2500 years, an assumption which requires the line of epacts to be changed seven times successively at the end of each period of 300 years, and once at the end of 400 years; and, from the manner in which the epacts were disposed at the Reformation, it was found most correct to suppose one of the periods of 2500 years to terminate with the year 1800.

The years in which the solar equation occurs, counting from the Reformation, are 1700, 1800, 1900, 2100, 2200, 2300, 2500, &c. Those in which the lunar equation occurs are 1800, 2100, 2400, 2700, 3000, 3300, 3600, 3900, after which, 4300, 4600 and so on. When the solar equation occurs, the epacts are diminished by unity; when the lunar equation occurs, the epacts are augmented by unity; and when both equations occur together, as in 1800, 2100, 2700, &c., they compensate each other, and the epacts are not changed.

In consequence of the solar and lunar equations, it is evident that the epact or moon's age at the beginning of the year, must, in the course of centuries, have all different values from one to thirty inclusive, corresponding to the days in a full lunar month. Hence, for the construction of a perpetual calendar, there must be thirty different sets or lines of epacts. These are exhibited in the subjoined table (Table III.) called the *Extended Table of Epacts*, which is constructed in the following manner. The series of golden numbers is written in a line at the top of the table, and under each golden number is a column of thirty epacts, arranged in the order of the natural numbers, beginning at the bottom and proceeding to the top of the column. The first column, under the golden number 1, contains the epacts, 1, 2, 3, 4, &c., to 30 or 0. The second column, corresponding to the following year in the lunar cycle, must have all its epacts augmented by 11; the lowest number, therefore, in the column is 12, then 13, 14, 15 and so on. The third column corresponding to the golden number 3, has for its first epact 12 + 11 = 23; and in the same manner all the nineteen columns of the table are formed. Each of the thirty lines of epacts is designated by a letter of the alphabet, which serves as its index or argument. The order of the letters, like that of the numbers, is from the bottom of the column upwards.

In the tables of the church calendar the epacts are usually printed in Roman numerals, excepting the last, which is designated by an asterisk (*), used as an indefinite symbol to denote 30 or 0, and 25, which in the last eight columns is expressed in Arabic characters, for a reason that will immediately be explained. In the table here given, this distinction is made by means of an accent placed over the last figure.

At the Reformation the epacts were given by the line D. The year 1600 was a leap year; the intercalation accordingly took place as usual, and there was no interruption in the order of the epacts; the line D was employed till 1700. In that year the omission of the intercalary day rendered it necessary to diminish the epacts by unity, or to pass to the line C. In 1800 the solar equation again occurred, in consequence of which it was necessary to descend one line to have the epacts diminished by unity; but in this year the lunar equation also occurred, the anticipation of the new moons having amounted to a day; the new moons accordingly happened a day earlier, which rendered it necessary to take the epacts in the next higher line. There was, consequently, no alteration; the two equations destroyed each other. The line of epacts belonging to the present century is therefore C. In 1900 the solar equation occurs, after which the line is B. The year 2000 is a leap year, and there is no alteration. In 2100 the equations again occur together and destroy each other, so that the line B will serve three centuries, from 1900 to 2200. From that year to

2300 the line will be A. In this manner the line of epacts belonging to any given century is easily found, and the method of proceeding is obvious. When the solar equation occurs alone, the line of epacts is changed to the next lower in the table; when the lunar equation occurs alone, the line is changed to the next higher; when both equations occur together, no change takes place. In order that it may be perceived at once to what centuries the different lines of epacts respectively belong, they have been placed in a column on the left hand side of the table on next page.

The use of the epacts is to show the days of the new moons, and consequently the moon's age on any day of the year. For this purpose they are placed in the calendar (Table IV.) along with the days of the month and dominical letters, in a retrograde order, so that the asterisk stands beside the 1st of January, 29 beside the 2nd, 28 beside the 3rd and so on to 1, which corresponds to the 30th. After this comes the asterisk, which corresponds to the 31st of January, then 29, which belongs to the 1st of February, and so on to the end of the year. The reason of this distribution is evident. If the last lunation of any year ends, for example, on the 2nd of December, the new moon falls on the 3rd; and the moon's age on the 31st, or at the end of the year, is twenty-nine days. The epact of the following year is therefore twenty-nine. Now that lunation having commenced on the 3rd of December, and consisting of thirty days, will end on the 1st of [v.04 p.0996] January. The 2nd of January is therefore the day of the new moon, which is indicated by the epact twenty-nine. In like manner, if the new moon fell on the 4th of December, the epact of the following year would be twenty-eight, which, to indicate the day of next new moon, must correspond to the 3rd of January.

When the epact of the year is known, the days on which the new moons occur throughout the whole year are shown by Table IV., which is called the *Gregorian Calendar of Epacts*. For example, the golden number of the year 1832 is $((1832 + 1) / 19)_r = 9$, and the epact, as found in Table III., is twenty-eight. This epact occurs at the 3rd of January, the 2nd of February, the 3rd of March, the 2nd of April, the 1st of May, &c., and these days are consequently the days of the ecclesiastical new moons in 1832. The astronomical new moons generally take place one or two days, sometimes even three days, earlier than those of the calendar.

There are some artifices employed in the construction of this table, to which it is necessary to pay attention. The thirty epacts correspond to the thirty days of a full lunar month; but the lunar months consist of twenty-nine and thirty days alternately, therefore in six months of the year the thirty epacts must correspond only to twenty-nine days. For this reason the epacts twenty-five and twenty-four are placed together, so as to belong only to one day in the months of February, April, June, August, September and November, and in the same months another 25′, distinguished by an accent, or by being printed in a different character, is placed beside 26, and belongs to the same day. The reason for doubling the 25 was to prevent the new moons from being indicated in the calendar as happening twice on the same day in the course of the lunar cycle, a thing which actually cannot take place. For example, if we observe the line B in Table III., we shall see that it contains both the epacts twenty-four and twenty-five, so that if these correspond to the same day of the month, two new moons would be indicated as happening on that day within nineteen years. Now the three epacts 24, 25, 26, can never occur in the same line; therefore in those lines in which 24 and 25 occur, the 25 is accented, and placed in the calendar beside 26. When 25 and 26 occur in the same line of epacts, the 25 is not accented, and in the calendar stands beside 24. The lines of epacts in which 24 and 25 both occur, are those which are marked by one of the eight letters *b*, *e*, *k*, *n*, *r*, B, E, N, in all of which 25′ stands in a column corresponding to a golden number higher than 11. There are also eight lines in which 25 and 26 occur, namely, *c*, *f*, *l*, *p*, *s*, C, F, P. In the other 14 lines, 25 either does not occur at all, or it occurs in a line in which neither 24 nor 26 is found. From this it appears that if the golden number of the year exceeds 11, the epact 25, in six months of the year, must correspond to the same day in the calendar as 26; but if the golden number does not exceed 11, that epact must correspond to the same day as 24. Hence the reason for distinguishing 25 and 25′. In using the calendar, if the epact of the year is 25, and the golden number not above 11, take 25; but if the golden number exceeds 11, take 25′.

Another peculiarity requires explanation. The epact 19′ (also distinguished by an accent or different character) is placed in the same line with 20 at the 31st of December. It is, however, only used in those years in which the epact 19 concurs with the golden number 19. When the golden number is 19, that is to say, in the last year of the lunar cycle, the supplementary month contains only 29 days. Hence, if in that year the epact should be 19, a new moon would fall on the 2nd of December, and the lunation would terminate on the 30th, so that the next new moon would arrive on the 31st. The epact of the year, therefore, or 19, must stand beside that day, whereas, according to the regular order, the epact corresponding to the 31st of December is 20; and this is the reason for the distinction.

TABLE III. *Extended Table of Epacts.*

Years.	Index.	Golden Numbers.																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1700 1800 8700	C	*	11	22	3	14	25	6	17	28	9	20	1	12	23	4	15	26	7	18
1900 2000 2100	B	29	10	21	2	13	24	5	16	27	8	19	*	11	22	3	14	25′	6	17
2200 2400	A	28	9	20	1	12	23	4	15	26	7	18	29	10	21	2	13	24	5	16
2300 2500	u	27	8	19	*	11	22	3	14	25	6	17	28	9	20	1	12	23	4	15
2600 2700 2800	t	26	7	18	29	10	21	2	13	24	5	16	27	8	19	*	11	22	3	14
2900 3000	s	25	6	17	28	9	20	1	12	23	4	15	26	7	18	29	10	21	2	13
3100 3200 3300	r	24	5	16	27	8	19	*	11	22	3	14	25′	6	17	28	9	20	1	12
3400 3600	q	23	4	15	26	7	18	29	10	21	2	13	24	5	16	27	8	19	*	11
3500 3700	p	22	3	14	25	6	17	28	9	20	1	12	23	4	15	26	7	18	29	10
3800 3900 4000	n	21	2	13	24	5	16	27	8	19	*	11	22	3	14	25′	6	17	28	9
4100	m	20	1	12	23	4	15	26	7	18	29	10	21	2	13	24	5	16	27	8
4200 4300 4400	l	19	*	11	22	3	14	25	6	17	28	9	20	1	12	23	4	15	26	7
4500 4600	k	18	29	10	21	2	13	24	5	16	27	8	19	*	11	22	3	14	25′	6
4700 4800 4900	i	17	28	9	20	1	12	23	4	15	26	7	18	29	10	21	2	13	24	5
5000 5200	h	16	27	8	19	*	11	22	3	14	25	6	17	28	9	20	1	12	23	4
5100 5300	g	15	26	7	18	29	10	21	2	13	24	5	16	27	8	19	*	11	22	3

5400 5500 5600	f	14	25	6	17	28	9	20	1	12	23	4	15	26	7	18	29	10	21	2
5700 5800	e	13	24	5	16	27	8	19	*	11	22	3	14	25′	6	17	28	9	20	1
5900 6000 6100	d	12	23	4	15	26	7	18	29	10	21	2	13	24	5	16	27	8	19	*
6200 6400	c	11	22	3	14	25	6	17	28	9	20	1	12	23	4	15	26	7	18	29
6300 6500	b	10	21	2	13	24	5	16	27	8	19	*	11	22	3	14	25′	6	17	28
6600 6800	a	9	20	1	12	23	4	15	26	7	18	29	10	21	2	13	24	5	16	27
6700 6900	P	8	19	*	11	22	3	14	25	6	17	28	9	20	1	12	23	4	15	26
7000 7100 7200	N	7	18	29	10	21	2	13	24	5	16	27	8	19	*	11	22	3	14	25′
7300 7400	M	6	17	28	9	20	1	12	23	4	15	26	7	18	29	10	21	2	13	24
7500 7600 7700	H	5	16	27	8	19	*	11	22	3	14	25	6	17	28	9	20	1	12	23
7800 8000	G	4	15	26	7	18	29	10	21	2	13	24	5	16	27	8	19	*	11	22
7900 8100	F	3	14	25	6	17	28	9	20	1	12	23	4	15	26	7	18	29	10	21
8200 8300 8400	E	2	13	24	5	16	27	8	19	*	11	22	3	14	25′	6	17	28	9	20
1500 1600 8500	D	1	12	23	4	15	26	7	18	29	10	21	2	13	24	5	16	27	8	19

As an example of the use of the preceding tables, suppose it were required to determine the moon's age on the 10th of April 1832. In 1832 the golden number is $((1832 + 1) / 19)_r = 9$ and the line of epacts belonging to the century is C. In Table III, under 9, and in the line C, we find the epact 28. In the calendar, Table IV., look for April, and the epact 28 is found opposite the second day. The 2nd of April is therefore
[v.04 p.0997] the first day of the moon, and the 10th is consequently the ninth day of the moon. Again, suppose it were required to find the moon's age on the 2nd of December in the year 1916. In this case the golden number is $((1916 + 1) / 19)_r = 17$, and in Table III., opposite to 1900, the line of epacts is B. Under 17, in line B, the epact is 25′. In the calendar this epact first occurs before the 2nd of December at the 26th of November. The 26th of November is consequently the first day of the moon, and the 2nd of December is therefore the seventh day.

Easter.—The next, and indeed the principal use of the calendar, is to find Easter, which, according to the traditional regulation of the council of Nice, must be determined from the following conditions:—*1st*, Easter must be celebrated on a Sunday; *2nd*, this Sunday must *follow* the 14th day of the paschal moon, so that if the 14th of the paschal moon falls on a Sunday then Easter must be celebrated on the Sunday following; *3rd*, the paschal moon is that of which the 14th day falls on or next follows the day of the vernal equinox; *4th* the equinox is fixed invariably in the calendar on the 21st of March. Sometimes a misunderstanding has arisen from not observing that this regulation is to be construed according to the tabular full moon as determined from the epact, and not by the true full moon, which, in general, occurs one or two days earlier.

From these conditions it follows that the paschal full moon, or the 14th of the paschal moon, cannot happen before the 21st of March, and that Easter in consequence cannot happen before the 22nd of March. If the 14th of the moon falls on the 21st, the new moon must fall on the 8th; for 21 - 13 = 8; and the paschal new moon cannot happen before the 8th; for suppose the new moon to fall on the 7th, then the full moon would arrive on the 20th, or the day before the equinox. The following moon would be the paschal moon. But the fourteenth of this moon falls at the latest on the 18th of April, or 29 days after the 20th of March; for by reason of the double epact that occurs at the 4th and 5th of April, this lunation has only 29 days. Now, if in this case the 18th of April is Sunday, then Easter must be celebrated on the following Sunday, or the 25th of April. Hence Easter Sunday cannot happen earlier than the 22nd of March, or later than the 25th of April.

Hence we derive the following rule for finding Easter Sunday from the tables:—*1st*, Find the golden number, and, from Table III., the epact of the proposed year. *2nd*, Find in the calendar (Table IV.) the first day after the 7th of March which corresponds to the epact of the year; this will be the first day of the paschal moon, *3rd*, Reckon thirteen days after that of the first of the moon, the following will be the 14th of the moon or the day of the full paschal moon. *4th*, Find from Table I. the dominical letter of the year, and observe in the calendar the first day, after the fourteenth of the moon, which corresponds to the dominical letter; this will be Easter Sunday.

TABLE IV.—*Gregorian Calendar*.

Days.	Jan.		Feb.		March.		April.		May.		June.	
	E	L	E	L	E	L	E	L	E	L	E	L
1	*	A	29	D	*	D	29	G	28	B	27	E
2	29	B	28	E	29	E	28	A	27	C	25 26	F
3	28	C	27	F	28	F	27	B	26	D	25 24	G
4	27	D	25 26	G	27	G	25′26	C	25′25	E	23	A
5	26	E	25 24	A	26	A	25 24	D	24	F	22	B
6	25′25	F	23	B	25′25	B	23	E	23	G	21	C
7	24	G	22	C	24	C	22	F	22	A	20	D
8	23	A	21	D	23	D	21	G	21	B	19	E
9	22	B	20	E	22	E	20	A	20	C	18	F
10	21	C	19	F	21	F	19	B	19	D	17	G
11	20	D	18	G	20	G	18	C	18	E	16	A
12	19	E	17	A	19	A	17	D	17	F	15	B
13	18	F	16	B	18	B	16	E	16	G	14	C
14	17	G	15	C	17	C	15	F	15	A	13	D
15	16	A	14	D	16	D	14	G	14	B	12	E
16	15	B	13	E	15	E	13	A	13	C	11	F
17	14	C	12	F	14	F	12	B	12	D	10	G
18	13	D	11	G	13	G	11	C	11	E	9	A
19	12	E	10	A	12	A	10	D	10	F	8	B
20	11	F	9	B	11	B	9	E	9	G	7	C

21	10	G	8	C	10	C	8	F	8	A	6	D
22	9	A	7	D	9	D	7	G	7	B	5	E
23	8	B	6	E	8	E	6	A	6	C	4	F
24	7	C	5	F	7	F	5	B	5	D	3	G
25	6	D	4	G	6	G	4	C	4	E	2	A
26	5	E	3	A	5	A	3	D	3	F	1	B
27	4	F	2	B	4	B	2	E	2	G	*	C
28	3	G	1	C	3	C	1	F	1	A	29	D
29	2	A			2	D	*	G	*	B	28	E
30	1	B			1	E	29	A	29	C	27	F
31	*	C			*	F			28	D		

Days.	July.		August.		Sept.		October.		Nov.		Dec.	
	E	L	E	L	E	L	E	L	E	L	E	L
1	26	G	25 24	C	23	F	22	A	21	D	20	F
2	25′25	A	23	D	22	G	21	B	20	E	19	G
3	24	B	22	E	21	A	20	C	19	F	18	A
4	23	C	21	F	20	B	19	D	18	G	17	B
5	22	D	20	G	19	C	18	E	17	A	16	C
6	21	E	19	A	18	D	17	F	16	B	15	D
7	20	F	18	B	17	E	16	G	15	C	14	E
8	19	G	17	C	16	F	15	A	14	D	13	F
9	18	A	16	D	15	G	14	B	13	E	12	G
10	17	B	15	E	14	A	13	C	12	F	11	A
11	16	C	14	F	13	B	12	D	11	G	10	B
12	15	D	13	G	12	C	11	E	10	A	9	C
13	14	E	12	A	11	D	10	F	9	B	8	D
14	13	F	11	B	10	E	9	G	8	C	7	E
15	12	G	10	C	9	F	8	A	7	D	6	F
16	11	A	9	D	8	G	7	B	6	E	5	G
17	10	B	8	E	7	A	6	C	5	F	4	A
18	9	C	7	F	6	B	5	D	4	G	3	B
19	8	D	6	G	5	C	4	E	3	A	2	C
20	7	E	5	A	4	D	3	F	2	B	1	D
21	6	F	4	B	3	E	2	G	1	C	*	E
22	5	G	3	C	2	F	1	A	*	D	29	F
23	4	A	2	D	1	G	*	B	29	E	28	G
24	3	B	1	E	*	A	29	C	28	F	27	A
25	2	C	*	F	29	B	28	D	27	G	26	B
26	1	D	29	G	28	C	27	E	25′26	A	25′25	C
27	*	E	28	A	27	D	26	F	25 24	B	24	D
28	29	F	27	B	25′26	E	25′25	G	23	C	23	E
29	28	G	26	C	25 24	F	24	A	22	D	22	F
30	27	A	25′25	D	23	G	23	B	21	E	21	G
31	25′26	B	24	E			22	C			19′20	A

Example.—Required the day on which Easter Sunday falls in the year 1840? *1st*, For this year the golden number is $((1840 + 1) / 19)_r = 17$, and the epact (Table III. line C) is 26. *2nd*, After the 7th of March the epact 26 first occurs in Table III. at the 4th of April, which, therefore, is the day of the new moon. *3rd*, Since the new moon falls on the 4th, the full moon is on the 17th (4 + 13 = 17). *4th*, The dominical letters of 1840 are E, D (Table I.), of which D must be taken, as E belongs only to January and February. After the 17th of April D first occurs in the calendar (Table IV.) at the 19th. Therefore, in 1840, Easter Sunday falls on the 19th of April. The operation is in all cases much facilitated by means of the table on next page.

Such is the very complicated and artificial, though highly ingenious method, invented by Lilius, for the determination of Easter and the other movable feasts. Its principal, though perhaps least obvious advantage, consists in its being entirely independent of astronomical tables, or indeed of any celestial phenomena whatever; so that all chances of disagreement arising from the inevitable errors of tables, or
[v.04 p.0998] the uncertainty of observation, are avoided, and Easter determined without the possibility of mistake. But this advantage is only procured by the sacrifice of some accuracy; for notwithstanding the cumbersome apparatus employed, the conditions of the problem are not always exactly satisfied, nor is it possible that they can be always satisfied by any similar method of proceeding. The equinox is fixed on the 21st of March, though the sun enters Aries generally on the 20th of that month, sometimes even on the 19th. It is accordingly quite possible that a full moon may arrive after the true equinox, and yet precede the 21st of March. This, therefore, would not be the paschal moon of the calendar, though it undoubtedly ought to be so if the intention of the council of Nice were rigidly followed. The new moons indicated by the epacts also differ from the astronomical new moons, and even from the mean new moons, in general by one or two days. In imitation of the Jews, who counted the time of the new moon, not from the moment of the actual phase, but from the time the moon first became visible after the conjunction, the fourteenth day of the moon is regarded as the full moon: but the moon is in opposition generally on the 16th day; therefore, when the new moons of the calendar nearly concur with the true new moons, the full moons are considerably in error. The epacts are also placed so as to indicate the full moons generally one or two days after the true full moons; but this was done purposely, to avoid the chance of concurring with the Jewish passover, which the framers of the calendar seem to have considered a greater evil than that of celebrating Easter a week too late.

TABLE V.—*Perpetual Table, showing Easter.*

Epact.	Dominical Letter. For Leap Years use the SECOND Letter.						
	A	B	C	D	E	F	G
*	Apr. 16	Apr. 17	Apr. 18	Apr. 19	Apr. 20	Apr. 14	Apr. 15
1	" 16	" 17	" 18	" 19	" 13	" 14	" 15
2	" 16	" 17	" 18	" 12	" 13	" 14	" 15
3	" 16	" 17	" 11	" 12	" 13	" 14	" 15
4	" 16	" 10	" 11	" 12	" 13	" 14	" 15
5	" 9	" 10	" 11	" 12	" 13	" 14	" 15
6	" 9	" 10	" 11	" 12	" 13	" 14	" 8
7	" 9	" 10	" 11	" 12	" 13	" 7	" 8
8	" 9	" 10	" 11	" 12	" 6	" 7	" 8
9	" 9	" 10	" 11	" 5	" 6	" 7	" 8
10	" 9	" 10	" 4	" 5	" 6	" 7	" 8
11	" 9	" 3	" 4	" 5	" 6	" 7	" 8
12	" 2	" 3	" 4	" 5	" 6	" 7	" 8
13	" 2	" 3	" 4	" 5	" 6	" 7	" 1
14	" 2	" 3	" 4	" 5	" 6	Mar. 31	" 1
15	" 2	" 3	" 4	" 5	Mar. 30	" 31	" 1
16	" 2	" 3	" 4	Mar. 29	" 30	" 31	" 1
17	" 2	" 3	Mar. 28	" 29	" 30	" 31	" 1
18	" 2	Mar. 27	" 28	" 29	" 30	" 31	" 1
19	Mar. 26	" 27	" 28	" 29	" 30	" 31	" 1
20	" 26	" 27	" 28	" 29	" 30	" 31	Mar. 25
21	" 26	" 27	" 28	" 29	" 30	" 24	" 25
22	" 26	" 27	" 28	" 29	" 23	" 24	" 25
23	" 26	" 27	" 28	" 22	" 23	" 24	" 25
24	Apr. 23	Apr. 24	Apr. 25	Apr. 19	Apr. 20	Apr. 21	Apr. 22
25	" 23	" 24	" 25	" 19	" 20	" 21	" 22
26	" 23	" 24	" 18	" 19	" 20	" 21	" 22
27	" 23	" 17	" 18	" 19	" 20	" 21	" 22
28	" 16	" 17	" 18	" 19	" 20	" 21	" 22
29	" 16	" 17	" 18	" 19	" 20	" 21	" 15

We will now show in what manner this whole apparatus of methods and tables may be dispensed with, and the Gregorian calendar reduced to a few simple formulae of easy computation.

And, first, to find the dominical letter. Let L denote the number of the dominical letter of any given year of the era. Then, since every year which is not a leap year ends with the same day as that with which it began, the dominical letter of the following year must be L - 1, retrograding one letter every common year. After x years, therefore, the number of the letter will be L - x. But as L can never exceed 7, the number x will always exceed L after the first seven years of the era. In order, therefore, to render the subtraction possible, L must be increased by some multiple of 7, as $7m$, and the formula then becomes $7m$ + L - x. In the year preceding the first of the era, the dominical letter was C; for that year, therefore, we have L = 3; consequently for any succeeding year x, L = $7m$ + 3 - x, the years being all supposed to consist of 365 days. But every fourth year is a leap year, and the effect of the intercalation is to throw the dominical letter one place farther back. The above expression must therefore be diminished by the number of units in $x/4$, or by $(x/4)_w$ (this notation being used to denote the quotient, *in a whole number*, that arises from dividing x by 4). Hence in the Julian calendar the dominical letter is given by the equation

$$\mathrm{L} = 7m + 3 - x - \left(\frac{x}{4}\right)_w.$$

This equation gives the dominical letter of any year from the commencement of the era to the Reformation. In order to adapt it to the Gregorian calendar, we must first add the 10 days that were left out of the year 1582; in the second place we must add one day for every century that has elapsed since 1600, in consequence of the secular suppression of the intercalary day; and lastly we must deduct the units contained in a fourth of the same number, because every fourth centesimal year is still a leap year. Denoting, therefore, the number of the century (or the date after the two right-hand digits have been struck out) by c, the value of L must be increased by 10 + (c - 16) - $((c - 16) / 4)_w$. We have then

$$\mathrm{L} = 7m + 3 - x - \left(\frac{x}{4}\right)_w + 10 + (c - 16) - \left(\frac{c - 16}{4}\right)_w;$$

that is, since 3 + 10 = 13 or 6 (the 7 days being rejected, as they do not affect the value of L),

$$\mathrm{L} = 7m + 6 - x - \left(\frac{x}{4}\right)_w + (c - 16) - \left(\frac{c - 16}{4}\right)_w.$$

This formula is perfectly general, and easily calculated.

As an example, let us take the year 1839. In this case,

$$x = 1839, \left(\frac{x}{4}\right)_w = \left(\frac{1839}{4}\right)_w = 459,\ c = 18,\ c - 16 = 2, \text{ and } \left(\frac{c - 16}{4}\right)_w = 0.$$

Hence

L = 7*m* + 6 - 1839 - 459 + 2 - 0
L = 7*m* - 2290 = 7 × 328 - 2290.
L = 6 = letter F.

The year therefore begins with Tuesday. It will be remembered that in a leap year there are always two dominical letters, one of which is employed till the 29th of February, and the other till the end of the year. In this case, as the formula supposes the intercalation already made, the resulting letter is that which applies after the 29th of February. Before the intercalation the dominical letter had retrograded one place less. Thus for 1840 the formula gives D; during the first two months, therefore, the dominical letter is E.

In order to investigate a formula for the epact, let us make

E = the true epact of the given year;

J = the Julian epact, that is to say, the number the epact would have been if the Julian year had been still in use and the lunar cycle had been exact;

S = the correction depending on the solar year;

M = the correction depending on the lunar cycle;

then the equation of the epact will be

E = J + S + M;

so that E will be known when the numbers J, S, and M are determined.

The epact J depends on the golden number N, and must be determined from the fact that in 1582, the first year of the reformed calendar, N was 6, and J 26. For the following years, then, the golden numbers and epacts are as follows:

1583, N = 7, J = 26 + 11 - 30 = 7;
1584, N = 8, J = 7 + 11 = 18;
1585, N = 9, J = 18 + 11 = 29;
1586, N = 10, J = 29 + 11 - 30 = 10;

and, therefore, in general J = $((26 + 11(N - 6)) / 30)_r$. But the numerator of this fraction becomes by reduction 11 N - 40 or 11 N - 10 (the 30 being rejected, as the remainder only is sought) = N + 10(N - 1); therefore, ultimately,

$$J = \left(\frac{N + 10(N - 1)}{30}\right)_r.$$

On account of the solar equation S, the epact J must be diminished by unity every centesimal year, excepting always the fourth. After *x* centuries, therefore, it must be diminished by $x - (x/4)_w$. Now, as 1600 was a leap year, the first correction of the Julian intercalation took place in 1700; hence, taking *c* to denote
[v.04 p.0999] the number of the century as before, the correction becomes $(c - 16) - ((c - 16) / 4)_w$, which must be deducted from J. We have therefore

$$S = -(c - 16) + \left(\frac{c - 16}{4}\right)_w.$$

With regard to the lunar equation M, we have already stated that in the Gregorian calendar the epacts are increased by unity at the end of every period of 300 years seven times successively, and then the increase takes place once at the end of 400 years. This gives eight to be added in a period of twenty-five centuries, and $x/25$ in *x* centuries. But $8x/25 = 1/3\ (x - x/25)$. Now, from the manner in which the intercalation is directed to be made (namely, seven times successively at the end of 300 years, and once at the end of 400), it is evident that the fraction $x/25$ must amount to unity when the number of centuries amounts to twenty-four. In like manner, when the number of centuries is 24 + 25 = 49, we must have $x/25 = 2$; when the number of centuries is 24 + 2 × 25 = 74, then $x/25 = 3$; and, generally, when the number of centuries is 24 + *n* × 25, then $x/25 = n + 1$. Now this is a condition which will evidently be expressed in general by the formula $n - ((n + 1) / 25)_w$. Hence the correction of the epact, or the number of days to be intercalated after *x* centuries reckoned from the commencement of one of the periods of twenty-five centuries, is $\{(x - ((x+1) / 25)_w) / 3\}_w$. The last period of twenty-five centuries terminated with 1800; therefore, in any succeeding year, if c be the number of the century, we shall have $x = c - 18$ and $x + 1 = c - 17$. Let $((c - 17) / 25)_w = a$, then for all years after 1800 the value of M will be given by the formula $((c - 18 - a) / 3)_w$; therefore, counting from the beginning of the calendar in 1582,

$$M = \left\{\frac{c - 15 - a}{3}\right\}_w.$$

By the substitution of these values of J, S and M, the equation of the epact becomes

$$E = \left(\frac{N + 10(N - 1)}{30}\right)_r - (c - 16) + \left(\frac{c - 16}{4}\right)_w + \left(\frac{c - 15 - a}{3}\right)_w.$$

It may be remarked, that as $a = ((c - 17) / 25)_w$, the value of *a* will be 0 till $c - 17 = 25$ or $c = 42$; therefore, till the year 4200, *a* may be neglected in the computation. Had the anticipation of the new moons been taken, as it ought to have been, at one day in 308 years instead of 312½, the lunar equation would have occurred only twelve times in 3700 years, or eleven times successively at the end of 300 years, and then at the end of 400. In strict accuracy, therefore, *a* ought to have no value till $c - 17 = 37$, or $c = 54$, that is to

say, till the year 5400. The above formula for the epact is given by Delambre (*Hist. de l'astronomie moderne,* t. i. p. 9); it may be exhibited under a variety of forms, but the above is perhaps the best adapted for calculation. Another had previously been given by Gauss, but inaccurately, inasmuch as the correction depending on ''a'' was omitted.

Having determined the epact of the year, it only remains to find Easter Sunday from the conditions already laid down. Let

P = the number of days from the 21st of March to the 15th of the paschal moon, which is the first day on which Easter Sunday can fall;

p = the number of days from the 21st of March to Easter Sunday;

L = the number of the dominical letter of the year;

l = letter belonging to the day on which the 15th of the moon falls:

then, since Easter is the Sunday following the 14th of the moon, we have

$$p = \mathrm{P} + (\mathrm{L} - l),$$

which is commonly called the *number of direction*.

The value of L is always given by the formula for the dominical letter, and P and l are easily deduced from the epact, as will appear from the following considerations.

When P = 1 the full moon is on the 21st of March, and the new moon on the 8th (21 - 13 = 8), therefore the moon's age on the 1st of March (which is the same as on the 1st of January) is twenty-three days; the epact of the year is consequently twenty-three. When P = 2 the new moon falls on the ninth, and the epact is consequently twenty-two; and, in general, when P becomes $1 + x$, E becomes $23 - x$, therefore $\mathrm{P} + \mathrm{E} = 1 + x + 23 - x = 24$, and P = 24 - E. In like manner, when P = 1, l = D = 4; for D is the dominical letter of the calendar belonging to the 22nd of March. But it is evident that when l is increased by unity, that is to say, when the full moon falls a day later, the epact of the year is diminished by unity; therefore, in general, when $l = 4 + x$, E = 23 - x, whence, l + E = 27 and l = 27 - E. But P can never be less than 1 nor l less than 4, and in both cases E = 23. When, therefore, E is greater than 23, we must add 30 in order that P and l may have positive values in the formula P = 24 - E and l = 27 - E. Hence there are two cases.

$$\text{When E} < 24, \begin{cases} \mathrm{P} = 24 - \mathrm{E} \\ l = 27 - \mathrm{E}, \text{ or } \left(\dfrac{27 - \mathrm{E}}{7}\right)_r. \end{cases}$$

$$\text{When E} > 23, \begin{cases} \mathrm{P} = 54 - \mathrm{E} \\ l = 57 - \mathrm{E}, \text{ or } \left(\dfrac{57 - \mathrm{E}}{7}\right)_r. \end{cases}$$

By substituting one or other of these values of P and l, according as the case may be, in the formula p = P + (L - l), we shall have p, or the number of days from the 21st of March to Easter Sunday. It will be remarked, that as L - l cannot either be 0 or negative, we must add 7 to L as often as may be necessary, in order that L - l may be a positive whole number.

By means of the formulae which we have now given for the dominical letter, the golden number and the epact, Easter Sunday may be computed for any year after the Reformation, without the assistance of any tables whatever. As an example, suppose it were required to compute Easter for the year 1840. By substituting this number in the formula for the dominical letter, we have x = 1840, c - 16 = 2, $((c - 16) / 4)_w = 0$, therefore

$$\begin{aligned} \mathrm{L} &= 7m + 6 - 1840 - 460 + 2 \\ &= 7m - 2292 \\ &= 7 \times 328 - 2292 = 2296 - 2292 = 4 \\ \mathrm{L} &= 4 = \text{letter D} \ldots (1). \end{aligned}$$

For the golden number we have $\mathrm{N} = ((1840 + 1) / 19)_r$; therefore N = 17 . . . (2).

For the epact we have

$$\left(\frac{\mathrm{N} + 10(\mathrm{N} - 1)}{30}\right)_r = \left(\frac{17 + 160}{30}\right)_r = \left(\frac{177}{30}\right)_r = 27;$$

likewise c - 16 = 18 - 16 = 2, $\dfrac{c - 15}{3} = 1$, a = 0; therefore

$$\mathrm{E} = 27 - 2 + 1 = 26 \ldots (3).$$

Now since E > 23, we have for P and l,

$$\mathrm{P} = 54 - \mathrm{E} = 54 - 26 = 28,$$

$$l = \left(\frac{57 - \mathrm{E}}{7}\right)_r = \left(\frac{57 - 26}{7}\right)_r = \left(\frac{31}{7}\right)_r = 3;$$

consequently, since p = P + (L - l),

$$\mathrm{p} = 28 + (4 - 3) = 29;$$

that is to say, Easter happens twenty-nine days after the 21st of March, or on the 19th April, the same result as was before found from the tables.

The principal church feasts depending on Easter, and the times of their celebration are as follows:—

Septuagesima Sunday First Sunday in Lent Ash Wednesday	is	9 weeks 6 weeks 46 days	before Easter.
Rogation Sunday Ascension day or Holy Thursday Pentecost or Whitsunday Trinity Sunday	is	5 weeks 39 days 7 weeks 8 weeks	after Easter.

The Gregorian calendar was introduced into Spain, Portugal and part of Italy the same day as at Rome. In France it was received in the same year in the month of December, and by the Catholic states of Germany the year following. In the Protestant states of Germany the Julian calendar was adhered to till the year 1700, when it was decreed by the diet of Regensburg that the new style and the Gregorian correction of the intercalation should be adopted. Instead, however, of employing the golden numbers and epacts for the determination of Easter and the movable feasts, it was resolved that the equinox and the paschal moon should be found by astronomical computation from the Rudolphine tables. But this method, though at first view it may appear more accurate, was soon found to be attended with numerous inconveniences, and was at length in 1774 abandoned at the instance of Frederick II., king of Prussia. In Denmark and Sweden the reformed calendar was received about the same time as in the Protestant states of Germany. It is remarkable that Russia still adheres to the Julian reckoning.

In Great Britain the alteration of the style was for a long time successfully opposed by popular prejudice. The inconvenience, however, of using a different date from that employed by the greater part of Europe in
[v.04 p.1000]
matters of history and chronology began to be generally felt; and at length the Calendar (New Style) Act 1750 was passed for the adoption of the new style in all public and legal transactions. The difference of the two styles, which then amounted to eleven days, was removed by ordering the day following the 2nd of September of the year 1752 to be accounted the 14th of that month; and in order to preserve uniformity in future, the Gregorian rule of intercalation respecting the secular years was adopted. At the same time, the commencement of the legal year was changed from the 25th of March to the 1st of January. In Scotland, January 1st was adopted for New Year's Day from 1600, according to an act of the privy council in December 1599. This fact is of importance with reference to the date of legal deeds executed in Scotland between that period and 1751, when the change was effected in England. With respect to the movable feasts, Easter is determined by the rule laid down by the council of Nice; but instead of employing the new moons and epacts, the golden numbers are prefixed to the days of the *full* moons. In those years in which the line of epacts is changed in the Gregorian calendar, the golden numbers are removed to different days, and of course a new table is required whenever the solar or lunar equation occurs. The golden numbers have been placed so that Easter may fall on the same day as in the Gregorian calendar. The calendar of the church of England is therefore from century to century the same in form as the old Roman calendar, excepting that the golden numbers indicate the full moons instead of the new moons.

Hebrew Calendar.—In the construction of the Jewish calendar numerous details require attention. The calendar is dated from the Creation, which is considered to have taken place 3760 years and 3 months before the commencement of the Christian era. The year is luni-solar, and, according as it is ordinary or embolismic, consists of twelve or thirteen lunar months, each of which has 29 or 30 days. Thus the duration of the ordinary year is 354 days, and that of the embolismic is 384 days. In either case, it is sometimes made a day more, and sometimes a day less, in order that certain festivals may fall on proper days of the week for their due observance. The distribution of the embolismic years, in each cycle of 19 years, is determined according to the following rule:—

The number of the Hebrew year (Y) which has its commencement in a Gregorian year (x) is obtained by the addition of 3761 years; that is, $Y = x + 3761$. Divide the Hebrew year by 19; then the quotient is the number of the last completed cycle, and the remainder is the year of the current cycle. If the remainder be 3, 6, 8, 11, 14, 17 or 19 (0), the year is embolismic; if any other number, it is ordinary. Or, otherwise, if we find the remainder

$$R=\left(\frac{7Y+1}{19}\right)_r$$

the year is embolismic when $R < 7$.

The calendar is constructed on the assumptions that the mean lunation is 29 days 12 hours 44 min. 3⅓ sec., and that the year commences on, or immediately after, the new moon following the autumnal equinox. The mean solar year is also assumed to be 365 days 5 hours 55 min. 25-25/57 sec., so that a cycle of nineteen of such years, containing 6939 days 16 hours 33 min. 3⅓ sec., is the exact measure of 235 of the assumed lunations. The year 5606 was the first of a cycle, and the mean new moon, appertaining to the 1st of Tisri for that year, was 1845, October 1, 15 hours 42 min. 43⅓ sec., as computed by Lindo, and adopting the civil mode of reckoning from the previous midnight. The times of all future new moons may consequently be deduced by successively adding 29 days 12 hours 44 min. 3⅓ sec. to this date.

To compute the times of the new moons which determine the commencement of successive years, it must be observed that in passing from an ordinary year the new moon of the following year is deduced by subtracting the interval that twelve lunations fall short of the corresponding Gregorian year of 365 or 366 days; and that, in passing from an embolismic year, it is to be found by adding the excess of thirteen lunations over the Gregorian year. Thus to deduce the new moon of Tisri, for the year immediately following any given year (Y), when Y is

ordinary, subtract $\binom{10}{11}$ days 15 hours 11 min. 20 sec.,

embolismic, add $\binom{18}{17}$ days 21 hours 32 min. 43½ sec.

the second-mentioned number of days being used, in each case, whenever the following or new Gregorian year is bissextile.

Hence, knowing which of the years are embolismic, from their ordinal position in the cycle, according to the rule before stated, the times of the commencement of successive years may be thus carried on indefinitely without any difficulty. But some slight adjustments will occasionally be needed for the reasons before assigned, viz. to avoid certain festivals falling on incompatible days of the week. Whenever the computed conjunction falls on a Sunday, Wednesday or Friday, the new year is in such case to be fixed on the day after. It will also be requisite to attend to the following conditions:—

If the computed new moon be after 18 hours, the following day is to be taken, and if that happen to be Sunday, Wednesday or Friday, it must be further postponed one day. If, for an ordinary year, the new moon falls on a Tuesday, as late as 9 hours 11 min. 20 sec., it is not to be observed thereon; and as it may not be held on a Wednesday, it is in such case to be postponed to Thursday. If, for a year immediately following an embolismic year, the computed new moon is on Monday, as late as 15 hours 30 min. 52 sec., the new year is to be fixed on Tuesday.

After the dates of commencement of the successive Hebrew years are finally adjusted, conformably with the foregoing directions, an estimation of the consecutive intervals, by taking the differences, will show the duration and character of the years that respectively intervene. According to the number of days thus found to be comprised in the different years, the days of the several months are distributed as in Table VI.

The signs + and - are respectively annexed to Hesvan and Kislev to indicate that the former of these months may sometimes require to have one day more, and the latter sometimes one day less, than the number of days shown in the table—the result, in every case, being at once determined by the total number of days that the year may happen to contain. An ordinary year may comprise 353, 354 or 355 days; and an embolismic year 383, 384 or 385 days. In these cases respectively the year is said to be imperfect, common or perfect. The intercalary month, Veadar, is introduced in embolismic years in order that Passover, the 15th day of Nisan, may be kept at its proper season, which is the full moon of the vernal equinox, or that which takes place after the sun has entered the sign Aries. It always precedes the following new year by 163 days, or 23 weeks and 2 days; and Pentecost always precedes the new year by 113 days, or 16 weeks and 1 day.

TABLE VI.—*Hebrew Months.*

Hebrew Month.	Ordinary Year.	Embolismic Year.
Tisri	30	30
Hesvan	29+	29+
Kislev	30-	30-
Tebet	29	29
Sebat	30	30
Adar	29	30
(Veadar)	(...)	(29)
Nisan	30	30
Yiar	29	29
Sivan	30	30
Tamuz	29	29
Ab	30	30
Elul	29	29
Total	354	384

The Gregorian epact being the age of the moon of Tebet at the beginning of the Gregorian year, it represents the day of Tebet which corresponds to January 1; and thus the approximate date of Tisri 1, the commencement of the Hebrew year, may be otherwise deduced by subtracting the epact from

$$\left.\begin{matrix}\text{Sept. 24}\\ \text{Oct. 24}\end{matrix}\right\} \text{after an} \left\{\begin{matrix}\text{ordinary}\\ \text{embolismic}\end{matrix}\right\} \text{Hebrew year.}$$

[v.04 p.1001] The result so obtained would in general be more accurate than the Jewish calculation, from which it may differ a day, as fractions of a day do not enter alike in these computations. Such difference may also in part be accounted for by the fact that the assumed duration of the solar year is 6 min. 39-25/57 sec. in excess of the true astronomical value, which will cause the dates of commencement of future Jewish years, so calculated, to advance forward from the equinox a day in error in 216 years. The lunations are estimated with much greater precision.

The following table is extracted from Woolhouse's *Measures, Weights and Moneys of all Nations*:—

TABLE VII.—*Hebrew Years.*

296 Cycle.				300 Cycle.				304 Cycle.			
Jewish Year	Number of Days	Commencement (1st of Tisri).		Jewish Year	Number of Days	Commencement (1st of Tisri).		Jewish Year	Number of Days	Commencement (1st of Tisri).	
5606	354	Thur.	2 Oct. 1845	5682	355	Mon.	3 Oct. 1921	5758	354	Thur.	2 Oct. 1997
07	355	Mon.	21 Sept. 1846	83	353	Sat.	23 Sept. 1922	59	355	Mon.	21 Sept. 1998
08	383	Sat.	11 Sept. 1847	84	384	Tues.	11 Sept. 1923	60	385	Sat.	11 Sept. 1999
09	354	Thur.	28 Sept. 1848	85	355	Mon.	29 Sept. 1924	61	353	Sat.	30 Sept. 2000
10	355	Mon.	17 Sept. 1849	86	355	Sat.	19 Sept. 1925	62	354	Tues.	18 Sept. 2001
11	385	Sat.	7 Sept. 1850	87	383	Thur.	9 Sept. 1926	63	385	Sat.	7 Sept. 2002

12	353	Sat.	27 Sept. 1851	88	354	Tues.	27 Sept. 1927	64	355	Sat.	27 Sept. 2003
13	384	Tues.	14 Sept. 1852	89	385	Sat.	15 Sept. 1928	65	383	Thur.	16 Sept. 2004
14	355	Mon.	3 Oct. 1853	90	353	Sat.	5 Oct. 1929	66	354	Tues.	4 Oct. 2005
15	355	Sat.	23 Sept. 1854	91	354	Tues.	23 Sept. 1930	67	355	Sat.	23 Sept. 2006
16	383	Thur.	13 Sept. 1855	92	385	Sat.	12 Sept. 1931	68	383	Thur.	13 Sept. 2007
17	354	Tues.	30 Sept. 1856	93	355	Sat.	1 Oct. 1932	69	354	Tues.	30 Sept. 2008
18	355	Sat.	19 Sept. 1857	94	354	Thur.	21 Sept. 1933	70	355	Sat.	19 Sept. 2009
19	385	Thur.	9 Sept. 1858	95	383	Mon.	10 Sept. 1934	71	385	Thur.	8 Sept. 2010
20	354	Thur.	29 Sept. 1859	96	355	Sat.	28 Sept. 1935	72	354	Thur.	29 Sept. 2011
21	353	Mon.	17 Sept. 1860	97	354	Thur.	17 Sept. 1936	73	353	Mon.	17 Sept. 2012
22	385	Thur.	5 Sept. 1861	98	385	Mon.	6 Sept. 1937	74	385	Thur.	5 Sept. 2013
23	354	Thur.	25 Sept. 1862	99	353	Mon.	26 Sept. 1938	75	354	Thur.	25 Sept. 2014
24	383	Mon.	14 Sept. 1863	5700	385	Thur.	14 Sept. 1939	76	385	Mon.	14 Sept. 2015
	297 Cycle.				301 Cycle.				305 Cycle.		
5625	355	Sat.	1 Oct. 1864	5701	354	Thur.	3 Oct. 1940	5777	353	Mon.	3 Oct. 2016
26	354	Thur.	21 Sept. 1865	02	355	Mon.	22 Sept. 1941	78	354	Thur.	21 Sept. 2017
27	385	Mon.	10 Sept. 1866	03	383	Sat.	12 Sept. 1942	79	385	Mon.	10 Sept. 2018
28	353	Mon.	30 Sept. 1867	04	354	Thur.	30 Sept. 1943	80	355	Mon.	30 Sept. 2019
29	354	Thur.	17 Sept. 1868	05	355	Mon.	18 Sept. 1944	81	353	Sat.	19 Sept. 2020
30	385	Mon.	6 Sept. 1869	06	383	Sat.	8 Sept. 1945	82	384	Tues.	7 Sept. 2021
31	355	Mon.	26 Sept. 1870	07	354	Thur.	26 Sept. 1946	83	355	Mon.	26 Sept. 2022
32	383	Sat.	16 Sept. 1871	08	385	Mon.	15 Sept. 1947	84	383	Sat.	16 Sept. 2023
33	354	Thur.	3 Oct. 1872	09	355	Mon.	4 Oct. 1948	85	355	Thur.	3 Oct. 2024
34	355	Mon.	22 Sept. 1873	10	353	Sat.	24 Sept. 1949	86	354	Tues.	23 Sept. 2025
35	383	Sat.	12 Sept. 1874	11	384	Tues.	12 Sept. 1950	87	385	Sat.	12 Sept. 2026
36	355	Thur.	30 Sept. 1875	12	355	Mon.	1 Oct. 1951	88	355	Sat.	2 Oct. 2027
37	354	Tues.	19 Sept. 1876	13	355	Sat.	20 Sept. 1952	89	354	Thur.	21 Sept. 2028
38	385	Sat.	8 Sept. 1877	14	383	Thur.	10 Sept. 1953	90	383	Mon.	10 Sept. 2029
39	355	Sat.	28 Sept. 1878	15	354	Tues.	28 Sept. 1954	91	355	Sat.	28 Sept. 2030
40	354	Thur.	18 Sept. 1879	16	355	Sat.	17 Sept. 1955	92	354	Thur.	18 Sept. 2031
41	383	Mon.	6 Sept. 1880	17	385	Thur.	6 Sept. 1956	93	383	Mon.	6 Sept. 2032
42	355	Sat.	24 Sept. 1881	18	354	Thur.	26 Sept. 1957	94	355	Sat.	24 Sept. 2033
43	383	Thur.	14 Sept. 1882	19	383	Mon.	15 Sept. 1958	95	385	Thur.	14 Sept. 2034
	298 Cycle.				302 Cycle.				306 Cycle.		
5644	354	Tues.	2 Oct. 1883	5720	355	Sat.	3 Oct. 1959	5796	354	Thur.	4 Oct. 2035
45	355	Sat.	20 Sept. 1884	21	354	Thur.	22 Sept. 1960	97	353	Mon.	22 Sept. 2036
46	385	Thur.	10 Sept. 1885	22	383	Mon.	11 Sept. 1961	98	385	Thur.	10 Sept. 2037
47	354	Thur.	30 Sept. 1886	23	355	Sat.	29 Sept. 1962	99	354	Thur.	30 Sept. 2038
48	353	Mon.	19 Sept. 1887	24	354	Thur.	19 Sept. 1963	5800	355	Mon.	19 Sept. 2039
49	385	Thur.	6 Sept. 1888	25	385	Mon.	7 Sept. 1964	01	383	Sat.	8 Sept. 2040
50	354	Thur.	26 Sept. 1889	26	353	Mon.	27 Sept. 1965	02	354	Thur.	26 Sept. 2041
51	383	Mon.	15 Sept. 1890	27	385	Thur.	15 Sept. 1966	03	385	Mon.	15 Sept. 2042
52	355	Sat.	3 Oct. 1891	28	354	Thur.	5 Oct. 1967	04	353	Mon.	5 Oct. 2043
53	354	Thur.	22 Sept. 1892	29	355	Mon.	23 Sept. 1968	05	355	Thur.	22 Sept. 2044
54	385	Mon.	11 Sept. 1893	30	383	Sat.	13 Sept. 1969	06	384	Tues.	12 Sept. 2045
55	353	Mon.	1 Oct. 1894	31	354	Thur.	1 Oct. 1970	07	355	Mon.	1 Oct. 2046
56	355	Thur.	19 Sept. 1895	32	355	Mon.	20 Sept. 1971	08	353	Sat.	21 Sept. 2047
57	384	Tues.	8 Sept. 1896	33	383	Sat.	9 Sept. 1972	09	384	Tues.	8 Sept. 2048
58	355	Mon.	27 Sept. 1897	34	355	Thur.	27 Sept. 1973	10	355	Mon.	27 Sept. 2049
59	353	Sat.	17 Sept. 1898	35	354	Tues.	17 Sept. 1974	11	355	Sat.	17 Sept. 2050
60	384	Tues.	5 Sept. 1899	36	385	Sat.	6 Sept. 1975	12	383	Thur.	7 Sept. 2051
61	355	Mon.	24 Sept. 1900	37	353	Sat.	25 Sept. 1976	13	354	Tues.	24 Sept. 2052
62	383	Sat	14 Sept. 1901	38	384	Tues.	13 Sept. 1977	14	385	Sat.	13 Sept. 2053
	299 Cycle.				303 Cycle.				307 Cycle.		
5663	355	Thur.	2 Oct. 1902	5739	355	Mon.	2 Oct. 1978	5815	355	Sat.	3 Oct. 2054
64	354	Tues.	22 Sept. 1903	40	355	Sat.	22 Sept. 1979	16	354	Thur.	23 Sept. 2055
65	385	Sat.	10 Sept. 1904	41	383	Thur.	11 Sept. 1980	17	383	Mon.	11 Sept. 2056
66	355	Sat.	30 Sept. 1905	42	354	Tues.	29 Sept. 1981	18	355	Sat.	29 Sept. 2057
67	354	Thur.	20 Sept. 1906	43	355	Sat.	18 Sept. 1982	19	354	Thur.	19 Sept. 2058
68	383	Mon.	9 Sept. 1907	44	385	Thur.	8 Sept. 1983	20	383	Mon.	8 Sept. 2059
69	355	Sat.	26 Sept. 1908	45	354	Thur.	27 Sept. 1984	21	355	Sat.	25 Sept. 2060
70	383	Thur.	16 Sept. 1909	46	383	Mon.	16 Sept. 1985	22	385	Thur.	15 Sept. 2061
71	354	Tues.	4 Oct. 1910	47	355	Sat.	4 Oct. 1986	23	354	Thur.	5 Oct. 2062
72	355	Sat.	23 Sept. 1911	48	354	Thur.	24 Sept. 1987	24	353	Mon.	24 Sept. 2063
73	385	Thur.	12 Sept. 1912	49	383	Mon.	12 Sept. 1988	25	385	Thur.	11 Sept. 2064
74	354	Thur.	2 Oct. 1913	50	355	Sat.	30 Sept. 1989	26	354	Thur.	1 Oct. 2065
75	353	Mon.	21 Sept. 1914	51	354	Thur.	20 Sept. 1990	27	355	Mon.	20 Sept. 2066
76	385	Thur.	9 Sept. 1915	52	385	Mon.	9 Sept. 1991	28	383	Sat.	10 Sept. 2067
77	354	Thur.	28 Sept. 1916	53	353	Mon.	28 Sept. 1992	29	354	Thur.	27 Sept. 2068
78	355	Mon.	17 Sept. 1917	54	355	Thur.	16 Sept. 1993	30	355	Mon.	16 Sept. 2069
79	383	Sat.	7 Sept. 1918	55	384	Tues.	6 Sept. 1994	31	383	Sat.	6 Sept. 2070
80	354	Thur.	25 Sept. 1919	56	355	Mon.	25 Sept. 1995	32	355	Thur.	24 Sept. 2071
81	385	Mon.	13 Sept. 1920	57	383	Sat.	14 Sept. 1996	33	384	Tues.	13 Sept. 2072

Mahommedan Calendar.—The Mahommedan era, or era of the Hegira, used in Turkey, Persia, Arabia, &c., is dated from the first day of the month preceding the flight of Mahomet from Mecca to Medina, *i.e.* Thursday the 15th of July A.D. 622, and it commenced on the day following. The years of the Hegira are purely lunar, and always consist of twelve lunar months, commencing with the approximate new moon, without any intercalation to keep them to the same season with respect to the sun, so that they retrograde through all the seasons in about 32½ years. They are also partitioned into cycles of 30 years, 19 of which are common years of 354 days each, and the other 11 are intercalary years having an additional day appended to the last month. The mean length of the year is therefore 354-11/30 days, or 354 days 8 hours 48 min., which divided by 12 gives 29-191/360 days, or 29 days 12 hours 44 min., as the time of a mean lunation, and this differs from the astronomical mean lunation by only 2.8 seconds. This small error will only amount to a day in about 2400 years.

To find if a year is intercalary or common, divide it by 30; the quotient will be the number of completed cycles and the remainder will be the year of the current cycle; if this last be one of the numbers 2, 5, 7, 10, 13, 16, 18, 21, 24, 26, 29, the year is intercalary and consists of 355 days; if it be any other number, the year is ordinary.

Or if Y denote the number of the Mahommedan year, and

$$R = \left(\frac{11\ Y + 14}{30}\right)_r,$$

the year is intercalary when $R < 11$.

[v.04 p.1002] Also the number of intercalary years from the year 1 up to the year Y inclusive $= ((11\ Y + 14) / 30)_w$; and the same up to the year $Y - 1 = (11\ Y + 3 / 30)_w$.

To find the day of the week on which any year of the Hegira begins, we observe that the year 1 began on a Friday, and that after every common year of 354 days, or 50 weeks and 4 days, the day of the week must necessarily become postponed 4 days, besides the additional day of each intercalary year.

Hence if $w = 1$	2	3	4	5	6	7
indicate Sun.	Mon.	Tue.	Wed.	Thur.	Frid.	Sat.

the day of the week on which the year Y commences will be

$$w = 2 + 4\left(\frac{Y}{7}\right)_r + \left(\frac{11\ Y + 3}{30}\right)_w \text{(rejecting sevens).}$$

But, $30\left(\frac{11\ Y + 3}{30}\right)_w + \left(\frac{11\ Y + 3}{30}\right)_r = 11\ Y + 3$

$$\text{gives } 120\left(\frac{11\ Y + 3}{30}\right)_w = 12 + 44\ Y - 4\left(\frac{11\ Y + 3}{30}\right)_r,$$

$$\text{or } \left(\frac{11\ Y + 3}{30}\right)_w = 5 + 2\ Y + 3\left(\frac{11\ Y + 3}{30}\right)_r \text{(rejecting sevens).}$$

So that

$$w = 6\left(\frac{Y}{7}\right)_r + 3\left(\frac{11\ Y + 3}{30}\right)_r \text{(rejecting sevens),}$$

the values of which obviously circulate in a period of 7 times 30 or 210 years.

Let C denote the number of completed cycles, and y the year of the cycle; then $Y = 30\ C + y$, and

$$w = 5\left(\frac{C}{7}\right)_r + 6\left(\frac{y}{7}\right)_r + 3\left(\frac{11\ y + 3}{30}\right)_r \text{(rejecting sevens).}$$

From this formula the following table has been constructed:—

TABLE VIII.

Year of the Current Cycle (y)				Number of the Period of Seven Cycles $= (C/7)_r$						
				0	1	2	3	4	5	6
0	8			Mon.	Sat.	Thur.	Tues.	Sun.	Frid.	Wed.
1	9	17	25	Frid.	Wed.	Mon.	Sat.	Thur.	Tues.	Sun.
*2	*10	*18	*26	Tues.	Sun.	Frid.	Wed.	Mon.	Sat.	Thur.
3	11	19	27	Sun.	Frid.	Wed.	Mon.	Sat.	Thur.	Tues.
4	12	20	28	Thur.	Tues.	Sun.	Frid.	Wed.	Mon.	Sat.
*5	*13	*21	*29	Mon.	Sat.	Thur.	Tues.	Sun.	Frid.	Wed.
6	14	22	30	Sat.	Thur.	Tues.	Sun.	Frid.	Wed.	Mon.
*7	15	23		Wed.	Mon.	Sat.	Thur.	Tues.	Sun.	Frid.
	*16	*24		Sun.	Frid.	Wed.	Mon.	Sat.	Thur.	Tues.

To find from this table the day of the week on which any year of the Hegira commences, the rule to be observed will be as follows:—

Rule.—Divide the year of the Hegira by 30; the quotient is the number of cycles, and the remainder is the

year of the current cycle. Next divide the number of cycles by 7, and the second remainder will be the Number of the Period, which being found at the top of the table, and the year of the cycle on the left hand, the required day of the week is immediately shown.

The intercalary years of the cycle are distinguished by an asterisk.

For the computation of the Christian date, the ratio of a mean year of the Hegira to a solar year is

$$\frac{\text{Year of Hegira}}{\text{Mean solar year}} = \frac{354\text{-}11/30}{365.2422} = 0.970224.$$

The year 1 began 16 July 622, Old Style, or 19 July 622, according to the New or Gregorian Style. Now the day of the year answering to the 19th of July is 200, which, in parts of the solar year, is 0.5476, and the number of years elapsed = Y - 1. Therefore, as the intercalary days are distributed with considerable regularity in both calendars, the date of commencement of the year Y expressed in Gregorian years is

$$0.970224\ (Y - 1) + 622.5476,$$
$$\text{or } 0.970224\ Y + 621.5774.$$

This formula gives the following rule for calculating the date of the commencement of any year of the Hegira, according to the Gregorian or New Style.

Rule.—Multiply 970224 by the year of the Hegira, cut off six decimals from the product, and add 621.5774. The sum will be the year of the Christian era, and the day of the year will be found by multiplying the decimal figures by 365.

The result may sometimes differ a day from the truth, as the intercalary days do not occur simultaneously; but as the day of the week can always be accurately obtained from the foregoing table, the result can be readily adjusted.

Example.—Required the date on which the year 1362 of the Hegira begins.

```
      970224
        1362
      ------
    1940448
    5821344
   2910672
  970224
      ------
1321.  445088
 621.  5774
      ------
1943.  0225
         365
        ---
       1125
     1350
    675
     ---
   8.  2125
```

Thus the date is the 8th day, or the 8th of January, of the year 1943.

To find, as a test, the accurate day of the week, the proposed year of the Hegira, divided by 30, gives 45 cycles, and remainder 12, the year of the current cycle.

Also 45, divided by 7, leaves a remainder 3 for the number of the period.

Therefore, referring to 3 at the top of the table, and 12 on the left, the required day is Friday.

The tables, page 571, show that 8th January 1943 is a Friday, therefore the date is exact.

For any other date of the Mahommedan year it is only requisite to know the names of the consecutive months, and the number of days in each; these are—

Muharram	30
Saphar	29
Rabia I.	30
Rabia II.	29
Jomada I.	30
Jomada II	29
Rajab	30
Shaaban	29
Ramadān	30
Shawall (Shawwāl)	29
Dulkaada (Dhu'l Qa'da)	30
Dulheggia (Dhu'l Hijja)	29
- and in intercalary years	30

The ninth month, Ramadān, is the month of Abstinence observed by the Moslems.

The Moslem calendar may evidently be carried on indefinitely by successive addition, observing only to allow for the additional day that occurs in the bissextile and intercalary years; but for any remote date the computation according to the preceding rules will be most efficient, and such computation may be usefully employed as a check on the accuracy of any considerable extension of the calendar by induction alone.

The following table, taken from Woolhouse's *Measures, Weights and Moneys of all Nations*, shows the dates of commencement of Mahommedan years from 1845 up to 2047, or from the 43rd to the 49th cycle inclusive, which form the whole of the seventh period of seven cycles. Throughout the next period of seven cycles, and all other like periods, the days of the week will recur in exactly the same order. All the tables of this kind previously published, which extend beyond the year 1900 of the Christian era, are erroneous, not excepting the celebrated French work, *L'Art de vérifier les dates*, so justly regarded as the greatest authority in chronological matters. The errors have probably arisen from a continued excess of 10 in the discrimination of the intercalary years.

TABLE IX.—*Mahommedan Years.*

43rd Cycle.		
Year of Hegira.	Commencement (1st of Muharram).	
1261	Frid.	10 Jan. 1845
1262*	Tues.	30 Dec. 1845
1263	Sun.	20 Dec. 1846
1264	Thur.	9 Dec. 1847
1265*	Mon.	27 Nov. 1848
1266	Sat.	17 Nov. 1849
1267*	Wed.	6 Nov. 1850
1268	Mon.	27 Oct. 1851
1269	Frid.	15 Oct. 1852
1270*	Tues.	4 Oct. 1853
1271	Sun.	24 Sept. 1854
1272	Thur.	13 Sept. 1855
1273*	Mon.	1 Sept. 1856
1274	Sat.	22 Aug. 1857
1275	Wed.	11 Aug. 1858
1276*	Sun.	31 July 1859
1277*	Frid.	20 July 1860
1278*	Tues.	9 July 1861
1279	Sun.	29 June 1862
1280	Thur.	18 June 1863
1281*	Mon.	6 June 1864
1282	Sat.	27 May 1865
1283	Wed.	16 May 1866
1284*	Sun.	5 May 1867
1285	Frid.	24 April 1868
1286*	Tues.	13 April 1869
1287	Sun.	3 April 1870
1288	Thur.	23 Mar. 1871
1289*	Mon.	11 Mar. 1872
1290	Sat.	1 Mar. 1873
44th Cycle.		
1291	Wed.	18 Feb. 1874
1292*	Sun.	7 Feb. 1875
1293	Frid.	28 Jan. 1876
1294	Tues.	16 Jan. 1877
1295*	Sat.	5 Jan. 1878
1296	Thur.	26 Dec. 1878
1297*	Mon.	15 Dec. 1879
1298	Sat.	4 Dec. 1880
1299	Wed.	23 Nov. 1881
1300*	Sun.	12 Nov. 1882
1301	Frid.	2 Nov. 1883
1302	Tues.	21 Oct. 1884
1303*	Sat.	10 Oct. 1885
1304	Thur.	30 Sept. 1886
1305	Mon.	19 Sept. 1887
1306*	Frid.	7 Sept. 1888
1307	Wed.	28 Aug. 1889
1308*	Sun.	17 Aug. 1890
1309	Frid.	7 Aug. 1891
1310	Tues.	26 July 1892
1311*	Sat.	15 July 1893
1312	Thur.	5 July 1894
1313	Mon.	24 June 1895
1314*	Frid.	12 June 1896
1315	Wed.	2 June 1897

45th Cycle.—*continued.*		
Year of Hegira.	Commencement (1st of Muharram).	
1331	Wed.	11 Dec. 1912
1332	Sun.	30 Nov. 1913
1333*	Thur.	19 Nov. 1914
1334	Tues.	9 Nov. 1915
1335	Sat.	28 Oct. 1916
1336*	Wed.	17 Oct. 1917
1337	Mon.	7 Oct. 1918
1338*	Frid.	26 Sept. 1919
1339	Wed.	15 Sept. 1920
1340	Sun.	4 Sept. 1921
1341*	Thur.	24 Aug. 1922
1342	Tues.	14 Aug. 1923
1343	Sat.	2 Aug. 1924
1344*	Wed.	22 July 1925
1345	Mon.	12 July 1926
1346*	Frid.	1 July 1927
1347	Wed.	20 June 1928
1348	Sun.	9 June 1929
1349*	Thur.	29 May 1930
1350	Tues.	19 May 1931
46th Cycle.		
1351	Sat.	7 May 1932
1352*	Wed.	26 April 1933
1353	Mon.	16 April 1934
1354	Frid.	5 April 1935
1355*	Tues.	24 Mar. 1936
1356	Sun.	14 Mar. 1937
1357*	Thur.	3 Mar. 1938
1358	Tues.	21 Feb. 1939
1359	Sat.	10 Feb. 1940
1360*	Wed.	29 Jan. 1941
1361	Mon.	19 Jan. 1942
1362	Frid.	8 Jan. 1943
1363*	Tues.	28 Dec. 1943
1364	Sun.	17 Dec. 1944
1365	Thur.	6 Dec. 1945
1366*	Mon.	25 Nov. 1946
1367	Sat.	15 Nov. 1947
1368*	Wed.	3 Nov. 1948
1369	Mon.	24 Oct. 1949
1370	Frid.	13 Oct. 1950
1371*	Tues.	2 Oct. 1951
1372	Sun.	21 Sept. 1952
1373	Thur.	10 Sept. 1953
1374*	Mon.	30 Aug. 1954
1375	Sat.	20 Aug. 1955
1376*	Wed.	8 Aug. 1956
1377	Mon.	29 July 1957
1378	Frid.	18 July 1958
1379*	Tues.	7 July 1959
1380	Sun.	26 June 1960
47th Cycle.		
1381	Thur.	15 June 1961
1382*	Mon.	4 June 1962
1383	Sat.	25 May 1963
1384	Wed.	13 May 1964

47th Cycle.—*continued.*		
Year of Hegira.	Commencement (1st of Muharram).	
1401*	Sun.	9 Nov. 1980
1402	Frid.	30 Oct. 1981
1403	Tues.	19 Oct. 1982
1404*	Sat.	8 Oct. 1983
1405	Thur.	27 Sept. 1984
1406*	Mon.	16 Sept. 1985
1407	Sat.	6 Sept. 1986
1408	Wed.	26 Aug. 1987
1409*	Sun.	14 Aug. 1988
1410	Frid.	4 Aug. 1989
48th Cycle.		
1411	Tues.	24 July 1990
1412*	Sat.	13 July 1991
1413	Thur.	2 July 1992
1414	Mon.	21 June 1993
1415*	Frid.	10 June 1994
1416	Wed.	31 May 1995
1417*	Sun.	19 May 1996
1418	Frid.	9 May 1997
1419	Tues.	28 April 1998
1420*	Sat.	17 April 1999
1421	Thur.	6 April 2000
1422	Mon.	26 Mar. 2001
1423	Frid.	15 Mar. 2002
1424	Wed.	5 Mar. 2003
1425	Sun.	22 Feb. 2004
1426*	Thur.	10 Feb. 2005
1427	Tues.	31 Jan. 2006
1428*	Sat.	20 Jan. 2007
1429	Thur.	10 Jan. 2008
1430	Mon.	29 Dec. 2008
1431*	Frid.	18 Dec. 2009
1432	Wed.	8 Dec. 2010
1433	Sun.	27 Nov. 2011
1434*	Thur.	15 Nov. 2012
1435	Tues.	5 Nov. 2013
1436*	Sat.	25 Oct. 2014
1437	Thur.	15 Oct. 2015
1438	Mon.	3 Oct. 2016
1439*	Frid.	22 Sept. 2017
1440	Wed.	12 Sept. 2018
49th Cycle.		
1441	Sun.	1 Sept. 2019
1442*	Thur.	20 Aug. 2020
1443	Tues.	10 Aug. 2021
1444	Sat.	30 July 2022
1445*	Wed.	19 July 2023
1446	Mon.	8 July 2024
1447*	Frid.	27 June 2025
1448	Wed.	17 June 2026
1449	Sun.	6 June 2027
1450*	Thur.	25 May 2028
1451	Tues.	15 May 2029
1452	Sat.	4 May 2030
1453*	Wed.	23 April 2031
1454	Mon.	12 April 2032

1316*	Sun.	22	May	1898	1385*	Sun.	2	May	1965	1455	Frid.	1	April	2033
1317	Frid.	12	May	1899	1386	Frid.	22	April	1966	1456*	Tues.	21	Mar.	2034
1318	Tues.	1	May	1900	1387*	Tues.	11	April	1967	1457	Sun.	11	Mar.	2035
1319*	Sat.	20	April	1901	1388	Sun.	31	Mar.	1968	1458*	Thur.	28	Feb.	2036
1320	Thur.	10	April	1902	1389	Thur.	20	Mar.	1969	1459	Tues.	17	Feb.	2037
45th Cycle.					1390*	Mon.	9	Mar.	1970	1460	Sat.	6	Feb.	2038
1321	Mon.	30	Mar.	1903	1391	Sat.	27	Feb.	1971	1461*	Wed.	26	Jan.	2039
1322*	Frid.	18	Mar.	1904	1392	Wed.	16	Feb.	1972	1462	Mon.	16	Jan.	2040
1323	Wed.	8	Mar.	1905	1393*	Sun.	4	Feb.	1973	1463	Frid.	4	Jan.	2041
1324	Sun.	25	Feb.	1906	1394	Frid.	25	Jan.	1974	1464*	Tues.	24	Dec.	2041
1325	Thur.	14	Feb.	1907	1395	Tues.	14	Jan.	1975	1465	Sun.	14	Dec.	2042
1326	Tues.	4	Feb.	1908	1396*	Sat.	3	Jan.	1976	1466*	Thur.	3	Dec.	2043
1327*	Sat.	23	Jan.	1909	1397	Thur.	23	Dec.	1976	1467	Tues.	22	Nov.	2044
1328	Thur.	13	Jan.	1910	1398*	Mon.	12	Dec.	1977	1468	Sat.	11	Nov.	2045
1329	Mon.	2	Jan.	1911	1399	Sat.	2	Dec.	1978	1469*	Wed.	31	Oct.	2046
1330*	Frid.	22	Dec.	1911	1400	Wed.	21	Nov.	1979	1470	Mon.	21	Oct.	2047

TABLE X.—*Principal Days of the Hebrew Calendar.*

Tisri	1,	New Year, Feast of Trumpets.	
"	3, [1]	Fast of Guedaliah.	
"	10,	Fast of Expiation.	
"	15,	Feast of Tabernacles.	
"	21,	Last Day of the Festival.	
"	22,	Feast of the 8th Day.	
"	23,	Rejoicing of the Law.	
Kislev	25,	Dedication of the Temple.	
Tebet	10,	Fast, Siege of Jerusalem.	
Adar	13, [2]	Fast of Esther,	In embolismic years, Veadar.
"	14,	Purim,	
Nisan	15,	Passover.	
Sivan	6,	Pentecost.	
Tamuz	17, [1]	Fast, Taking of Jerusalem.	
Ab	9, [1]	Fast, Destruction of the Temple.	

[1] If Saturday, substitute Sunday immediately following.

[2] If Saturday, substitute Thursday immediately preceding.

TABLE XI.—*Principal Days of the Mahommedan Calendar.*

Muharram	1, New Year.
"	10, Ashura.
Rabia I.	11, Birth of Mahomet.
Jornada I.	20, Taking of Constantinople.
Rajab	15, Day of Victory.
"	20, Exaltation of Mahomet.
Shaaban	15, Borak's Night.
Shawall	1,2,3, Kutshuk Bairam.
Dulheggia	10, Qurban Bairam.

TABLE XII.—*Epochs, Eras, and Periods.*

Name.	Christian Date of Commencement.		
Grecian Mundane era	1 Sep.	5598	B.C.
Civil era of Constantinople	1 Sep.	5508	"
Alexandrian era	29 Aug.	5502	"
Ecclesiastical era of Antioch	1 Sep.	5492	"
Julian Period	1 Jan.	4713	"
Mundane era	Oct.	4008	"
Jewish Mundane era	Oct.	3761	"
Era of Abraham	1 Oct.	2015	"
Era of the Olympiads	1 July	776	"
Roman era	24 April	753	"
Era of Nabonassar	26 Feb.	747	"
Metonic Cycle	15 July	432	"
Grecian or Syro-Macedonian era	1 Sep.	312	"
Tyrian era	19 Oct.	125	"
Sidonian era	Oct.	110	"
Caesarean era of Antioch	1 Sep.	48	"
Julian year	1 Jan.	45	"
Spanish era	1 Jan.	38	"
Actian era	1 Jan.	30	"

Augustan era	14 Feb.	27	"
Vulgar Christian era	1 Jan.	1	A.D.
Destruction of Jerusalem	1 Sep.	69	"
Era of Maccabees	24 Nov.	166	"
Era of Diocletian	17 Sep.	284	"
Era of Ascension	12 Nov.	295	"
Era of the Armenians	7 July	552	"
Mahommedan era of the Hegira	16 July	622	"
Persian era of Yezdegird	16 June	632	"

For the Revolutionary Calendar see FRENCH REVOLUTION *ad fin.*

The principal works on the calendar are the following:—Clavius, *Romani Calendarii a Gregorio XIII. P.M. restituti Explicatio* (Rome, 1603); *L'Art de vérifier les dates*; Lalande, *Astronomie* tome ii.; *Traité de la sphère et du calendrier*, par M. Revard (Paris, 1816); Delambre, *Traité de l'astronomie théorique et pratique*, tome iii.; *Histoire de l'astronomie moderne; Methodus technica brevis, perfacilis, ac perpetua construendi Calendarium Ecclesiasticum, Stylo tam novo quam vetere, pro cunctis Christianis Europae populis, &c.*, auctore Paulo Tittel (Gottingen, 1816); *Formole analitiche pel calcolo delta Pasgua, e correzione di quello di Gauss, con critiche osservazioni sù quanta ha scritto del calendario il Delambri*, di Lodovico Ciccolini (Rome, 1817); E.H. Lindo, *Jewish Calendar for Sixty-four Years* (1838); W.S.B. Woolhouse, *Measures, Weights, and Moneys of all Nations* (1869).

(T. G.; W. S. B. W.)

CALENDER, (1) (Fr. *calendre*, from the Med. Lat. *calendra*, a corruption of the Latinized form of the Gr. κύλινδρος, a cylinder), a machine consisting of two or more rollers or cylinders in close contact with each other, and often heated, through which are passed cotton, calico and other fabrics, for the purpose of having a finished smooth surface given to them; the process flattens the fibres, removes inequalities, and also gives a glaze to the surface. It is similarly employed in paper manufacture (*q.v.*). (2) (From the Arabic *qalandar*), an order of dervishes, who separated from the Baktashite order in the 14th century; they were vowed to perpetual travelling. Other forms of the name by which they are known are Kalenderis, Kalenderites, and Qalandarites (see DERVISH).

CALENUS, QUINTUS FUFIUS, Roman general. As tribune of the people in 61 B.C., he wa$ chiefly instrumental in securing the acquittal of the notorious Publius Clodius when charged with having profaned the mysteries of Bona Dea (Cicero, *Ad. Att.* i. 16). In 59 Calenus was praetor, and brought forward a law that the senators, knights, and tribuni aerarii, who composed the judices, should vote separately, so that it might be known how they gave their votes (Dio Cassius xxxviii. 8). He fought in Gaul (51) and Spain (49) under Caesar, who, after he had crossed over to Greece (48), sent Calenus from Epirus to bring over the rest of the troops from Italy. On the passage to Italy, most of the ships were captured by Bibulus and Calenus himself escaped with difficulty. In 47 he was raised to the consulship through the influence of Caesar. After the death of the dictator, he joined Antony, whose legions he afterwards commanded in the north of Italy. He died in 41, while stationed with his army at the foot of the Alps, just as he was on the point of marching against Octavianus.

Caesar, *B.G.* viii. 39; *B.C.* i. 87, iii. 26; Cic. *Philippicae*, viii. 4.

CALEPINO, AMBROGIO (1435-1511), Italian lexicographer, born at Bergamo in 1435, was descended of an old family of Calepio, whence he took his name. Becoming an Augustinian monk, he devoted his whole life to the composition of a polyglott dictionary, first printed at Reggio in 1502. This gigantic work was afterwards augmented by Passerat and others. The most complete edition, published at Basel in 1590, comprises no fewer than eleven languages. The best edition is that published at Padua in seven languages in 1772. Calepino died blind in 1511.

CALES (mod. *Calvi*), an ancient city of Campania, belonging Originally to the Aurunci, on the Via Latina, 8 m. N.N.W. of Casilinum. It was taken by the Romans in 335 B.C., and, a colony with Latin rights of 2500 citizens having been established there, it was for a long time the centre of the Roman dominion in Campania, and the seat of the quaestor for southern Italy even down to the days of Tacitus.[1] It was an important base in the war against Hannibal, and at last refused further contributions for the war. Before 184 more settlers were sent there. After the Social War it became a *municipium*. The fertility of its territory and its manufacture of black glazed pottery, which was even exported to Etruria, made it prosperous. At the end of the 3rd century it appears as a colony, and in the 5th century it became an episcopal see, which (jointly with Teano since 1818) it still is, though it is now a mere village. The cathedral, of the 12th century, has a carved portal and three apses decorated with small arches and
[v.04 p.1003]
pilasters, and contains a fine pulpit and episcopal throne in marble mosaic. Near it are two grottos which have been used for Christian worship and contain frescoes of the 10th and 11th centuries (E. Bertaux, *L'Art dans l'Italie méridionale* (Paris, 1904), i. 244, &c.). Inscriptions name six gates of the town: and there are considerable remains of antiquity, especially of an amphitheatre and theatre, of a supposed temple, and other edifices. A number of tombs belonging to the Roman necropolis were discovered in 1883.

See C. Hülsen in Pauly-Wissowa, *Realencyclopädie*, iii. 1351 (Stuttgart, 1899).

(T. As.)

[1] To the period after 335 belong numerous silver and bronze coins with the legend *Caleno*.

CALF. (1) (A word common in various forms to Teutonic languages, cf. German *Kalb*, and Dutch *kalf*), the young of the family of *Bovidae*, and particularly of the domestic cow, also of the elephant, and of marine mammals, as the whale and seal. The word is applied to a small island close to a larger one, like a calf close to its mother's side, as in the "Calf of Man," and to a mass of ice detached from an iceberg. (2) (Of unknown origin, possibly connected with the Celtic *calpa*, a leg), the fleshy hinder part of the leg, between the knee and the ankle.

CALF, THE GOLDEN, a molten image made by the Israelites when Moses had ascended the Mount of Yahweh to receive the Law (Ex. xxxii.). Alarmed at his lengthy absence the people clamoured for "gods" to

lead them, and at the instigation of Aaron, they brought their jewelry and made the calf out of it. This was celebrated by a sacred festival, and it was only through the intervention of Moses that the people were saved from the wrath of Yahweh (cp. Deut. ix. 19 sqq.). Nevertheless 3000 of them fell at the hands of the Levites who, in answer to the summons of Moses, declared themselves on the side of Yahweh. The origin of this particular form of worship can scarcely be sought in Egypt; the Apis which was worshipped there was a live bull, and image-worship was common among the Canaanites in connexion with the cult of Baal and Astarte (*qq.v.*). In early Israel it was considered natural to worship Yahweh by means of images (cp. the story of Gideon, Judg. viii. 24 sqq.), and even to Moses himself was attributed the bronze-serpent whose cult at Jerusalem was destroyed in the time of Hezekiah (2 Kings xviii. 4, Num. xxi. 4-9). The condemnation which later writers, particularly those imbued with the spirit of the Deuteronomic reformation, pass upon all image-worship, is in harmony with the judgment upon Jeroboam for his innovations at Bethel and Dan (1 Kings xii. 28 sqq., xvi. 26, &c.). But neither Elijah nor Elisha raised a voice against the cult; then, as later, in the time of Amos, it was nominally Yahweh-worship, and Hosea is the first to regard it as the fundamental cause of Israel's misery.

See further, W.R. Smith, *Prophets of Israel*, pp. 175 sqq.; Kennedy, Hastings' *Dict. Bib.* i. 342; and HEBREW RELIGION.

(S. A. C.)

CALGARY, the oldest city in the province of Alberta. Pop. (1901) 4091; (1907) 21,112. It is situated in 114° 15′ W., and 51° 4½′ N., on the Bow river, which flows with its crystal waters from the pass in the Rocky Mountains, by which the main line of the Canadian Pacific railway crosses the Rocky Mountains. The pass proper—Kananaskis—penetrates the mountains beginning 40 m. west of Calgary, and the well-known watering-place, Banff, lies 81 m. west of it, in the Canadian national park. The streets are wide and laid out on a rectangular system. The buildings are largely of stone, the building stone used being the brown Laramie sandstone found in the valley of the Bow river in the neighbourhood of the city. Calgary is an important point on the Canadian Pacific railway, which has a general superintendent resident here. It is an important centre of wholesale dealers, and also of industrial establishments. Calgary is near the site of Fort La Jonquiere founded by the French in 1752. Old Bow fort was a trading post for many years though now in ruins. The present city was created by the building of the Canadian Pacific railway about 1883.

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