The Project Gutenberg eBook of Encyclopaedia Britannica, 11th Edition, "Cerargyrite" to "Charing Cross"

This eBook is for the use of anyone anywhere in the United States and most other parts of the world at no cost and with almost no restrictions whatsoever. You may copy it, give it away or re-use it under the terms of the Project Gutenberg License included with this eBook or online at www.gutenberg.org. If you are not located in the United States, you will have to check the laws of the country where you are located before using this eBook.

Title: Encyclopaedia Britannica, 11th Edition, "Cerargyrite" to "Charing Cross"

Author: Various

Release date: August 6, 2010 [eBook #33365]
Most recently updated: January 6, 2021

Language: English

Other information and formats: www.gutenberg.org/ebooks/33365

Credits: Produced by Marius Masi, Don Kretz and the Online Distributed Proofreading Team at https://www.pgdp.net

*** START OF THE PROJECT GUTENBERG EBOOK ENCYCLOPAEDIA BRITANNICA, 11TH EDITION, "CERARGYRITE" TO "CHARING CROSS" ***

Transcriber's note: A few typographical errors have been corrected. They appear in the text like this, and the explanation will appear when the mouse pointer is moved over the marked passage. Sections in Greek will yield a transliteration when the pointer is moved over them, and words using diacritic characters in the Latin Extended Additional block, which may not display in some fonts or browsers, will display an unaccented version.

Links to other EB articles: Links to articles residing in other EB volumes will be made available when the respective volumes are introduced online.

THE ENCYCLOPÆDIA BRITANNICA

A DICTIONARY OF ARTS, SCIENCES, LITERATURE AND GENERAL INFORMATION

ELEVENTH EDITION

VOLUME V SLICE VII

Cerargyrite to Charing Cross

Articles in This Slice

CERARGYRITE	CHAMBERS
CERBERUS	CHAMBERSBURG
CERDIC	CHAMBÉRY
CERDONIANS	CHAMBORD, HENRI CHARLES FERDINAND MARIE DIEUDONNÉ
CEREALIS, PETILLIUS	CHAMBORD
CERES	CHAMBRE ARDENTE
CERIGNOLA	CHAMELEON
CERIGOTTO	CHAMFER

CERINTHUS
CERIUM
CERNUSCHI, HENRI
CEROGRAPHY
CERRO DE PASCO
CERTALDO
CERUSSITE
CERUTTI, GIUSEPPE ANTONIO GIACHIMO
CERVANTES SAAVEDRA, MIGUEL DE
CERVERA, PASCUAL CERVERA Y TOPETE
CESAREVICH
CESARI, GIUSEPPE
CESAROTTI, MELCHIORE
CESENA
CESNOLA, LUIGI PALMA DI
CESPEDES, PABLO DE
CÉSPEDES Y MENESES, GONZALO DE
CESS
CESSIO BONORUM
CESTI, MARC' ANTONIO
CESTIUS, LUCIUS
CESTUI, CESTUY
CETACEA
CETHEGUS
CETINA, GUTIERRE DE
CETTE
CETTIGNE
CETUS
CHAMFORT, SEBASTIEN ROCH NICOLAS
CHAMIER, FREDERICK
CHAMILLART, MICHEL
CHAMINADE, CÉCILE
CHAMISSO, ADELBERT VON
CHAMKANNI
CHAMOIS
CHAMOMILE
CHAMONIX
CHAMPAGNE
CHAMPAGNY, JEAN BAPTISTE NOMPÈRE DE
CHAMPAIGN
CHAMPAIGNE, PHILIPPE DE
CHAMPARAN
CHAMPEAUX, WILLIAM OF
CHAMPERTY
CHAMPION
CHAMPIONNET, JEAN ÉTIENNE
CHAMPLAIN, SAMUEL DE
CHAMPLAIN
CHAMPMESLÉ, MARIE
CHAMPOLLION, JEAN FRANÇOIS
CHAMPOLLION-FIGEAC, JACQUES JOSEPH
CHANCE
CHANCEL
CHANCELLOR
CHANCELLORSVILLE
CHANCE-MEDLEY

CETYWAYO
CEUTA
CEVA
CÉVENNES
CEYLON
CHABAZITE
CHABLIS
CHABOT, FRANÇOIS
CHABOT, GEORGES ANTOINE
CHABOT, PHILIPPE DE
CHABRIAS
CHABRIER, ALEXIS EMMANUEL
CHACMA
CHACO
CHACONNE
CHAD, SAINT
CHAD
CHADDERTON
CHADERTON, LAURENCE
CHADWICK, SIR EDWIN
CHAEREMON (Athenian dramatist)
CHAEREMON (Stoic philosopher)
CHAERONEIA
CHAETOGNATHA
CHAETOPODA
CHAETOSOMATIDA
CHAFER
CHAFF
CHAFFARINAS
CHAFFEE, ADNA ROMANZA
CHAFFINCH
CHANCERY
CHANDA
CHANDAUSI
CHAND BARDAI
CHANDELIER
CHANDERNAGORE
CHANDLER, HENRY WILLIAM
CHANDLER, RICHARD
CHANDLER, SAMUEL
CHANDLER, ZACHARIAH
CHANDOS, BARONS AND DUKES OF
CHANDOS, SIR JOHN
CHANDRAGUPTA MAURYA
CHANGARNIER, NICOLAS ANNE THÉODULE
CHANG-CHOW
CHANG CHUN, KIU
CHANGE
CHANGELING
CHANGOS
CHANGRA
CHANNEL ISLANDS
CHANNING, WILLIAM ELLERY
CHANSONS DE GESTE
CHANT
CHANTABUN
CHANTADA
CHANTAGE
CHANTARELLE
CHANTAVOINE, HENRI
CHANTILLY
CHANTREY, SIR FRANCIS LEGATT

CHAFING-DISH
CHAGOS
CHAGRES
CHAIN
CHAIR
CHAISE
CHAKRATA
CHALCEDON
CHALCEDON, COUNCIL OF
CHALCEDONY
CHALCIDICUM
CHALCIS
CHALCONDYLES
CHALDAEA
CHALDEE
CHALICE
CHALIER, JOSEPH
CHALK
CHALKHILL, JOHN
CHALKING THE DOOR
CHALLAMEL, JEAN BAPTISTE MARIUS AUGUSTIN
CHALLEMEL-LACOUR, PAUL AMAND
CHALLENGE
“CHALLENGER” EXPEDITION
CHALLONER, RICHARD
CHALMERS, ALEXANDER
CHALMERS, GEORGE
CHALMERS, GEORGE PAUL
CHALMERS, JAMES
CHALMERS, THOMAS
CHALONER, SIR THOMAS
CHANT ROYAL
CHANTRY
CHANUTE
CHANZY, ANTOINE EUGÈNE ALFRED
CHAOS
CHAPBOOK
CHAPE
CHAPEL
CHAPELAIN, JEAN
CHAPEL-EN-LE-FRITH
CHAPEL HILL
CHAPELLE ARDENTE
CHAPERON
CHAPLAIN
CHAPLIN, HENRY
CHAPMAN, GEORGE
CHAPMAN
CHAPONE, HESTER
CHAPPE, CLAUDE
CHAPPELL, WILLIAM
CHAPRA
CHAPTAL, JEAN ANTOINE CLAUDE
CHAPTER
CHAPTER-HOUSE
CHAPU
CHAR
CHAR-À-BANC
CHARACTER
CHARADE
CHARCOAL
CHARCOT, JEAN MARTIN

CHÂLONS-SUR-MARNE	CHARD, JOHN ROUSE MERRIOTT
CHALON-SUR-SAÔNE	CHARD
CHALUKYA	CHARDIN, JEAN SIMÉON
CHALYBÄUS, HEINRICH MORITZ	CHARDIN, SIR JOHN
CHALYBITE	CHARENTE
CHAMBA	CHARENTE-INFÉRIEURE
CHAMBAL	CHARENTON-LE-PONT
CHAMBERLAIN, JOSEPH	CHARES
CHAMBERLAIN, JOSHUA LAWRENCE	CHARES
CHAMBERLAIN, SIR NEVILLE BOWLES	CHARES
CHAMBERLAIN	CHARGE
CHAMBERLAYNE, WILLIAM	CHARGÉ D'AFFAIRES
CHAMBERS, EPHRAIM	CHARGING ORDER
CHAMBERS, GEORGE	CHARIBERT
CHAMBERS, ROBERT	CHARIDEMUS
CHAMBERS, SIR WILLIAM	CHARING CROSS

CERARGYRITE, a mineral species consisting of silver chloride; an important ore of silver. The name cerargyrite is a Greek form (from κέρας, horn, and ἄργυρος, silver) of the older name hornsilver, which was used by K. Gesner as far back as 1565. The chloro-bromide and bromide of silver were also included under this term until they were distinguished chemically in 1841 and 1842, and described under the names embolite and bromargyrite (or bromyrite) respectively; the chloride then came to be distinguished as chlorargyrite, though the name cerargyrite is often now applied to this alone.

Chloro-bromo-iodide of silver has also been recognized as a mineral and called iodembolite. All these are strikingly alike in appearance and general characters, differing essentially only in chemical composition, and it would seem better to reserve the name cerargyrite for the whole group, using the names chlorargyrite (AgCl), embolite (Ag(Cl, Bl)), bromargyrite (AgBr) and iodembolite (Ag(Cl, Br, I)) for the different isomorphous members of the group. They are cubic in crystallization, with the cube and the octahedron as prominent forms, but crystals are small and usually indistinct; there is no cleavage. They are soft (H = 2½) and sectile to a high degree, being readily cut with a knife like horn. With their resinous to adamantine lustre and their translucency they also present somewhat the appearance of horn; hence the name hornsilver. The colour varies somewhat with the chemical composition, being grey or colourless in chlorargyrite, greenish-grey in embolite and bromargyrite, and greenish-yellow to orange-yellow in iodembolite. On exposure to light the colour quickly darkens. The specific gravity also varies with the composition: for the pure chloride it is 5.55, and the highest recorded for an iodembolite is 6.3.

The hornsilvers all occur under similar conditions and are often associated together; they are found in metalliferous veins with native silver and ores of silver, and are usually confined to the upper oxidized parts of the lodes. They are important ores of silver (the pure chloride contains 75.3% of silver), and have been extensively mined at several places in Chile, also in Mexico, and at Broken Hill in New South Wales. The chloride and chloro-bromide have been found in several Cornish mines, but never in very large amounts.

(L. J. S.)

CERBERUS, in Greek mythology, the dog who guarded the entrance to the lower world. He allowed all to enter, but seized those who attempted to escape. According to Hesiod (*Theog.* 311), he was a fifty-headed monster with a fearful bark, the offspring of Typhon and Echidna. He was variously represented with one, two or (usually) three heads, often with the tail of a snake or with snakes growing from his head or twined round his body. One of the tasks imposed upon Heracles was to fetch Cerberus from below to the upper world, a favourite subject of ancient vase-paintings.

CERDIC (d. 534), founder of the West Saxon kingdom, is described as an ealdorman who in 495 landed with his son Cynric in Hampshire, where he was attacked at once by the Britons. Nothing more is heard of him until 508, when he defeated the Britons with great slaughter. Strengthened by fresh arrivals of Saxons, he gained another victory in 519 at Certicesford, a spot which has been identified with the modern Charford, and in this year took the title of king. Turning westward, Cerdic appears to have been defeated by the Britons in 520 at Badbury or Mount Badon, in Dorset, and in 527 yet another fight with the Britons is recorded. His last work was the conquest of the Isle of Wight, probably in the interest of some Jutish allies. All the sovereigns of England, except Canute, Hardicanute, the two Harolds and William the Conqueror, are said to be descended from Cerdic.

See *Anglo-Saxon Chronicle*, edited by C. Plummer (Oxford, 1892-1899); Gildas, *De excidio Britanniae*, edited by Th. Mommsen (Berlin, 1898); Nennius, *Historia, Brittonum*, edited by Th. Mommsen (Berlin, 1898); Bede, *Historiae ecclesiasticae gentis Anglorum libri v.*, ed. C. Plummer (Oxford,

1896); E. Guest, *Origines Celticae* (London, 1883); J.R. Green, *The Making of England* (London, 1897).

CERDONIANS, a Gnostic sect, founded by Cerdo, a Syrian, who came to Rome about 137, but concerning whose history little is known. They held that there are two first causes—the perfectly good and the perfectly evil. The latter is also the creator of the world, the god of the Jews, and the author of the Old Testament. Jesus Christ is the son of the good deity; he was sent into the world to oppose the evil; but his incarnation, and therefore his sufferings, were a mere appearance. Regarding the body as the work of the evil deity, the Cerdonians formed a moral system of great severity, prohibiting marriage, wine and the eating of flesh, and advocating fasting and other austerities. Most of what the Fathers narrate of Cerdo's tenets has probably been transferred to him from his famous pupil Marcion, like whom he is said to have rejected the Old Testament and the New, except part of Luke's Gospel and of Paul's Epistles. (See MARCION, and GNOSTICISM.)

CEREALIS (CERIALIS), **PETILLIUS** (1st century A.D.), Roman general, a near relative of the emperor Vespasian. He is first heard of during the reign of Nero in Britain, where he was completely defeated (A.D. 61) by Boadicea. Eight years later he played an important part in the capture of Rome by the

supporters of Vespasian. In 70 he put down the revolt of Civilis (*q.v.*). In 71, as governor of Britain, where he had as a subordinate the famous Agricola, he inflicted severe defeats upon the Brigantes, the most powerful of the tribes of Britain. Tacitus says that he was a bold soldier rather than a careful general, and preferred to stake everything on the issue of a single engagement. He possessed natural eloquence of a kind that readily appealed to his soldiers. His loyalty towards his superiors was unshakable.

Tacitus, *Annals*, xiv. 32; *Histories*, iii. 59, 78, iv. 71, 75, 86, v. 21; *Agricola*, 8, 17.

CERES, an old Italian goddess of agriculture. The name probably means the "creator" or "created," connected with *crescere* and *creare*. But when Greek deities were introduced into Rome on the advice of the Sibylline books (in 495 B.C., on the occasion of a severe drought), Demeter, the Greek goddess of seed and harvest, whose worship was already common in Sicily and Lower Italy, usurped the place of Ceres in Rome, or rather, to Ceres were added the religious rites which the Greeks paid to Demeter, and the mythological incidents which originated with her. At the same time the cult of Dionysus and Persephone (see LIBER AND LIBERA) was introduced. The rites of Ceres were Greek in language and form. Her priestesses were Italian Greeks and her temple was Greek in its architecture and built by Greek artists. She was worshipped almost exclusively by plebeians, and her temple near the Circus Maximus was under the care of the plebeian aediles, one of whose duties was the superintendence of the corn-market. Her chief festivals were the *ludi Cereris* or *Cerealia* (more correctly, *Cerialia*), games held

annually from April 12-19 (Ovid, *Fasti*, iv. 392 ff.); a second festival, in August, to celebrate the reunion of Ceres and Proserpine, in which women, dressed in white, after a fast of nine days offered the goddess the first-fruits of the harvest (Livy xxii. 56); and the *Jejunium Cereris*, a fast also introduced (191 B.C.) by command of the Sibylline books (Livy xxvi. 37), at first held only every four years, then annually on the 4th of October. In later times Ceres was confused with Tellus. (See also DEMETER.)

CERIGNOLA, a town of Apulia, Italy, in the province of Foggia, 26 m. S.E. by rail from the town of Foggia. Pop. (1901) 34,195. It was rebuilt after a great earthquake in 1731, and has a considerable agricultural trade. In 1503 the Spaniards under Gonzalo de Cordoba defeated the French under the duc de Nemours below the town—a victory which made the kingdom of Naples into a Spanish province in Italy. Cerignola occupies the site of Furfane, a station on the Via Traiana between Canusium and Herdoniae.

CERIGOTTO, called locally LIUS (anc. *Aegilia* or *Ogylos*; mod. Gr. officially *Antikythera*), an island of Greece, belonging to the Ionian group, and situated between Cythera (Cerigo) and Crete, about 20 m. from each. Some raised beaches testify to an upheaval in comparatively recent times. With an area of about 10 sq. m. it supports a population of about 300, who

are mainly Cretan refugees, and in favourable seasons exports a quantity of good wheat. It was long a favourite resort of Greek pirates. It is famous for the discovery in 1900, close to its coast, of the wreck of an ancient ship with a cargo of bronze and marble statues.

CERINTHUS (c. A.D. 100), an early Christian heretic, contemporary with the closing years of the apostle John, who, according to the well-known story of Polycarp, reported by Irenaeus (iii. 3) and twice recorded in Eusebius (*Hist. Eccl.* iii. 28, iv. 14), made a hasty exit from a bath in Ephesus on learning that Cerinthus was within. Other early accounts agree in making the province of Asia the scene of his activity, and Hippolytus (*Haer*. vii. 33) credits him with an Egyptian training. There can be no truth in the notice given by Epiphanius (*Haer*. xxviii. 4) that Cerinthus had in earlier days at Jerusalem led the judaizing opposition against Paul.

The difficulty of defining Cerinthus's theological position is due not only to the paucity of our sources but to the fact that the witness of the two principal authorities, Irenaeus (1. 26, iii. 11) and Hippolytus (*Syntagma*), does not agree. Further, Irenaeus himself in one passage fails to distinguish between Cerinthian and Valentinian doctrines. It would appear, however, that Cerinthus laid stress on the rite of circumcision and on the observance of the Sabbath. He taught that the world had been made by angels, from one of whom, the god of the Jews, the people of Israel had received their Law, which was not perfect. The only New Testament writing which he accepted was a mutilated Gospel of Matthew. Jesus was the offspring of Joseph and Mary, and on him at the baptism descended the Christ,[1] revealing the

hitherto unknown Father, and endowing him with miraculous power. This Christ left Jesus again before the Passion, and the resurrection of Jesus was still in the future. Together with these somewhat gnostic ideas, Cerinthus, if we may trust the notices of Gaius the Roman presbyter (c. 290) and Dionysius of Alexandria (c. 340), held a violent and crude form of chiliasm. But the chief significance of the man is his "combination of zeal for legal observances with bold criticism of the Law itself as a whole and of its origin," which reminds us of the Clementine *Recognitions*. Cerinthus is a blend of judaizing christian and gnostic.

1 So Irenaeus. According to Hippolytus and Epiphanius it was the Holy Ghost that thus descended.

CERIUM (symbol Ce, atomic weight 140.25), a metallic chemical element which occurs with the rare earths in the minerals cerite, samarskite, euxenite, monazite, parisite and many yttrium minerals. The particular earth containing cerium was discovered by M.H. Klaproth in 1803, whilst J. Berzelius at about the same time also examined it and came to the conclusion that it was the oxide of a new metal, which he termed cerium. The crude oxide of the metal is obtained from cerite, by evaporating the mineral with strong sulphuric acid, removing excess of acid and dissolving the residue in ice-cold water; sulphuretted hydrogen is passed through the solution, which is then filtered, acidified with hydrochloric acid, and precipitated as oxalate by oxalic acid; the oxalate is then converted into oxide by ignition. From the crude oxide so obtained (which contains lanthanum and didymium oxides) the cerium may be separated by

conversion into its double sulphate on the addition of potassium sulphate, the sulphates of the cerium group being insoluble in a saturated solution of potassium sulphate. The sulphate is subsequently boiled with water, when a basic sulphate is precipitated. For the preparation of pure cerium compounds see Auer v. Welsbach, *Monatshefte*, 1884, v. 508.

The metal was first obtained, in an impure state, by C.G. Mosander, by fusing its chloride with sodium. W.F. Hillebrand and T. Norton have prepared it by the electrolysis of the melted chloride (*Pogg. Ann.*, 1875, 156, p. 466); and C. Winkler (*Berichte*, 1891, xxiv. 884) obtained it by heating the dioxide with magnesium powder. The metal has somewhat the appearance of iron, and has a specific gravity of 6.628, which, after melting, is increased to 6.728. Its specific heat is 0.04479 (W.F. Hillebrand). It is permanent in dry air, but tarnishes in moist air; it can be hammered and rolled; it melts at 623° C. It burns readily on heating, with a brilliant flame; and it also combines with chlorine, bromine, iodine, sulphur, phosphorus and cyanogen. In the case of the two former elements the combination is accompanied by combustion of the metal. With water it is slowly converted into the dioxide. Cold concentrated nitric and sulphuric acids are without action on the metal, but it reacts rapidly with dilute nitric and hydrochloric acids. The dioxide is used in incandescent gas mantles (see LIGHTING).

Three oxides of cerium are known. The sesquioxide, Ce_2O_3, is obtained by heating the carbonate in a current of hydrogen. It is a bluish-green powder, which on exposure rapidly combines with the oxygen of the air. By the addition of caustic soda to cerous salts, a white precipitate of cerous hydroxide is formed. Cerium dioxide, CeO_2, is produced when cerium carbonate, nitrate, sulphate or oxalate is heated in air. It is a white or pale yellow compound, which becomes reddish on heating. Its specific gravity is 6.739, and its specific heat 0.0877. It is not reduced to the metallic condition on heating with carbon. Concentrated sulphuric acid dissolves this oxide,

forming a yellowish solution and ozone. By suspending the precipitated cerous hydroxide in water and passing chlorine through the solution, a hydrated form of the dioxide, $2CeO_2 \cdot 3H_2O$, is obtained, which is readily soluble in nitric and sulphuric acids, forming ceric salts, and in hydrochloric acid, where it forms cerous chloride, with liberation of chlorine. A higher hydrated oxide, $CeO_3 \cdot xH_2O$, is formed by the interaction of cerous sulphate with sodium acetate and hydrogen peroxide (Lecoq de Boisbaudran, *Comptes rendus*, 1885, 100, p. 605).

Cerous chloride, $CeCl_3$, is obtained when the metal is burned in chlorine; when a mixture of cerous oxide and carbon is heated in chlorine; or by rapid heating of the dioxide in a stream of carbon monoxide and chlorine. It is a colourless substance, which is easily fusible. A hydrated chloride of composition $2CeCl_3 \cdot 15H_2O$ is also known, and is obtained when a solution of cerous oxide in hydrochloric acid is evaporated over sulphuric acid. Double salts of cerous chloride with stannic chloride, mercuric chloride, and platinic chloride are also known. Cerous bromide, $2CeBr_3 \cdot 3H_2O$, and iodide, $CeI_3 \cdot 9H_2O$, are known. Cerous sulphide, Ce_2S_3, results on heating cerium with sulphur or cerium oxide in carbon bisulphide vapour. It is a red infusible mass of specific gravity 5.1, and is slowly decomposed by warm water. The sulphate, $Ce_2(SO_4)_3$, is formed on dissolving the carbonate in sulphuric acid, or on dissolving the basic sulphate in sulphuric acid, in the presence of sulphur dioxide, evaporating the solution, and drying the product obtained, at high temperature (B. Brauner, *Monatshefte*, 1885, vi. 793). It is a white powder of specific gravity 3.912, easily soluble in cold water. Many hydrated forms of the sulphate are known, as are also double salts of the sulphate with potassium, sodium, ammonium, thallium and cadmium sulphates. Ceric fluoride, $CeF_4 \cdot H_2O$, is obtained when the hydrated dioxide is dissolved in hydrofluoric acid and the solution evaporated on the water bath (B. Brauner). The sulphate, $Ce(SO_4)_2 \cdot 4H_2O$, is formed when the basic

sulphate is dissolved in sulphuric acid; or when the dioxide is dissolved in dilute sulphuric acid, and evaporated *in vacuo* over sulphuric acid. It forms yellow crystals soluble in water; the aqueous solution on standing gradually depositing a basic salt. Double sulphates of composition $2Ce(SO_4)_2 \cdot 2K_2SO_4 \cdot 2H_2O$, $Ce(SO_4)_2 \cdot 3(NH_4)_2SO_4 \cdot 4H_2O$ are known. Nitrates of cerium have been described, as have also phosphates, carbonates and a carbide.

Cerium compounds may be recognized by the red precipitate of ceric hydroxide, which is formed when sodium hypochlorite is added to a colourless cerous salt. For the quantitative determination of the metal, the salts are precipitated by caustic potash, the precipitate washed, dried and heated, and finally weighed as the dioxide.

The atomic weight of cerium has been determined by B. Brauner (*Chem. News*, 1895, lxxi. 283) from the analysis of the oxalate; the values obtained varying from 140.07 to 140.35.

CERNUSCHI, HENRI (1821-1896), Italian politician and economist, was born of wealthy parents at Milan in 1821, and was destined for the legal profession. During his studies he became involved in the revolutionary movement. He played a conspicuous part in the insurrection at Milan in 1848, and also at Rome in 1849, where he had a seat in the National Assembly. On the collapse of the revolutionary government he was arrested (1850), but managed to escape to France, where he engaged in commerce and banking, became naturalized, and acquired a large fortune. He took a prominent part in opposing the Socialist movement, and in April 1870,

having subscribed a large sum to the funds of a committee formed to combat the Napoleonic plebiscite, had to leave the country. In September the formation of the Third Republic enabled him to return, but he soon left Paris to travel in the East, whence he returned with a fine art collection, particularly of Japanese objects. Cernuschi is best known for his publications on financial questions, more especially bimetallism. Of the latter he was an ardent champion, and the word itself is commonly supposed to have originated with him—at least in its English form it is first found in his *Silver Vindicated* (1876). Among his other works may be mentioned: *Mécanique de l'échange* (1861); *Illusion des sociétés coopératives* (1886); *Le Bimétallisme en Angleterre* (1879); *Le Grand Procès de l'Union latine* (1884). He died at Mentone on the 12th of May 1896.

CEROGRAPHY (from the Gr. κηρός, wax, and γράφειν, to write), the art of painting in wax. (See ENCAUSTIC PAINTING.)

CERRO DE PASCO, or PASCO, a mining town of Peru, capital of the department of Junin, 107 m. (221 m. by rail, via Oroya) N.E. of Lima. Pop. (1907 est.) 10,000. It is situated on the plateau of Bombon, 14,280 ft. above sea-level, and in the midst of one of the oldest and richest silver-mining districts of Peru. There were 342 silver mines in this district in 1890, and at

the end of the 19th century the average annual output since the discovery of the mines in 1630 was estimated at 1,600,000 oz. A decline in the silver production having set in, the American company which had become owners of three-fourths of the mining properties in the district turned its attention to the extensive copper deposits there, built a railway to Oroya 83 m. distant, another, 25 m. long, to the coal-fields of Gollarisquisga, north of Pasco, and then erected large smelting works (in which 2500 men were regularly employed in 1907) 8 m. out of town and 4 m. from limestone beds. The railway to Oroya was completed in 1903, the coal mine branch and smelter later on, and in 1907 the copper output was 20,152,000 ℔ The town of Pasco is badly built and unattractive, and is inhabited chiefly by mining labourers and their families. Its population is increased 50% in times of great mining activity. The name Cerro de Pasco is that of a “knot” of mountains uniting the two great ranges of the Andes at this point.

CERTALDO, a town of Tuscany, Italy, in the province of Florence, 35 m. S.S.W. by rail and 18 m. direct from the town of Florence. Pop. (1901) town, 4552; commune, 9120. It was the home of the family of Giovanni Boccaccio, who died and was buried here in 1375. His house (of red brick, like the other old houses of the town) was restored in 1823 and fitted up with old furniture. A statue of him was erected in the principal square in 1875. The Palazzo Pretorio, or Vicariale, the residence of the Florentine governors, recently restored to its original condition, has a picturesque facade and court adorned with coats of arms, and in the interior are various frescoes dating from the 13th to the 16th century. The town as a whole is picturesque, and lies on a hill 426 ft. above sea-level.

See R. Pantini, *S. Gimignano e Certaldo* (Bergamo, 1904), p. 101 seq.

CERUSSITE, a mineral consisting of lead carbonate ($PbCO_3$), and an important ore of lead. The name (sometimes erroneously spelt cerusite) is from the Lat. *cerussa*, "white lead." "Cerussa nativa" was mentioned by K. Gesner in 1565, and in 1832 F.S. Beudant applied the name céruse to the mineral, whilst the present form, cerussite, is due to W. Haidinger (1845). Popular names in early use were lead-spar and white-lead-ore.

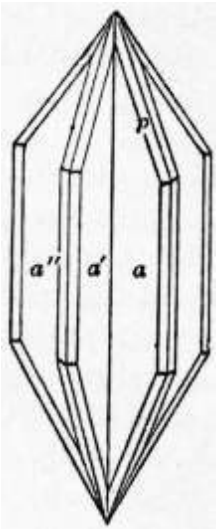


FIG. 1.

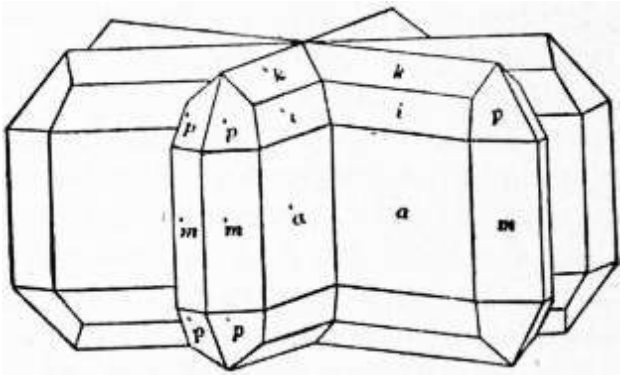


FIG. 2.

Cerussite crystallizes in the orthorhombic system and is isomorphous with aragonite. Like aragonite it is very frequently twinned, the compound crystals being pseudo-hexagonal in form. Three crystals are usually twinned together on two faces of the prism

m{110}, producing six-rayed stellate groups (figs, 1 and 2) with the individual crystals intercrossing at angles of nearly 60°. Twinning on the faces of the prism *r*{130}, the angles of which are also nearly 60°, produces a similar kind of grouping, but is much less common. Crystals are of frequent occurrence, and they usually have very bright and smooth faces. The mineral also occurs in compact granular masses, and sometimes in fibrous forms. It is usually colourless or white, sometimes grey or greenish in tint; it varies from transparent to translucent, and has an adamantine lustre. It is very brittle, and has a conchoidal fracture. Hardness 3-3½; sp. gr. 6.5. A variety containing 7% of zinc carbonate, replacing lead carbonate, is known as iglesiasite, from Iglesias in Sardinia, where it is found.

The mineral may be readily recognized by its characteristic twinning, in conjunction with the adamantine lustre and high specific gravity. It dissolves with effervescence in dilute nitric acid. Before the blow-pipe it fuses very readily, and gives reactions for lead. Cerussite occurs in metalliferous veins in association with galena, and has been formed by the action of carbonated waters on the galena; it is therefore found in the upper parts of the lodes together with other secondary minerals, such as limonite. Finely crystallized specimens have been obtained from the Friedrichssegen mine near Ems in Nassau, Johanngeorgenstadt in Saxony, Mies in Bohemia, Phenixville in Pennsylvania, Broken Hill in New South Wales, and several other localities. Delicate acicular crystals of considerable length were found long ago in the Pentire Glaze mine near St Minver in Cornwall. It is often found in considerable quantities, and contains as much as 77½% of lead.

(L. J. S.)

CERUTTI, GIUSEPPE ANTONIO GIACHIMO (1738-1792), French author and politician, was born at Turin on the 13th of June 1738. He joined the Society of Jesus and became professor at the Jesuit college at Lyons. In 1762, in reply to the attacks on his order, he published an *Apologie générale de l'institut et de la doctrine des Jésuites*, which won him much fame and some exalted patronage; notably that of the ex-king Stanislaus of Poland and of his grandson the dauphin. During the agitations that preceded the Revolution Cerutti took the popular side, and in 1788 published a pamphlet, *Mémoire pour le peuple français*, in which in a clear and trenchant style he advocated the claims of the *tiers état*. In May 1789 he presided over the electors of Paris, by whom in January 1791 he was chosen member of the administration of the department and afterwards deputy to the Legislative Assembly. He was a friend of Mirabeau, whose policy he supported and whose funeral oration he pronounced. He himself died on the 3rd of February 1792. Of Cerutti's literary enterprises the most interesting, and probably the most influential, was the popular newspaper founded by him, on the 30th of September 1790, in collaboration with Rabaut Saint-Étienne and Philippe Antoine Grouvelle. Its character and objects are explained by its title: *La Feuille villageoise, adressée chaque semaine à tous les villages de France pour les instruire des lois, des événements, des découvertes qui interessent tout ban citoyen, &c.* It was continued by Grouvelle after Cerutti's death, the last number appearing on the 2nd of August 1795.

Cerutti's works were published in 1793 in 3 volumes. On the *Mémoire pour le peuple français*, see F.A. Aulard in *La Révolution française*, tom. xv. (1888).

CERVANTES SAAVEDRA, MIGUEL DE (1547-1616), Spanish novelist, playwright and poet, was born at Alcalá de Henares in 1547. The attempts of biographers to provide him with an illustrious genealogy are unsuccessful. The family history begins with the author's grandfather, Juan de Cervantes (b. 1490), a lawyer who at one time (1545-6) administered the estates of the duke de Osuna, and resided later at Cordova, where he died about 1555. Cervantes' father was Rodrigo de Cervantes, an apothecary-surgeon, who married Leonor de Cortinas in 1540 or 1541. The children of this marriage were Andrés (b. 1543), Andrea (b. 1544), Luisa (b. 1546), Miguel, Rodrigo (b. 1550), Magdalena (b. 1554) and Juan (of whom nothing is known beyond the mention of him in his father's will).

The exact date of Cervantes' birth is not recorded: he was baptized on the 9th of October 1547, in the church of Santa Maria la Mayor at Alcalá. There are indications that Rodrigo de Cervantes resided at Valladolid in 1554, at Madrid in 1561, at Seville in 1564-1565, and at Madrid from 1566 onwards. It may be assumed that his family accompanied him, and it seems likely that either at Valladolid or at Madrid Cervantes saw the famous actor-manager and dramatist, Lope de Rueda, of whose performances he speaks enthusiastically in the preface to his plays. In 1569 a Madrid schoolmaster, Juan Lopez de Hoyos, issued a work commemorative of Philip II.'s third wife, Isabel de Valois, who had died on the 3rd of October 1568. This volume, entitled *Historia y relación verdadera de la enfermedad, felicisimo tránsito y sumptuosas exequias fúnebres de la Serenisima Reyna de Españia Doña Isabel de Valoys*, contains six contributions by Cervantes: a sonnet, four *redondillas*, and an elegy. Lopez de Hoyos introduces Cervantes as "our dear and beloved pupil," and the elegy is dedicated to Cardinal Espinosa "in the name of the whole school." It has been inferred that Cervantes was educated by Lopez de Hoyos, but this conclusion is untenable, for Lopez de Hoyos' school was not opened till 1567. On the 13th of October 1568, Giulio Acquaviva reached Madrid charged with a special mission to Philip

II.; he left for Rome on the 2nd of December, and Cervantes is supposed to have accompanied him. This conjecture is based solely on a passage in the dedication of the *Galatea*, where the writer speaks of having been "*camarero* to Cardinal Acquaviva at Rome." There is, however, no reason to think that Cervantes met Acquaviva in Madrid; the probability is that he enlisted as a supernumerary towards the end of 1568, that he served in Italy, and there entered the household of Acquaviva, who had been raised to the cardinalate on the 17th of May 1570. There exists a warrant (dated September 15, 1569) for the arrest of one Miguel de Cervantes, who had wounded Antonio de Sigura, and had been condemned in absence to have his right hand cut off and to be exiled from the capital for ten years; and it has been sought to identify the offender with the future author of *Don Quixote*. No evidence is available. All that is known with certainty is that Cervantes was in Rome at the end of 1569, for on the 22nd of December of that year the fact was recorded in an official information lodged by Rodrigo de Cervantes with a view to proving his son's legitimacy and untainted Christian descent.

If it is difficult to say precisely when Cervantes was in Acquaviva's service, it is no less difficult to say when he left it to join the regular army. There is evidence, more or less satisfactory, that his enlistment took place in 1570; in 1571 he was serving as a private in the company commanded by Captain Diego de Urbina which formed part of Miguel de Moncada's famous regiment, and on the 16th of September he sailed from Messina on board the "Marquesa," which formed part of the armada under Don John of Austria. At the battle of Lepanto (October 7, 1571) the "Marquesa" was in the thickest of the conflict. As the fleet came into action Cervantes lay below, ill with fever; but, despite the remonstrances of his comrades, he vehemently insisted on rising to take his share in the fighting, and was posted with twelve men under him in a boat by the galley's side. He received three gunshot wounds, two in the chest, and one which permanently maimed

his right hand—"for the greater glory of the right," in his own phrase. On the 30th of October the fleet returned to Messina, where Cervantes went into hospital, and during his convalescence received grants-in-aid amounting to eighty-two ducats. On the 29th of April 1572 he was transferred to Captain Manuel Ponce de León's company in Lope de Figueroa's regiment; he shared in the indecisive naval engagement off Navarino on the 7th of October 1572, in the capture of Tunis on the 10th of October 1573, and in the unsuccessful expedition to relieve the Goletta in the autumn of 1574. The rest of his military service was spent in garrison at Palermo and Naples, and shortly after the arrival of Don John at Naples on the 18th of June 1575, Cervantes was granted leave to return to Spain; he received a recommendatory letter from Don John to Philip II., and a similar testimonial from the duke de Sessa, viceroy of Sicily. Armed with these credentials, Cervantes embarked on the "Sol" to push his claim for promotion in Spain.

On the 26th of September 1575, near Les Trois Maries off the coast of Marseilles, the "Sol" and its companion ships the "Mendoza" and the "Higuera" encountered a squadron of Barbary corsairs under Arnaut Mami; Cervantes, his brother Rodrigo and other Spaniards were captured, and were taken as prisoners to Algiers. Cervantes became the slave of a Greek renegade named Dali Mami, and, as the letters found on him were taken to prove that he was a man of importance in a position to pay a high ransom, he was put under special surveillance. With undaunted courage and persistence he organized plans of escape. In 1576 he induced a Moor to guide him and other Christian captives to Oran; the Moor deserted them on the road, the baffled fugitives returned to Algiers, and Cervantes was treated with additional severity. In the spring of 1577 two priests of the Order of Mercy arrived in Algiers with a sum of three hundred crowns entrusted to them by Cervantes' parents; the amount was insufficient to free him, and was spent in ransoming his brother Rodrigo. Cervantes made another attempt to escape in September 1577, but was betrayed by the renegade whose services he had

enlisted. On being brought before Hassan Pasha, the viceroy of Algiers, he took the blame on himself, and was threatened with death; struck, however, by the heroic bearing of the prisoner, Hassan remitted the sentence, and bought Cervantes from Dali Mami for five hundred crowns. In 1577 the captive addressed to the Spanish secretary of state, Mateo Vazquez, a versified letter suggesting that an expedition should be fitted out to seize Algiers; the project, though practicable, was not entertained. In 1578 Cervantes was sentenced to two thousand strokes for sending a letter begging help from Martín de Córdoba, governor of Oran; the punishment was not, however, inflicted on him. Meanwhile his family were not idle. In March 1578 his father presented a petition to the king setting forth Cervantes' services; the duke de Sessa repeated his testimony to the captive's merits; in the spring of 1579 Cervantes' mother applied for leave to export two thousand ducats' worth of goods from Valencia to Algiers, and on the 31st of July 1579 she gave the Trinitarian monks, Juan Gil and Antón de la Bella, a sum of two hundred and fifty ducats to be applied to her son's ransom. On his side Cervantes was indefatigable, and towards the end of 1579 he arranged to secure a frigate; but the plot was revealed to Hassan by Juan Blanco de Paz, a Dominican monk, who appears to have conceived an unaccountable hatred of Cervantes. Once more the conspirator's life was spared by Hassan who, it is recorded, declared that "so long as he had the maimed Spaniard in safe keeping, his Christians, ships and city were secure." On the 29th of May 1580 the two Trinitarians arrived in Algiers: they were barely in time, for Hassan's term of office was drawing to a close, and the arrangement of any ransom was a slow process, involving much patient bargaining. Hassan refused to accept less than five hundred gold ducats for his slave; the available funds fell short of this amount, and the balance was collected from the Christian traders of Algiers. Cervantes was already embarked for Constantinople when the money was paid on the 19th of September 1580. The first use that he made of his liberty was to cause affidavits of his proceedings at Algiers to be drawn up; he sailed for Spain

towards the end of October, landed at Denia in November, and made his way to Madrid. He signed an information before a notary in that city on the 18th of December 1580.

These dates prove that he cannot, as is often alleged, have served under Alva in the Portuguese campaign of 1580: that campaign ended with the battle of Alcántara on the 25th of August 1580. It seems certain, however, that he visited Portugal soon after his return from Algiers, and in May 1581 he was sent from Thomar on a mission to Oran. Construed literally, a formal statement of his services, signed by Cervantes on the 21st of May 1590, makes it appear that he served in the Azores campaigns of 1582-83; but the wording of the document is involved, the claims of Cervantes are confused with those of his brother Rodrigo (who was promoted ensign at the Azores), and on the whole it is doubtful if he took part in either of the expeditions under Santa Cruz. In any case, the stories of his residence in Portugal, and of his love affairs with a noble Portuguese lady who bore him a daughter, are simple inventions. From 1582-3 to 1587 Cervantes seems to have written copiously for the stage, and in the *Adjunta al Parnaso* he mentions several of his plays as "worthy of praise"; these were *Los Tratos de Argel, La Numancia, La Gran Turquesa, La Batalla naval, La Jerusalem, La Amaranta ó la de Mayo, El Bosque amoroso, La Unica y Bizarra Ársinda* —"and many others which I do not remember, but that which I most prize and pique myself on was, and is, one called *La Confusa* which, with all respect to as many sword-and-cloak plays as have been staged up to the present, may take a prominent place as being good among the best." Of these only *Los Tratos de Argel* (or *El Trato de Argel*) and *La Numancia* have survived, and, though *La Numancia* contains many fine rhetorical passages, both plays go to prove that the author's genius was not essentially dramatic. In February 1584 he obtained a licence to print a pastoral novel entitled *Primera parte de la Galatea*, the copyright of which he sold on the 14th of June to Blas de Robles, a bookseller at Alcalá de Henares, for 1336 *reales*.

On the 12th of December he married Catalina de Palacios Salazar y Vozmediano of Esquivias, eighteen years his junior. The *Galatea* was published in the spring of 1585, and is frequently said to relate the story of Cervantes' courtship, and to introduce various distinguished writers under pastoral names. These assertions must be received with great reserve. The birth of an illegitimate daughter, borne to Cervantes by a certain Ana Francisca de Rojas, is referred to 1584, and earlier in that same year the *Galatea* had passed the censor; with few exceptions, the identifications of the characters in the book with personages in real life are purely conjectural. These circumstances, together with the internal evidence of the work, point to the conclusion that the *Galatea* was begun and completed before 1583. It was only twice reprinted—once at Lisbon (1590), and once at Paris (1611)—during the author's lifetime; but it won him a measure of repute, it was his favourite among his books, and during the thirty years that remained to him he repeatedly announced the second part which is promised conditionally in the text. However, it is not greatly to be regretted that the continuation was never published; though the *Galatea* is interesting as the first deliberate bid for fame on the part of a great genius, it is an exercise in the pseudo-classic literature introduced into Italy by Sannazaro, and transplanted to Spain by the Portuguese Montemõr; and, ingenious or eloquent as the Renaissance prose-pastoral may be, its innate artificiality stifles Cervantes' rich and glowing realism. He himself recognized its defects; with all his weakness for the *Galatea*, he ruefully allows that "it proposes something and concludes nothing." Its comparative failure was a serious matter for Cervantes who had no other resource but his pen; his plays were probably less successful than his account of them would imply, and at any rate play-writing was not at this time a lucrative occupation in Spain. No doubt the death of his father on the 13th of June 1585 increased the burden of Cervantes' responsibilities; and the dowry of his wife, as appears from a document dated the 9th of August 1586, consisted of nothing more valuable than five vines, an orchard, some

household furniture, four beehives, forty-five hens and chickens, one cock and a crucible.

It had become evident that Cervantes could not gain his bread by literature, and in 1587 he went to Seville to seek employment in connexion with the provisioning of the Invincible Armada. He was placed under the orders of Antonio de Guevara, and before the 24th of February was excommunicated for excessive zeal in collecting wheat at Écija. During the next few months he was engaged in gathering stores at Seville and the adjacent district, and after the defeat of the Armada he was retained as commissary to the galleys. Tired of the drudgery, and without any prospect of advancement, on the 21st of May 1590 Cervantes drew up a petition to the king, recording his services and applying for one of four posts then vacant in the American colonies: a place in the department of public accounts in New Granada, the governorship of Soconusco in Guatemala, the position of auditor to the galleys at Cartagena, or that of *corregidor* in the city of La Paz. The petition was referred to the Council of the Indies, and was annotated with the words:—"Let him look for something nearer home." Cervantes perforce remained at his post; the work was hard, uncongenial and ill-paid, and the salary was in constant arrears. In November 1590 he was in such straits that he borrowed money to buy himself a suit of clothes, and in August 1592 his sureties were called upon to make good a deficiency of 795 *reales* in his accounts. His thoughts turned to literature once more, and on the 5th of September 1592, he signed a contract with Rodrigo Osorio undertaking to write six plays at fifty ducats each, no payment to be made unless Osorio considered that each of these pieces was "one of the best ever produced in Spain." Nothing came of this agreement, and it appears that, between the date of signing it and the 19th of September, Cervantes was imprisoned (for reasons unknown to us) at Castro del Río. He was speedily released, and continued to perquisition as before in Andalusia; but his literary ambitions were not dead, and in May 1595 he won the first prize—

three silver spoons—at a poetical tourney held in honour of St Hyacinth at Saragossa. Shortly afterwards Cervantes found himself in difficulties with the exchequer officials. He entrusted a sum of 7400 *reales* to a merchant named Simón Freire de Lima with instructions to pay the amount into the treasury at Madrid; the agent became bankrupt and absconded, leaving Cervantes responsible for the deficit. By some means the money was raised, and the debt was liquidated on the 21st of January 1597. But Cervantes' position was shaken, and his unbusinesslike habits lent themselves to misinterpretation. On the 6th of September 1597 he was ordered to find sureties that he would present himself at Madrid within twenty days, and there submit to the exchequer vouchers for all official moneys collected by him in Granada and elsewhere. No such sureties being available, he was committed to Seville jail, but was released on the 1st of December on condition that he complied with the original order of the court within thirty days. He was apparently unable to find bail, was dismissed from the public service, and sank into extreme poverty. During a momentary absence from Seville in February 1590, he was again summoned to Madrid by the treasury, but does not appear to have obeyed: it is only too likely that he had not the money to pay for the journey. There is some reason to think that he was imprisoned at Seville in 1602, but nothing positive is known of his existence between 1600 and the 8th of February 1603: at the latter date he seems to have been at Valladolid, to which city Philip III. had removed the court in 1601.

Since the publication of the *Galatea* in 1585 Cervantes' contributions to literature had been limited to occasional poems. In 1591 he published a ballad in Andrés de Villalta's *Flor de varios y nuevos romances*; in 1595 he composed a poem, already mentioned, to celebrate the canonization of St Hyacinth; in 1596 he wrote a sonnet ridiculing Medina Sidonia's tardy entry into Cadiz after the English invaders had retired, and in the same year his sonnet lauding Santa Cruz was printed in Cristóbal. Mosquera de Figueroa's

Comentario en breve compendio de disciplina militar; to 1597 is assigned a sonnet (the authenticity of which is disputed) commemorative of the poet Herrera; in 1598 he wrote two sonnets and a copy of *quintillas* on the death of Philip II.; and in 1602 a complimentary sonnet from his pen appeared in the second edition of Lope de Vega's *Dragontea*. Curiously enough, it is by Lope de Vega that *Don Quixote* is first mentioned. Writing to an unknown correspondent (apparently a physician) on the 14th of August 1604, Lope de Vega says that "no poet is as bad as Cervantes, nor so foolish as to praise *Don Quixote*," and he goes on to speak of his own plays as being odious to Cervantes. It is obvious that the two men had quarrelled since 1602, and that Lope de Vega smarted under the satire of himself and his works in Cervantes' forthcoming book; *Don Quixote* may have been circulated in manuscript, or may even have been printed before the official licence was granted on the 26th of September 1604. It was published early in 1605, and was dedicated to the seventh duke de Béjar in phrases largely borrowed from the dedication in Herrera's edition (1580) of Garcilaso de la Vega, and from Francisco de Medina's preface to that work.

The mention of Bernardo de la Vega's *Pastor de Iberia* shows that the sixth chapter of *Don Quixote* cannot have been written before 1591. In the prologue Cervantes describes his masterpiece as being "just what might be begotten in a jail"; on the strength of this passage, it has been thought that he conceived the story, and perhaps began writing it, during one of his terms of imprisonment at Seville between 1597 and 1602. Within a few weeks of its publication at Madrid, three pirated editions of *Don Quixote* were issued at Lisbon; a second authorized edition, imperfectly revised, was hurried out at Madrid; and another reprint appeared at Valencia with an *aprobación* dated 18th July 1605. With the exception of Alemán's *Guzmán de Alfarache*, no Spanish book of the period was more successful. Modern criticism is prone to regard *Don Quixote* as a symbolic, didactic or controversial work intended to bring about radical reforms in church and state. Such

interpretations did not occur to Cervantes' contemporaries, nor to Cervantes himself. There is no reason for rejecting his plain statement that his main object was to ridicule the romances of chivalry, which in their latest developments had become a tissue of tiresome absurdities. It seems clear that his first intention was merely to parody these extravagances in a short story; but as he proceeded the immense possibilities of the subject became more evident to him, and he ended by expanding his work into a brilliant panorama of Spanish society as it existed during the 16th century. Nobles, knights, poets, courtly gentlemen, priests, traders, farmers, barbers, muleteers, scullions and convicts; accomplished ladies, impassioned damsels, Moorish beauties, simple-hearted country-girls and kindly kitchen-wenches of questionable morals—all these are presented with the genial fidelity which comes of sympathetic insight. The immediate vogue of *Don Quixote* was due chiefly to its variety of incident, to its wealth of comedy bordering on farce, and perhaps also to its keen thrusts at eminent contemporaries; its reticent pathos, its large humanity, and its penetrating criticism of life were less speedily appreciated.

Meanwhile, on the 12th of April 1605, Cervantes authorized his publisher to proceed against the Lisbon booksellers who threatened to introduce their piratical reprints into Castile. By June the citizens of Valladolid already regarded Don Quixote and Sancho Panza as proverbial types. Less gratifying experiences awaited the popular author. On the 27th of June 1605 Gaspar de Ezpeleta, a Navarrese gentleman of dissolute life, was wounded outside the lodging-house in which Cervantes and his family lived; he was taken indoors, was nursed by Cervantes' sister Magdalena, and died on the 29th of June. That same day Cervantes, his natural daughter (Isabel de Saavedra), his sister Andrea and her daughter were lodged in jail on suspicion of being indirectly concerned in Ezpeleta's death; one of the witnesses made damaging charges against Cervantes' daughter, but no substantial evidence was produced, and the prisoners were released. Little is known of Cervantes'

life between 1605 and 1608. A *Relación* of the festivities held to celebrate the birth of Philip IV., and a certain *Carta á don Diego Astudillo Carrillo* have been erroneously ascribed to him; during these three years he apparently wrote nothing beyond three sonnets, and one of these is of doubtful authenticity. The depositions of the Valladolid enquiry show that he was living in poverty five months after the appearance of *Don Quixote*, and the fact that he borrowed 450 *reales* from his publisher before November 1607 would convey the idea that his position improved slowly, if at all. But it is difficult to reconcile this view of his circumstances with the details concerning his illegitimate daughter revealed in documents recently discovered. Isabel de Saavedra was stated to be a spinster when arrested at Valladolid in June 1605; the settlement of her marriage with Luis de Molina in 1608 describes her as the widow of Diego Sanz, as the mother of a daughter eight months old, and as owning house-property of some value. These particulars are perplexing, and the situation is further complicated by the publication of a deed in which Cervantes declares that he himself is the real owner of this house-property, and that his daughter has merely a life-interest in it. This claim may be regarded as a legal fiction; it cannot easily be reconciled with Cervantes' statement towards the end of his life, that he was dependent on the bounty of the count de Lemos and of Bernardo de Sandoval, cardinal-archbishop of Toledo. In 1609 he joined the newly founded confraternity of the Slaves of the Most Blessed Sacrament; in 1610 Lemos was appointed viceroy of Naples, and Cervantes was keenly disappointed at not being chosen to accompany his patron. In 1611 he lost his sister Magdalena, who was buried by the charity of the Tertiaries of Saint Francis; in 1612 he joined the Academia Selvaje, and there appears to have renewed his former friendly relations with Lope de Vega; in 1613 he dedicated his *Novelas exemplares* to the count de Lemos, and disposed of his rights for 1600 *reales* and twenty-four copies of the book. The twelve tales in this volume, some of them written very much later than others, are of unequal merit, but they contain some of the writer's best work, and the two

picaresque stories—*Rinconete y Cortadillo* and the *Coloquio de los perros*—are superb examples of their kind, and would alone entitle Cervantes to take rank with the greatest masters of Spanish prose. In 1614 he published the *Viage del Parnaso*, a burlesque poem suggested by the *Viaggio in Parnaso* (1582) of the Perugian poet Cesare Caporali. It contains some interesting autobiographical passages, much flattery of contemporary poetasters, and a few happy satirical touches; but, though it is Cervantes' most serious bid for fame as a poet, it has seldom been reprinted, and would probably have been forgotten but for an admirably humorous postscript in prose which is worthy of the author at his best. In the preface to his *Ocho comedias y ocho entremeses nuevos* (1615) he good-humouredly admits that his dramatic works found no favour with managers, and, when this collection was first reprinted (1749), the editor advanced the fantastic theory that the *comedias* were deliberate exercises in absurdity, intended to parody the popular dramas of the day. This view cannot be maintained, but a sharp distinction must be drawn between the eight set plays and the eight interludes; with one or two exceptions, the *comedias* or set plays are unsuccessful experiments in Lope de Vega's manner, while the *entremeses* or *interludes*, particularly those in prose, are models of spontaneous gaiety and ingenious wit.

In the preface to the *Novelas exemplares* Cervantes had announced the speedy appearance of the sequel to *Don Quixote* which he had vaguely promised at the end of the first part. He was at work on the fifty-ninth chapter of his continuation when he learned that he had been anticipated by Alonso Fernandez de Avellaneda of Tordesillas, whose *Segunde tamo del ingenioso hidalgo don Quixote de la Mancha* was published at Tarragona in 1614. On the assumption that Fernandez de Avellaneda is a pseudonym, this spurious sequel has been ascribed to the king's confessor, Luis de Aliaga, to Cervantes' old enemy, Blanco de Paz, to his old friend, Bartolomé Leonardo de Argensola, to the three great dramatists, Lope de Vega, Tirso de Molina and Ruiz de Alarcón, to Alonso Fernandez, to Juan José Martí, to Alfonso

Lamberto, to Luis de Granada, and probably to others. Some of these attributions are manifestly absurd—for example, Luis de Granada died seventeen years before the first part of *Don Quixote* was published—and all of them are improbable conjectures; if Avellaneda be not the real name of the author, his identity is still undiscovered. His book is not devoid of literary talent and robust humour, and possibly he began it under the impression that Cervantes was no more likely to finish *Don Quixote* than to finish the *Galatea*. He should, however, have abandoned his project on reading the announcement in the preface to the *Novelas exemplares*; what he actually did was to disgrace himself by writing an insolent preface taunting Cervantes with his physical defects, his moral infirmities, his age, loneliness and experiences in jail. He was too intelligent to imagine that his continuation could hold its own against the authentic sequel, and malignantly avowed his intention of being first in the field and so spoiling Cervantes' market. It is quite possible that *Don Quixote* might have been left incomplete but for this insulting intrusion; Cervantes was a leisurely writer and was, as he states, engaged on *El Engaño à los ojos, Las Semanas del Jardín* and *El Famoso Bernardo*, none of which have been preserved. Avellaneda forced him to concentrate his attention on his masterpiece, and the authentic second part of *Don Quixote* appeared towards the end of 1615. No book more signally contradicts the maxim, quoted by the Bachelor Carrasco, that "no second part was ever good." It is true that the last fourteen chapters are damaged by undignified denunciations of Avellaneda; but, apart from this, the second part of *Don Quixote* is an improvement on the first. The humour is more subtle and mature; the style is of more even excellence; and the characters of the bachelor and of the physician, Pedro Recio de Agüero, are presented with a more vivid effect than any of the secondary characters in the first part. Cervantes had clearly profited by the criticism of those who objected to "the countless cudgellings inflicted on Señor Don Quixote," and to the irrelevant interpolation of extraneous stories in the text. Don Quixote moves through the second part with unruffled dignity; Sancho

Panza loses something of his rustic cunning, but he gains in wit, sense and manners. The original conception is unchanged in essentials, but it is more logically developed, and there is a notable progress in construction. Cervantes had grown to love his knight and squire, and he understood his own creations better than at the outset; more completely master of his craft, he wrote his sequel with the unfaltering confidence of a renowned artist bent on sustaining his reputation.

The first part of *Don Quixote* had been reprinted at Madrid in 1608; it had been produced at Brussels in 1607 and 1611, and at Milan in 1610; it had been translated into English in 1612 and into French in 1614. Cervantes was celebrated in and out of Spain, but his celebrity had not brought him wealth. The members of the French special embassy, sent to Madrid in February 1615, under the Commandeur de Sillery, heard with amazement that the author of the *Galatea*, the *Novelas exemplares* and *Don Quixote* was "old, a soldier, a gentleman and poor." But his trials were almost at an end. Though failing in health, he worked assiduously at *Los Trabajos de Persiles y Sigismunda*, which, as he had jocosely prophesied in the preface to the second part of *Don Quixote*, would be "either the worst or the best book ever written in our tongue." It is the most carefully written of his prose works, and the least animated or attractive of them; signs of fatigue and of waning powers are unmistakably visible. Cervantes was not destined to see it in print. He was attacked by dropsy, and, on the 18th of April 1616, received the sacrament of extreme unction; next day he wrote the dedication of *Persiles y Sigismunda* to the count de Lemos—the most moving and gallant of farewells. He died at Madrid in the Calle del León on the 23rd of April; he was borne from his house "with his face uncovered," according to the rule of the Tertiaries of St Francis, and on the 24th of April was buried in the church attached to the convent of the Trinitarian nuns in the Calle de Cantarranas. There he rests—the story of his remains being removed in 1633 to the Calle del Humilladero has no foundation in fact—but the exact

position of his grave is unknown. Early in 1617 *Persiles y Sigismunda* was published, and passed through eight editions within two years; but the interest in it soon died away, and it was not reprinted between 1625 and 1719. Cervantes' wife died without issue on the 31st of October 1626; his natural daughter, who survived both the child of her first marriage and her second husband, died on the 20th of September 1652. Cervantes is represented solely by his works. The *Novelas exemplares* alone would give him the foremost place among Spanish novelists; *Don Quixote* entitles him to rank with the greatest writers of all time: "children turn its leaves, young people read it, grown men understand it, old folk praise it." It has outlived all changes of literary taste, and is even more popular to-day than it was three centuries ago.

BIBLIOGRAPHY.—Leopold Rius, *Bibliografía crítica de las obras de Miguel de Cervantes Saavedra* (Madrid, 1895-1905, 3 vols.); *Obras completas* (Madrid, 1863-1864, 12 vols.), edited by Juan Eugenio Hartzenbusch; *Complete Works* (Glasgow, 1901-1906, 8 vols. in progress), edited by James Fitzmaurice-Kelly; *Don Quijote* (Madrid, 1833-1839, 6 vols.), edited by Diego Clemencíu; *Don Quixote* (London, 1899-1900, 2 vols.), edited by James Fitzmaurice-Kelly and John Ormsby; *Don Quijote* (Madrid, 1905-1906, 2 vols. in progress), edited by Clemente Cortejón; *Rinconete y Cortadillo* (Sevilla, 1905), edited by Francisco Rodriguez Marín; *Epístola á Mateo Vázquez* (Madrid, 1905), edited by E[milio] C[otarelo]; Julián Apráiz, *Estudio histórico-crítico sobre las Novelas ejemplares de Cervantes* (Madrid, 1901); Francisco A. de Icaza, *Las Novelas ejemplares de Cervantes* (Madrid, 1901); Francisco Rodríguez Marín, *El Loaysa de "El Celoso Extremeño"* (Sevilla, 1901); Narciso Díaz de Escovar, *Apuntes escénicos cervantinos* (Madrid, 1905); Manuel José García, *Estudio crítico acerca del entremés "El Vizcaino fingido"* (Madrid, 1905); Alfred Morel-Fatio, *L'Espagne de Don Quichotte* in *Études sur l'Espagne* (Paris, 1895, 2me série); Julio Puyol y Alonso, *Estado social que refleja "El*

Quijote" (Madrid, 1905); James Fitzmaurice-Kelly, *Cervantes in England* (London, 1905); Raymond Foulché-Delbose, *Étude sur "La tia fingida,"* in the *Revue hispanique* (Paris, 1899), vol. vi. pp. 256-306; Benedetto Croce, *Due illustrazioni al "Viage del Parnaso,"* in the *Homenaje á Menéndez y Pelayo* (Madrid, 1899), vol. i. pp. 161-193; Paul Groussac, *Une Énigme littéraire: le Don Quichotte d'Avellaneda* (Paris, 1903); Alonso Fernández de Avellaneda, *El ingenioso hidalgo Don Quixote de la Mancha* (Barcelona, [1905]), edited by Marcelino Menéndez y Pelayo; Julio Cejador y Franca, *La Lengua de Cervantes* (Madrid, 1905, &c.); Martin Fernández de Navarrete, *Vida de Miguel de Cervantes Saavedra* (Madrid, 1819); Cristóbal Perez Pastor, *Documentos Cervantinos hasta ahora inéditos* (Madrid, 1897-1902, 2 vols.); Emilio Cotardo y Mori, *Efemérides Cervantinas* (Madrid, 1905); Francisco Rodríguez Marín, *Cervantes estudió en Sevilla, 1564-1565* (Seville, 1905).

(J. F.-K.)

CERVERA, PASCUAL CERVERA Y TOPETE (1839-1909), Spanish admiral, was born at Medina Sidonia on the 18th of February 1839. He showed an early inclination for the sea, and his family sent him to the naval cadet school at the age of twelve. As a sub-lieutenant he took part in the naval operations on the coast of Morocco during the campaign of 1859-60. Then he was for some time engaged in operations in the Sulu Islands and the Philippines. Afterwards he was on the West Indian station during the early part of the first Cuban War (1868-78), returning to Spain in 1873 to serve on the Basque coast against the Carlists. He distinguished himself in defending the Carraca arsenal near Cadiz against the Federals in 1873. He won each step in his promotion up to flag-rank through his steadiness and brilliant

conduct in action, and was awarded the crosses of the Orders of Military and Naval Merit, Isabella the Catholic, and St Hermengilde, besides several medals. Cervera had a great reputation for decision, unbending temper and honesty, before he was placed at the head of the Bilbao building-yards. This post he resigned after a few months in order to become minister of marine in 1892, in a cabinet presided over by Sagasta. He withdrew from the cabinet when he found that his colleagues, from political motives, declined to support him in making reforms and, on the other hand, unwisely cut down the naval estimates. When in 1898 the Spanish-American War (*q.v.*) broke out, he was chosen to command a squadron composed of four first-class cruisers, the "Maria Theresa," his flagship, "Oquendo," "Vizcaya," and "Columbus," and several destroyers. This ill-fated squadron only started upon its reckless cruise across the ocean after its gallant commander had repeatedly warned both the minister of marine and the prime minister, Sagasta, in despatches from Cadiz and from the Canary and Cape Verde Islands, that the ships were insufficiently provided with coal and ammunition. Some of them, indeed, even lacked proper guns. In compliance with the instructions of the government, Admiral Cervera made for the landlocked harbour of Santiago de Cuba, where he co-operated in the defence, landing some guns and a naval brigade. In spite of his energetic representations, Cervera received an order from Madrid, dictated by political considerations, to sally forth. It meant certain destruction. The gallant squadron met forces trebly superior to it, and was totally destroyed. The admiral, three of his captains, and 1800 sailors and marines were taken by the victors to Portsmouth, New Hampshire, U.S.A. After the war, Cervera and his captains were tried before the supreme naval and military court of the realm, which honourably acquitted them all. In 1901 he became vice-admiral, in 1902 was appointed chief of staff of the Spanish navy, and in 1903 was made life senator. He died at Puerto Real on the 3rd of April 1909.

CESAREVICH, or more properly TSESAREVICH, the title of the heir-apparent to the Russian throne. The full official title is *Nasliednik Tsesarevich*, *i.e.* "heir of Caesar," and in Russia the heir to the throne is commonly called simply *Nasliednik*, the word *Tsesarevich* never being used alone. *Tsarevich*, a form now much used in England, means simply any "king's son"; it is an antiquated term now out of use in Russia, and was last borne as heir to the throne by the unfortunate Alexius, son of Peter the Great. The style of the wife of the tsesarevich is *Tsesarevna*. The Cesarewitch handicap race at Newmarket, founded in 1839, was named after the prince who was afterwards Alexander II. of Russia, who paid a state visit to England that year.

CESARI, GIUSEPPE, called Il Cavaliere d' Arpino (born in or about 1568 and created a "Cavaliere di Cristo" by Pope Clement VIII.), also named Il Giuseppino, an Italian painter, much encouraged at Rome and munificently rewarded. His father had been a native of Arpino, but Giuseppe himself was born in Rome. Cesari is stigmatized by Lanzi as not less the corrupter of taste in painting than Marino was in poetry; indeed, another of the nicknames of Cesari is "Il Marino de' Pittori" (the pictorial Marino). There was spirit in Cesari's heads of men and horses, and his frescoes in the Capitol (story of Romulus and Remus, &c.), which occupied him at intervals during forty years, are well coloured; but he drew the human form ill. His perspective is faulty, his extremities monotonous, and his chiaroscuro defective. He died in 1640, at the age of seventy-two, or perhaps of eighty, at Rome. Cesari ranks as the head of the "Idealists" of his period, as opposed to the "Naturalists," of whom Michelangelo da Caravaggio was the leading

champion,—the so-called “idealism” consisting more in reckless facility, and disregard of the common facts and common-sense of nature, than in anything to which so lofty a name could be properly accorded. He was a man of touchy and irascible character, and rose from penury to the height of opulence. His brother Bernardino assisted in many of his works.

CESAROTTI, MELCHIORE (1730-1808), Italian poet, was born at Padua in 1730, of a noble but impoverished family. At the university of his native place his literary progress procured for him at a very early age the chair of rhetoric, and in 1768 the professorship of Greek and Hebrew. On the invasion of Italy by the French, he gave his pen to their cause, received a pension, and was made knight of the iron crown by Napoleon I., to whom, in consequence, he addressed a bombastic and extravagantly flattering poem called *Pronea*. Cesarotti is best known as the translator of Homer and Ossian. Much praise cannot be given to his version of the *Iliad*, for he has not scrupled to add, omit and modernize. Ossian, which he held to be the finest of poems, he has, on the other hand, considerably improved in translation; and the appearance of his version attracted much attention in Italy and France, and raised up many imitators of the Ossianic style. Cesarotti also produced a number of works in prose, including a *Course of Greek Literature*, and essays *On the Origin and Progress of the Poetic Art*, *On the Sources of the Pleasure derived from Tragedy*, *On the Philosophy of Language* and *On the Philosophy of Taste*, the last being a defence of his own great eccentricities in criticism. His weakness was a straining after novelty. His style is forcible, but full of Gallicisms.

A complete edition of his works, in 42 vols. 8vo. began to appear at Pisa in 1800, and was completed in 1813, after his death. See *Memoirs*, by Barbieri (Padua, 1810), and *Un Filosofo delle lettere*, by Alemanni (Turin, 1894).

CESENA (anc. *Caesena*), a town and episcopal see of Emilia, Italy, in the province of Forlì, 12 m. S.E. by rail from the town of Forlì, on the line between Bologna and Rimini, 144 ft. above sea-level. Pop. (1905) 12,245 (town); 43,468 (commune). The town is picturesquely situated at the foot of the slopes of the Apennines, and is crowned by a medieval fortress (Rocca), begun by the emperor Frederick I. (Barbarossa) probably, but altered and added to later. The cathedral has two fine marble altars by the Lombardi of Venice (or their school). The library, built for Domenico Malatesta in 1452 by Matteo Nuzio, is a fine early Renaissance building, and its internal arrangements, with the original desks to which the books are still chained, are especially well preserved (see J.W. Clark, *The Care of Books*, Cambridge, 1901, p. 199). In it are valuable MSS., many of which were used by Aldus Manutius. It also contains a picture gallery with a good "Presentation in the Temple" by Francesco Francia. There are some fine palaces in the town. Three-quarters of a mile south-east on the hill stands the handsome church of S. Maria del Monte, after the style of Bramante, with carved stalls of the 16th century. Wine, hemp and silk are the main articles of trade. About the ancient Caesena little is said in classical authors: it is mentioned as a station on the Via Aemilia and as a fortress in the wars of Theodoric and Narses. During the middle ages it was at first independent. In 1357 it was unsuccessfully defended by the wife of Francesco Ordelaffi, lord

of Forlì, against the papal troops under Albornoz. In 1377 it was sacked by Cardinal Robert of Geneva (afterwards Clement VII., antipope). It was then held by the Malatesta of Rimini until 1465, when it came under the dominion of the church. Both Pius VI. (1717) and Pius VII. (1742) were born at Cesena.

(T. As.)

CESNOLA, LUIGI PALMA DI (1832-1904), Italian-American soldier and archaeologist, was born near Turin on the 29th of July 1832. Having served in the Austrian and Crimean Wars, in 1860 he went to New York, where he taught Italian and French and founded a military school for officers. He took part in the American Civil War as colonel of a cavalry regiment, and at Aldie (June 1863) was wounded and taken prisoner. He was released from Libby prison early in 1864, served in the Wilderness and Petersburg campaigns (1864-65) as a brigadier of cavalry, and at the close of the war was breveted brigadier-general. He was then appointed United States consul at Larnaca in Cyprus (1865-1877). During his stay in the island he carried on excavations, which resulted in the discovery of a large number of antiquities. The collection was purchased by the Metropolitan Museum of New York, and Cesnola became director in 1879. Doubt having been thrown by Gaston L. Feuerdant, in an article in the New York *Herald* (August 1880), upon the genuineness of his restorations, the matter was referred to a special committee, which pronounced in his favour.[1] He is the author of *Cyprus, its ancient Cities, Tombs and Temples* (1877), an interesting book of travel and of considerable service to the practical antiquary; and of a *Descriptive Atlas of the Cesnola Collection of Cypriote Antiquities* (3 vols.,

1884-6). He died in New York on the 21st of November 1904. He was a member of several learned societies in Europe and America, and in 1897 he received a Congressional medal of honour for conspicuous military services.

His brother, ALESSANDRO PALMA DI CESNOLA, born in 1839, conducted excavations at Paphos (where he was U.S. vice-consul) and Salamis on behalf of the British government. The results of these are described in *Salaminia* (1882).

---

1 For the Cesnola controversy see C.D. Cobham's *Attempt at a Bibliography of Cyprus* (4th ed., 1900). See also article CYPRUS.

CESPEDES (in Ital. CEDASPE), **PABLO DE** (1538-1608), Spanish poet, painter, sculptor and architect, was born at Cordova, and was educated at Alcalá de Henares, where he studied theology and Oriental languages. On leaving the university, he went to Rome, where he became the pupil and friend of Federigo Zuccaro, under whose direction he studied particularly the works of Raphael and of Michelangelo. In 1560, while yet in Rome, proceedings were taken against him by the Inquisition at Valladolid on account of a letter which, found among the papers of the archbishop of Toledo, had been written by Cespedes during the preceding year, and in which he had spoken with great freedom against the holy office and the inquisitor-general, Fernando de Valdés. Cespedes remained in Rome at this critical moment, and he appears rightly to have treated the prosecution with derision. It is not known how he contrived to bring the proceedings to an end; he returned, however, to Spain a little before 1577, and in that year was installed in a prebend of the cathedral at Cordova, where he resided till his

death. Pablo de Cespedes has been called the most *savant* of Spanish artists. According to his friend Francisco Pacheco, to whom posterity is indebted for the preservation of all of Cespedes's verse that is extant, the school of Seville owes to him its introduction to the practice of chiaroscuro. He was a bold and correct draughtsman, a skilful anatomist, a master of colour and composition; and the influence he exerted to the advantage of early Spanish art was considerable. Cristobal de Vera, Juan de Peñalosa and Zambrano were among his pupils. His best picture is a Last Supper at Cordova, but there are good examples of his work at Seville and at Madrid. Cespedes was author of several opuscules in prose on subjects connected with his profession. Of his poem on *The Art of Painting* enough was preserved by Pacheco to enable us to form an opinion of the whole. It is esteemed the best didactic verse in Spanish; and it has been compared, not disadvantageously, with the *Georgics*. It is written in strong and sonorous octaves, in the majestic declamatory vein of Fernando Herrera, and is not altogether so dull and lifeless as is most didactic verse. It contains a glowing eulogy of Michelangelo, and some excellent advice to young painters, insisting particularly on hard work and on the study of nature. The few fragments yet remaining, amounting in all to some six hundred lines, were first printed by Pacheco in his treatise *Del arte de la pintura*, in 1649.

CÉSPEDES Y MENESES, GONZALO DE (1585?-1638), Spanish novelist, was born at Madrid about 1585. Nothing positive is known of him before the publication of his celebrated romance, the *Poema trágico del Español Gerardo, y desengaño del amor lascivo* (1615-1617); there is evidence that he had been sentenced to eight years at the galleys previous to

the 1st of January 1620, and that the penalty had been remitted; but the nature of his offence is not stated. His treatment of political questions in the *Historia apologética en los sucesos del reyno de Aragón, y su ciudad de Zaragoza, años de 91 y 92* (1622), having led to the confiscation of the book, Céspedes took up his residence at Saragossa and Lisbon. While in exile he issued a collection of short stories entitled *Historias peregrinas y exemplares* (1623), the unfinished romance *Varia fortuna del soldado Píndaro* (1626), and the first part of his *Historia de Felipe IV.* (1631), a fulsome eulogy which was rewarded by the author's appointment as official historiographer to the Spanish king. Céspedes died on the 27th of January 1638. His novels, though written in a ponderous, affected style, display considerable imagination and insight into character. The *Poema trágico* has been utilized by Fletcher in *The Spanish Curate* and in *The Maid of the Mill*.

The *Historias peregrinas* has been reprinted (1906) with a valuable introduction by Sr. Cotarelo y Mori.

CESS (a shortened form of "assess"; the spelling is due to a mistaken connexion with "census"), a tax; a term formerly more particularly applied to local taxation, in which sense it still is used in Ireland; otherwise it has been superseded by "rate." In India it is applied, with the qualifying word prefixed, to any taxation, such as "irrigation-cess" and the like, and in Scotland to the land-tax.

CESSIO BONORUM (Latin for a "surrender of goods"), in Roman law, a voluntary surrender of goods by a debtor to his creditors. It did not amount to a discharge unless the property ceded was sufficient for the purpose, but it secured the debtor from personal arrest. The creditors sold the goods in satisfaction, *pro tanto*, of their claims. The procedure of *cessio bonorum* avoided infamy, and the debtor, though his after-acquired property might be proceeded against, could not be deprived of the bare necessaries of life. The main features of the Roman law of *cessio bonorum* were adopted in Scots law, and also in the French legal system. (See further BANKRUPTCY.)

CESTI, MARC' ANTONIO (1620?-1669?), Italian musical composer, was born at Florence about 1620. He was a pupil of Carissimi, and after holding a post somewhere in Florence as *maestro di cappella* entered the papal chapel in 1660. In 1666 he became *Vice-Kapellmeister* at Vienna, and died at Venice in 1669. Cesti is known principally as a composer of operas, the most celebrated of which were *La Dori* (Venice, 1663) and *Il Pomo d' oro* (Vienna, 1668). He was also a composer of chamber-cantatas, and his operas are notable for the pure and delicate style of their airs, more suited to the chamber than to the stage.

CESTIUS, LUCIUS, surnamed Pius, Latin rhetorician, flourished during the reign of Augustus. He was a native of Smyrna, a Greek by birth. According to Jerome, he was teaching Latin at Rome in the year 13 B.C. He must have been living after A.D. 9, since we are told that he taunted the son of Quintilius Varus with his father's defeat in the Teutoburgian forest (Seneca, *Controv.* i. 3, 10). Cestius was a man of great ability, but vain, quarrelsome and sarcastic. Before he left Asia, he was invited to dinner by Cicero's son, then governor of the province. His host, being uncertain as to his identity, asked a slave who Cestius was; and on receiving the answer, "he is the man who said your father was illiterate," ordered him to be flogged (Seneca, *Suasoriae*, vii. 13). As an orator in the schools Cestius enjoyed a great reputation, and was worshipped by his youthful pupils, one of whom imitated him so slavishly that he was nicknamed "my monkey" by his teacher (Seneca, *Controv.* ix. 3, 12). As a public orator, on the other hand, he was a failure. Although a Greek, he always used Latin in his declamations, and, although he was sometimes at a loss for Latin words, he never suffered from lack of ideas. Numerous specimens of his declamations will be found in the works of Seneca the rhetorician.

See the monograph *De Lucio Cestio Pio*, by F.G. Lindner (1858); T. Brzoska in Pauly-Wissowa's *Realencyclopadie*, iii. 2 (1899); Teuffel-Schwabe, *Hist, of Roman Lit.* (Eng. tr.), § 268, 6; M. Schanz, *Geschichte der romischen Litteratur*, ii.

CESTUI, CESTUY, an Anglo-French word, meaning "that person," which appears in the legal phrases *cestui que trust*, *use*, or *vie*. It is usually

pronounced as “cetty.” *Cestui que trust* means literally “the person for whose benefit the trust” is created. The *cestui que trust* is the person entitled to the equitable, as opposed to the legal, estate. Thus, if land be granted unto, and to the use of A. in trust for B., B. is *cestui que trust*, and A. trustee. The term, principally owing to its cumbersomeness, is being gradually superseded in modern law by that of “beneficiary.” *Cestui que use* (sometimes *cestui à que use*) means “the person for whose benefit a use” is created (see TRUST). *Cestui que vie* is “the person for whose life” lands are held by another (see REMAINDER).

CETACEA (from the Gr. κέτος, a whale), the name of the mammalian order represented by whales, dolphins, porpoises, &c. From their fish-like form, which is manifestly merely an adaptation to their purely aquatic life, these creatures are often regarded as fishes, although they are true mammals, with warm blood, and suckle their young.

The general form is essentially fish-like, the spindle-shaped body passing anteriorly into the head without any distinct neck, and posteriorly tapering gradually towards the extremity of the tail, which is provided with a pair of lateral, pointed expansions of skin supported by fibrous tissue, called “flukes,” forming a horizontal triangular propelling organ, notched behind in the middle line. The head is generally large, in some cases attaining more than one-third the entire length; and the mouth is wide, and bounded by stiff, immobile lips. The fore-limbs are reduced to flattened paddles, encased in a continuous skin, showing no external sign of division, and without trace of nails. There are no signs of hind-limbs visible externally. The surface of the

skin is smooth and glistening, and devoid of hair, although in many species there are a few bristles in the neighbourhood of the mouth which may persist through life or be present only in the young state. Immediately beneath the skin is a thick layer of fat, held together by a mesh of tissue, constituting the "blubber," which retains the heat of the body. In nearly all species a compressed dorsal fin is present. The eye is small, and not provided with a true lacrymal apparatus. The external ear is a minute aperture in the skin situated at a short distance behind the eye. The nostrils open separately or by a single crescentic aperture, near the vertex of the head.

The bones generally are spongy in texture, the cavities being filled with oil. In the vertebral column, the cervical region is short and immobile, and the vertebrae, always seven in number, are in many species more or less fused together into a solid mass. The odontoid process of the second cervical vertebra, when that bone is free, is usually very obtuse, or even obsolete. In a paper on the form and function of the cervical vertebrae published in the *Jenaische Zeitschrift* for 1905, Dr O. Reche points out that the shortening and soldering is most pronounced in species which, like the right-whales, live entirely on minute organisms, to capture which there is no necessity to turn the head at all. Accordingly we find that in these whales the whole seven cervical vertebrae are fused into an immovable solid mass, of which the compound elements, with the exception of the first and second, are but little thicker than plates. On the other hand, in the finner-whales, several of which live exclusively on fish, and thus require a certain amount of mobility in the head and neck, we find all the cervical vertebrae much thicker and entirely separate from one another. Among the dolphin group the narwhal and the white whale, or beluga, are distinguished from all other cetaceans by the great comparative length of their cervical vertebrae, all of which are completely free. In the case of the narwhal such an abnormal structure is easily accounted for, seeing that to use effectively the long tusk with which the male is armed a considerable amount of mobility in the neck is

absolutely essential. The beluga, too, which is believed to feed on large and active fishes, would likewise seem to require mobility in the same region in order to effect their capture. On the other hand, the porpoise preys on herrings, pilchards and mackerel, which in their densely packed shoals must apparently fall an easy prey with but little exertion on the part of their captor, and we accordingly find all the neck-vertebrae very short, and at least six out of the seven coalesced into a solid immovable mass. None of the vertebrae are united to form a sacrum. The lumbar and caudal vertebrae are numerous and large, and, as their arches are not connected by articular processes (zygapophyses), they are capable of free motion in all directions. The caps, or epiphyses, at the end of the vertebral bodies are flattened disks, not uniting until after the animal has attained its full dimensions. There are largely developed chevron-bones on the under side of the tail, the presence of which indicates the distinction between caudal and lumbar vertebrae.

In the skull, the brain-case is short, broad and high, almost spherical, in fact (fig. 1). The supra-occipital bone rises upwards and forwards from the foramen magnum, to meet the frontals at the vertex, completely excluding the parietals from the upper region; and the frontals are expanded laterally to form the roof of the orbits. The nasal aperture opens upwards, and has in front of it a more or less horizontally prolonged beak, formed of the maxillae, premaxillae, vomer, and mesethmoid cartilage, extending forwards to form the upper jaw or roof of the mouth.

There are no clavicles. The humerus is freely movable on the scapula at the shoulder-joint, but beyond this the articulations of the limb are imperfect; the flattened ends of the bones coming in contact, with fibrous tissue interposed, allowing of scarcely any motion. The radius and ulna are distinct, and about equally developed, and much flattened, as are all the bones of the flippers. There are four, or more commonly five, digits, and the number of the phalanges of the second and third always exceeds the normal number in mammals, sometimes considerably; they present the exceptional

character of having epiphyses at both ends. The pelvis is represented by a pair of small rod-like bones placed longitudinally, suspended below and at some distance from the vertebral column at the commencement of the tail. In some species, to the outer surface of these are fixed other small bones or cartilages, the rudiments of the hind-limb.

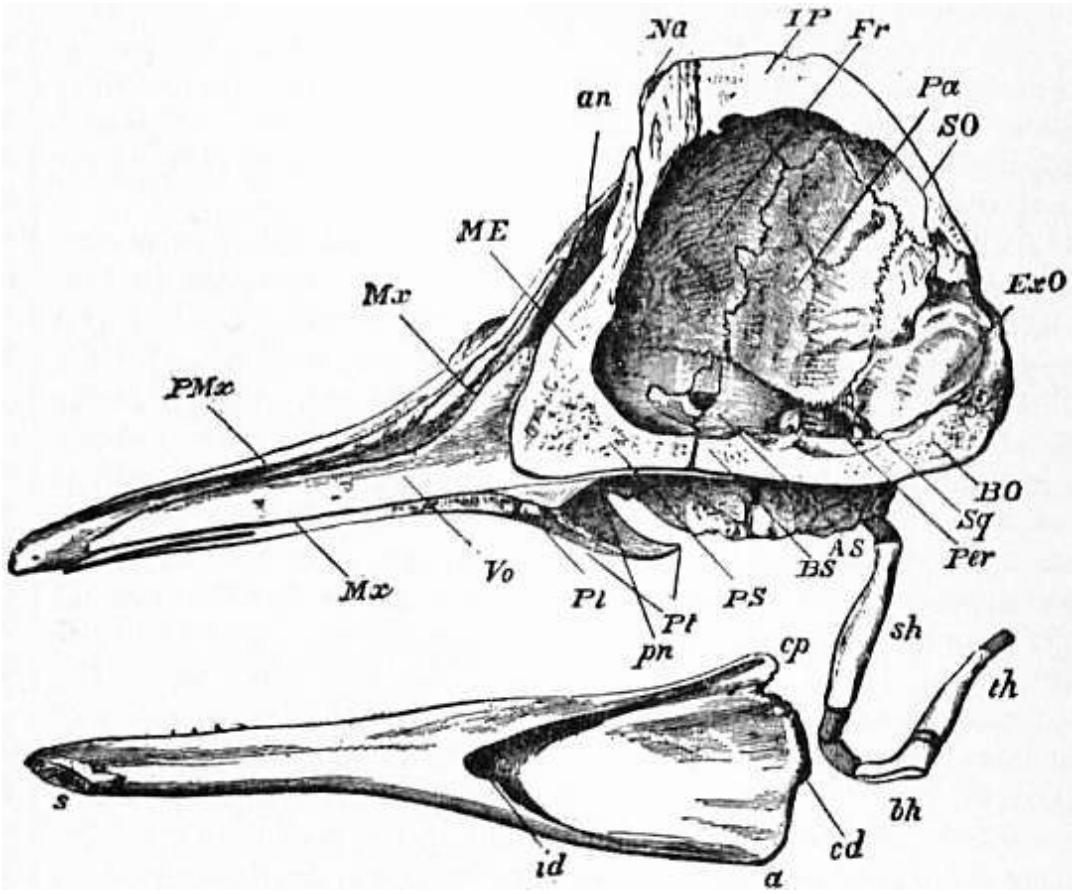


FIG. 1.—A Section of the Skull of a Black-Fish (*Globicephalus melas*).

PMx, Premaxilla.
Mx, Maxilla.
ME, Ossified portion of the mesethmoid.
an, Nostrils.
Na, Nasal.
IP, Inter-parietal.
Fr, Frontal.
Pa, Parietal.
AS, Alisphenoid.
PS, Presphenoid.
Pt, Pterygoid.
pn, Posterior nares.
Pl, Palatine.
Vo, Vomer.
s, Symphysis of lower jaw.
id, Inferior dental canal.

SO, Supra-occipital.
ExO, Ex-occipital.
BO, Basi-occipital.
Sq, Squamosal.
Per, Periotic.

cp, Coronoid process of lower jaw.
cd, Condyle.
a, Angle.
sh, Stylo-hyal.
bh, Basi-hyal.
th, Thyro-hyal.

Teeth are generally present, but exceedingly variable in number. In existing species, they are of simple, uniform character, with conical or compressed crowns and single roots, and are never preceded by milk-teeth. In the whalebone whales teeth are absent (except in the foetal condition), and the palate is provided with numerous transversely placed horny plates, forming the "whalebone." Salivary glands are rudimentary or absent. The stomach is complex, and the intestine simple, and only in some species provided with a small caecum. The liver is little fissured, and there is no gall-bladder. The blood-vascular system is complicated by net-like expansions of both arteries and veins, or *retia mirabilia*, The larynx is of peculiar shape, the arytenoid cartilages and the epiglottis being elongated, and forming a tubular prolongation, which projects into the posterior nares, and when embraced by the soft palate forms a continuous passage between the nostrils and the trachea, or wind-pipe, in a more perfect manner. The brain is relatively large, round in form, with its surface divided into numerous and complex convolutions. The kidneys are deeply lobulated; the testes are abdominal; and there are no vesiculae seminales nor an os penis. The uterus is bicornuate; the placenta non-deciduate and diffuse. The two teats are placed in depressions on each side of the genital aperture. The ducts of the milk-glands are dilated during suckling into large reservoirs, into which the milk collects, and from which it is injected by the action of a muscle into the mouth of the young animal, so that sucking under water is greatly facilitated.

Whales and porpoises are found in all seas, and some dolphins and porpoises are inhabitants of the larger rivers of South America and Asia.

Their organization necessitates their passing their life entirely in the water, as on land they are absolutely helpless. They have, however, to rise very frequently to the surface for the purpose of respiration; and, in relation to the upward and downward movement in the water thus necessitated, the principal instrument of motion, the tail, is expanded horizontally. The position of the nostril on the highest part of the head is important for this mode of life, as it is the only part of the body the exposure of which above the surface is absolutely necessary. Of numerous erroneous ideas connected with natural history, few are so widespread as that whales spout through their blow-holes water taken in at the mouth. But the "spouting," or "blowing," of whales is nothing more than the ordinary act of expiration, which, taking place at longer intervals than land-animals, is performed with a greater emphasis. The moment the animal rises to the surface it forcibly expels from its lungs the air taken in at the last inspiration, which is charged with vapour in consequence of the respiratory changes. This rapidly condensing in the cold atmosphere in which the phenomenon is often observed, forms a column of steam or spray, which has been taken for water. It happens, however, especially when the surface of the ocean is agitated into waves, that the animal commences its expiratory puff before the orifice has cleared the top of the water, some of which may thus be driven upwards with the blast, tending to complete the illusion. From photographs of spouting rorquals, it appears that the height and volume of the "spout" of all the species is much less than was supposed to be the case by the older observers; even that of the huge "sulphur-bottom" (*Balaenoptera sibbaldi*) averaging only about 14 ft. in height, although it may occasionally reach 20 ft.

As regards their powers of hearing, the capacity of cetaceans for receiving (and acting upon) sound-waves is demonstrated by the practice of shouting on the part of the fishermen when engaged in driving a shoal of porpoises or black-fish into shallow water, for the purpose of frightening their intended

victims. As regards the possession of a voice by cetaceans, it is stated that one species, the “buckelwal” of the Germans, utters during the breeding-season a prolonged scream, comparable to the scream of a steam-siren, and embracing the whole musical scale, from base to treble. In respect of anatomical considerations, it is true that the external ear is much reduced, the “pinna” being absent, and the tube or “meatus” of very small calibre. On the other hand, the internal auditory organs are developed on the plan of those of ordinary mammals, but display certain peculiar modifications (notably the remarkable shell-like form of the tympanic bone) for intensifying and strengthening the sound-waves as they are received from the water. It seems, therefore, perfectly evident that whales must hear when in the water. This inference is confirmed by the comparatively small development of the other sense-organs. The eye, for instance, is very small, and can be of little use even at the comparatively small depths to which whales are now believed to descend. Again, the sense of smell, judging from the rudimentary condition of the olfactory organs, must be in abeyance; and whales have no sense-organs comparable to the lateral-line-system of fishes. Consequently, it would seem that when below the surface of the water they must depend chiefly upon the sense of hearing. Probably this sense is so highly developed as to enable the animals, in the midst of the vibrations made by the screw-like movements of the tail, or flukes, to distinguish the sound (or the vibrations) made by the impact of water against rocks, even in a dead calm, and, in the case of piscivorous species, to recognize by the pulse in the water the presence of a shoal of fish. Failing this explanation, it is difficult to imagine how whales can find their way about in the semi-darkness, and avoid collisions with rocks and rock-bound coasts.

In the Christiania *Nyt Magazin for Naturvidenskaberne*, vol. xxxviii., Dr G. Guldberg has published some observations on the body-temperature of the Cetacea, in which he shows how extremely imperfect is our knowledge of this subject. As he remarks, it is a matter of extreme difficulty to obtain

the temperature of living cetaceans, although this has been taken in the case of a white-whale and a dolphin, which some years ago were kept in confinement in a pond in the United States. With the larger whales such a mode of procedure is, however, obviously quite impracticable, and we have, accordingly, to rely on *post-mortem* observations. The layer of blubber by which all cetaceans are protected from cold renders the *post-mortem* refrigeration of the blood a much slower process than in most mammals, so that such observations have a much higher value than might at first be supposed to be the case. Indeed, the blood-temperature of a specimen of Sibbald's rorqual three days after death still stood at 34° C. The various observations that have been taken have afforded the following results in individual cases: Sperm-whale, 40° C.; Greenland right-whale, 38.8° C.; porpoise, 35.6° C.; liver of a second individual, 37.8° C.; common rorqual, 35.4° C.; dolphin, 35.6° C. The average blood-temperature of man is 37° C., and that of other mammals 39° C.; while that of birds is 42 C. The record of 40° C. in the case of the sperm-whale seems to indicate that at least some cetaceans have a relatively high temperature.

With the possible exception of one West African dolphin, all the Cetacea are predaceous, subsisting on living animal food of some kind. One kind alone (*Orca*) eats other warm-blooded animals, as seals, and even members of its own order, both large and small. Many feed on fish, others on small floating crustaceans, pteropods and jelly-fishes, while the principal staple of the food of many is constituted by cuttle-fishes and squids. In size cetaceans vary much, some of the smaller dolphins scarcely exceeding 4 ft. in length, while whales are the most colossal of all animals. It is true that many statements of their bulk are exaggerated, but the actual dimensions of the larger species exceed those of all other animals, not even excluding the extinct dinosaurian reptiles. With some exceptions, cetaceans are generally timid, inoffensive animals, active in their movements and affectionate in their disposition towards one another, especially the mother towards the

young, of which there is usually but one, or at most two at a time. They are generally gregarious, swimming in herds or "schools," sometimes amounting to many thousands in number; though some species are met with either singly or in pairs.

Commercially these animals are of importance on account of the oil yielded by the blubber of all of them; while whalebone, spermaceti and ambergris are still more valuable products yielded by certain species. Within the last few years whalebone has been sold in America for £2900 per ton, while it is also asserted that £3000 per ton has been paid for two and a quarter tons at Aberdeen, although there seems to be some degree of doubt attaching to the statement. Soon after the middle of the last century, the price of this commodity was as low as £150 per ton, but, according to Mr Frank Buckland, it suddenly leapt up to £620 with the introduction of "crinoline" into ladies' costume, and it has apparently been on the rise ever since. Ambergris, which is very largely used in perfumery, is solely a product of the sperm-whale, and appears to be a kind of biliary calculus. It generally contains a number of the horny beaks of the cuttle-fishes and squids upon which these whales chiefly feed. Its market-price is subject to considerable variation, but from £3 to £4 per oz. is the usual average for samples of good quality. In 1898 a merchant in Mincing Lane was the owner of a lump of ambergris weighing 270 ℔, which was sold in Paris for about 85 s. per oz., or £18,360.

Whalebone Whales.—Existing Cetacea are divisible into two sections, or suborders, the relationships of which are by no means clearly apparent. The first section is that of the whalebone whales, or Mystacoceti, in which no functional teeth are developed, although there are tooth-germs during foetal life. The palate is furnished with plates of baleen or whalebone; the skull is symmetrical; and the nasal bones form a roof to the nasal passages, which are directed upwards and forwards. The maxilla is produced in front of, but not over, the orbital process of the frontal. The lacrymal is small and distinct

from the jugal. The tympanic is welded with the periotic, which is attached to the base of the skull by two strong diverging processes. The olfactory organ is distinctly developed. The two halves of the lower jaw are arched outwards, their anterior ends meeting at an angle, and connected by fibrous tissue without any symphysis. All the ribs at their upper extremity articulate only with the transverse processes of the vertebrae; their capitular processes when present not articulating directly with the bodies of the vertebrae. The sternum is composed of a single piece, and articulates only with a single pair of ribs; and there are no ossified sternal ribs. External openings of nostrils distinct from each other, longitudinal. A short conical caecum.

When in the foetal state these whales have numerous minute teeth lying in the dental groove of both upper and lower jaws. They are best developed about the middle of foetal life, after which they are absorbed, and no trace of them remains at the time of birth. The whalebone does not make its appearance until after birth; and consists of a series of flattened horny plates, between three and four hundred in number, on each side of the palate, with a bare interval along the middle line. The plates are placed transversely to the long axis of the palate, with short intervals between them. Each plate or blade is somewhat triangular in form, with the base attached to the palate and the apex hanging downwards. The outer edge of the blade is hard and smooth, but the inner edge and apex fray out into long bristly fibres, so that the roof of the whale's mouth looks as if covered with hair, as described by Aristotle. At the inner edge of each principal blade are two or three much smaller or subsidiary blades. The principal blades are longest near the middle of the series, and gradually diminish towards the front and back of the mouth. The horny plates grow from a fibrous and vascular matrix, which covers the palatal surface of the maxillae, and sends out plate-like processes, one of which penetrates the base of each blade. Moreover, the free edges of these processes are covered with long vascular thread-like papillae, one of which forms the central axis of each of the hair-like fibres mainly

composing the blade. A transverse section of fresh whalebone shows that it is made up of numbers of these soft vascular papillae, circular in outline, and surrounded by concentrically arranged epidermic cells, the whole bound together by other epidermic cells, that constitute the smooth (so-called "enamel") surface of the blade, which, disintegrating at the free edge, allows the individual fibres to become loose and assume a hair-like appearance.

Whalebone really consists of modified papillae of the mucous membrane of the mouth, with an excessive and horny epithelial development. The blades are supported and bound together for a certain distance from their base, by a mass of less hardened epithelium, secreted by the surface of the palatal membrane or matrix of the whalebone in the intervals of the plate-like processes. This is the "gum" of the whalers. Whalebone varies much in colour in different species; in some it is almost jet black, in others slate colour, horn colour, yellow, or even creamy-white. In some descriptions the blades are variegated with longitudinal stripes of different hues. It differs also greatly in other respects, being short, thick, coarse, and stiff in some cases, and greatly elongated and highly elastic in those species in which it has attained its fullest development. Its function is to strain the water from the small marine molluscs, crustaceans, or fish upon which the whales subsist. In feeding, whales fill the immense mouth with water containing shoals of these small creatures, and then, on closing the jaws and raising the tongue, so as to diminish the cavity of the mouth, the water streams out through the narrow intervals between the hairy fringe of the whalebone blades, and escapes through the lips, leaving the living prey to be swallowed.

Although sometimes divided into two families, *Balaenidae* and *Balaenopteridae*, whalebone-whales are best included in a single family group under the former name. The typical members of this family are the so-called right-whales, forming the genus *Balaena*, in which there are no folds on the throat and chest, and no back-fin; while the cervical vertebrae are

fused into a single mass. The flippers are short and broad, with five digits; the head is very large and the whalebone very long and narrow, highly elastic and black; while the scapula is high, with a distinct coracoid and coronoid process. This genus contains the well-known Greenland right-whale (*B. mysticetus*) of the Arctic seas, the whalebone and oil of which are so much valued in commerce, and also other whales, distinguished by having the head somewhat smaller in proportion to the body, with shorter whalebone and a larger number of vertebrae. These inhabit the temperate seas of both northern and southern hemispheres, and have been divided into species in accordance with their geographical distribution, such as *B. biscayensis* of the North Atlantic, *B. japonica* of the North Pacific, *B. australis* of the South Atlantic, and *B. antipodarum* and *novae-zelandiae* of the South Pacific; but the differences between them are so small that they may probably be regarded as races of a single species, the black whale (*B. australis*). On the head these whales carry a peculiar structure which is known to whalers as the "bonnet." This is a large horny excrescence, worn into hollows like a much-denuded piece of limestone rock, growing probably in the neighbourhood of the blow-hole. More than one theory has been suggested to account for its presence. One suggestion is that it indicates the descent of whales from rhinoceros-like mammals; another that this species of whale is in the habit of rubbing against rocks in order to free itself from barnacles, and thus produces a kind of corn—although why on the nose alone is not stated. Dr W.G. Ridewood, however, considers that the structure is due to the fact that the horny layers which are produced all over the skin are not shed on this particular spot.

The pigmy whale (*Neobalaena marginata*) represents a genus agreeing with the right-whales in the absence of throat-flutings, and with the rorquals in the presence of a dorsal fin. The cervical vertebrae are united, and there are only 43 vertebrae altogether. The flippers are small, narrow, and with only four digits. The ribs remarkably expanded and flattened; the scapula

low and broad, with completely developed acromion and coracoid processes. The whalebone is long, slender, elastic and white. The species which inhabits the South American, Australian and New Zealand seas is the smallest of the whalebone-whales, being not more than 20 ft. in length.

In contrast to the preceding is the great grey whale (*Rachianectes glaucus*) of the North Pacific, which combines the relatively small head, elongated shape, and narrow flippers of the fin-whales, with the smooth throat and absence of a back-fin distinctive of the right-whales. The whalebone is shorter and coarser than in any other species. In the skeleton the cervical vertebrae are free, and the first two ribs on each side expanded and united to form a large bony shield. In the humpback-whale (*Megaptera longimana* or *boops*) the head is of moderate size, the whalebone-plates are short and wide, and the cervical vertebrae free. The skin of the throat is fluted so as to form an expansible pouch; there is a low back-fin; and the flippers, which have four digits each, are extremely long, equalling about one-fourth the total length of the animal. The acromion and coracoid processes of the scapula are rudimentary. See HUMPBACK-WHALE.

The right-whales are built for cruising slowly about in search of the shoals of small floating invertebrates which form their food, and are consequently broad in beam, with a float-shaped body and immovable neck. The humpback is of somewhat similar build, but with a smaller head, and probably attains considerable speed owing to the length of its flippers. The finners, or rorquals (*Balaenoptera*), which prey largely on fish, are built entirely for speed, and are the ocean greyhounds of the group. Their bodies are consequently long and attenuated, and their necks are partially mobile; while they are furnished with capacious pouches for storing their food. They chiefly differ from the humpback by the smaller head, long and slender build, small, narrow, and pointed flippers, each containing four digits, and the large acromion and coracoid processes to the low and broad scapula. Rorquals are found in almost every sea. Among them are the most gigantic

of all animals, *B. sibbaldi*, which attains the length of 80 ft., and the small *B. rostrata*, which does not exceed 30. There are certainly four distinct modifications of this genus, represented by the two just mentioned, and by *B. musculus* and *B. borealis*, all inhabitants of British seas, but the question whether almost identical forms found in the Indian, Southern and Pacific Oceans are to be regarded as specifically identical or as distinct awaits future researches, although some of these have already received distinct names. See RORQUAL.

In the report on the zoology of the "Discovery" expedition, published in 1907 by the British Museum, E.A. Wilson describes a whale frequenting the fringe of the Antarctic ice which indicates a new generic type. Mainly black in colour, these whales measure about 20 or 30 ft. in length, and have a tall dorsal fin like that of a killer.

Toothed Whales.—-The second suborder is represented by the toothed whales, or Odontoceti, in which there is no whalebone, and teeth, generally numerous, though sometimes reduced to a single pair, and occasionally wanting, are normally developed. Unlike that of the whalebone-whales, the upper surface of the skull is more or less unsymmetrical. The nasal bones are in the form of nodules or flattened plates, applied closely to the frontals, and not forming any part of the roof to the nasal passage, which is directed upwards and backwards. The olfactory organ is rudimentary or absent. Hinder end of the maxilla expanded and covering the greater part of the orbital plate of the frontal bone. Lacrymal bone either inseparable from the jugal, or, if distinct, large, and forming part of the roof of the orbit. Tympanic bone not welded with the periotic, which is usually only attached to the rest of the skull by ligament. Two halves of the lower jaw nearly straight, expanded in height posteriorly, with a wide funnel-shaped aperture to the dental canal, and coming in contact in front by a flat surface of variable length, but constituting a symphysis. Several of the anterior ribs with well-developed capitular processes, which articulate with the bodies of

the vertebrae. Sternum almost always composed of several pieces, placed one behind the other, with which several pairs of ribs are connected by well-developed cartilaginous or ossified sternal ribs. External respiratory aperture single, the two nostrils uniting before they reach the surface, usually in the form of a transverse sub-crescentic valvular aperture, situated on the top of the head. Flippers with five digits, though the first and fifth are usually little developed. No caecum, except in *Platanista*.

The first family, *Physeteridae*, is typified by the sperm-whale, and characterized by the absence of functional teeth in the upper jaw; the lower teeth being various, and often much reduced in number. Bones of the skull raised so as to form an elevated prominence or crest behind the nostrils. Pterygoid bones thick, produced backwards, meeting in the middle line, and not involuted to form the outer wall of the post-palatine air-sinuses, but simply hollowed on their outer side. Transverse processes of the arches of the dorsal vertebrae, to which the tubercles of the ribs are attached, ceasing abruptly near the end of the series, and replaced by processes on the body at a lower level, and serially homologous anteriorly with the heads of the ribs, and posteriorly with the transverse processes of the lumbar vertebrae. Costal cartilages not ossified.

The first group, or *Physeterinae*, includes the sperm-whale itself and is characterized by the presence of a full series of lower teeth, which are set in a groove in place of sockets, the groove being imperfectly divided by partial septa, and the teeth held in place by the strong, fibrous gum. No distinct lacrymal bone. Skull strikingly asymmetrical in the region of the nasal apertures, in consequence of the left opening greatly exceeding the right in size.

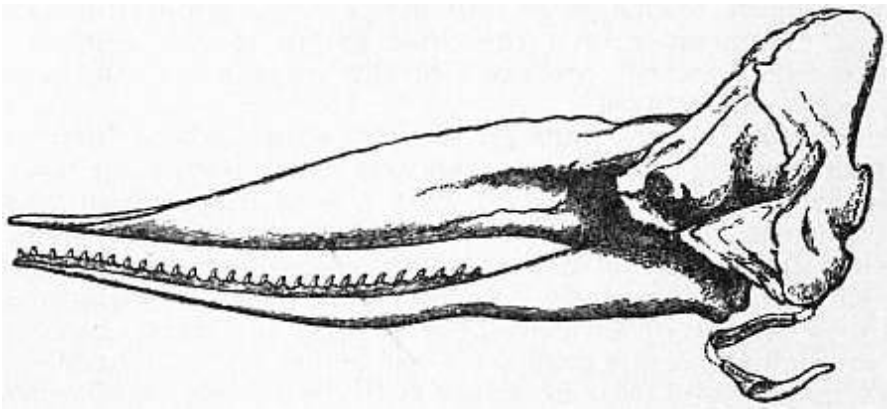


FIG. 2.—Skull of Sperm-Whale (*Physeter macrocephalus*).

In the sperm-whale (*Physeter macrocephalus*) the upper teeth are apparently of uncertain number, rudimentary and functionless, being embedded in the gum. Lower jaw with from 20 to 25 teeth on each side, stout, conical, recurved and pointed at the apex until they are worn, without enamel. Upper surface of the skull concave; its posterior and lateral edges raised into a very high and greatly compressed semicircular crest or wall (fig. 2). Zygomatic processes of jugal bones thick and massive. Muzzle greatly elongated, broad at the base, and gradually tapering to the apex. Lower jaw exceedingly long and narrow, the symphysis being more than half the length. Vertebrae: C 7, D 11, L 8, Ca 24; total 50. Atlas, or first vertebra, free; all the other cervical vertebrae united by their bodies and spines into a single mass. Eleventh pair of ribs rudimentary. Head about one-third the length of the body; very massive, high and truncated, and rather compressed in front; owing its huge size and form mainly to the accumulation of a mass of fatty tissue filling the large hollow on the upper surface of the skull and overlying the long muzzle. The single blow-hole is longitudinal, slightly S-shaped, and placed at the upper and anterior extremity of the head to the left side of the middle line. The opening of the mouth is on the under side of the head, considerably behind the end of the

snout. Flippers short, broad and truncated. Dorsal fin represented by a low protuberance. See SPERM-WHALE.

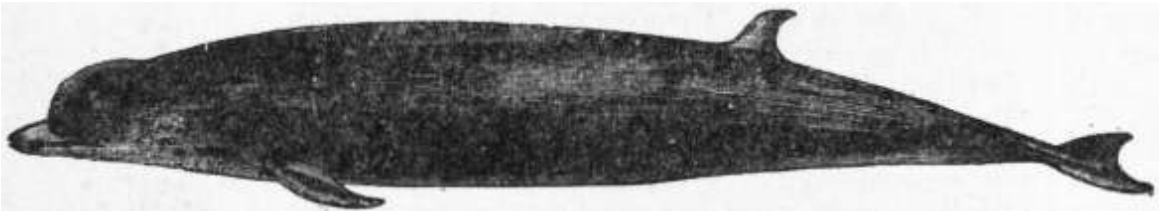


FIG. 3.—Bottle-nose (*Hyperoödon rostratus*). From a specimen taken off the coast of Scotland, 1882.

In the lesser or pigmy sperm-whale (*Cogia breviceps*) there may be a pair of rudimentary teeth in the upper jaw, while on each side of the lower jaw there are from 9 to 12 rather long, slender, pointed and curved teeth, with a coating of enamel. Upper surface of the skull concave, with thick, raised, posterior and lateral margins, massive and rounded at their anterior terminations above the orbits. Muzzle not longer than the cranial position of the skull, broad at the base, and rapidly tapering to the apex. Zygomatic process of the jugal rod-like. Lower jaw with symphysis less than half its length. Vertebrae: C 7, D 13 or 14, L and Ca 30; total 50 or 51. All the cervical vertebrae united by their bodies and arches. The head is about one-sixth of the length of the body, and obtusely pointed in front; the mouth small and placed far below the apex of the snout; the blow-hole crescentic, and placed obliquely on the crown of the head in advance of the eyes and to the left of the middle line; while the flippers are bluntly sickle-shaped, and the back-fin triangular. This species attains a length of from 9 to 13 ft.

A second subfamily is represented by the bottle-noses and beaked whales, and known as the *Ziphiinae*. In this group the lower teeth are rudimentary and concealed in the gum, except one, or rarely two, pairs which may be largely developed, especially in the male. There is a distinct lacrymal bone. Externally the mouth is produced into a slender rostrum or beak, from above

which the rounded eminence formed by a cushion of fat resting on the cranium in front of the blow-hole rises somewhat abruptly. The blow-hole is single, crescentic and median, as in the *Delphinidae*. Flippers small, ovate, with five digits moderately well developed. A small obtuse dorsal fin situated considerably behind the middle of the back. Longitudinal grooves on each side of the skin of the throat, diverging posteriorly, and nearly meeting in front. In external characters and habits the whales of this group closely resemble each other. They appear to be almost exclusively feeders on cuttle-fishes, and occur either singly, in pairs, or in small herds. By their dental and osteological characters they are easily separated into four genera.

In the first of these, *Hyperoödon*, or bottle-nose, there is a small conical pointed tooth at the apex of each half of the lower jaw, concealed by the gum during life. Skull with the upper ends of the premaxillae rising suddenly behind the nostrils to the vertex and expanded laterally, their outer edges curving backwards and their anterior surfaces arching forwards and overhanging the nostrils; the right larger than the left. Nasal bones lying in the hollow between the upper extremities of the premaxillae, strongly concave in the middle line and in front; their outer edges, especially that of the right, expanded over the front of the inner border of the maxilla. Very high longitudinal crests on the maxillae at the base of the beak, extending backwards almost to the nostrils, approaching each other in the middle line above; sometimes compressed and sometimes so massive that their inner edges come almost in contact. Preorbital notch distinct, and mesethmoid cartilage slightly ossified. Vertebrae: C 7, D 9, L 10, Ca 19; total 45. All the cervical vertebrae united. Upper surface of the head in front of the blow-hole very prominent and rounded, rising abruptly from above the small, distinct snout. Two species are known. See BOTTLE-NOSE WHALE.

The typical representative of the beaked whales is *Ziphius cuvieri*, in which there is a single conical tooth of moderate size on each side close to the anterior extremity of the lower jaw, directed forwards and upwards.

Skull with the premaxillae immediately in front and at the sides of the nostrils expanded, hollowed, with elevated lateral margins, the posterior ends rising to the vertex and curving forwards, the right being considerably more developed than the left. The conjoint nasals form a pronounced symmetrical eminence at the top of the skull, projecting forwards over the nostrils, flat above, prominent and rounded in the middle line in front, and separated by a notch on each side from the premaxillae. Preorbital notch not distinct. Rostrum (seen from above) triangular, tapering from the base to the apex; upper and outer edges of maxillae at base of rostrum raised into low roughened tuberosities. Mesethmoid cartilage densely ossified in adult age, and coalescing with the surrounding bones of the rostrum. Vertebrae: C 7, D 10, L 10, Ca 22; total 49. The three anterior cervical vertebrae united, the rest free.

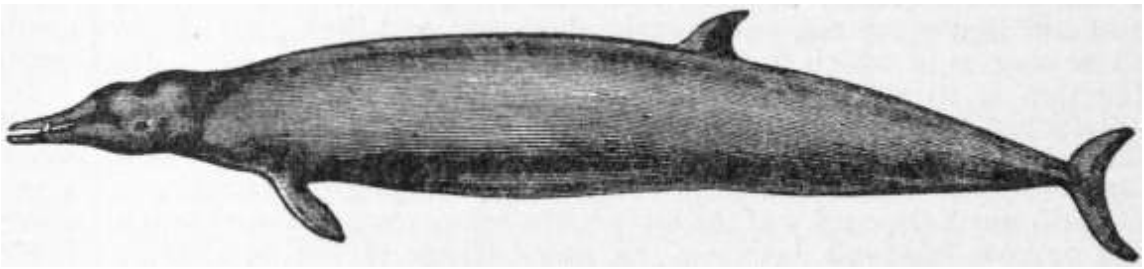


FIG. 4.—Sowerby's Beaked Whale (*Mesoplodon bidens*).

In the numerous species of the allied genus *Mesoplodon* there is a much-compressed and pointed tooth in each half of the lower jaw, variously situated, but generally at some distance behind the apex; its point directed upwards, and often somewhat backwards, occasionally developed to a great size. In the skull the region round the nostrils is as in *Hyperoödon*, except that the nasals are narrow and more sunk between the upper ends of the premaxillae; like those of *Hyperoödon*, they are concave in the middle line in front and above. No maxillary tuberosities. Preorbital notch not very distinct. Rostrum long and narrow. Mesethmoid in the adult ossified in its

entire length, and coalescing with the surrounding bones. Vertebrae: C 7, D 10, L 10 or 11, Ca 19 or 20; total 46 to 48. Two or three anterior cervicals united, the rest usually free.

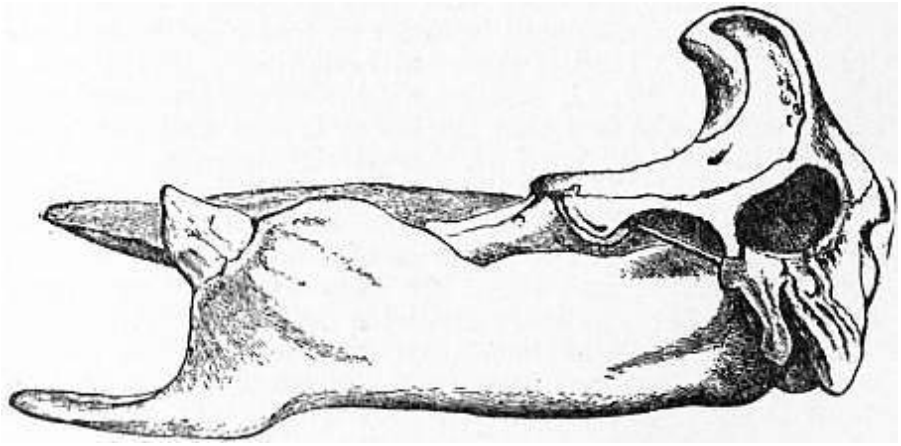


FIG. 5.—Skull of a Beaked Whale (*Mesoplodon densirostris*).

Though varying in form, the lower teeth of the different members of this genus agree in their essential structure, having a small and pointed enamel-covered crown, composed of dentine, which, instead of surmounting a root of the ordinary character, is raised upon a solid mass of osteo-dentine, the continuous growth of which greatly alters the form and general appearance of the tooth as age advances, as in the case of *M. layardi*, where the long, narrow, flat, strap-like teeth, curving inwards at their extremities, meet over the rostrum, and interfere with the movements of the jaw. In one species (*M. grayi*) a row of minute, conical, pointed teeth, like those of ordinary Dolphins, 17 to 19 in number, is present even in the adults, on each side of the middle part of the upper jaw, but embedded by their roots only in the gum, and not in bony sockets. This, with the frequent presence of rudimentary teeth in other species of this genus, indicates that the beaked whales are derived from ancestral forms with teeth of normal character in both jaws. The species are distributed in both northern and southern hemispheres, but most frequent in the latter. Among them are *M. bidens*, *M.*

europaeas, *M. densirostris*, *M. layardi*, *M. grayi* and *M. hectori*; but there is still much to be learned with regard to their characters and distribution. This group was abundant in the Pliocene age, as attested by the frequency with which the imperishable long, cylindrical rostrum of the skull, of more than ivory denseness, is found among the rolled and waterworn animal remains which compose the "bone-bed" at the base of the Red Crag of Suffolk.

Finally, in Arnoux's beaked whale (*Berardius arnouxi*), of New Zealand, which grows to a length of 30 ft., there are two moderate-sized, compressed, pointed teeth, on each side of the symphysis of the lower jaw, with their summits directed forwards, the anterior being the larger of the two and close to the front of the jaw. Upper ends of the premaxillae nearly symmetrical, moderately elevated, slightly expanded, and not curved forward over the nostrils. Nasals broad, massive and rounded, of nearly equal size, forming the vertex of the skull, flattened in front, most prominent in the middle line. Preorbital notch distinct. Rostrum long and narrow. Mesethmoid partially ossified. Small rough eminences on the outer edge of the upper surface of the maxillae at base of rostrum. Vertebrae: C 7, D 10, L 12, Ca 19; total 48. The three anterior cervicals welded, the rest free and well developed. Apparently this whale has the power of thrusting its teeth up and down, exposing them to view when attacked.

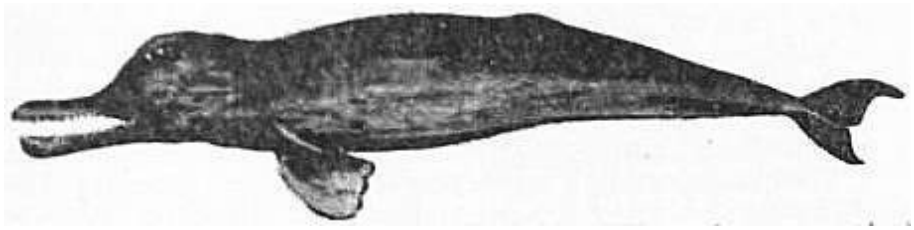


FIG. 6.—The Susu, or Ganges Dolphin (*Platanista gangetica*).

In a family by themselves—the *Platinistidae*—are placed three cetaceans which differ from the members of the preceding and the following groups in

the mode of articulation of the ribs with the vertebrae, as the tubercular and capitular articulations, distinct at the commencement of the series, gradually blend together, as in most mammals. The cervical vertebrae are all free. The lacrymal bone is not distinct from the jugal. The jaws are long and narrow, with numerous teeth in both; the symphysis of the lower one exceeding half its length. Externally the head is divided from the body by a slightly constricted neck. Pectoral limbs broad and truncated. Dorsal fin small or obsolete. In habits these dolphins are fluviatile or estuarine. In the Indian susu, or Ganges dolphin (*Platanista gangetica*), the teeth number about $^{30}/_{30}$ on each side, are set near together, are rather large, cylindrical, and sharp-pointed in the young, but in old animals acquire a large laterally compressed base, which in the posterior part of the series becomes irregularly divided into roots. As the conical enamel-covered crown wears away, the teeth of the young and old animals have a totally different appearance. The beak and tooth-bearing portion of the lower jaw are so narrow that the teeth of the two sides are almost in contact. Maxillae supporting large, incurved, compressed bony crests, which overarch the nostrils and base of the rostrum, and almost meet in the middle line above. Orbits very small and eyes rudimentary, without crystalline lens. Blow-hole longitudinal, linear. Vertebrae: C 7, D 11, L 8, Ca 25; total 51. A small caecum. No pelvic bones. Dorsal fin represented by a low ridge.

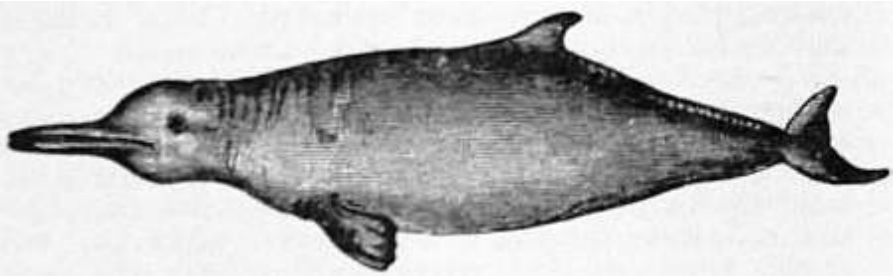


FIG. 7.—River Plate Dolphin (*Stenodelphis blainvillei*).

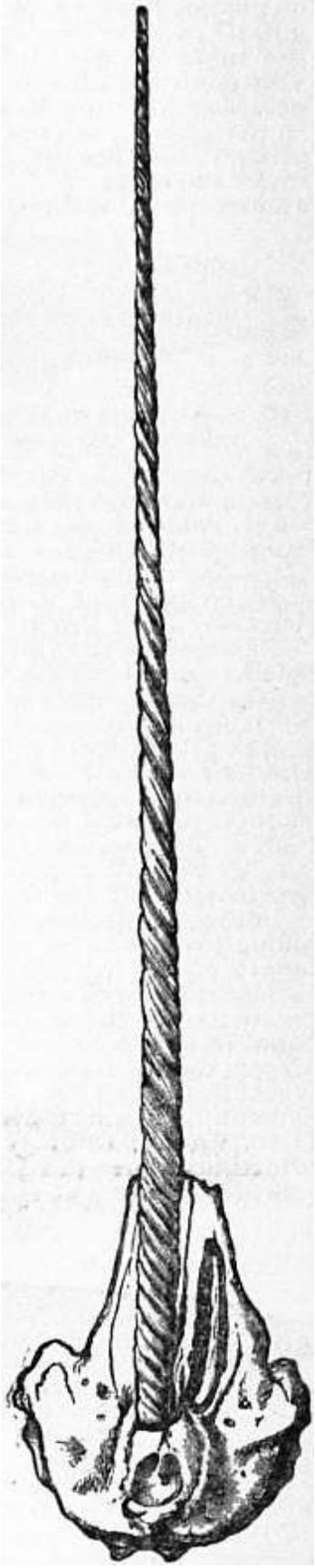
The second genus is represented by *Inia geoffroyi*, of the Amazon, in which the teeth vary from 26 to 33 pairs in each jaw; those at the posterior part with a distinct tubercle at the inner side of the base of the crown. Vertebrae: C 7, D 13, L 3, Ca 18; total 41. Transverse processes of lumbar vertebrae very broad. Sternum short and broad, and consisting of a single segment only. Dorsal fin a mere ridge. The long cylindrical rostrum externally furnished with scattered, stout and crisp hairs. The third type is *Stenodelphis blainvillei*, the River Plate dolphin, a small brown species (fig. 7), with from 50 to 60 pairs of teeth in each jaw, furnished with a cingulum at the base of the crown. Jaws very long and slender. Vertebrae: C 7, D 10, L 5, Ca 19; total 41. Transverse processes of the lumbar vertebrae extremely broad. Sternum elongated, composed of two segments, with four sternal ribs attached. Dorsal fin rather small, triangular, pointed. Blow-hole transverse. In several respects this species connects the two preceding ones with the *Delphinidae* (see DOLPHIN).

The last family of existing cetaceans is the above-mentioned *Delphinidae*, which includes the true dolphins, porpoises, grampuses and their relatives. As a rule there are numerous teeth in both jaws; and the pterygoid bones of the skull are short, thin and involuted to form with a process of the palate bone the outer wall of the post-palatine air-sinus. Symphysis of lower jaw short, or moderate, never exceeding one-third the length of the jaw. Lacrymal bone not distinct from the jugal. Transverse processes of the dorsal vertebrae gradually transferred from the arches to the bodies of the vertebrae without any sudden break, and becoming posteriorly continuous serially with the transverse processes of the lumbar vertebrae. Anterior ribs attached to the transverse process by the tubercle, and to the body of the vertebra by the head; the latter attachment lost in the posterior ribs. Sternal ribs ossified. The blow-hole is transverse, crescentic, with the horns of the crescent pointing forwards.

First on the long list is the narwhal, *Monodon monoceros*, in which, apart from some irregular rudimentary teeth, the dentition is reduced to a single pair of teeth which lie horizontally in the maxilla, and in the female remain permanently concealed within the socket, so that this sex is practically toothless, while in the male (fig. 8), the right tooth usually remains similarly concealed while the left is immensely developed, attaining a length equal to more than half that of the entire animal, projecting horizontally from the head in the form of a cylindrical, or slightly tapering, pointed tusk, without enamel, and with the surface marked by spiral grooves and ridges, running in a sinistral direction. Vertebrae: C 7, D 11, L 6, Ca 26; total 50. Cervical region comparatively long, and all the vertebrae distinct, or with irregular unions towards the middle of the series, the atlas and axis being usually free. Flipper small, short and broad, with the second and third digits nearly equal, the fourth slightly shorter. No dorsal fin. See NARWHAL.

Closely allied is the beluga or white-whale (*Delphinapterus leucas*), of the Arctic seas, in which, however, there are from eight to ten pairs of teeth in each jaw, occupying the anterior three-fourths of the rostrum and corresponding portion of the lower jaw, rather

small, conical, and pointed when unworn, but usually become obliquely truncated, separated by intervals considerably wider than the diameter of the tooth, and implanted obliquely, the crowns inclining forwards especially in the upper jaw. Skull rather narrow and elongated, depressed. Premaxillae convex in front of the nostrils. Rostrum about equal in length to the cranial portion of the skull, triangular, broad at the base, and gradually contracting towards the apex, where it is somewhat curved downwards. Vertebrae: C 7, D 11, L 9, Ca 23; total 50. Cervical vertebrae free. Flippers broad, short and rounded, all the digits being tolerably well developed, except the first. Anterior part of head rounded; no distinct snout. No dorsal fin, but a low ridge in its place. See BELUGA.



In all the remaining genera of *Delphinidae* the cervical region of the vertebral column is very short, and the first two, and usually more, of the vertebrae are firmly united. The common porpoise (*Phocaena communis*, or *P. phocaena*) is the typical representative of the first genus, in which the teeth vary from 18/18 to 25/25 , are small, and occupy nearly the whole length of the rostrum, with compressed, spade-shaped crowns, separated from the root by a constricted neck. Rostrum rather shorter than the cranium proper, broad at the base and tapering towards the apex. Premaxillae raised

into tuberosities in front of the nostrils. The frontal bones form a somewhat square elevated protuberance in the middle line of the skull behind the nostrils, rising above the flattened nasals. Symphysis of lower jaw very short. Vertebrae: C 7, D 13, L 14, Ca 30; total 64. First to sixth cervical vertebrae and sometimes the seventh also, coalesced. Flippers of moderate size, oval, slightly sickle-shaped, with the second and third digits nearly equal in length, and the fourth and fifth well developed, but shorter. Head short, moderately rounded in front of the blow-hole. Dorsal fin near the middle of the back, triangular; its height considerably less than the length of the base; its anterior edge frequently furnished with one or more rows of conical horny tubercles.

FIG. 8.—Upper surface of the Skull of male Narwhal (*Monodon monoceros*), with the whole of both teeth exposed by removal of the upper wall of their alveolar cavities.

The porpoise, which is so common in British waters and the Atlantic, seldom enters the Mediterranean, and apparently never resides there. There is, however, a porpoise in the Black Sea, which, according to Dr O. Abel, is entitled to rank as a distinct species, with the name of *Phocaena relicta*. This Black Sea porpoise is readily distinguished from the Atlantic species by the contour of the profile of the head, which, in place of forming a continuous curve from the muzzle to what represents the neck, has a marked prominence above the angle of the mouth, followed by an equally marked depression. The teeth are also different in form and number. The absence of porpoises from the Mediterranean is explained by Dr Abel on account of the greater saltness of that sea as compared with the ocean in general; his idea being that these cetaceans are near akin to fresh-water members of the group, and therefore unsuited to withstand an excessively saline medium. From the Taman Peninsula, on the north shore of the Black Sea, the same writer has described an extinct type of ancestral porpoise, under the name of *Palaeophocaena andrussowi*. Another species is the wholly black *P.*

spinipennis, typically from South America. Black is also the hue of the Indian porpoise (*Neophocaena phocaenoides*), which wants a dorsal fin, and has eighteen pairs of teeth rather larger than those of the ordinary porpoise. (See PORPOISE.)

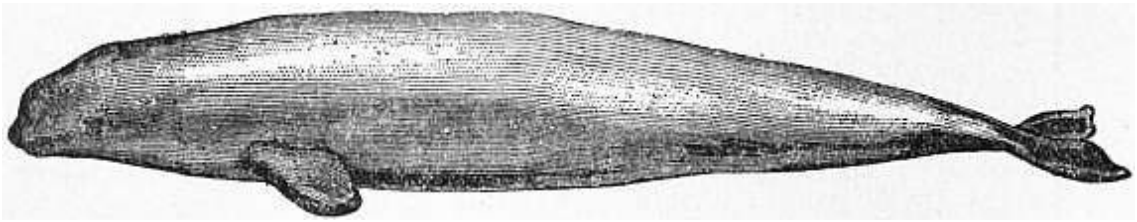


FIG. 9.—Beluga or White-Whale (*Delphinapterus leucas*). From a specimen taken in the river St Lawrence and exhibited in London, 1877.

Next comes the Indo-Malay genus *Orcella*, in which the 12/12 to 14/14 , small, conical teeth are pointed, rather closely set, and occupy nearly the whole length of the rostrum. Skull sub-globular, high. Rostrum nearly equal in length to the cranial portion of the skull, tapering. Flippers of moderate size, not elongated, but somewhat pointed, with all the bones of the digits broader than long, except the first phalanges of the index and third fingers. Head globular in front. Dorsal fin rather small, placed behind the middle of the body. Two species, both of small size—*O. brevirostris*, from the Bay of Bengal, and *O. fluminalis*, from the Irrawaddy river, from 300 to 900 m. from the sea.

In the grampus, or killer, *Orca gladiator* (or *O. orca*) the teeth form about twenty pairs, above and below, occupying nearly the whole length of the rostrum, very large and stout, with conical recurved crowns and large roots, expanded laterally and flattened, or rather hollowed, on the anterior and posterior surfaces. Rostrum about equal in length to the cranial part of the skull, broad and flattened above, rounded in front; premaxillae broad and rather concave in front of the nostrils, contracted at the middle of the

rostrum, and expanding again towards the apex. Vertebrae: C 7, D 11-12, L 10, Ca 23; total 51 or 52; bodies of the first and second and sometimes the third cervical vertebrae united; the rest free. Flippers very large, ovate, nearly as broad as long, with all the phalanges and metacarpals broader than long. General form of body robust. Face short and rounded. Dorsal fin near the middle of the back, very high and pointed. See GRAMPUS.

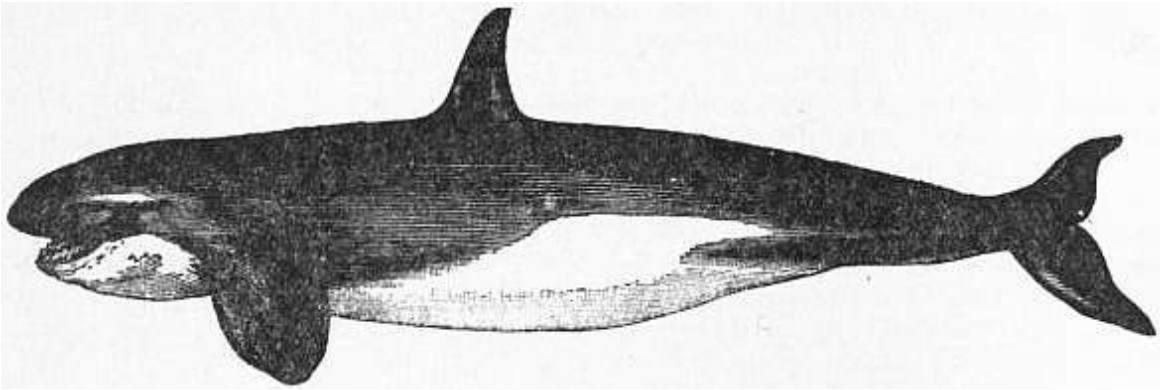


FIG. 10.—The Grampus or Killer (*Orca gladiator*).

The lesser killer or black killer, *Pseudorca crassidens*, has its 8-12/8-12 teeth confined to the anterior half of the rostrum and corresponding part of the lower jaw; they are small, conical, curved and sharp-pointed when unworn, but sometimes deciduous in old age. Skull broad and depressed; with the rostrum and cranial portions about equal in length. Upper surface of rostrum broad and flat. Premaxillae concave in front of the nostrils, as wide at the middle of the rostrum as at the base, and nearly or completely concealing the maxillae in the anterior half of this region. Vertebrae: C 7, D II, L 12-14, Ca 28-29; total 58 or 59. Bodies of the anterior five or six cervical vertebrae united. Length of the bodies of the lumbar and anterior caudal vertebrae about equal to their width. Flippers very long and narrow, with the second digit the longest, and having as many as 12 or 13 phalanges, the third shorter (with 9 phalanges), the first, fourth and fifth very short. Fore part of the head round, in consequence of the great development of a cushion of fat, placed

on the rostrum of the skull in front of the blow-hole. Dorsal fin low and triangular, the length of its base considerably exceeding its vertical height.

Next comes the ca'ing whale, or black-fish (*Globicephalus melas*), with about ten pairs of upper and lower teeth. Cranial and dental characters generally like those of *Orca*, except that the roots of the teeth are cylindrical. Vertebrae: C 7, D 10, L 9, Ca 24; total 50; first to sixth or seventh cervical vertebrae united; bodies of the lumbar vertebrae distinguished from those of the preceding genera by being more elongated, the length being to the width as 3 to 2. Flippers of moderate size, narrow and pointed. Dorsal fin situated near the middle of the back, of moderate size, and sickle-shaped. Head in front of the blow-hole high, and compressed anteriorly, the snout truncated. See Ca'ing Whale.

Risso's dolphin, *Grampus griseus*, represents another genus, characterized by the absence of teeth in the upper and the small number of these in the lower jaw (3 to 7 on each side, and confined to the region of the symphysis). Vertebrae: C 7, D 12, L 19, Ca 30; total 68. General external characters much as in *Globicephalus*, but the fore part of the head less rounded, and the flippers less elongated. *G. griseus* is about 13 ft. long, and remarkable for its great variability of colour. It has been found, though rarely, in the North Atlantic and Mediterranean.

The common dolphin (*Delphinus delphis*) is the typical representative of a large group of relatively small species, some of which are wholly marine, while others are more or less completely fluviatile. They are divided into a number of genera, such as *Prodelphinus*, *Steno*, *Lagenorhynchus*, *Cephalorhynchus*, *Tursiops*, &c., best distinguished from one another by the number and size of the teeth, the form and relations of the bones on the hinder part of the palate, the length of the beak and of the union of the two halves of the lower jaw, and the number of vertebrae. For the distinctive characters of these genera the reader may refer to one of the works

mentioned below; and it must suffice to state that, collectively, all these dolphins are characterized by the following features. The teeth are numerous in both jaws, and more than 20⁄20 in number, occupying nearly the whole length of the rostrum, and small, close-set, conical, pointed and slightly curved. Rostrum more or less elongated, and pointed in front, usually considerably longer than the cranial portion of the skull. Vertebrae: C 7, D 12-14, L and Ca variable; total 51 to 90. Flippers of moderate size, narrow, pointed, somewhat sickle-shaped, with the first digit rudimentary, the second longest, third nearly equal, and the fourth and fifth extremely short. Externally the head shows a distinct beak or pointed snout, marked off from the antenasal fatty elevation by a V-shaped groove. Dorsal fin rather large, triangular or sickle-shaped, rarely wanting. A curiously marked brown and white species, perhaps referable to *Lagenorhynchus* is found on the fringe of the Antarctic ice (see report on the zoology of the "Discovery," published in 1907 by the British Museum). See DOLPHIN.

Extinct Cetacea.

At present we are totally in the dark as to the origin of the whalebone-whales, not being even assured that they are derived from the same stock as the toothed whales. It is noteworthy, however, that some of the fossil representatives of the latter have nasal bones of a type recalling those of the former. Such fossil whalebone-whales as are known occur in Pliocene, and Miocene formations are either referable to existing genera, or to more or less nearly related extinct ones, such as *Plesiocetus*, *Herpetocetus* and *Cetotherium*.

The toothed whales, on the other hand, are very largely represented in a fossil state, reaching as low in the geological series as the upper Cretaceous. Many of these present much more generalized characters than their modern

representatives, while others indicate apparently a transition towards the still more primitive zeuglodonts, which, as will be shown later, are themselves derived from the creodont Carnivora. In the Pliocene deposits of Belgium and England are preserved the teeth and other remains of a number of cetaceans, such as *Physodon*, *Encetus*, *Dinoziphius*, *Hoplocetus*, *Balaenodon* and *Scaldicetus*, more or less nearly related to the sperm-whale, but presenting several primitive characters. A complete skull of a member of this group from the Tertiary deposits of Patagonia, at first referred to *Physodon*, but subsequently to *Scaldicetus*, has a full series of enamelled teeth in the upper jaw; and it is probable that the same was the case in other forms. This entails either a modification of the definition of the *Physeteridae* as given above, or the creation of a separate family for these primitive sperm-whales. In other cases, however, as in the Miocene *Prophyseter* and *Placoziphius*, the anterior portion or the whole of the upper jaw had already become toothless; and these forms are regarded as indicating the descent of the sperm-whales from the under-mentioned *Squalodon*. The beaked whales, again, are believed to be independently descended from the latter type, *Berardius* being traced into the Miocene *Mioziphius*, *Anoplonassa* and *Palaeoziphius*, the last of which shows signs in its dentition of approximating to the complicated tooth-structure of the squalodonts.

Another line of descent from the latter, apparently culminating in the modern *Platanistidae*, is represented by the family *Eurhinodelphidae*, typified by the European Miocene *Eurhinodelphis*, but also including the contemporary Patagonian *Argyrocetus* and the nearly allied European *Cyrtodelphis*. All these were very long-beaked dolphins; and in *Argyrocetus*, at all events, the occipital condyles, instead of being closely pressed to the skull, are as prominent as in ordinary mammals, while the nasal bones, instead of forming mere rudimentary nodules, were squared and roofed over the hind part of the nasal chamber.

In the Miocene *Squalodon*, representing the family *Squalodontidae*, the dentition is differentiated into incisors, canines and cheek-teeth, the hinder ones of the latter series having double roots and compressed crowns carrying serrations on the hinder edge; generally the dental formula has been given as i. 3/3 , c. 1/1 , p. 4/4 , m. 7/7 , the single-rooted cheek-teeth being regarded as premolars and those with double roots as molars. Dr Abel is, however, of opinion that the formula is better represented as i. 3/3 , c. 1/1 , p. 8 or 9/9, m. 3/2 ; the teeth reckoned as molars corresponding to those of the creodont Carnivora. The single-rooted cheek-teeth are regarded as due, not to the division of double-rooted ones, but to the fusion of the two roots of teeth of the latter type. In *Squalodon* the nasal bones were of the modern nodular type, but in the Miocene Patagonian *Prosqualodon* they partially covered the nasal chamber.

At present there is a gap between the most primitive squalodonts and the Eocene zeuglodonts (*Zeuglodontidae*), which are regarded by Messrs Max Weber, O. Abel and C.W. Andrews as the direct forerunners of the modern-toothed whales, forming the suborder *Archaeoceti*. It is, however, right to mention that some authorities refuse to admit the relation of the Archaeoceti to the whales.

In the typical zeuglodonts the long and flat skull has large temporal fossae, a strong sagittal crest, a long beak formed mainly by the premaxillae (in place of the maxillae, as in modern whales), and long nasal bones covering over the nasal chamber, so that the nostrils opened about half-way down the beak. All the cervical vertebrae were free. Normally the dentition in the typical genus *Zeuglodon* (which is common to the Eocene of North America and Egypt) is i. 3/3 , c. 1/1 , p. 4/4 , m. 3/3 ; the cheek-teeth being two-rooted, with compressed pointed crowns, of which the fore-and-aft edges are coarsely serrated. In the Egyptian *Zeuglodon osiris* the number of the molars is, however, reduced to 2/3 , while some of the earlier cheek-teeth have

become single-rooted, as in the squalodonts. The probable transitional form between the latter and the zeuglodonts is the small *Microzeuglodon caucasicus* described by the present writer, from the Caucasus. As regards the origin of the zeuglodonts themselves, remains discovered in the Eocene formations of Egypt indicate a practically complete transition, so far at least as dental characters are concerned, from these whale-like creatures to the creodont Carnivora. In the earliest type, *Protocetus*, the skull is practically that of a zeuglodont, the snout being in fact more elongated than in some of the earliest representatives of the latter, although the nostrils are placed nearer the tip. The incisors are unknown, but the cheek-teeth are essentially those of a creodont, none of them having acquired the serrated edges distinctive of the typical zeuglodonts; and the hinder premolars and molars retaining the three roots of the creodonts. In the somewhat later *Prozeuglodon* the skull is likewise essentially of the zeuglodont type, although the nostrils have shifted a little more backwards; as regards the cheek-teeth, which have acquired serrated crowns, the premolars at any rate retain the inner buttress supported by a distinct third root, so that they are precisely intermediate between *Protocetus* and *Zeuglodon*. Yet another connecting form is *Eocetus*, a very large animal from nearly the same horizon as *Prozeuglodon*; its skull approaching that of *Zeuglodon* as regards the backward position of the nostrils, although the cheek-teeth are of the creodont type, having inner, or third, roots. It is noteworthy that *Zeuglodon* apparently occurs in the same beds as these intermediate types.

It follows from the foregoing that if zeuglodonts are the ancestors of the true Cetacea—and the probability that they are so is very great—the latter are derived from primitive Carnivora, and not, as has been suggested, from herbivorous Ungulata. The idea that the zeuglodonts were provided with a bony armour does not appear to be supported by recent discoveries.

AUTHORITIES.—The above article is based on that by Sir W.H. Flower in the 9th edition of this work. See also W.H. Flower, “On the Characters and

Divisions of the Family Delphinidae," *Proc. Zool. Soc.* (London, 1883); F.W. True, "Review of the Family Delphinidae," *Proc. U.S. Museum*, No. 36 (1889); R. Lydekker, "Cetacean Skulls from Patagonia," *Palaeontol. Argentina*, vol. ii: *An. Mus. La Plata* (1893); W. Dames, "Über Zeuglodonten aus Ägypten," *Paläontol. Abhandlungen*, vol. i. (1894); F.E. Beddard, *A Book of Whales* (London, 1900); O. Abel, "Untersuchungen über die fossilen Platanistiden des Wiener Beckens," *Denks. k. Akad. Wiss. Wien.*, vol. lxviii. (1899); "Les Dauphins longirostres du Bolérien," *Mém. musée d'hist. nat. belgique* (1901 and 1902); "Die phylogenetische Entwickelung des Cetaceengebisses und die systematische Stellung der Physeteriden," *Verhandl. deutsch. zool. Gesellschaft* (1905); E. Fraas, "Neue Zeuglodonten aus dem unteren Mittelocean vom Mokattam bei Cairo," *Geol. und paläontol. Abhandl.* ser. 2, vol. vi. (1904); C.W. Andrews, "Descriptive Catalogue of the Tertiary Vertebrata of the Fayum" (British Museum, 1906).

CETHEGUS, the name of a Roman patrician family of the Cornelian gens. Like the younger Cato its members kept up the old Roman fashion of dispensing with the tunic and leaving the arms bare (Horace, *Ars Poëtica*, 50; Lucan, *Pharsalia*, ii. 543). Two individuals are of some importance:—

(1) Marcus Cornelius Cethegus, pontifex maximus and curule aedile, 213 B.C. In 211, as praetor, he had charge of Apulia; later, he was sent to Sicily, where he proved a successful administrator. In 209 he was censor, and in 204 consul. In 203 he was proconsul in Upper Italy, where, in conjunction with the praetor P. Quintilius Varus, he gained a hard-won victory over Mago, Hannibal's brother, in Insubrian territory, and obliged him to leave Italy. He died in 196. He had a great reputation as an orator, and is characterized by Ennius as "the quintessence of persuasiveness" (*suadae medulla*). Horace (*Ars Poët.* 50; *Epistles*, ii. 2. 117) calls him an authority on the use of Latin words.

Livy xxv. 2, 41, xxvii. 11, xxix. 11, xxx. 18.

(2) Gaius Cornelius Cethegus, the boldest and most dangerous of Catiline's associates. Like many other youthful profligates, he joined the conspiracy in the hope of getting his debts cancelled. When Catiline left Rome in 63 B.C., after Cicero's first speech, Cethegus remained behind as leader of the conspirators with P. Lentulus Sura. He himself undertook to murder Cicero and other prominent men, but was hampered by the dilatoriness of Sura, whose age and rank entitled him to the chief consideration. The discovery of arms in Cethegus's house, and of the letter

which he had given to the ambassadors of the Allobroges, who had been invited to co-operate, led to his arrest. He was condemned to death, and executed, with Sura and others, on the night of the 5th of December.

Sallust, *Catilina*, 46-55; Cicero, *In Cat.* iii. 5-7; Appian, *Bell. Civ.* ii. 2-5; see CATILINE.

CETINA, GUTIERRE DE (1518?-1572?), Spanish poet and soldier, was born at Seville shortly before 1520. He served under Charles V. in Italy and Germany, but retired from the army in 1545 to settle in Seville. Soon afterwards, however, he sailed for Mexico, where he resided for some ten years; he appears to have visited Seville in 1557, and to have returned to Mexico, where he died at some date previous to 1575. A follower of Boscan and Garcilaso de la Vega, a friend of Jerónimo de Urrea and Baltavar del Alcázar, Cetina adopted the doctrines of the Italian school and, under the name of Vandalio, wrote an extensive series of poems in the newly introduced metres; his sonnets are remarkable for elegance of form and sincerity of sentiment, his other productions being in great part adaptations from Petrarch, Ariosto and Ludovico Dolce. His patrons were Antonio de Leyva, prince of Ascoli, Hurtado de Mendoza, and Alva's grandson, the duke de Sessa, but he seems to have profited little by their protection. His works have been well edited by Joaquín Hazañas y la Rúa in two volumes published at Seville (1895).

CETTE, a seaport of southern France in the department of Hérault, 18 m. S.W. of Montpellier by the Southern railway. Pop. (1906) 32,659. After Marseilles it is the principal commercial port on the south coast of France. The older part of Cette occupies the foot and slope of the Mont St Clair (the ancient *Mons Setius*), a hill 590 ft. in height, situated on a tongue of land that lies between the Mediterranean and the lagoon of Thau. This quarter with its wide streets and lofty stone buildings is bounded on the east by the Canal de Cette, which leads from the lagoon of Thau to the Old Basin and the outer harbour. Across the canal lie the newer quarters, which chiefly occupy two islands separated from each other by a wet dock and limited on the east by the Canal Maritime, parallel to the Canal de Cette. A lateral canal unites the northern ends of the two main canals. A breakwater running W.S.W. and E.N.E. protects the entrance to the harbour, which is one of the safest in France. The outer port and the Old Basin are enclosed by a mole to the south and by a jetty to the east. Behind the outer port lies an inner and more recent basin which communicates with the Canal Maritime. The entire area of the harbour, including the canals, is 111 acres with a quayage length of over 8000 yds. The public institutions of Cette include tribunals of commerce and of maritime commerce, councils of arbitration in commercial and fishing affairs, an exchange and chamber of commerce, a branch of the Bank of France and a large hospital. There are also a communal college, a naval school, and schools of music, commerce and industry, and navigation. Cette is much resorted to for sea-bathing. The town is connected with Lyons by the canal from the Rhone to Cette, and with Bordeaux by the Canal du Midi, and is a junction of the Southern and Paris-Lyon railways. The shipping trade is carried on with South America, the chief ports of the Mediterranean, and especially with Spain. The chief exports are wines and brandy, chemical products, skins and soap; the chief imports are wine, cereals, coal, timber, petroleum, sulphur, tar and chemical substances. In the five years 1901-1905 the average annual value of imports

was £3,720,000 (£4,980,000 in years 1896-1900), of exports £1,427,000 (£1,237,000 in 1896-1900). More than 400 small craft are employed in the sardine, tunny, cod and other fisheries. Large quantities of shell-fish are obtained from the lagoon of Thau. There are factories for the pickling of sardines, for the manufacture of liqueurs and casks, and for the treatment of sulphur, phosphates, and nitrate of soda. The Schneider Company of Creusot also have metallurgical works at Cette, and the establishments for making wine give employment to thousands. The port of Cette was created in 1666 by the agency of Colbert, minister of Louis XIV., and according to the plans of Vauban; toward the end of the 17th century its development was aided by the opening of the Canal du Midi.

CETTIGNE (Servian, *Tsetinye*; also written *Cettinje*, *Tzetinje*, and *Tsettinye*), the capital of Montenegro; in a narrow plain deeply sunk in the heart of the limestone mountains, at a height of 2093 ft. above the sea. Pop. (1900) about 3200. The surrounding country is bare and stony, with carefully cultivated patches of rich red soil among the crevices of the rock. In winter it is often so deeply covered with snow as to be well-nigh inaccessible, while in spring and autumn it is frequently flooded by the waters of a small brook which becomes a torrent after rain or a thaw. Cettigne itself is little more than a walled village, consisting of a cluster of whitewashed cottages and some unadorned public buildings. These include a church; a fortified monastery which was founded in 1478, but so often burned and rebuilt as to seem quite modern, and which is visited by pilgrims to the tomb of Peter I. (1782-1830); residences for the

archimandrite and the *vladika* or metropolitan of Cettigne; a palace built in 1863, which accommodates the ministries; the court of appeal, and a school modelled on the gymnasia of Germany and Austria; the newer palaces of the prince and his heir; foreign legations; barracks; a seminary for priests and teachers, established by the tsar Alexander II. (1855-1881), with a very successful girls' school founded and endowed by the tsaritsa Marie; a library and reading-room; a theatre, a museum and a hospital. In an open space near the old palace stood the celebrated plane tree, beneath which Prince Nicholas gave audience to his subjects, and administered justice until the closing years of the 19th century. A zigzag highway, regarded as a triumph of engineering, winds through the mountain passes between Cettigne and the Austrian seaport of Cattaro; and other good roads give access to the richest parts of the interior. There is, however, little trade, though mineral waters are manufactured.

Cettigne owes its origin to Ivan the Black, who was forced, towards the end of the 15th century, to withdraw from Zhabliak, his former capital. It has often been taken and sacked by the Turks, but has seldom been occupied by them for long.

CETUS ("The Whale"), in astronomy, a constellation of the southern hemisphere, mentioned by Eudoxus (4th century B.C.) and Aratus (3rd century B.C.), and fabled by the Greeks to be the monster sent by Neptune to devour Andromeda, but which was slain by Perseus. Ptolemy catalogued 22 stars in this constellation; Tycho Brahe, 21; and Hevelius, 45. The most remarkable star of this constellation is *o*-(*Mira*) *Ceti*, a long-period variable,

discovered by the German astronomer Fabricius; its magnitude varies between about 3 to 9, and its period is 331 days. *τ-Ceti* is an irregular variable, its extreme magnitudes being 5 and 7; *γ-Ceti* is a beautiful double star, consisting of a yellow star of magnitude 3 and a blue of magnitude 6.8; *ν-Ceti* is also a double star.

CETYWAYO (?-1884), king of the Zulus, was the eldest son of King Umpande or Panda, and a nephew of the two previous kings, Dingaan and Chaka. Cetywayo was a young man when in 1840 his father was placed on the throne by the aid of the Natal Boers; and three years later Natal became a British colony. Cetywayo had inherited much of the military talent of his uncle Chaka, the organizer of the Zulu military system, and chafed under his father's peaceful policy towards his British and Boer neighbours. Suspecting Panda of favouring a younger son, Umbulazi, as his successor, Cetywayo made war on his brother, whom he defeated and slew at a great battle on the banks of the Tugela in December 1856. In the following year, at an assembly of the Zulus, it was resolved that Panda should retire from the management of the affairs of the nation, which were entrusted to Cetywayo, though the old chief kept the title of king. Cetywayo was, however, suspicious of the Natal government, which afforded protection to two of his brothers. The feeling of distrust was removed in 1861 by a visit from Mr (afterwards Sir) Theophilus Shepstone, secretary for native affairs in Natal, who induced Panda to proclaim Cetywayo publicly as the future king. Friendly relations were then maintained between the Zulus and Natal for many years. In 1872 Panda died, and Cetywayo was

declared king, August 1873, in the presence of Shepstone, to whom he made solemn promises to live at peace with his neighbours and to govern his people more humanely. These promises were not kept. Not only were numbers of his own people wantonly slain (Cetywayo returning defiant messages to the governor of Natal when remonstrated with), and the military system of Chaka and Dingaan strengthened, but he had a feud with the Transvaal Boers as to the possession of the territory between the Buffalo and Pongola rivers, and encouraged the chief Sikukuni (Secocoeni) in his struggle against the Boers. This feud with the Boers was inherited by the British government on the annexation of the Transvaal in 1877. Cetywayo's attitude became menacing; he allowed a minor chief to make raids into the Transvaal, and seized natives within the Natal border.

Sir Bartle Frere, who became high commissioner of South Africa in March 1877, found evidence which convinced him that the Kaffir revolt of that year on the eastern border of Cape Colony was part of a design or desire "for a general and simultaneous rising of Kaffirdom against white civilization"; and the Kaffirs undoubtedly looked to Cetywayo and the Zulus as the most redoubtable of their champions. In December 1878 Frere sent the Zulu king an ultimatum, which, while awarding him the territory he claimed from the Boers, required him to make reparation for the outrages committed within the British borders, to receive a British resident, to disband his regiments, and to allow his young men to marry without the necessity of having first "washed their spears." Cetywayo, who had found a defender in Bishop Colenso, vouchsafed no reply, and Lord Chelmsford entered Zululand, at the head of 13,000 troops, on the 11th of January 1879 to enforce the British demands. The disaster of Isandhlwana and the defence of Rorke's Drift signalized the commencement of the campaign, but on the 4th of July the Zulus were utterly routed at Ulundi. Cetywayo became a fugitive, but was captured on the 28th of August. His kingdom was divided among thirteen chiefs and he himself taken to Cape Town, whence he was

brought to London in August 1882. He remained in England less than a month, during which time the government (the second Gladstone administration) announced that they had decided upon his restoration. To his great disappointment, however, restoration proved to refer only to a portion of his old kingdom. Even there one of his kinsmen and chief enemies, Usibepu, was allowed to retain the territory allotted to him in 1879. Cetywayo was reinstalled on the 29th of January 1883 by Shepstone, but his enemies, headed by Usibepu, attacked him within a week, and after a struggle of nearly a year's duration he was defeated and his kraal destroyed. He then took refuge in the Native Reserve, where he died on the 8th of February 1884. For a quarter of a century he had been the most conspicuous native figure in South Africa, and had been the cause of long and bitter political controversy in Great Britain.

His son DINIZULU afterwards attempted to become king, was exiled (1889) to St Helena, permitted to return (1898), and granted the position of a chief. In December 1907 Dinizulu was imprisoned at Maritzburg, being suspected of complicity in the revolt which had occurred in Zululand the previous year. He was kept many months waiting trial, there being considerable friction between the colonial government and the British government over the incident. He was eventually brought to trial in November 1908 before a special court, his defence (to the cost of which the British government contributed £2000) being undertaken by Mr W.P. Schreiner. The trial was not concluded until March 1909. The charge of high treason was not proved, but Dinizulu was convicted of harbouring rebels and was sentenced to four years' imprisonment.

The Life of Sir Bartle Frere, by John Martineau, vol. ii. chaps. 18 to 21, contains much information concerning Cetywayo.

CEUTA (Arabic *Sebta*), a Spanish military and convict station and seaport on the north coast of Morocco, in 35° 54′ N., 5° 18′ W. Pop. about 13,000. It is situated on a promontory connected with the mainland by a narrow isthmus. This promontory marks the south-eastern end of the straits of Gibraltar, which between Ceuta and Gibraltar have a width of 14 m. The promontory terminates in a bold headland, the Montagne des Singes, with seven distinct peaks. Of these the highest is the Monte del Hacko, the ancient *Abyla*, one of the "Pillars of Hercules," which faces Gibraltar and rises 636 ft. above the sea. On the westernmost point—Almina, 476 ft. high—is a lighthouse with a light visible for 23 m. Ceuta consists of two quarters, the old town, covering the low ground of the isthmus, and the modern town, built on the hills forming the north and west faces of the peninsula. Between the old and new quarters and on the north side of the isthmus lies the port. The public buildings in the town, thoroughly Spanish in its character, are not striking: they include the cathedral (formerly a mosque), the governor's palace, the town hall, barracks, and the convict prison in the old convent of San Francisco. Ceuta has been fortified seaward, the works being furnished with modern artillery intended to command the entrance to the Mediterranean. Landward are three lines of defence, the inner line stretching completely across the isthmus. These fortifications, which date from the time of the Portuguese occupation, have been partly modernized. The citadel, El Hacho, built on the neck of the isthmus, dates from the 15th century. The garrison consists of between 3000 and 4000 men, inclusive of a disciplinary corps of military convicts. Of the rest of the population about 2000 are civilian convicts; and there are colonies of Jews, negroes and Moors, the last including descendants of Moors transferred to Ceuta from Oran when Spain abandoned that city in 1796.

Ceuta occupies in part the site of a Carthaginian colony, which was succeeded by a Roman colony said to have been called *Ad Septem Fratres*

and also *Exilissa* or *Lissa Civitas*. From the Romans the town passed to the Vandals and afterwards to Byzantium, the emperor Justinian restoring its fortifications in 535. In 618 the town, then known as *Septon*, fell into the hands of the Visigoths. It was the last stronghold in North Africa which held out against the Arabs. At that date (A.D. 711) the governor of the town was the Count Julian who, in revenge for the betrayal of his daughter by King Roderick of Toledo, invited the Arabs to cross the straits under Tarik and conquer Spain for Islam. By the Arabs the town was called *Cibta* or *Sebta*, hence the Spanish form *Ceuta*. From the date of its occupation by the Arabs the town had a stormy history, being repeatedly captured by rival Berber and Spanish-Moorish dynasties. It became nevertheless an important commercial and industrial city, being noted for its brass ware, its trade in ivory, gold and slaves. It is said to have been the first place in the West where a paper manufactory was established. In 1415 the town was captured by the Portuguese under John I., among those taking part in the attack being Prince Henry "the Navigator" and two of his brothers, who were knighted on the day following in the mosque (hastily dedicated as a Christian church). Ceuta passed to Spain in 1580 on the subjugation of Portugal by Philip II., and was definitely assigned to the Spanish crown by the treaty of Lisbon in 1688. The town has been several times unsuccessfully besieged by the Moors—one siege, under Mulai Ismail, lasting twenty-six years (1694-1720). In 1810, with the consent of Spain, it was occupied by British troops under General Sir J.F. Fraser. The town was restored to Spain by the British at the close of the Napoleonic Wars. As the result of the war between Spain and Morocco in 1860 the area of Spanish territory around the town was increased. The military governor of the town also commands the troops in the other Spanish stations on the coast of Morocco. For civil purposes Ceuta is attached to the province of Cadiz. It is a free port, but does little trade.

See de Prado, *Recuerdos de Africa; historia de la plaza de Ceuta* (Madrid, 1859-1860); Budgett Meakin, *The Land of the Moors* (London, 1901), chap, xix., where many works dealing with Spanish Morocco are cited.

CEVA, a town of Piedmont, Italy, in the province of Cuneo, 33 m. E. by rail from the town of Cuneo, 1270 ft. above sea-level. Pop. (1901) 2703. In the middle ages it was a strong fortress defending the confines of Piedmont towards Liguria, but the fortifications on the rock above the town were demolished in 1800 by the French, to whom it had been ceded in 1796. Its cheese (*caseus cebanus*) was famous in Roman times, but it does not seem ever to have been a Roman town. It lay on the road between Augusta Taurinorum and Vada Sabatia. A branch railway runs from Ceva through Garessio, with its marble quarries, to Ormea (2398 ft.), 22 m. to the south through the upper valley of the Tanaro, which in Roman times was under Albingaunum (Th. Mommsen in *Corp. Inscr. Lat.* v. (Berlin, 1877), p. 898). From Ormea a road runs south to (31 m.) Oneglia on the Ligurian coast.

CÉVENNES (Lat. *Cebenna* or *Gebenna*), a mountain range of southern France, forming the southern and eastern fringe of the central plateau and part of the watershed between the Atlantic and Mediterranean basins. It

consists of a narrow ridge some 320 m. long, with numerous lofty plateaus and secondary ranges branching from it. The northern division of the range, which nowhere exceeds 3320 ft. in height, extends, under the name of the mountains of Charolais, Beaujolais and Lyonnais, from the Col de Longpendu (west of Chalon-sur-Saône) in a southerly direction to the Col de Gier. The central Cévennes, comprising the volcanic chain of Vivarais, incline south-east and extend as far as the Lozère group. The northern portion of this chain forms the Boutières range. Farther south it includes the Gerbier des Joncs (5089 ft.), the Mont de Mézenc (5755 ft.), the culminating point of the entire range, and the Tanargue group. South of the Mont Lozère, where the Pic Finiels reaches 5584 ft., lies that portion of the range to which the name Cévennes is most strictly applied. This region, now embraced in the departments of Lozère and Gard, stretches south to include the Aigoual and Espérou groups. Under various local names (the Garrigues, the mountains of Espinouse and Lacaune) and with numerous offshoots the range extends south-east and then east to the Montagne Noire, which runs parallel to the Canal du Midi and comes to an end some 25 m. east of Toulouse. In the south the Cévennes separate the cold and barren table-lands known as the Causses from the sunny region of Languedoc, where the olive, vine and mulberry flourish. Northwards the contrast between the two slopes is less striking.

The Cévennes proper are formed by a folded belt of Palaeozoic rocks which lies along the south-east border of the central plateau of France. Concealed in part by later deposits, this ancient mountain chain extends from Castelnaudary to the neighbourhood of Valence, where it sinks suddenly beneath the Tertiary and recent deposits of the valley of the Rhone. It is in the Montagne Noire rather than in the Cévennes proper that the structure of the chain has been most fully investigated. All the geological systems from the Cambrian to the Carboniferous are included in the folded belt, and J. Bergeron has shown that the gneiss and schist which

form so much of the chain consist, in part at least, of metamorphosed Cambrian beds. The direction of the folds is about N. 60° E., and the structure is complicated by overthrusting on an extensive scale. The overthrust came from the south-east, and the Palaeozoic beds were crushed and crumpled against the ancient massif of the central plateau. The principal folding took place at the close of the Carboniferous period, and was contemporaneous with that of the old Hercynian chain of Belgium, &c. The Permian and later beds lie unconformably upon the denuded folds, and in the space between the Montagne Noire and the Cévennes proper the folded belt is buried beneath the horizontal Jurassic strata of the Causses. Although the chain was completed in Palaeozoic times, a second folding took place along its south-east margin at the close of the Eocene period. The Secondary and Tertiary beds of the Languedoc were crushed against the central plateau and were frequently overfolded. But by this time the ancient Palaeozoic chain had become a part of the unyielding massif, and the folding did not extend beyond its foot.

As the division between the basins of the Loire and the Garonne to the west and those of the Saône and Rhone to the east, the Cévennes send many affluents to those rivers. In the south the Orb, the Hérault and the Vidourle are independent rivers flowing to the Golfe du Lion; farther north, the Gard —formed by the union of several streams named Gardon—the Cèze and the Ardèche flow to the Rhone. The Vivarais mountains and the northern Cévennes approach the right banks of the Rhone and Saône closely, and on that side send their waters by way of short torrents to those rivers; on the west side the streams are tributaries of the Loire, which rises at the foot of Mont Mézenc. A short distance to the south on the same side are the sources of the Allier and Lot. The waters of the north-western slope of the southern Cévennes drain into the Tarn either directly or by way of the Aveyron, which rises in the outlying chain of the Lévezou, and, in the extreme south, the Agout. The Tarn itself rises on the southern slope of the Mont Lozère.

In the Lozère group and the southern Cévennes generally, good pasturage is found, and huge flocks spend the summer there. Silkworm-rearing and the cultivation of peaches, chestnuts and other fruits are also carried on. In the Vivarais cattle are reared, while on the slopes of the Beaujolais excellent wines are grown.

The chief historical event in the history of the Cévennes is the revolt of the Camisards in the early years of the 18th century (see CAMISARDS).

CEYLON, a large island and British colony in the Indian Ocean, separated on the N.W. from India by the Gulf of Manaar and Palk Strait. It lies between 5° 55′ and 9° 51′ N. and between 79° 41′ and 81° 54′ E. Its extreme length from north to south is 271½ m.; its greatest width is 137½ m.; and its area amounts to 25,481 sq. m., or about five-sixths of that of Ireland. In its general outline the island resembles a pear, the apex of which points towards the north.

Coast.

The coast is beset on the N.W. with numberless sandbanks, rocks and shoals, and may be said to be almost connected with India by the island of Rameswaram and Adam's Bridge, a succession of bold rocks reaching almost across the gulf at its narrowest point. Between the island and the opposite coast there exist two open channels of varying depth and width, beset by rocks and shoals. One of these, the Manaar Passage, is only navigable by very small craft. The other, called the Paumben Passage, lying between Rameswaram and the mainland, has been deepened at considerable outlay, and is used by

large vessels in passing from the Malabar to the Coromandel coast, which were formerly compelled in doing so to make the circuit of the island. The west and south coasts, which are uniformly low, are fringed their entire length by coco-nut trees, which grow to the water's edge in great luxuriance, and give the island a most picturesque appearance. Along these shores there are numerous inlets and backwaters of the sea, some of which are available as harbours for small native craft. The east coast from Point de Galle to Trincomalee is of an entirely opposite character, wanting the ample vegetation of the other, and being at the same time of a bold precipitous character. The largest ships may freely approach this side of the island, provided they take care to avoid a few dangerous rocks, whose localities, however, are well known to navigators.

Seen from a distance at sea this "utmost Indian isle" of the old geographers wears a truly beautiful appearance. The remarkable elevation known as "Adam's Peak," the most prominent, though not the loftiest, of the hilly ranges of the interior, towers like a mountain monarch amongst an assemblage of picturesque hills, and is a sure landmark for the navigator when as yet the Colombo lighthouse is hidden from sight amid the green groves of palms that seem to be springing from the waters of the ocean. The low coast-line encircles the mountain zone of the interior on the east, south and west, forming a belt which extends inland to a varying distance of from 30 to 80 m.; but on the north the whole breadth of the island from Kalpitiya to Batticaloa is an almost unbroken plain, containing magnificent forests of great extent.

Mountains.

The mountain zone is towards the south of the island, and covers an area of about 4212 sq. m. The uplifting force seems to have been exerted from south-west to north-east, and although there is much confusion in many of the intersecting ridges, and spurs of great size and extent are sent off in many directions, the lower ranges manifest

a remarkable tendency to run in parallel ridges in a direction from south-east to north-west. Towards the north the offsets of the mountain system radiate to short distances and speedily sink to the level of the plain. Detached hills are rare; the most celebrated of these are Mihintale (anc. *Missïaka*), which overlooks the sacred city of Anuradhapura, and Sigiri. The latter is the only example in Ceylon of those solitary acclivities which form so remarkable a feature in the tableland of the Deccan—which, starting abruptly from the plain, with scarped and perpendicular sides, are frequently converted into strongholds accessible only by precipitous pathways or by steps hewn in the solid rock.

For a long period Adam's Peak was supposed to be the highest mountain in Ceylon, but actual survey makes it only 7353 ft. above sea-level. This elevation is chiefly remarkable as the resort of pilgrims from all parts of the East. The hollow in the lofty rock that crowns the summit is said by the Brahmans to be the footstep of Siva, by the Buddhists of Buddha, by the Mahommedans of Adam, whilst the Portuguese Christians were divided between the conflicting claims of St Thomas and the eunuch of Candace, queen of Ethiopia. The footstep is covered by a handsome roof, and is guarded by the priests of a rich monastery half-way up the mountain, who maintain a shrine on the summit of the peak. The highest mountains in Ceylon are Pidurutalagala, 8296 ft. in altitude; Kirigalpota, 7836 ft.; and Totapelakanda, 7746 ft.

The summits of the highest ridges are clothed with verdure, and along their base, in the beautiful valleys which intersect them in every direction, the slopes were formerly covered with forests of gigantic and valuable trees, which, however, have disappeared under the axe of the planter, who felled and burnt the timber on all the finest slopes at an elevation of 2000 to 4500 ft., and converted the hillsides into highly cultivated coffee and afterwards tea estates.

The plain of Nuwara Eliya, the sanatorium of the island, is at an elevation of 6200 ft., and possesses many of the attributes of an alpine country. The climate of the Horton plains, at an elevation of 7000 ft., is still finer than that of Nuwara Eliya, but they are difficult of access, and are but little known to Europeans. The town of Kandy, in the Central Province, formerly the capital of the native sovereigns of the interior, is situated 1727 ft. above sea-level.

Rivers.

The island, though completely within the influence of oceanic evaporation, and possessing an elevated tableland of considerable extent, does not boast of any rivers of great volume. The rains which usher in each monsoon or change of season are indeed heavy, and during their fall swell the streams to torrents and impetuous rivers. But when these cease the water-courses fall back to their original state, and there are few of the rivers which cannot generally be passed on horseback. The largest river, the Mahaweliganga, has a course of 206 m., draining about one-sixth of the area of the island before it reaches the sea at Trincomalee on the east coast. There are twelve other considerable rivers, running to the west, east and south, but none of these exceeds 90 m. in length. The rivers are not favourable for navigation, except near the sea, where they expand into backwaters, which were used by the Dutch for the construction of their system of canals all round the western and southern coasts. Steamers ply between Colombo and Negombo along this narrow canal and lake. A similar service on the Kaluganga did not prove a success. There are no inland lakes except the remains of magnificent artificial lakes in the north and east of the island, and the backwaters on the coast. The lakes which add to the beauty of Colombo, Kandy, Lake Gregory, Nuwara Eliya and Kurunegala are artificial or partly so. Giant’s Tank is said to have an area of 6380 acres, and Minneri and Kalawewa each exceed 4000 acres.

The magnificent basin of Trincomalee, situated on the east coast of Ceylon, is perhaps unsurpassed in extent, security and beauty by any haven in the world. The admiralty had a dockyard here which was closed in 1905.

Geology.—Ceylon may be said to have been for ages slowly rising from the sea, as appears from the terraces abounding in marine shells, which occur in situations far above high-water mark, and at some miles distance from the sea. A great portion of the north of the island may be regarded as the joint production of the coral polyps and the currents, which for the greater part of the year set impetuously towards the south; coming laden with alluvial matter collected along the coast of Coromandel, and meeting with obstacles south of Point Calimere, they have deposited their burdens on the coral reefs round Point Pedro; and these, raised above the sea-level and covered deeply by sand drifts, have formed the peninsula of Jaffna, and the plains that trend westward till they unite with the narrow causeway of Adam's Bridge. Tertiary rocks are almost unknown. The great geological feature of the island is the profusion of gneiss, overlaid in many places in the interior by extensive beds of dolomitic limestone. This formation appears to be of great thickness; and when, as is not often the case, the under-surface of the gneiss series is exposed, it is invariably found resting on granite. Veins of pure quartz and felspar of considerable extent have been frequently met with in the gneiss; while in the elevated lands of the interior in the Galle districts may be seen copious deposits of disintegrated felspar, or *kaolin*, commonly known as porcelain clay. At various elevations the gneiss may be found intersected by veins of trap rock, upheaved whilst in a state of fusion subsequent to the consolidation of the former. In some localities on the seashore these veins assume the character of pitch-stone porphyry highly impregnated with iron. Hornblende and primitive greenstone are found in the vicinity of Adam's Peak and in the Pussellava district. Laterite, known in Ceylon as *kabuk*, a product of disintegrated

gneiss, exists in vast quantities in many parts, and is quarried for building purposes.

Climate.—The seasons in Ceylon differ very slightly from those prevailing along the coasts of the Indian peninsula. The two distinctive monsoons of the year are called, from the winds which accompany them, the south-west and the north-east. The former is very regular in its approach, and may be looked for along the south-west coast between the 10th and 20th of May; the latter reaches the north-east coast between the end of October and the middle of November. There is a striking contrast in the influence which the south-west monsoon exerts on the one side of the island and on the other. The clouds are driven against the lofty mountains that overhang the western and southern coasts, and their condensed vapours descend there in copious showers. But the rains do not reach the opposite side of the island: while the south-west is deluged, the east and north are sometimes exhausted with dryness; and it not unfrequently happens that different sides of the same mountain present at the same moment the opposite extreme of droughts and moisture. The influence of the north-east monsoon is more general. The mountains which face the north-east are lower and more remote from the sea than those on the south-west; the clouds are carried farther inland, and it rains simultaneously on both sides of the island.

The length of the day, owing to the proximity of the island to the equator, does not vary more than an hour at any season. The mean time of the rising of the sun's centre at Colombo on February 1st is 6h 23m A.M., and of its setting 6h 5m P.M. On August 15th its rising is at 5h 45m A.M., and its setting at 6h 7m P.M. It is mid-day in Colombo when it is morning in England. Colombo is situated in 79° 50′ 45″ E., and the day is further advanced there than at Greenwich by 5h 19m 23s.

Flora.—The characteristics of the low-growing plants of Ceylon approach nearly to those of the coasts of southern India. The *Rhizophoreae* are numerous along the low muddy shores of salt lakes and stagnant pools; and the acacias are equally abundant. The list comprises *Aegiceras fragrans*, *Epithinia malayana*, *Thespesia populnea*, *Feronia elephantum*, *Salvadora persica* (the true mustard tree of Scripture), *Eugenia bracteata*, *Elaeodendron Roxburghii*, *Cassia Fistula*, *Cassia Roxburghii*, &c. The herbaceous plants of the low country belong mostly to the natural orders *Compositae*, *Leguminosae*, *Rubiaceae*, *Scrophulariaceae* and *Euphorbiaceae*.

Leaving the plains of the maritime country and ascending a height of 4000 ft. in the central districts, we find both herbage and trees assume an altered character. The foliage of the latter is larger and deeper coloured, and they attain a height unknown in the hot low country. The herbaceous vegetation is there made up of ferns, *Cyrtandreae*, *Compositae*, *Scitamineae* and *Urticaceae*. The dense masses of lofty forest at that altitude are interspersed with large open tracts of coarse wiry grass, called by the natives *patanas*, and of value to them as affording pasturage for their cattle.

Between the altitudes of 4000 and 8000 ft., many plants are to be met with partaking of European forms, yet blended with tropical characteristics. The guelder rose, St John's wort, the *Nepenthes distillatoria* or pitcher plant, violets, geraniums, buttercups, sundews, ladies' mantles and campanulas thrive by the side of *Magnoliaceae*, *Ranunculaceae*, *Elaeocarpeae*, &c. The most beautiful flowering shrub of this truly alpine region is the rhododendron, which in many instances grows to the height of 70 ft. It is met with in great abundance in the moist plains of the elevated land above Nuwara Eliya, flowering abundantly in June and July. There are two distinct varieties, one similar to the Nilgiri plant, having its leaves broad and cordate, and of a rusty colour on the under side; the other,

peculiar to Ceylon, is found only in forests at the loftiest elevations; it has narrow rounded leaves, silvery on the under side, and grows to enormous heights, frequently measuring 3 ft. round the stem. At these altitudes English flowers, herbs and vegetables have been cultivated with perfect success, as also wheat, oats and barley. English fruit-trees grow, but rarely bear. Grapes are grown successfully in the north of the island. The vines were introduced by the Dutch, who overcame the difficulty of perpetual summer by exposing the roots, and thus giving the plants an artificial winter.

The timber trees indigenous to Ceylon are met with at every altitude from the sea-beach to the loftiest mountain peak. They vary much in their hardiness and durability, from the common cashew-nut tree, which when felled decays in a month, to the ebony and satinwood, which for many years resist the attacks of insects and climate. Many of the woods are valuable for furniture, and house and shipbuilding, and are capable of standing long exposure to weather. The most beautiful woods adapted to furniture work are the calamander, ebony, flowered satinwood, tamarind, nedun, dell, kadomberiya, kitul, coco-nut, &c.; the sack-yielding tree (*Antiaris saccidora*), for a long time confounded with the far-famed upas tree of Java (*Antiaris toxicaria*), grows in the Kurunegala district of the island. The *Cocos nucifera*, or coco-nut palm, is a native of the island, and may justly be considered the most valuable of its trees. It grows in vast abundance alone the entire sea-coast of the west and south sides of the island, and furnishes almost all that a Sinhalese villager requires. Its fruit, when green, supplies food and drink; when ripe, it yields oil. The juice of the unopened flower gives him toddy and arrack. The fibrous casing of the fruit when woven makes him ropes, nets, matting. The nut-shells form drinking-vessels, spoons, &c. The plaited leaves serve as plates and dishes, and as thatch for his cottage. The dried leaves are used as torches, the large leaf-stalks as garden fences. The trunk of the tree sawn up is employed for every

possible purpose, from knife-handles to door-posts; hollowed out it forms a canoe or a coffin. There are four kinds of this palm—the common, the king, the dwarf and the Maldive. The Palmyra and Areca palms grow luxuriantly and abundantly, the former in the northern, the latter in the western and central districts. The one is valuable chiefly for its timber, of which large quantities are exported to the Indian coasts; the other supplies the betel-nut in common use amongst natives of the eastern tropics as a masticatory. The export trade in the latter to India and eastern ports is very considerable. Next in importance to the coco-nut palm among the indigenous products of Ceylon is the cinnamon plant, yielding the well-known spice of that name.

Fauna.—Foremost among the animals of Ceylon is the elephant, which, though far inferior to those of Africa and the Indian continent, is nevertheless of considerable value when tamed, on account of its strength, sagacity and docility. They are to be met with in greater or less numbers throughout most unfrequented parts of the interior. Occasionally they make inroads in herds upon the cultivated grounds and plantations, committing great damage. In order to protect these lands, and at the same time keep up the government stud of draught elephants, "kraals" or traps on a large scale are erected in the forests, into which the wild herds are driven; and once secured they are soon tamed and fit for service. The oxen are of small size, but hardy, and capable of drawing heavy loads. Buffaloes exist in great numbers throughout the interior, where they are employed in a half-tame state for ploughing rice-fields and treading out the corn. They feed upon any coarse grass, and can therefore be maintained on the village pasture-lands where oxen would not find support. Of deer, Ceylon possesses the spotted kind (*Axis maculata*), the muntjac (*Stylocerus muntjac*), a red deer (the Sambur of India), popularly called the Ceylon elk (*Musa Aristotelis*), and the small musk (*Moschus minima*). There are five species of monkeys, one the small rilawa (*Macacus pileatus*), and four known in Ceylon by the name of "wandaru" (*Presbytes ursinus*, *P. Thersites*, *P. cephalopterus*, *P.*

Priamus), and the small quadrumanous animal, the loris (*Loris gracilis*), known as the "Ceylon sloth." Of the Cheiroptera sixteen species have been identified; amongst them is the rousette or flying fox (*Pteropus Edwardsii*). Of the Carnivora the only one dangerous to man is the small black bear (*Prochilus labiatus*). The tiger is not known in Ceylon, but the true panther (*Felis pardus*) is common, as is the jackal (*Canis aureus*) and the mongoose or ichneumon (*Herpestes vitticollis*). Rats are numerous, as are the squirrel and the porcupine, and the pig-rat or bandicoot (*Mus bandicota*), while the scaly ant-eater (*Manis pentedactyla*), locally known by the Malay name of pangolin, is occasionally found. The dugong (*Halicore dugong*), is frequently seen on various points of the coast. A game preservation society and the judicious action of government have done much to prevent the wanton destruction of Ceylon deer, elephants, &c., by establishing a close season. It is estimated that there must be 5000 wild elephants in the Ceylon forests. A licence to shoot or capture and an export royalty are now levied by government.

Captain V. Legge includes 371 species of birds in Ceylon, and many of them have splendid plumage, but in this respect they are surpassed by the birds of South America and Northern India. The eagles are small and rare, but hawks and owls are numerous; among the latter is a remarkable brown species, the cry of which has earned for it the name of the "devil-bird." The esculent swift, which furnishes in its edible nest the celebrated Chinese dainty, builds in caves in Ceylon. Crows of various species are numerous, and in the wilder parts pea-fowl are abundant. There are also to be mentioned king-fishers, sun-birds, several beautiful fly-catchers and snatchers, the golden oriole, parroquets and numerous pigeons, of which there are at least a dozen species. The Ceylon jungle-fowl (*Gallus Lafayetti*) is distinct from the Indian species. Ceylon is singularly rich in wading and water birds—ibises, storks, egrets, spoonbills and herons being frequently seen on the wet sands, while flamingoes line the beach in long files, and on

the deeper waters inland are found teal and a countless variety of ducks and smaller fowl. Of the birds familiar to European sportsmen there are partridge, quail and snipe in abundance, and the woodcock has been seen.

The poisonous snakes of Ceylon are not numerous. Four species have been enumerated—the ticpolonga (*Daboia elegans*), the cobra di capello (*Naja tripudians*), the carawilla (*Trigonocephalus hypnale*), and the *Trigonocephalus nigromarginatus*, which is so rare that it has no popular name. The largest snake in Ceylon is the "boa," or "anaconda" of Eastern story (*Python reticulatus*); it is from 20 to 30 ft. in length, and preys on hog-deer and other smaller animals. Crocodiles infest the rivers and estuaries, and the large fresh-water reservoirs which supply the rice-fields; there are two species (*C. biporcatus* and *C. palustris*). Of lizards the most noteworthy are the iguana, several bloodsuckers, the chameleon and the familiar geckoes, which are furnished with pads to each toe, by which they are enabled to ascend perpendicular walls and adhere to glass and ceilings.

Insects exist in great numbers. The leaf and stick insects are of great variety and beauty. Ceylon has four species of the ant-lion, renowned for the predaceous ingenuity of its larvae; and the white ants or termites, the ravages of which are most destructive, are at once ubiquitous and innumerable in every place where the climate is not too chilly or the soil too sandy for them to construct their domed dwellings. They make their way through walls and floors, and in a few hours destroy every vegetable substance within their reach. Of all the insect pests that beset an unseasoned European the most annoying are the mosquitoes. Ticks are also an intolerable nuisance; they are exceedingly minute, and burrow under the skin. In the lower ranges of the hill country land leeches are found in tormenting profusion. But insects and reptiles do not trouble European residents so much as in early years—at any rate in the towns, while in the higher planting districts there is almost complete exemption from their

unwelcome attentions. Bungalows are more carefully built to resist white ants, drainage and cleanliness prevent mosquitoes and ticks from multiplying, while snakes and leeches avoid cultivated, occupied ground.

Of the fish in ordinary use for the table the finest is the seir, a species of scomber (*Cybium guttatum*). Mackerel, dories, carp, whitings, mullet (red and striped), soles and sardines are abundant. Sharks appear on all parts of the coast, and the huge saw fish (*Pristis antiquorum*) infests the eastern coast of the island, where it attains a length of 12 to 15 ft. There are also several fishes remarkable for the brilliancy of their colouring; *e.g.* the Red Sea perch (*Holocentrum rubrum*), of the deepest scarlet, and the great fire fish (*Scorpaena miles*), of a brilliant red. Some are purple, others yellow, and numbers with scales of a lustrous green are called "parrots" by the natives; of these one (*Sparus Hardwickii*) is called the "flower parrot," from its exquisite colouring—irregular bands of blue, crimson and purple, green, yellow and grey, crossed by perpendicular stripes of black. The pearl fishery, as indicated below, is of great importance.

Population.—The total population of Ceylon in 1901, inclusive of military, shipping and 4914 prisoners of war, was 3,578,333, showing an increase of 18.8% in the decade. The population of Colombo was 158,228.

The population and area of the nine provinces was as follows:—

District.	Population.	Area in sq. m.
Western Province	925,342	1,432
Central Province	623,011	2,299½
Northern Province	341,985	3,363¼
Southern Province	566,925	2,146¼
Eastern Province	174,288	4,036½

North-Western Province	353,845	2,996⅞
North Central Province	79,110	4,002¼
Province of Uva	192,072	3,154½
Province of Sabaragamuwa	321,755	1,901⅛
	3,578,333	25,332

The table of nationality gives the principal groups as follows:—

Europeans	9,509
Burghers and Eurasians	23,539
Low-country Sinhalese	1,458,320
Kandyan Sinhalese	872,487
Tamils	953,535
Moors (Mahommedan)	228,706
Malays	11,963
Veddahs (Aborigines)	3,971

Altogether there are representatives of some seventy races in Ceylon. The Veddahs, who run wild in the woods, are the aborigines of the island.

Language.—The language of nearly 70% of the population is Sinhalese, which is nearly allied to Pali (*q.v.*); of the remaining 30%, with the exception of Europeans, the language is Tamil. A corrupt form of Portuguese is spoken by some natives of European descent. The Veddahs, a small forest tribe, speak a distinct language, and the Rodiyas, an outcast tribe, possess a large vocabulary of their own. The Sinhalese possess several original poems of some merit, and an extensive and most interesting series of native chronicles, but their most valuable literature is written in

Pali, though the greater portion of it has been translated into Sinhalese, and is best known to the people through these Sinhalese translations.

Religion.—The principal religions may be distributed as follows:—Christians, 349,239; Buddhists, 2,141,404; Hindus, 826,826; Mahommedans, 246,118. Of the Christians, 287,419 are Roman Catholics, and 61,820 are Protestants of various denominations; and of these Christians 319,001 are natives, and 30,238 Europeans. The Mahommedans are the descendants of Arabs (locally termed Moormen) and the Malays. The Tamils, both the inhabitants of the island and the immigrants from India, are Hindus, with the exception of 93,000 Christians. The Sinhalese, numbering 70% of the whole population, are, with the exception of 180,000 Christians, Buddhists. Ceylon may properly be called a Buddhist country, and it is here that Buddhism is found almost in its pristine purity. Ceylon was converted to Buddhism in the 3rd century B.C. by the great Augustine of Buddhism, Mahinda, son of the Indian king Asoka; and the extensive ruins throughout Ceylon, especially in the ancient cities of Anuradhapura and Polonnaruwa, bear witness to the sacrifices which kings and people joined in making to create lasting monuments of their faith. The Buddhist temples in the Kandyan country possess valuable lands, the greater portion of which is held by hereditary tenants on the tenure of service. These lands were given out with much care to provide for all that was necessary to maintain the temple and its connected monastery. Some tenants had to do the blacksmiths' work, others the carpenters', while another set of tenants had to cultivate the land reserved for supplying the monastery; others again had to attend at the festivals, and prepare decorations, and carry lamps and banners. In course of time difficulties arose; the English courts were averse to a system under which the rent of lands was paid by hereditary service, and a commission was issued by Sir Hercules Robinson (afterwards Lord Rosmead) when governor, to deal with the whole question, to define the services and to enable the tenants to commute these for a money payment.

The result of the inquiry was to show that the services, except in a few instances, were not onerous, and that almost without an exception the tenants were willing to continue the system. The anomaly of an ecclesiastical establishment of Anglican and Presbyterian chaplains with a bishop of Colombo paid out of the general revenues has now been abolished in Ceylon, and only the bishop and two or three incumbents remain on the list for life, or till they retire on pension.

Education.—There has been a great advance in public instruction since 1875, through the multiplication of vernacular, Anglo-vernacular and English schools by government, by the different Christian missions and by the Buddhists and Hindus who have come forward to claim the government grant. The government has also started a technical college, and an agricultural school has been reorganized. An agricultural department, recommended by a commission, should profit by the services of the entomologist, mycologist and chemical analyst added by the governor to the staff of the royal botanic gardens at Peradeniya. There are industrial and reformatory schools, which are partially supported by government. In spite of the great advance that has been made, however, at the census of 1901 no fewer than 2,790,235 of the total population were entered as unable to read or write their own tongue. Of this number 1,553,078 were females, showing a very unsatisfactory state of things.

Agriculture.—The natural soils of Ceylon are composed of quartzose gravel, felspathic clay and sand often of a pure white, blended with or overlaid by brown and red loams, resulting; from the decay of vegetable matter, or the disintegration of the gneiss and hornblende formations. The whole of the great northern extremity of the island consists of a sandy and calcareous admixture, made to yield productive crops of grain, tobacco, cotton and vegetables by the careful industry of the Tamil population, who spare no pains in

Soil.

irrigating and manuring their lands. Between the northern districts and the elevated mountain ranges which overlook the Bintenne and Uva countries are extensive plains of alluvial soil washed down from the table-lands above, where once a teeming population produced large quantities of grain. The remains of ancient works of irrigation bear testimony to the bygone agriculture of these extensive regions now covered by swamps or dense jungle.

The general character of the soil in the maritime provinces to the east, south and west is sandy. Large tracts of quartzose sand spread along the whole line of sea-coast, some of which, of a pure white, and very deficient in vegetable matter, is admirably adapted to the growth of the cinnamon plant. In the light sandy districts where the soil is perfectly free, and contains a portion of vegetable and mineral loam, the coco-nut palm flourishes in great luxuriance. This is the case along the entire coast line from Kalpitiya to Point de Galle, and farther eastward and northward to Matara, stretching to a distance inland varying from 100 yds. to 3 m. From this light sandy belt as far as the mountain-zone of the Kandyan country the land is mainly composed of low hilly undulations of sandstone and ferruginous clay, incapable of almost any cultivation, but intersected in every direction with extensive valleys and wide plains of a more generous soil, not highly fertile, but still capable, with a little industry, of yielding ample crops of rice.

The soil of the central province, although frequently containing great quantities of quartzose sand and ferruginous clay, is in many of the more elevated districts of a fine loamy character. Sand sufficiently vegetable and light for rice culture may be seen at all elevations in the hill districts; but the fine chocolate and brown loams overlying gneiss or limestone formations, so admirably adapted for coffee cultivation, are only to be found on the steep sides or along the base of mountain ranges at an elevation varying

from 2000 to 4000 ft. Such land, well-timbered, contains in its elements the decomposed particles of the rocks above, blended with the decayed vegetable matter of forests that have for centuries scattered beneath them the germs of fertility. The quantity of really rich coffee land in these districts is but small as compared with the extent of country—vast tracts of open valleys consisting of an indifferent yellow tenacious soil interspersed with many low ranges of quartz rock, but tea is a much hardier plant than coffee, and grows on poorer soil.

Irrigation.—The native rulers covered the whole face of the country with a network of irrigation reservoirs, by which Ceylon was enabled in ancient times to be the great granary of southern Asia. Wars, and the want of a strong hand to guide the agriculture of the country, led to the decay of these ancient works, and large tracts of land, which were formerly highly productive, became swampy wastes or dense forests. The remains of some of the larger irrigation works are amongst the most interesting of the memorials of Ceylon's former greatness. Some of the artificial lakes were of great size. Minneri, formed by damming across the valleys between the low hills which surround it with an embankment 60 ft. wide at the top, is at this day 20 m. in circumference. It has recently been restored by government, and is capable of irrigating 15,000 acres; while the Giant's Tank, which has also been restored, irrigates 20,000 acres. Another lake, with an embankment several miles in length, the Kalawewa, was formed by damming back the waters of the Kalaoya, but they have forced their way through the embankment, and in the ancient bed of the lake, or tank, are now many small villages. In connexion with these large tanks were numerous canals and channels for supplying smaller tanks, or for irrigating large tracts of fields. Throughout the district of Nuwarakalawiya every village has its tank. The embankments have been formed with great skill, and advantage has been taken to the utmost of the slightest fall in the land; but they in common with the larger works had been allowed to fall into

decay, and were being brought to destruction by the evil practice of cutting them every year to irrigate the fields. The work of restoring these embankments was undertaken by the government, and 100 village tanks were repaired every year, besides eighteen larger works. In 1900 a sum of five million rupees was set apart for these larger undertakings.

Cultivation and Products.—The area of uncultivated land is little over 3½ million acres, whereas fully four times that amount is capable of cultivation. A great deal is waste, besides lagoons, tanks, backwaters, &c. Thick forest land does not cover more than 5000 sq. m. Scrub, or chena, and patana grass cover a very great area. Tea, cacao, cardamoms, cinchona, coffee and indiarubber are the products cultivated by European and an increasing number of native planters in the hill country and part of the low country of Ceylon. A great change has been effected in the appearance of the country by the introduction of the tea plant in place of the coffee plant, after the total failure of the latter owing to disease. For some time coffee had been the most important crop. In the old days it grew wild like cinnamon, and was exported so far back as the time of the Portuguese, but was lightly esteemed as an article of European commerce, as the berry was gathered unripe, was imperfectly cured and had little flavour. In 1824 the governor, Sir E. Barnes, introduced coffee cultivation on the West Indian plan; in 1834 the falling off of other sources of supply drew general attention to Ceylon, and by 1841 the Ceylon output had become considerable, and grew steadily (with an interval in 1847 due to a commercial crisis) till 1877 when 272,000 acres were under coffee cultivation, the total export amounting to 103,000,000 ℔ Then owing to disease came a crisis, and a rapid decline, and now only a few thousand acres are left. On the failure of the coffee crops planters began extensively to grow the tea plant, which had already been known in the island for several years. By 1882 over 20,000 acres had been planted with tea, but the export that year was under 700,000 ℔ Five years later the area planted was

170,000 acres, while the export had risen to nearly 14,000,000 ℔ By 1892 there were 262,000 acres covered with tea, and 71,000,000 ℔ were that year exported. In 1897, 350,000 acres were planted, and the export was 116,000,000 ℔ By the beginning of the 20th century, the total area cultivated with tea was not under 390,000 acres, while the estimate of shipments was put at 146,000,000 ℔ annually. Nearly every plantation has its factory, with the machinery necessary to prepare the leaf as brought in from the bushes until it becomes the tea of commerce. The total amount of capital now invested in the tea industry in Ceylon cannot be less than £10,000,000. The tea-planting industry more than anything else has raised Ceylon from the depressed state to which it fell in 1882.

Before tea was proved a success, however, *cinchona* cultivation was found a useful bridge from coffee to the Ceylon planter, who, however, grew it so freely that in one year 15,000,000 ℔ bark was shipped, bringing the price of quinine down from 16s. to 1s. 6d. an ounce.

In a few places, where the rainfall is abundant, rice cultivation is allowed to depend on the natural supply of water, but in most parts the cultivation is not attempted unless there is secured beforehand a certain and sufficient supply, by means of canals or reservoirs. In the hill country every valley and open plain capable of tillage is made to yield its crops of grain, and the steep sides of the hills are cut into terraces, on which are seen waving patches of green rice watered by mountain streams, which are conducted by means of channels ingeniously carried round the spurs of the hills and along the face of acclivities, by earthen water-courses and bamboo aqueducts, so as to fertilize the fields below. These works bear witness to the patience, industry and skill of the Kandyan villagers. In the low country to the north and east and north-west of the hills, irrigation works of a more expensive kind are necessary. In January 1892, the immemorial rent or tax on fields of *paddy* (rice in the husk) was removed, but not the customs duty on imported

rice. But even with the advantage of protection to the extent of 10% in the local markets, there has been no extension of paddy cultivation; on the contrary, the import of grain from India has grown larger year by year. Through the multiplication of irrigation works and the northern railway, rice culture may be sufficiently extended to save some of the large imports (8,000,000 to 9,000,000 bushels annually) now required from India.

Tobacco is extensively cultivated in various parts of the island, and the growth of particular places, such as Dumbara and Uva, is much prized for local consumption. The tobacco of export is grown in the peninsula of Jaffna. The exports of this article in 1850 were 22,176 cwts., valued at £20,698. The cultivation of the plant has not greatly increased of recent years, and is almost entirely in the hands of natives in the northern and parts of the central Province.

Ceylon has been celebrated since the middle of the 14th century for its cinnamon, and during the period of the Dutch occupation this spice was the principal article of commerce; under their rule and up to 1832 its cultivation was a government monopoly. With the abolition of the monopoly the quantity exported increased, but the value declined.

Unlike the coffee plant, the hardy tea plant grows from sea-level to 7000 ft. altitude; but crown forest-lands above 5000 ft. are no longer sold, so that a very large area on the highest mountain ranges and plateaus is still under forest. Moreover, on the tea plantations arboriculture is attended to in a way unknown in 1875; the Australian eucalypts, acacias and grevilleas, Indian and Japanese conifers, and other trees of different lands, are now freely planted for ornament, for protection from wind, for firewood or for timber. A great advance has been made at Hakgalla and Nuwara Eliya, in Upper Uva, and other high districts, in naturalizing English fruits and vegetables. The calamander tree is nearly extinct, and ebony and other fine cabinet woods are getting scarce; but the conservation of forests after the Indian

system has been taken in hand under a director and trained officers, and much good has been done. The cinnamon tree (wild in the jungles, cultivated as a shrub in plantations) is almost the only one yielding a trade product which is indigenous to the island. The coco-nut and nearly all other palms have been introduced.

Among other agricultural products mention must be made of *cacao*, the growth and export of which have steadily extended since coffee failed. Important also is the spice or aromatic product of cardamoms.

The culture of *indiarubber* was begun on low-country plantations, and Ceylon rubber is of the best quality in the market. The area of cultivation of the coco-nut palm has been greatly extended since 1875 by natives as well as by Europeans. The products of this palm that are exported, apart from those so extensively used in the island itself, exceed in a good year £1,000,000 sterling in value. Viticulture and cotton cultivation, as well as tobacco growing, are being developed along the course of the new northern railway.

Taking the trade in the products mentioned as a whole, no country can compete with the United Kingdom as a customer of Ceylon. But there is a considerable trade in nearly all products with Germany and America; in cardamoms with India; in cinnamon with Spain, Italy, Belgium, Australia, Austria and France; and in one or other of the products of the coco-nut palm (coco-nuts, coco-nut oil, copra, desiccated coco-nut, poonac, coir) with Belgium, Russia, France, Austria, Australia and Holland.

Pearl Fishery.—Pearl oysters are found in the Tambalagam bay, near Trincomalee, but the great banks on which these oysters are usually found lie near Arippu, off the northern part of the west coast of Ceylon, at a distance of from 16 to 20 m. from the shore. They extend for many miles north and south, varying considerably in their size and productiveness. It is

generally believed that the oyster arrives at maturity in its seventh year, that the pearl is then of full size and perfect lustre, and that if the oyster be not then secured it will shortly die, and the pearl be lost. It is certain that from some unexplained cause the oysters disappear from their known beds for years together. The Dutch had no fishery from 1732 to 1746, and it failed them again for twenty-seven years from 1768 to 1796. The fishery was again interrupted between 1820 and 1828, also from 1833 to 1854, from 1864 to 1873, and again from 1892 to 1900. The fishery of 1903 was the first since 1891, and produced a revenue of Rs. 829,348, being the third largest on record. In 1797 and 1798 the government sold the privilege of fishing the oyster-beds for £123,982 and £142,780 respectively. From that time the fishery was conducted by the government itself until 1906, when it was leased to the Ceylon Pearl Fisheries Company for twenty years at a rent of £20,000 a year. Professor Herdman, F.R.S., was appointed to inquire and report on the conservation and cultivation of the Ceylon pearl-oyster, and visited Ceylon in January 1902. In consequence of his report, a marine laboratory for the culture of the pearl oysters was established in Galle harbour under the care of Mr Hornell.

Mineral Industries.—Commercially there are two established mineral industries:—(1) that of digging for precious stones; and (2) the much more important industry of digging for plumbago or graphite, the one mineral of commercial importance found. Further developments may result in the shipment of the exceptionally pure iron ore found in different parts of Ceylon, though still no coal has been found to be utilized with it. Several places, too—Ruanwella, Rangalla, Rangbodde, &c.—indicate where gold was found in the time of the Kandyan kings; and geologists might possibly indicate a paying quartz reef, as in Mysore. Owing to the greatly increased demand in Europe and America, plumbago in 1899 more than doubled in price, rising from £40 to £80, and even £100 a ton for the finest. Latterly there has been a considerable fall, but the permanent demand is likely to

continue keen in consequence mainly of the Ceylon kind being the best for making crucibles. The trade with Great Britain and the United States has slightly decreased, but there has been a rapid expansion in the exports to Belgium and Holland, Russia, Japan and Victoria; and the industry seems to be established on a sound basis. One consequence of its development has been to bring European and American capitalists and Cornish and Italian miners into a field hitherto almost entirely worked by Sinhalese. Though some of the mines were carried to a depth of 1000 ft., the work was generally very primitive in character, and Western methods of working are sure to lead to greater safety and economy. Besides a royalty or customs duty of 5 rupees (about 6s. 8d.) per ton on all plumbago exported, the government issue licenses at moderate rates for the digging of plumbago on crown lands, a certain share of the resulting mineral also going to government. The plumbago industry, in all its departments of mining, carting, preparing, packing and shipping, gives employment to fully 100,000 men and women, still almost entirely Sinhalese. The wealthiest mine-owners, too, are Sinhalese land-owners or merchants.

As regards *gems*, there are perhaps 500 gem pits or quarries worked in the island during the dry season from November to June in the Ratnapura, Rakwane and Matara districts. Some of these are on a small scale; but altogether several thousands of Sinhalese find a precarious existence in digging for gems. Rich finds of a valuable ruby, sapphire, cat's-eye, amethyst, alexandrite or star stone, are comparatively rare; it is only of the commoner gems, such as moonstone, garnet, spinels, that a steady supply is obtained. The cat's-eye in its finer qualities is peculiar to Ceylon, and is occasionally in great demand, according to the fashion. The obstacle to the investment of European capital in "gemming" has always been the difficulty of preventing the native labourers in the pits—-even if practically naked—from concealing and stealing gems. A Chamber of Mines, with a suitable library, was established in Colombo during 1899.

Manufactures.—Little is done save in the preparation in factories and stores, in Colombo or on the plantations, of the several products exported. The manufacture of jewellery and preparation of precious stones, and, among native women and children, of pillow lace, give employment to several thousands. Iron and engineering works are numerous in Colombo and in the planting districts. The Sinhalese are skilful cabinetmakers and carpenters. The Moormen and Tamils furnish good masons and builders.

Commerce.—There has been rapid development since 1882, and the returns for 1903 showed a total value of 22½ millions sterling. The principal imports were articles of food and drink (chiefly rice from India) manufactured metals (with specie), coal, cotton yarns and piece goods from Manchester, machinery and millwork and apparel. The Ceylon customs tariff for imports is one of 6½% *ad valorem*, save in the case of intoxicating drinks, arms, ammunition, opium, &c. The chief export is tea.

Roads.—The policy of the Sinhalese rulers of the interior was to exclude strangers from the hill country. Prior to the British occupation of the Kandyan territory in 1815, the only means of access from one district to another was by footpaths through the forests. The Portuguese do not appear to have attempted to open up the country below the hills, and the Dutch confined themselves to the improvement of the inland water-communications. The British government saw from the first the necessity of making roads into the interior for military purposes, and, more recently, for developing the resources of the country. The credit of opening up the country is due mainly to the governor, Sir Edward Barnes, by whose direction the great military road from Colombo to Kandy was made. Gradually all the military stations were connected by broad tracks, which by degrees were bridged and converted into good carriage roads. The governors Sir Henry Ward and Sir Hercules Robinson recognized the importance of giving the coffee planters every assistance in opening up the

country, and the result of their policy is that the whole of the hill country is now intersected by a vast number of splendid roads, made at a cost of upwards of £2000 per mile. In 1848 an ordinance was passed to levy from every adult male in the colony (except Buddhist priests and British soldiers) six days' labour on the roads, or an equivalent in money. The labour and money obtained by this wise measure have enabled the local authorities to connect the government highways by minor roads, which bring every village of importance into communication with the principal towns.

Railways.—After repeated vain attempts by successive governors to connect Colombo with the interior by railways, Sir Charles MacCarthy successfully set on foot a railway of 75 m. in length from Colombo to Kandy. The railway mileage had developed to 563 m. in 1908, including one of the finest mountain lines in the world—over 160 m. long, rising to 6200 ft. above sea-level, and falling at the terminus to 4000 ft. The towns of Kandy, Matale, Gampola, Nawalapitiya, Hatton and Haputale (and practically Nuwara Eliya) in the hills, are thus connected by rail, and in the low country the towns of Kurunegala, Galle, Matara, Kalutara, &c. Most of the debt on the railways (all government lines) is paid off, and the traffic receipts now make up nearly one-third of the general revenue. An Indo-Ceylon railway to connect the Indian and Ceylon systems has been the subject of separate reports and estimates by engineers serving the Ceylon and Indian governments, who have pronounced the work across the coral reef between Manaar and Rameswaram quite feasible. A commission sat in 1903 to consider the gauge of an Indo-Ceylon railway. Such a line promised to serve strategic as well as commercial purposes, and to make Colombo more than ever the port for southern India. The headquarters of the mail steamers have been removed from Galle to Colombo, where the colonial government have constructed a magnificent breakwater, and undertaken other harbour works which have greatly augmented both the external trade and the coasting trade of the island.

Government.—Ceylon is a crown colony, that is, a possession of the British crown acquired by conquest or cession, the affairs of which are administered by a governor, who receives his appointment from the crown, generally for a term of six years. He is assisted by an executive and a legislative council. The executive council acts as the cabinet of the governor, and consists of the attorney-general, the three principal officers of the colony (namely, the colonial secretary, the treasurer and the auditor-general), and the general in command of the forces. The legislative council includes, besides the governor as president and nine official members, eight unofficial members—one for the Kandyan Sinhalese (or Highlanders) and one for the "Moormen" having been added in 1890. The term of office for the unofficial members is limited to five years, though the governor may reappoint if he choose. The king's advocate, the deputy-advocate, and the surveyor-general are now respectively styled attorney-general, solicitor-general, and director of public works. The civil service has been reconstituted into five classes, not including the colonial secretary as a staff appointment, nor ten cadets; these five classes number seventy officers. The district judges can punish up to two years' imprisonment, and impose fines up to Rs.1000. The police magistrates can pass sentences up to six months' imprisonment, and impose fines of Rs.150. The criminal law has since 1890 been codified on the model of the Indian penal code; criminal and civil procedure have also been the subject of codification. There are twenty-three prisons in the island, mostly small; but convict establishments in and near the capital take all long-sentence prisoners.

Banks and Currency.—Ceylon has agencies of the National Bank of India, Bank of Madras, Mercantile Bank of India, Chartered Bank of India, Australia and China, and of the Hong-kong and Shanghai Bank, besides mercantile agencies of other banks, also a government savings bank at Colombo, and post-office savings banks all over the island. In 1884, on the failure of the Oriental Bank, the notes in currency were guaranteed by

government, and a government note currency was started in supersession of bank notes. The coin currency of Ceylon is in rupees and decimals of a rupee, the value of the standard following that fixed for the Indian rupee, about 1s. 4d. per rupee.

Finance.—With the disease of the coffee plant the general revenue fell from Rs.1,70,00,000 in 1877 to Rs.1,20,00,000 in 1882, when trade was in a very depressed state, and the general prosperity of the island was seriously affected. Since then, however, the revenue has steadily risen with the growing export of tea, cocoa-nut produce, plumbago, &c., and in 1902 it reached a total of 28 millions of rupees. (J. F. D.; C. L.)

History.—The island of Ceylon was known to the Greeks and Romans under the name of *Taprobane*, and in later times Serendib, Sirinduil and Zeylan have been employed to designate it by writers of the Western and Eastern worlds. Serendib is a corruption of the Sanskrit *Sinhaladvïpa*. Like most oriental countries, Ceylon possesses a great mass of ancient records, in which fact is so confused with fable that they are difficult to distinguish. The labours of George Turnour (1799-1843), however, helped to dissipate much of this obscurity, and his admirable edition (1836) of the *Mahavamsa* first made it possible to trace the main lines of Sinhalese history.

The Sinhalese inscriptional records, to which George Turnour first called attention, and which, through the activity of Sir William Gregory in 1874, began to be accurately transcribed and translated, extend from the 2nd century B.C. onwards. Among the oldest inscriptions discovered are those on the rock cells of the Vessagiri Vihara of Anuradhapura, cut in the old Brahma-lipi character. The inscriptions show how powerful was the Buddhist hierarchy which dominated the government and national life. The royal decrees of successive rulers are mainly concerned with the safeguarding of the rights of the hierarchy, but a few contain references to executive acts of the kings, as in a slab inscription of Kassapa V. (c. A.D.

929-939). In an edict ascribed to Mahinda IV. (c. A.D. 975-991) reference is made to the Sinhalese palladium, the famous tooth-relic of Buddha, now enshrined at Kandy, and the decree confirms tradition as to the identity of the fine stone temple, east of the Thuparama at Anuradhapura, with the shrine in which the tooth was first deposited when brought from Kalinga in the reign of Kirti Sri Meghavarna (A.D. 304-324).

The earliest inhabitants of Ceylon were probably the ancestors of the modern Veddahs, a small tribe of primitive hunters who inhabit the eastern jungles; and the discovery of palaeolithic stone implements buried in some of their caves points to the fact that they represent a race which has been in the island for untold ages. As to subsequent immigrations, the great Hindu epic, the *Ramayana*, tells the story of the conquest of part of the island by the hero Rama and his followers, who took the capital of its king Rawana. Whatever element of truth there may be in this fable, it certainly represents no permanent occupation. The authentic history of Ceylon, so far as it can be traced, begins with the landing in 543 B.C. of Vijaya, the founder of the Sinhalese dynasty, with a small band of Aryan-speaking followers from the mainland of India. Vijaya married the daughter of a native chief, with whose aid he proceeded to master the whole island, which he parcelled out among his followers, some of whom formed petty kingdoms. The Sinhalese introduced from the mainland a comparatively high type of civilization, notably agriculture. The earliest of the great irrigation tanks, near Anuradhapura, was opened about 504 B.C. by the successor of Vijaya; and about this time was established that system of village communities which still obtains over a large part of Ceylon.

The island was converted to Buddhism at the beginning of the 3rd century B.C. by the preaching of Mahinda, a son of the great Buddhist emperor Asoka; a conversion that was followed by an immense multiplication of *daghobas*, curious bell-shaped reliquaries of solid stone,

and of Buddhist monasteries. For the rest, the history of ancient Ceylon is largely a monotonous record of Malabar or Tamil invasions, conquests and usurpations. Of these latter the first was in 237 B.C. when two officers in the cavalry and fleet revolted, overthrew the Sinhalese ruler with the aid of his own Tamil mercenaries, and reigned jointly, as Sena I. and Guptika, until 215. The Sinhalese Asela then ruled till 205, when he was overthrown by a Tamil from Tanjore, Elala, who held the reins of power for 44 years. In 161 B.C. Elala was defeated and slain by Dutegemunu, still remembered as one of the great Sinhalese heroes of Ceylon. The ruins of the great monastery, known as the Brazen Palace, at Anuradhapura, remain a memorial of King Dutegemunu's splendour and religious zeal. He died in 137 B.C., and thenceforth the history of Ceylon is mainly that of further Tamil invasions, of the construction of irrigation tanks, and of the immense development of the Buddhist monastic system. A tragic episode in the royal family in the 5th century A.D. is, however, worthy of notice as connected with one of Ceylon's most interesting remains, the Sīgiri rock and tank (see SĪGIRI). In A.D. 477 King Datu Sen was murdered by his son, who mounted the throne as Kasyapa I., and when he was driven from the capital by the inhabitants, infuriated by his crime, built himself a stronghold on the inaccessible Sīgiri rock, whence he ruled the country until in 495 he was overthrown and slain by his brother Mugallana (495-513), who at the time of his father's murder had escaped to India.

Towards the close of the 10th century Ceylon was invaded by Rajaraja the Great, the Chola king, and after a series of protracted campaigns was annexed to his empire in 1005. The island, did not, however, remain long under Tamil domination. In 1071 Vijaya Bahu succeeded in re-establishing the Sinhalese dynasty, and for a while Ceylon was freed from foreign intervention. The most notable of the successors of Vijaya Bahu, and indeed of all the long line of Sinhalese rulers, was Parakrama Bahu I. (1155-1180), whose colossal statue still stands near Polonnaruwa. He not only took

advantage of the unaccustomed tranquillity of the country to restore the irrigation tanks and the monasteries, but he availed himself of a disputed succession to the Pandya throne of Madura to turn the tables on his Tamil enemies by invading India. According to the *Mahavamsa* his generals met with immediate and unbroken success; according to the more probable account preserved in a long Chola inscription at Arpakkam near Kanchi, they were, though at first successful, ultimately driven out by a coalition of the southern princes (V.A. Smith, *Early History of India*, ed. 1908, p. 411). In any case, within thirty years of Parakrama Bahu's death his work was undone; the Malabar invaders were once more able to effect a settlement in the island, and the Sinhalese capital was moved farther and farther south, till in 1410 it had become established at Kotta, now a suburb of Colombo. In 1408 a new misfortune had befallen the Sinhalese dynasty; in revenge for an insult offered to a Chinese envoy, a Chinese army invaded the island and carried away King Vijaya Bahu IV. into captivity. For thirty years from this date the Sinhalese kings of Ceylon were tributary to China.

When, in 1505, the Portuguese Francisco de Almeida landed in Ceylon, he found the island divided into seven kingdoms. Twelve years later the viceroy of Goa ordered the erection of a fort at Colombo, for which permission was obtained from the king of Kotta; and from this time until the advent of the Dutch in the 17th century the Portuguese endeavoured, amid perpetual wars with the native kings, who were assisted by Arab and other traders jealous of European rivalry, to establish their control over the island. They ultimately succeeded so far as the coast was concerned, though their dominion scarcely penetrated inland. Materially their gain was but small, for the trade of Ceylon was quite insignificant; but they had the spiritual satisfaction of prosecuting a vigorous propaganda of Catholicism, St Francis Xavier being the most notable of the missionaries who at this time laboured in the island.

The fanatical zeal and the masterful attitude of the Portuguese were a constant source of dissension with the native rulers, and when the Dutch, under Admiral Spilberg, landed on the east coast in 1602 and sought the alliance of the king of Kandy in the interior of the island, every inducement was held out to them to aid in expelling the Portuguese. Nothing seems to have come of this until 1638-1639, when a Dutch expedition attacked and razed the Portuguese forts on the east coast. In the following year they landed at Negombo, without however establishing themselves in any strong post. In 1644 Negombo was captured and fortified by the Dutch, while in 1656 they took Colombo, and in 1658 they drove the Portuguese from Jaffna, their last stronghold in Ceylon.

Pursuing a wiser policy than their predecessors, the Dutch lost no opportunity of improving that portion of the country which owned their supremacy, and of opening a trade with the interior. More tolerant and less disposed to stand upon their dignity than the Portuguese, they subordinated political to commercial ends, flattered the native rulers by a show of deference, and so far succeeded in their object as to render their trade between the island and Holland a source of great profit. Many new branches of industry were developed. Public works were undertaken on a large scale, and education, if not universally placed within the reach of the inhabitants of the maritime provinces, was at least well cared for on a broad plan of government supervision. That which they had so much improved by policy, they were, however, unable to defend by force when the British turned their arms against them. A century and a half had wrought great changes in the physical and mental status of the Dutch colonists. The territory which in 1658 they had slowly gained by undaunted and obstinate bravery, they as rapidly lost in 1796 by imbecility and cowardice.

The first intercourse of the English with Ceylon was as far back as 1763, when an embassy was despatched from Madras to the king of Kandy,

without, however, leading to any result. On the rupture between Great Britain and Holland in 1795, a force was sent against the Dutch possessions in Ceylon, where the opposition offered was so slight that by the following year the whole of their forts were in the hands of the English commander.

The abiding results of the occupation of Ceylon by the Portuguese and Dutch is described by Sir Emerson Tennent (*Ceylon*) as follows:

"The dominion of the Netherlands in Ceylon was nearly equal in duration with that of Portugal, about 140 years; but the policies of the two countries have left a very different impress on the character and institutions of the people amongst whom they lived. The most important bequest left by the utilitarian genius of Holland is the code of Roman Dutch law, which still prevails in the supreme courts of justice, whilst the fanatical propagandism of the Portuguese has reared for itself a monument in the abiding and expanding influence of the Roman Catholic faith. This flourishes in every hamlet and province where it was implanted by the Franciscans, whilst the doctrines of the reformed church of Holland, never preached beyond the walls of the fortresses, are already almost forgotten throughout the island, with the exception of an expiring community at Colombo. Already the language of the Dutch, which they sought to extend by penal enactments, has ceased to be spoken even by their direct descendants, whilst a corrupted Portuguese is to the present day the vernacular of the lower classes in every town of importance. As the practical and sordid government of the Netherlands only recognized the interest of the native population in so far as they were essential to uphold their trading monopolies, their memory was recalled by no agreeable associations: whilst the Portuguese, who, in spite of their cruelties, were identified with the people by the bond of a common faith, excited a feeling of admiration by the boldness of their conflicts with the Kandyans, and the chivalrous though ineffectual defence of their beleaguered fortresses. The Dutch and their proceedings have

almost ceased to be remembered by the lowland Sinhalese; but the chiefs of the south and west perpetuate with pride the honorific title Don, accorded to them by their first European conquerors, and still prefix to their ancient patronymics the sonorous Christian names of the Portuguese."

The British forces by which the island had been conquered were those of the East India Company, and Ceylon was therefore at first placed under its jurisdiction and administered from Madras. The introduction of the Madras revenue system, however, together with a host of Malabar collectors, led to much discontent, which culminated in rebellion; and in 1798 the colony was placed directly under the crown. By the treaty of Amiens, in 1803, this situation was regularized, from the international point of view, by the formal cession to Great Britain of the former Dutch possessions in the island. For a while the British dominion was confined to the coast. The central tract of hilly country, hedged in by impenetrable forests and precipitous mountain ranges, remained in possession of Sri Vikrama Raja Sinha, the last of the Sinhalese dynasty, who showed no signs of encouraging communication with his European neighbours.

Minor differences led in 1803 to an invasion of the Kandyan territory; but sickness, desertion and fatigue proved more formidable adversaries to the British forces than the troops of the Sinhalese monarch, and peace was eventually concluded upon terms by no means favourable to the English. The cruelty and oppression of the king now became so intolerable to his subjects that disaffection spread rapidly amongst them. Punishments of the most horrible kinds were inflicted, but failed to repress the popular indignation; and in 1815 the British, at the urgent request of many of the Adigars and other native chiefs, proceeded against the tyrant, who was captured near Kandy, and subsequently ended his days in exile. With him ended a long line of sovereigns, whose pedigree may be traced through upwards of two thousand years.

By a convention entered into with the Kandyan chiefs on the 2nd of March 1815, the entire sovereignty of the island passed into the hands of the British, who in return guaranteed to the inhabitants civil and religious liberty. The religion of Buddha was declared inviolable, and its rights, ministers and places of worship were to be maintained and protected; the laws of the country were to be preserved and administered according to established forms; and the royal dues and revenues were to be levied as before for the support of government.

With the exception of a serious outbreak in some parts of the interior in 1817, which lasted for upwards of a year, and of two minor attempts at rebellion easily put down, in 1843 and 1848, the political atmosphere of Ceylon has remained undisturbed since the deportation of the last king of Kandy.

AUTHORITIES.—Major Thomas Skinner, *Fifty Years in Ceylon*, edited by his son, A. Skinner (London, 1891); Constance F. Gordon Gumming, *Two Happy Years in Ceylon* (2 vols., Edinburgh, 1892); H.W. Cave, *The Ruined Cities of Ceylon* (London, 1897), and *The Book of Ceylon* (London, 1908); Sir Emerson Tennent, *Ceylon* (2 vols. 4th ed., 1860); J. Ferguson, *Ceylon in 1903* (Colombo); J.C. Willis, *Ceylon* (Colombo, 1907). See also E. Müller, *Ancient Inscriptions in Ceylon*, published for the government (1883-1884), and the important archaeological survey in *Epigraphia Zeylonica*, part i., 1904, ii., 1907, iii., 1907, by Don Martino de Silva Wickremasinghe, who in 1899 was appointed epigraphist to the Ceylon government. Among other works on special subjects may be mentioned H. Trimen, F.R.S., director of Ceylon Botanic Gardens, *Ceylon Flora*, in 5 vols., completed by Sir Joseph Hooker; Captain V. Legge, F.Z.S., *History of the Birds of Ceylon* (London, 1870); Dr Copleston, bishop of Colombo, *Buddhism, Primitive and Present, in Magadha and in Ceylon* (London, 1892); review by Sir West Ridgeway,

Administration of Ceylon, 1896-1903; Professor W.A. Herdman, *Report on the Pearl Oyster Fisheries, 1903-1904*.

CHABAZITE, a mineral species belonging to the group of zeolites. It occurs as white to flesh-red crystals which vary from transparent to translucent and have a vitreous lustre. The crystals are rhombohedral, and the predominating form is often a rhombohedron (*r*) with interfacial angles of 85° 14′; they therefore closely resemble cubes in appearance, and the mineral was in fact early (in 1772) described as a cubic zeolite. A characteristic feature is the twinning, the crystals being frequently interpenetration twins with the principal axis as twin-axis (figs, 1, 2). The appearance shown in fig. 1, with the corners of small crystals in twinned position projecting from the faces *r* of the main crystal, is especially characteristic of chabazite. Such groups resemble the interpenetrating twinned cubes of fluorspar, but the two minerals are readily distinguished by their cleavage, fluorspar having a perfect octahedral cleavage truncating the corners of the cube, whilst in chabazite there are less distinct cleavages parallel to the rhombohedral (cube-like) faces. Another type of twinned crystal is represented in fig. 2, in which the predominating form is an obtuse hexagonal pyramid (*t*); the faces of these flatter crystals are often rounded, giving rise to lenticular shapes, hence the name phacolite (from φακός, a lentil) for this variety of chabazite.

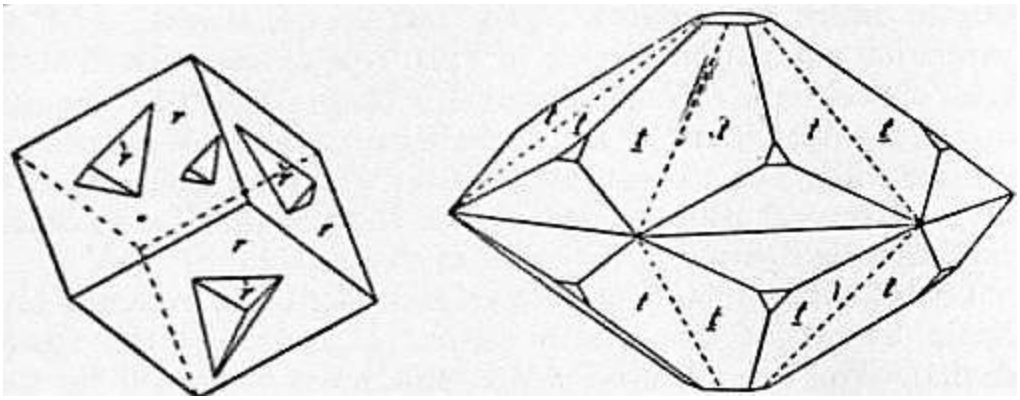


FIG. 1. FIG. 2.

Twinned Crystals of Chabazite.

The hardness of chabazite is 4½, and the specific gravity 2.08-2.16. As first noticed by Sir David Brewster in 1830, the crystals often exhibit anomalous optical characters: instead of being uniaxial, a basal section may be divided into sharply-defined biaxial sectors. Heating of the crystals is attended by a loss of water and a change in their optical characters; it is probable therefore that the anomalous optical characters are dependent on the amount of water present.

Besides phacolite, mentioned above, other varieties of chabazite are distinguished. Herschelite and seebachite are essentially the same as phacolite. Haydenite is the name given to small yellowish crystals, twinned on a rhombohedron plane *r*, from Jones's Falls near Baltimore in Maryland. Acadialite is a reddish chabazite from Nova Scotia (the old French name of which is Acadie).

Chemically, chabazite is a complex hydrated calcium and sodium silicate, with a small proportion of the sodium replaced by potassium, and sometimes a small amount of the calcium replaced by barium and strontium. The composition is however variable, and is best expressed as an isomorphous mixture of the molecules $(Ca, Na_2)\ Al_2(SiO_4)_2 + 4H_2O$ and

(Ca, Na_2) $Al_2(Si_3O_8)_2 + 8H_2O$, which are analogous to the felspars. Most analyses correspond with a formula midway between these extremes, namely, (Ca, Na_2)$Al_2(SiO_3)_4 + 6H_2O$.

Chabazite occurs with other zeolites in the amygdaloidal cavities of basaltic rocks; occasionally it has been found in gneisses and schists. Well-formed crystals are known from many localities; for example, Kilmalcolm in Renfrewshire, the Giant's Causeway in Co. Antrim, and Oberstein in Germany. Beautiful, clear glassy crystals of the phacolite ("seebachite") variety occur with phillipsite and radiating bundles of brown calcite in cavities in compact basalt near Richmond, Melbourne, Victoria. Small crystals have been observed lining the cavities of fossil shells from Iceland, and in the recent deposits of the hot springs of Plombières and Bourbonne-les-Bains in France.

Gmelinite and levynite are other species of zeolites which may be mentioned here, since they are closely related to chabazite, and like it are rhombohedral and frequently twinned. Gmelinite forms large flesh-red crystals usually of hexagonal habit, and was early known as soda-chabazite, it having the composition of chabazite but with sodium predominating over calcium (Na_2, Ca)$Al_2(SiO_3)_46H_2O$. The formula of levynite is $CaAl_2Si_3O_{10} + 5H_2O$.

(L. J. S.)

CHABLIS, a town of north-central France, in the department of Yonne, on the left bank of the Serein, 14 m. E. by N. of Auxerre by road. Pop.

(1906) 2227. Its church of St Martin belongs to the end of the 12th century. The town gives its name to a well-known white wine produced in the neighbouring vineyards, of which the most esteemed are Clos, Bouguerots, Moutonne, Grenouille, Montmaires, Lys and Vaux-Désirs. There are manufactures of biscuits.

CHABOT, FRANÇOIS (1757-1794), French revolutionist, had been a Franciscan friar before the Revolution, and after the civil constitution of the clergy continued to act as "constitutional" priest, becoming grand vicar of Henri Grégoire, bishop of Blois. Then he was elected to the Legislative Assembly, sitting at the extreme left, and forming with C. Bazire and Merlin de Thionville the "Cordelier trio." Re-elected to the Convention he voted for the death of Louis XVI., and opposed the proposal to prosecute the authors of the massacre of September, "because among them there are heroes of Jemmapes." Some of his sayings are well known, such as that Christ was the first "*sans-culotte*." Compromised in the falsification of a decree suppressing the India Company and in a plot to bribe certain members of the Convention, especially Fabre d'Eglantine and C. Bazire, he was arrested, brought before the Revolutionary Tribunal, and was condemned and executed at the same time as the Dantonists, who protested against being associated with such a "*fripon*."

CHABOT, GEORGES ANTOINE, known as CHABOT DE L'ALLIER (1758-1819), French jurist and statesman, was president of the tribunal of Montluçon when he was elected as a deputy *suppléant* to the National Convention. A member of the council of the Ancients, then of the Tribunate, he was president of the latter when the peace of Amiens was signed. He had a resolution adopted, tending to give Napoleon Bonaparte the consulship for life; and in 1804 supported the proposal to establish a hereditary monarchy. Napoleon named him inspector-general of the law schools, then judge of the court of cassation. He published various legal works, *e.g. Tableau de la législation ancienne sur les successions et de la législation nouvelle établie par le code civil* (Paris, 1804), and *Questions fransitoires sur le code Napoléon* (Paris, 1809).

CHABOT, PHILIPPE DE, SEIGNEUR DE BRION, COUNT OF CHARNY AND BUZANÇAIS (c. 1492-1543), admiral of France. The Chabot family was one of the oldest and most powerful in Poitou. Philippe was a cadet of the Jarnac branch. He was a companion of Francis I. as a child, and on that king's accession was loaded with honours and estates. After the battle of Pavia he was made admiral of France and governor of Burgundy (1526), and shared with Anne de Montmorency the direction of affairs. He was at the height of his power in 1535, and commanded the army for the invasion of the states of the duke of Savoy; but in the campaigns of 1536 and 1537 he was eclipsed by Montmorency, and from that moment his influence began to wane. He was accused by his enemies of peculation, and condemned on the 10th of February 1541 to a fine of 1,500,000 livres, to

banishment, and to the confiscation of his estates. Through the good offices of Madam d'Étampes, however, he obtained the king's pardon almost immediately (March 1541), was reinstated in his posts, and regained his estates and even his influence, while Montmorency in his turn was disgraced. But his health was affected by these troubles, and he died soon afterwards on the 1st of June 1543. His tomb in the Louvre, by an unknown sculptor, is a fine example of French Renaissance work. It was his nephew, Guy Chabot, seigneur de Jarnac, who fought the famous duel with François de Vivonne, seigneur de la Châtaigneraie, in 1547, at the beginning of the reign of Henry II.

The main authorities for Chabot's life are his MS. correspondence in the Bibliothèque Nationale, Paris, and contemporary memoirs. See also E de Barthélemy, "Chabot de Brion," in the *Revue des questions historiques* (vol. xx. 1876); Martineau, "L'Amiral Chabot," in the *Positions des thèses de l'École des Chartes* (1883).

CHABRIAS (4th century B.C.), a celebrated Athenian general. In 388 B.C. he defeated the Spartans at Aegina and commanded the fleet sent to assist Evagoras, king of Cyprus, against the Persians. In 378, when Athens entered into an alliance with, Thebes against Sparta, he defeated Agesilaus near Thebes. On this occasion he invented a manoeuvre, which consisted in receiving a charge on the left knee, with shields resting on the ground and spears pointed against the enemy. In 376 he gained a decisive victory over the Spartan fleet off Naxos, but, when he might have destroyed the Spartan fleet, remembering the fate of the generals at Arginusae, he delayed to pick

up the bodies of his dead. Later, when the Athenians changed sides and joined the Spartans, he repulsed Epaminondas before the walls of Corinth. In 366, together with Callistratus, he was accused of treachery in advising the surrender of Oropus to the Thebans. He was acquitted, and soon after he accepted a command under Tachos, king of Egypt, who had revolted against Persia. But on the outbreak of the Social War (357) he joined Chares in the command of the Athenian fleet. He lost his life in an attack on the island of Chios.

See Cornelius Nepos, *Chabrias*; Xenophon, *Hellenica*, v. 1-4; Diod. Sic. xv. 29-34; and C. Rehdantz, *Vitae Iphicratis, Chabriae, et Timothei* (1845); art. DELIAN LEAGUE, section B, and authorities there quoted.

CHABRIER, ALEXIS EMMANUEL (1841-1894), French composer, was born at Ambert, Puy de Dôme, on the 18th of January 1841. At first he only cultivated music as an amateur, and it was not until 1879 that he threw up an administration appointment in order to devote himself entirely to the art. He had two years previously written an *opéra bouffe* entitled *L'Étoile*, which was performed at the Bouffes Parisiens. In 1881 he was appointed chorus-master of the concerts then recently established by Lamoureux. In 1883 he composed the brilliant orchestral rhapsody entitled *España*, the themes of which he had jotted down when travelling in Spain. His opera *Gwendoline* was brought out with considerable success at Brussels on the 10th of April 1886, and was given later at the Paris Grand Opéra. The following year 1887, *Le Roi malgré lui*, an opera of a lighter description, was produced in Paris at the Opéra Comique, its run being interrupted by

the terrible fire by which this theatre was destroyed. His last opera, *Briseis*, was left unfinished, and performed in a fragmentary condition at the Paris Opéra, after the composer's death in Paris on the 13th of September 1894. Chabrier was also the author of a set of piano pieces entitled *Pièces pittoresques, Valses romantiques*, for two pianos, a fantasia for horn and piano, &c. His great admiration for Wagner asserted itself in *Gwendoline*, a work which, in spite of inequalities due to want of experience, is animated by a high artistic ideal, is poetically conceived, and shows considerable harmonic originality, besides a thorough mastery over the treatment of the orchestra. The characteristics of *Le Roi malgré lui* have been well summed up by M. Joncières when he alludes to "cette verve inépuisable, ces rythmes endiablés, cette exubérance de gaieté et de vigueur, à laquelle venait se joindre la note mélancolique et émue." Chabrier's premature death prevented him from giving the full measure of his worth.

CHACMA, the Hottentot name of the Cape baboon, *Papio porcarius*, a species inhabiting the mountains of South Africa as far north as the Zambezi. Of the approximate size of an English mastiff, this powerful baboon is blackish grey in colour with a tinge of green due to the yellow rings on most of the hairs. Unlike most of its tribe, it is a good climber; and where wooded cliffs are not available, will take up its quarters in tall trees. Chacmas frequently strip orchards and fruit-gardens, break and devour ostrich eggs, and kill lambs and kids for the sake of the milk in their stomachs.

CHACO, a territory of northern Argentina, part of a large district known as the Gran Chaco, bounded N. by the territory of Formosa, E. by Paraguay and Corrientes, S. by Santa Fé, and W. by Santiago del Estero and Salta. The Bermejo river forms its northern boundary, and the Paraguay and Paraná rivers its eastern; these rivers are its only means of communication. Pop. (1895) 10,422; (1904, est.) 13,937; area, 52,741 sq. m. The northern part consists of a vast plain filled with numberless lagoons; the southern part is slightly higher and is covered with dense forests, occasionally broken by open grassy spaces. Its forests contain many species of trees of great economic value; among them is the *quebracho*, which is exported for the tannin which it contains. The capital, Resistencia, with an estimated population of 3500 in 1904, is situated on the Paraná river opposite the city of Corrientes. There is railway communication between Santa Fé and La Sabana, an insignificant timber-cutting village on the southern frontier. In the territory there are still several tribes of uncivilized Indians, who occasionally raid the neighbouring settlements of Santa Fé.

CHACONNE (Span. *chacona*), a slow dance, introduced into Spain by the Moors, now obsolete. It resembles the Passacaglia. The word is used also of the music composed for this dance—a slow stately movement in ¾ time. Such a movement was often introduced into a sonata, and formed the conventional finale to an opera or ballet until the time of Gluck.

CHAD [CEADDA], **SAINT** (d. 672), brother of Cedd, whom he succeeded as abbot at Lastingham, was consecrated bishop of the Northumbrians by Wine, the West Saxon bishop, at the request of Oswio in 664. On the return of Wilfrid from France, where he had been sent to be consecrated to the same see, a dispute of course arose, which was settled by Theodore in favour of Wilfrid after three years had passed. Chad thereupon retired to Lastingham, whence with the permission of Oswio he was summoned by Wulfhere of Mercia to succeed his bishop Jaruman, who died 667. Chad built a monastery at Barrow in Lincolnshire and fixed his see at Lichfield. He died after he had held his bishopric in Mercia two and a half years, and was succeeded by Wynfrith. Bede gives a beautiful character of Chad.

See Bede's *Hist. Eccl.* edited by C. Plummer, iii. 23, 24, 28; iv. 2, 3 (Oxford, 1896); Eddius, *Vita Wilfridi*, xiv., xv. edited by J. Raine, Rolls Series (London, 1879).

CHAD, a lake of northern Central Africa lying between 12° 50′ and 14° 10′ N. and 13° and 15° E. The lake is situated about 850 ft. above the sea in the borderland between the fertile and wooded regions of the Sudan on the south and the arid steppes which merge into the Sahara on the north. The area of the lake is shrinking owing to the progressive desiccation of the country, Saharan climate and conditions replacing those of the Sudan. The drying-up process has been comparatively rapid since the middle of the 19th century, a town which in 1850 was on the southern margin of the lake being in 1905 over 20 m. from it. On the west the shore is perfectly flat, so that a slight rise in the water causes the inundation of a considerable area—

a fact not without its influence on the estimates made at varying periods as to the size of the lake. Around the north-west and north shores is a continuous chain of gently sloping sand-hills covered with bush. This region abounds in big game and birds are plentiful. In the east, the country of Kanem, the desiccation has been most marked. Along this coast is a continuous chain of islands running from north-west to south-east. But what were islands when viewed by Overweg in 1851, formed in 1903 part of the mainland and new islands had arisen in the lake. They are generally low, being composed of sand and clay, and lie from 5 to 20 m. from the shore, which throughout its eastern side nowhere faces open water. The channels between the islands do not exceed 2 m. in width. Two principal groups are distinguished, the Kuri archipelago in the south, and the Buduma in the north. The inhabitants of the last-named islands were noted pirates until reduced to order by the French. The coast-line is, in general, undefined and marshy, and broken into numerous bays and peninsulas. It is also, especially on the east, lined by lagoons which communicate with the lake by intricate channels. The lake is nowhere of great depth, and about midway numerous mud-banks, marshes, islands and dense growths of aqueous plants stretch across its surface. Another stretch of marsh usually cuts off the northernmost part of the lake from the central sections. The open water varies in depth from 3 ft. in the north-west to over 20 in the south, where desiccation is less apparent. Fed by the Shari (*q.v.*) and other rivers, the lake has no outlet and its area varies according to the season. The flood water brought down by the Shari in December and January causes the lake to rise to a maximum of 24 ft., the water spreading over low-lying ground, left dry again in May or June. But after several seasons of heavy rainfall the waters have remained for years beyond their low-water level. Nevertheless the secular shrinking goes on, the loss by evaporation and percolation exceeding the amount of water received; whilst, on the average, the rainfall is diminishing. In 1870 the lake rose to an exceptional height, but since

then, save in 1897, there has been only the normal seasonal rise. The prevalent north-east wind causes at times a heavy swell on the lake. Fish abound in its waters, which are sweet, save at low-level, when they become brackish. The lagoons are believed to act as purifying pans in which the greater part of the salt in the water is precipitated. In the south-west end of the lake the water is yellow, caused by banks of clay; elsewhere it is clear.

The southern basin of Chad is described under the Shari, which empties its waters into the lake about the middle of the southern shore, forming a delta of considerable extent. Beyond the south-east corner of the lake is a

depression known as the Bahr-el-Ghazal (not to be confounded with the Nile affluent of the same name). This depression is the termination of what is in all probability the bed of one of the dried-up Saharan rivers. Coming from the Tibesti highlands the Bahr-el-Ghazal has a south-westerly trend to Lake Chad. Near the lake the valley was formerly swampy, and at high-water the lake overflowed into it. There was also at one time communication between the Shari and the Bahr-el-Ghazal, so that the water of the first-named stream reached Chad by way of the Bahr-el-Ghazal. There is now neither inlet nor outlet to the lake in this direction, the mouth of the Ghazal having become a fertile millet field. There is still, however, a distinct current from the Shari delta to the east end of the lake—known to the natives, like the depression beyond, as the Bahr-el-Ghazal—indicative of the former overflow outlet.

Besides the Shari, the only important stream entering Lake Chad is the Waube or Yo (otherwise the Komadugu Yobe), which rises near Kano, and flowing eastward enters the lake on its western side 40 m. north of Kuka. In the rains the Waube carries down a considerable body of water to the lake.

Lake Chad is supposed to have been known by report to Ptolemy, and is identified by some writers with the Kura lake of the middle ages. It was first seen by white men in 1823 when it was reached by way of Tripoli by the British expedition under Dr Walter Oudney, R.N., the other members being Captain Hugh Clapperton and Major (afterwards Lieut.-Colonel) Dixon Denham. By them the lake was named Waterloo. In 1850 James Richardson, accompanied by Heinrich Barth and Adolf Overweg, reached the lake, also via Tripoli, and Overweg was the first European to navigate its waters (1851). The lake was visited by Eduard Vogel (1855) and by Gustav Nachtigal (1870), the last-named investigating its hydrography in some detail. In 1890-1893 its shores were divided by treaty between Great Britain, France and Germany. The first of these nations to make good its

footing in the region was France. A small steamer, brought from the Congo by Emile Gentil, was in 1897 launched on the Shari, and reaching the Chad, navigated the southern part of the lake. Communication between Algeria and Lake Chad by way of the Sahara was opened, after repeated failures, by the French explorer F. Foureau in 1899-1900. At the same time a French officer, Lieut. Joalland, reached the lake from the middle Niger, continuing his journey round the north end to Kanem. A British force under Colonel T.L.N. Morland visited the lake at the beginning of 1902, and in May of the same year the Germans first reached it from Cameroon. In 1902-1903 French officers under Colonel Destenave made detailed surveys of the south-eastern and eastern shores and the adjacent islands. In 1903 Captain E. Lenfant, also a French officer, succeeded in reaching the lake (which he circumnavigated) via the Benue, proving the existence of water communication between the Shari and the Niger. In 1905 Lieut. Boyd Alexander, a British officer, further explored the lake, which then contained few stretches of open water. The lake is bordered W. and S.W. by Bornu, which is partly in the British protectorate of Nigeria and partly in the German protectorate of Cameroon. Bagirmi to the S.E. of the lake and Kanem to the N.E. are both French possessions. The north and north-west shores also belong to France. One of the ancient trade routes across the Sahara—that from Tripoli to Kuka in Bornu—strikes the lake at its north-west corner, but this has lost much of its former importance.

See the works of Denham, Clapperton, Barth and Nachtigal cited in the biographical notices; *Geog. Journal*, vol. xxiv. (1904); Capt. Tilho in *La Géographie* (March 1906); Boyd Alexander, *From the Niger to the Nile*, vol. i. (London, 1907); A. Chevalier, *Mission Chari-Lac Tchad 1902-1904* (Paris 1908); E. Lenfant, *La Grande Route du Tchad* (Paris, 1905); H. Freydenberg, *Étude sur le Tchad et le bassin du Chari* (Paris, 1908).

CHADDERTON, an urban district of Lancashire, England, within the parliamentary borough of Oldham (*q.v.*). Pop. (1901) 24,892. Cotton and chemical works, and the coal-mines of the neighbourhood, employ the large industrial population.

CHADERTON, LAURENCE (?1536-1640), Puritan divine, was born at Lees Hall, in the parish of Oldham, Lancashire, probably in September 1536, being the second son of Edmund Chaderton, a gentleman of an ancient and wealthy family, and a zealous Catholic. Under the tuition of Laurence Vaux, a priest, he became an able scholar. In 1564 he entered Christ's College, Cambridge, where, after a short time, he formally adopted the reformed doctrines and was in consequence disinherited by his father. In 1567 he was elected a fellow of his college, and subsequently was chosen lecturer of St Clement's church, Cambridge, where he preached to admiring audiences for many years. He was a man of moderate views, though numbering among his friends extremists like Cartwright and Perkins. So great was his reputation that when Sir Walter Mildmay founded Emmanuel College in 1584 he chose Chaderton for the first master, and on his expressing some reluctance, declared that if he would not accept the office the foundation should not go on. In 1604 Chaderton was appointed one of the four divines for managing the cause of the Puritans at the Hampton Court conference; and he was also one of the translators of the Bible. In 1578 he had taken the degree of B.D., and in 1613 he was created D.D. At this period he made provision for twelve fellows and above forty scholars in Emmanuel College. Fearing that he might have a successor who held

Arminian doctrines, he resigned the mastership in favour of John Preston, but survived him, and lived also to see the college presided over successively by William Sancroft (or Sandcroft) and Richard Holdsworth. He died on the 13th of November 1640 at the age of about 103, preserving his bodily and mental faculties to the end.

Chaderton published a sermon preached at St Paul's Cross about 1580, and a treatise of his *On Justification* was printed by Anthony Thysius, professor of divinity at Leiden. Some other works by him on theological subjects remain in manuscript.

CHADWICK, SIR EDWIN (1800-1890), English sanitary reformer, was born at Longsight, near Manchester, on the 24th of January 1800. Called to the bar without any independent means, he sought to support himself by literary work, and his essays in the *Westminster Review* (mainly on different methods of applying scientific knowledge to the business of government) introduced him to the notice of Jeremy Bentham, who engaged him as a literary assistant and left him a handsome legacy. In 1832 he was employed by the royal commission appointed to inquire into the operation of the poor laws, and in 1833 he was made a full member of that body. In conjunction with Nassau W. Senior he drafted the celebrated report of 1834 which procured the reform of the old poor law. His special contribution was the institution of the union as the area of administration. He favoured, however, a much more centralized system of administration than was adopted, and he never ceased to complain that the reform of 1834 was fatally marred by the rejection of his views, which contemplated the

management of poor-law relief by salaried officers controlled from a central board, the boards of guardians acting merely as inspectors. In 1834 he was appointed secretary to the poor law commissioners. Finding himself unable to administer in accordance with his own views an act of which he was largely the author, his relations with his official chiefs became much strained, and the disagreement led, among other causes, to the dissolution of the poor law commission in 1846. Chadwick's chief contribution to political controversy was his constant advocacy of entrusting certain departments of local affairs to trained and selected experts, instead of to representatives elected on the principle of local self-government. While still officially connected with the poor law he had taken up the question of sanitation in conjunction with Dr Southwood Smith, and their joint labours produced a most salutary improvement in the public health. His report on "The Sanitary Condition of the Labouring Population" (1842) is a valuable historical document. He was a commissioner of the Board of Health from its establishment in 1848 to its abolition in 1854, when he retired upon a pension, and occupied the remainder of his life in voluntary contributions to sanitary and economical questions. He died at East Sheen, Surrey, on the 6th of July 1890. He had been made K.C.B. in 1889.

See a volume on *The Evils of Disunity in Central and Local Administration ... and the New Centralization for the People*, by Edwin Chadwick (1885); also *The Health of Nations, a Review of the Works of Edwin Chadwick, with a Biographical Introduction*, by Sir B.W. Richardson (1887).

CHAEREMON, Athenian dramatist of the first half of the 4th century B.C. He is generally considered a tragic poet. Aristotle (*Rhetoric*, iii. 12) says his works were intended for reading, not for representation. According to Suidas, he was also a comic poet, and the title of at least one of his plays (*Achilles Slayer of Thersites*) seems to indicate that it was a satyric drama. His *Centaurus* is described by Aristotle (*Poet.* i. 12) as a rhapsody in all kinds of metres. The fragments of Chaeremon are distinguished by correctness of form and facility of rhythm, but marred by a florid and affected style reminiscent of Agathon. He especially excelled in descriptions (irrelevantly introduced) dealing with such subjects as flowers and female beauty. It is not agreed whether he is the author of three epigrams in the Greek Anthology (Palatine vii. 469, 720, 721) which bear his name.

See H. Bartsch, *De Chaeremone Poëta tragico* (1843); fragments in A. Nauck, *Fragmenta Tragicorum Graecorum*.

CHAEREMON, of Alexandria (1st century A.D.), Stoic philosopher and grammarian. He was superintendent of the portion of the Alexandrian library that was kept in the temple of Serapis, and as custodian and expounder of the sacred books (ἱερογραμματεύς sacred scribe) belonged to the higher ranks of the priesthood. In A.D. 49 he was summoned to Rome, with Alexander of Aegae, to become tutor to the youthful Nero. He was the author of a *History of Egypt*; of works on *Comets, Egyptian Astrology*, and *Hieroglyphics*; and of a grammatical treatise on *Expletive Conjunctions* (συνδεσμοὶ παραπληρωματικοί). Chaeremon was the chief of the party

which explained the Egyptian religious system as a mere allegory of the worship of nature. His books were not intended to represent the ideas of his Egyptian contemporaries; their chief object was to give a description of the sanctity and symbolical secrets of ancient Egypt. He can hardly be identical with the Chaeremon who accompanied (c. 26 B.C.; Strabo xvii. p. 806) Aelius Gallus, praefect of Egypt, on a journey into the interior of the country.

Fragments in C. Müller, *Fragmenta Historicorum Graecorum*, iii. 495-499.

CHAERONEIA, or CHAERONEA, an ancient town of Boeotia, said by some to be the Homeric Arne, situated about 7 m. W. of Orchomenus. Until the 4th century B.C. it was a dependency of Orchomenus, and at all times it played but a subordinate part in Boeotian politics. Its importance lay in its strategic position near the head of the defile which presents the last serious obstacle to an invader in central Greece. Two great battles were fought on this site in antiquity. In 338 B.C. Philip II. and Alexander of Macedon were confronted by a confederate host from central Greece and Peloponnese under the leadership of Thebes and Athens, which here made the last stand on behalf of Greek liberty. A hard-fought conflict, in which the Greek infantry displayed admirable firmness, was decided in favour of Philip through the superior organization of his army. In 86 B.C. the Roman general L. Cornelius Sulla defeated the army of Mithradates VI., king of Pontus, near Chaeroneia. The latter's enormous numerical superiority was neutralized by Sulla's judicious choice of ground and the steadiness of his

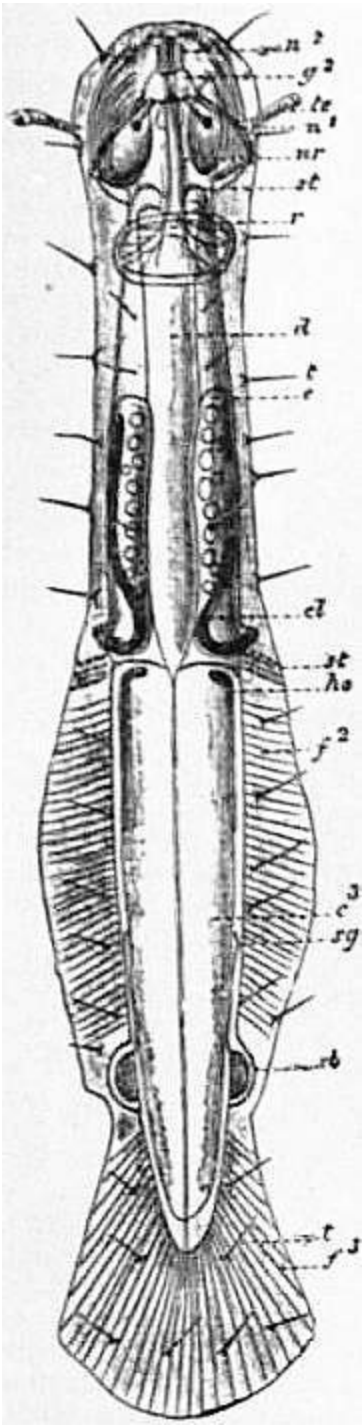
legionaries; the Asiatics after the failure of their attack were worn down and almost annihilated. Chaeroneia is also notable as the birthplace of Plutarch, who returned to his native town in old age, and was held in honour by its citizens for many successive generations. Pausanias (ix. 40) mentions the divine honours accorded at Chaeroneia to the sceptre of Agamemnon, the work of Hephaestus (cf. *Iliad*, ii. 101). The site of the town is partly occupied by the village of Kapraena; the ancient citadel was known as the Petrachus, and there is a theatre cut in the rock. A colossal seated lion a little to the S.E. of the site marks the grave of the Boeotians who fell fighting against Philip; this lion was found broken to pieces; the tradition that it was blown up by Odysseus Androutsos is incorrect (see Murray, *Handbook for Greece*, ed. 5, 1884, p. 409). It has now been restored and re-erected (1905).

AUTHORITIES.—Thucydides iv. 76; Diodorus xvi. 85-86; Plutarch, *Alexander*, ch. 9; *Sulla*, chs. 16-19; Appian, *Mithradatica*, chs. 42-45; W.M. Leake, *Travels in Northern Greece* (London, 1835), ii. 112-117, 192-201; B.V. Head, *Historia Numorum* (Oxford, 1887), p. 292; J. Kromayer, *Antike Schlachtfelder in Griechenland* (Berlin, 1903), pp. 127-195; G. Sotiriades in *Athen. Mitteil.* 1903, pp. 301 ff.; 1905, p. 120; 1906, p. 396; Ἐφημ. Ἀρχαιολ., 1908, p. 65.

CHAETOGNATHA, the name given by R. Leuckhart to a small group of transparent and for the most part pelagic organisms, whose position in the animal kingdom is a very isolated one. Only three genera, *Sagitta*, *Spadella* and *Krohnia*, are recognised, and the number of species is small.

Nevertheless these animals exist in extraordinary quantities, so that at certain seasons and under certain conditions the surface of the sea seems almost stiff with the incredible multitude of organisms which pervade it. Rough seas, &c., cause them to seek safety in dropping into deeper water. Deep-sea forms also occur, but in spite of this the group is essentially pelagic.

As a rule the body is some 1 to 2 or 3 cm. in length, though some species are larger, by 4 or 5 mm. in breadth, and it is shaped something like a torpedo with side flanges and a slightly swollen, rounded head. It can be divided into three regions—(i.) head, (ii.) trunk, and (iii.) tail, separated from one another by two transverse septa. The almost spherical head is covered by a hood which can be retracted; it bears upon its side a number of sickle-shaped, chitinous hooks and one or more short rows of low spines—both of these features are used in characterizing the various species. A pair of eyes lie dorsally and behind them is a closed circlet, often pulled out into various shapes, of modified epidermis, to which an olfactory function has been attributed.



Spadella cephaloptera (Busch).

St, Septa dividing body-cavity transversely.

g^2, Cerebral ganglia.

The interior of the head is filled up with masses of muscle fibres which are mainly occupied with moving the sickle-shaped hooks. The trunk contains a spacious body-cavity filled during the breeding season by the swollen ovaries, and the same is true of the tail if we substitute testes for ovaries.

*n*¹, Commissure uniting this with ventral ganglion (not shown in fig.).
*n*², Nerve uniting cerebral ganglia with small ganglia on head.
nr, Olfactory nerve.
d, Alimentary canal.
r, Olfactory organ.
te, Tentacle.
t, Tactile hairs springing from surface of body.
e, Ovary.
el, Oviduct.
ho, Testes.
sg, Vas deferens.
*f*², *f*³, Lateral and caudal fins.
sb, Seminal pouch.

The eyes are indicated as black dots behind the cerebral ganglia.

The skin consists of a transparent cuticle excreted by the underlying ectoderm, the cells of which though usually one-layered may be heaped up into several layers in the head; beneath this is a basement membrane, and then a layer of longitudinal muscle fibres which are limited inside by a layer of peritoneal cells. The muscles are striated and arranged in four quadrants, two dorso-lateral and two ventro-lateral, an arrangement which recalls that of the Nematoda, whilst in their histology they somewhat resemble the muscles of the Oligochaeta. Along each side of the body stretches a horizontal fin and a similar flange surrounds the tail. Into these fins, which are largely cuticular and strengthened by radiating bars, a single layer of ectoderm cells projects.

The mouth, a longitudinal slit, opens on to the ventral surface of the head. It leads into a straight alimentary canal whose walls consist of a layer of ciliated cells ensheathed in a thin layer of peritoneal cells. There is no armature, and no glands, and the whole tract can only be divided into an oesophagus and an intestine. The latter runs with no twists or coils straight to the anus, which is situated at the junction of the trunk with the tail. A median mesentery running dorso-ventrally supports the alimentary canal

and is continued behind it into the tail, thus dividing the body cavity into two lateral halves.

There are no specialized circulatory, respiratory or excretory organs.

The nervous system consists of a cerebral ganglion in the head, a conspicuous ventral ganglion in the trunk, and of lateral commissures uniting these ganglia on each side. The whole of this system has retained its primitive connexion with the ectoderm. The cerebral ganglion also gives off a nerve on each side to a pair of small-ganglia, united by a median commissure, which have sunk into and control the muscles of the head. As in other animals there is a minute but extensive nervous plexus, which permeates the whole body and takes its origin from the chief ganglia. In addition to the eyes and the olfactory circle on the head scattered tactile papillae are found on the ectoderm.

Chaetognatha are hermaphrodite. The ovaries are attached to the side walls of the trunk region; between them and the body wall lie the two oviducts whose inner and anterior end is described as closed, their outer ends opening one on each side of the anus, where the trunk joins the tail. According to Miss N.M. Stevens the so-called oviduct acts only as a “sperm-duct” or receptaculum seminis. The spermatozoa enter it and pass through its walls and traverse a minute duct formed of two accessory cells, and finally enter the ripe ovum. Temporary oviducts are formed between the “sperm-duct” and the germinal epithelium at each oviposition. A number of ova ripen simultaneously. The two testes lie in the tail and are formed by lateral proliferations of the living peritoneal cells. These break off and, lying in the coelomic fluid, break up into spermatozoa. They pass out through short vasa deferentia with internal ciliated funnels, sometimes an enlargement on their course—the seminal vesicles—and a minute external pore situated on the side of the tail.

With hardly an exception the transparent eggs are laid into the sea and float on its surface. The development is direct and there is no larval stage. The segmentation is complete; one side of the hollow blastosphere invaginates and forms a gastrula. The blastopore closes, a new mouth and a new anus subsequently arising. The archenteron gives off two lateral pounchs and thus becomes trilobed. The middle lobe forms the alimentary canal; it closes behind and opens to the exterior anteriorly and so makes the mouth. The two lateral lobes contain the coelom; each separates off in front a segment which forms the head and presumably then divides again to form anteriorly the trunk, and posteriorly the tail regions. An interesting feature of the development of Chaetognaths is that, as in some insects, the cells destined to form the reproductive organs are differentiated at a very early period, being apparent even in the gastrula stage.

The great bulk of the group is pelagic, as the transparent nature of all their tissues indicates. They move by flexing their bodies. *Spadella cephaloptera* is, however, littoral and oviposits on seaweed, and the "Valdivia" brought home a deep-sea species.

The three genera are differentiated as follows:—

Sagitta M. Slabber, with two pairs of lateral fins. This genus was named as long ago as 1775.

Krohnia P. Langerhans, with one lateral fin on each side, extending on to the tail.

Spadella P. Langerhans, with a pair of lateral fins on the tail and a thickened ectodermic ridge running back on each side from the head to the anterior end of the fin.

The group is an isolated one and should probably be regarded as a separate phylum. It has certain histological resemblances with the

Nematoda and certain primitive Annelids, but little stress must be laid on these. The most that can be said is that the Chaetognaths begin life with three segments, a feature they share with such widely-differing groups as the Brachiopoda, the Echinoderma and the Enteropneusta, and probably Vertebrata generally.

See O. Hertwig, *Die Chaetognathen, eine Monographie* (Jena, 1880); B.J. Grassi, *Chetognathi: Flora u. Fauna d. Golfes von Neapel* (1883); S. Strodtman, *Arch. Naturg.* lviii., 1892; N.M. Stevens, *Zool. Jahrb. Anat.* xviii., 1903, and xxi., 1905.

(A. E. S.)

CHAETOPODA (Gr. χαίτη, hair, πούς, foot), a zoological class, including the majority of the Annelida (*q.v.*), and indeed, save for the Echiuroidea (*q.v.*), co-extensive with that group as usually accepted. They are divisible into the Haplodrili (*q.v.*) or Archiannelida, the Polychaeta containing the marine worms, the Oligochaeta or terrestrial and fresh-water annelids (see EARTHWORM), the Hirudinea or leeches (see LEECH), and a small group of parasitic worms, the Myzostomida (*q.v.*).

The distinctive characters of the class Chaetopoda as a whole are partly embodied in the name. They possess (save for certain Archiannelida, most Hirudinea, and other very rare exceptions) setae or chaetae implanted in epidermal pits. The setae are implanted metamerically in accordance with the metamerism of the body, which consists of a prostomium followed by a number of segments. The number of segments in an individual is frequently more or less definite. The anterior end of body always shows some

"cephalization." The internal organs are largely repeated metamerically, in correspondence with the external metamerism. Thus the body cavity is divided into a sequence of chambers by transverse septa; and even among the Hirudinea, where this condition is usually not to be observed, there is embryological evidence that the existing state of affairs is derived from this. Commonly the nephridia are strictly paired a single pair to each segment, while the branches of the blood vascular system are similarly metameric. The alimentary canal is nearly always a straight tube running from the mouth, which is surrounded by the first segment of the body and overhung by the prostomium, to the anus, which is then either surrounded by the last segment of the body or opens dorsally a little way in front of this.

The Class as a Whole.—The Chaetopoda are with but few exceptions (Myzostomida in part, *Sternaspis*) elongated worms, flattened or, more usually, cylindrical, and bilaterally symmetrical. The body consists of a number of exactly similar or closely similar segments, which are never fused and metamorphosed, as in the Arthropoda, to form specialized regions of the body. It is, however, always possible to recognize a head, which consists at least of the peristomial segment with a forward projection of the same, the prostomium. A thorax also is sometimes to be distinguished from an abdomen. Where locomotive appendages (the parapodia of the Polychaeta) exist, they are never jointed, as always in the Arthropoda; nor are they modified anteriorly to form jaws, as in that group.

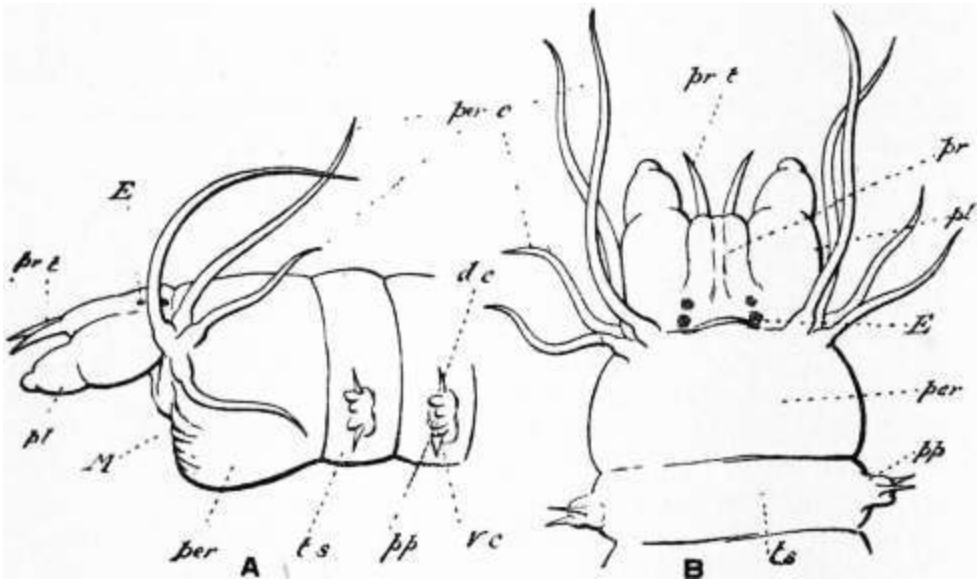


FIG. 1.—A, side view of the head region of *Nereis cultrifera*; B, dorsal view of the same.

E, Eye.
M, Mouth.
d.c, Dorcal cirrus.
per, Peristomium, probably equal to two segments,
per.c, Peristomial cirri.
pl, Prostomial palp.
pp, Parapodium.
pr, Prostomium.
pr.t, Prostomial tentacle.
t.s, Trunk segment.
v.c, Ventral cirrus.

The prostomium overhangs the mouth, and is often of considerable size and, as a rule, quite distinct from the segment following, being separated by an external groove, and containing, at least temporarily, the brain, which always arises there. Its cavity also is at first independent of the coelom though later invaded by the latter. In any case the cavity of the prostomium is single, and not formed, as is the cavity of the segments of the body, by paired coelomic chambers. It has, however, been alleged that this cavity is formed by a pair of mesoblastic somites (N. Kleinenberg), in which case there is more reason for favouring the view that would assign an equality between the prostomium and the (in that case) other segments of the body. The peculiar prostomium of *Tomopteris* is described below. The body wall of the Chaetopoda consists of a "dermo-muscular" tube which is separated from the gut by the coelom and its peritoneal walls, except in most leeches. A single layer of epidermic cells, some of which are glandular, forms the outer layer. Rarely are these ciliated, and then only in limited tracts. They secrete a cuticle which never approaches in thickness the often calcified cuticle of Arthropods. Below this is a circular, and below that again a longitudinal, layer of muscle fibres. These muscles are not striated, as they are in the Arthropoda.

Setae.—These chitinous, rod-like, rarely squat and then hook-like structures are found in the majority of the Chaetopoda, being absent only in certain Archiannelida, most leeches, and a very few Oligochaeta. They exist in the Brachiopoda (which are probably not unrelated to the Chaetopoda), but otherwise are absolutely distinctive of the Chaetopods. The setae are invariably formed each within an epidermic cell, and they are sheathed in involutions of the epidermis. Their shape and size varies greatly and is often of use in classification. The setae are organs of locomotion, though their large size and occasionally jagged edges in some of the Polychaeta suggest an aggressive function. They are disposed in two groups on either side,

corresponding in the Polychaeta to the parapodia; the two bundles are commonly reduced among the earthworms to two pairs of setae or even to a single seta. On the other hand, in certain Polychaeta the bundles of setae are so extensive that they nearly form a complete circle surrounding the body; and in the Oligochaet genus *Perichaeta* (= *Pheretima*), and some allies, there is actually a complete circle of setae in each segment broken only by minute gaps, one dorsal, the other ventral.

Coelom.—The Chaetopoda are characterized by a spacious coelom, which is divided into a series of chambers in accordance with the general metamerism of the body. This is the typical arrangement, which is exhibited in the majority of the Polychaeta and Oligochaeta; in these the successive chambers of the coelom are separated by the intersegmental septa, sheets of muscle fibres extending from the body wall to the gut and thus forming partitions across the body. The successive cavities are not, however, completely closed from each other; there is some communication between adjoining segments, and the septa are sometimes deficient here and there. Thus in the Chaetopoda the perivisceral cavity is coelomic; in this respect the group contrasts with the Arthropoda and Molluscs, where the perivisceral cavity is, mainly at least, part of the vascular or haemal system, and agrees with the Vertebrata. The coelom is lined throughout by cells, which upon the intestine become large and loaded with excretory granules, and are known as chloragogen cells. Several forms of cells float freely in the fluid of the coelom. In another sense also the coelom is not a closed cavity, for it communicates in several ways with the external medium. Thus, among the Oligochaeta there are often a series of dorsal pores, or a single head pore, present also among the Polychaeta (in *Ammochares*). In these and other Chaetopods the coelom is also put into indirect relations with the outside world by the nephridia and by the gonad ducts. In these features, and in the fact that the gonads are local proliferations of the coelomic epithelium, which have undergone no further changes in the simpler forms,

the coelom of this group shows in a particularly clear fashion the general characters of the coelom in the higher Metazoa. It has been indeed largely upon the conditions characterizing the Chaetopoda that the conception of the coelom in the Coelomocoela has been based.

Among the simpler Chaetopoda the coelom retains the character of a series of paired chambers, showing the above relations to the exterior and to the gonads. There are, however, further complications in some forms. Especially are these to be seen in the more modified Oligochaeta and in the much more modified Hirudinea. In the Polychaeta, which are to be regarded as structurally simpler forms than the two groups just referred to, there is but little subdivision of the coelom of the segments, indeed a tendency in the reverse direction, owing to the suppression of septa. Among the Oligochaeta the dorsal vessel in *Dinodrilus* and *Megascolides* is enclosed in a separate coelomic chamber which may or may not communicate with the main coelomic cavity. To this pericardial coelom is frequently added a gonocoel enclosing the gonads and the funnels of their ducts. This condition is more fully dealt with below in the description of the Oligochaeta. The division and, indeed, partial suppression of the coelom culminates in the leeches, which in this, as in some other respects, are the most modified of Annelids.

Nervous System.—In all Chaetopods this system consists of cerebral ganglia connected by a circumoesophageal commissure with a ventral ganglionated cord. The plan of the central nervous system is therefore that of the Arthropoda. Among the Archiannelida, in *Aeolosoma* and some Polychaetes, the whole central nervous system remains imbedded in the epidermis. In others, it lies in the coelom, often surrounded by a special and occasionally rather thick sheath. The cerebral ganglia constitute an archicerebrum for the most part, there being no evidence that, as in the Arthropoda, a movement forward of post-oral ganglia has taken place. In

the leeches, however, there seems to be the commencement of the formation of a syncerebrum. In the latter, the segmentally arranged ganglia are more sharply marked off from the connectives than in other Chaetopods, where nerve cells exist along the whole ventral chain, though more numerous in segmentally disposed swellings.

Vascular System.—In addition to the coelom, another system of fluid-holding spaces lies between the body wall and the gut in the Chaetopoda. This is the vascular or haemal system (formerly and unnecessarily termed pseudhaemal). With a few exceptions among the Polychaeta the vascular system is always present among the Chaetopoda, and always consists of a system of vessels with definite walls, which rarely communicate with the coelom. It is in fact typically a closed system. The larger trunks open into each other either directly by cross branches, or a capillary system is formed. There are no lacunar blood spaces with ill-defined or absent walls except for a sinus surrounding the intestine, which is at least frequently present. The principal trunks consist of a dorsal vessel lying above the gut, and a ventral vessel below the gut but above the nervous cord. These two vessels in the Oligochaeta are united in the anterior region of the body by a smaller or greater number of branches which surround the oesophagus and are, some of them at least, contractile and in that case wider than the rest. The dorsal vessel also communicates with the ventral vessel indirectly by the intestinal sinus, which gives off branches to both the longitudinal trunks, and by tegementary vessels and capillaries which supply the skin and the nephridia. In the smaller and simpler forms the capillary networks are much reduced, but the dorsal and ventral vessels are usually present. The former, however, is frequently developed only in the anterior region of the body where it emerges from the peri-intestinal blood sinus. On the other hand, additional longitudinal trunks are sometimes developed, the chief one of which is a supra-intestinal vessel lying below the dorsal vessel and closely adherent to the walls of the oesophagus in which region it appears. The

capillaries sometimes (in many leeches and Oligochaeta) extend into the epidermis itself. Usually they do not extend outwards of the muscular layers of the body wall. The main trunks of the vascular system often possess valves at the origin of branches which regulate the direction of the blood flow. Among many Oligochaeta the dorsal blood-vessel is partly or entirely a double tube, which is a retention of a character shown by F. Vezhdovský to exist in the embryo of certain forms. The blood in the Chaetopoda consists of a plasma in which float a few corpuscles. The plasma is coloured red by haemoglobin: it is sometimes (in *Sabella* and a few other Polychaeta) green, which tint is due to another respiratory pigment. The plasma may be pink (*Magelona*) or yellow (*Aphrodite*) in which cases the colour is owing to another pigment. In *Aeolosoma* it is usually colourless. The vascular system is in the majority of Chaetopods a closed system. It has been asserted (and denied) that the cellular rod which is known as the "Heart-body" (*Herzkorper*), and is to be found in the dorsal vessel of many Oligochaeta and Polychaeta, is formed of cells which are continuous with the chloragogen cells, thus implying the existence of apertures of communication with the coelom. The statement has been often made and denied, but it now seems to have been placed on a firm basis (E.S. Goodrich), that among the Hirudinea the coelom, which is largely broken up into narrow tubes, may be confluent with the tubes of the vascular system. This state of affairs has no antecedent improbability about it, since in the Vertebrata the coelom is unquestionably confluent with the haemal system through the lymphatic vessels. Finally, there are certain Polychaeta, *e g.* the *Capitellidae*, in which the vascular system has vanished altogether, leaving a coelom containing haemoglobin-impregnated corpuscles. It has been suggested (E. Ray Lankester) that this condition has been arrived at through some such intermediate stage as that offered by Polychaet *Magelona*. In this worm the ventral blood-vessel is so swollen as to occupy nearly the whole of the available coelom. Carry the process but a little

farther and the coelom disappears and its place is taken by a blood space or haemocoel. It has been held that the condition shown in certain leeches tend to prove that the coelom and haemocoel are primitively one series of spaces which have been gradually differentiated. The facts of development, however, prove their distinctness, though those same facts do not speak clearly as to the true nature of the blood system. One view of the origin of the latter (largely based upon observations upon the development of *Polygordius*) sees in the blood system a persistent blastocoel. F. Vezhdovský has lately seen reasons for regarding the blood system as originating entirely from the hypoblast by the secretion of fluid, the blood, from particular intestinal cells and the consequent formation of spaces through pressure, which become lined with these cells.

Nephridia and Coelomoducts.—The name "Nephridium" was originally given by Sir E. Ray Lankester to the members of a series of tubes, proved in some cases to be excretory in nature, which exist typically to the number of a single pair in most of the segments of the Chaetopod body, and open each by a ciliated orifice into the coelom on the one hand, and by a pore on to the exterior of the body on the other. In its earlier conception, this view embraced as homologous organs (so far as the present group is concerned) not only the nephridia of Oligochaeta and Hirudinea, which are obviously closely similar, but the wide tubes with an intercellular lumen and large funnels of certain Polychaeta, and (though with less assurance) the gonad ducts in Oligochaeta and Hirudinea. The function of nitrogenous excretion was not therefore a necessary part of the view—though it may be pointed out that there are grounds for believing that the gonad ducts are to some extent also organs of excretion (see below). Later, the investigations of E. Meyer and E.S. Goodrich, endorsed by Lankester, led to the opinion that under the general morphological conception of "nephridium" were included two distinct sets of organs, viz. nephridia and coelomoducts. The former (represented by, *e.g.* the "segmental organs" of *Lumbricus*) have been

asserted to be “ultimately, though not always, actually traceable to the ectoderm”; the latter (represented by, *e.g.* the oviduct of *Lumbricus*) are parts of the coelomic wall itself, which have grown out to the exterior. The nephridia, in fact, on this view, are *ectodermic ingrowths*, the coelomoducts *coelomic outgrowths*. The cavity of the former has nothing to do with coelom. The cavity of the latter is coelom.

The embryological facts upon which this view has been based, however, have been differently interpreted. According to C.O. Whitman the entire nephridial system (in the leech *Clepsine*) is formed by the differentiation of a continuous epiblastic band on each side. The exact opposite is maintained by R.S. Bergh (for *Lumbricus* and *Criodrilus*), whose figures show a derivation of the entire nephridium from mesoblast, and an absence of any connexion between successive nephridia by any continuous band, epiblastic or mesoblastic. A midway position is taken up by Wilson, who asserts the mesoblastic formation of the funnel, but also asserts the presence of a continuous band of epiblast from which certainly the terminal vesicle of the nephridium, and doubtfully the glandular part of the tube is derived. Vezhdovský’s figures of *Rhynchelmis* agree with those of Bergh in showing the backward growth of the nephridium from the funnel cell. There are thus substantial reasons for believing that the nephridium grows backwards from a funnel as does the coelomoduct. It is therefore by no means certain that so profound a difference embryologically can be asserted to exist between the excretory nephridia and the ducts leading from the coelom to the exterior, which are usually associated with the extrusion of the genital products among the Chaetopoda.

There are, however, anatomical and histological differences to be seen at any rate at the extremes between the undoubted nephridia of Goodrich, Meyer and Lankester, and the coelomoducts of the same authors.

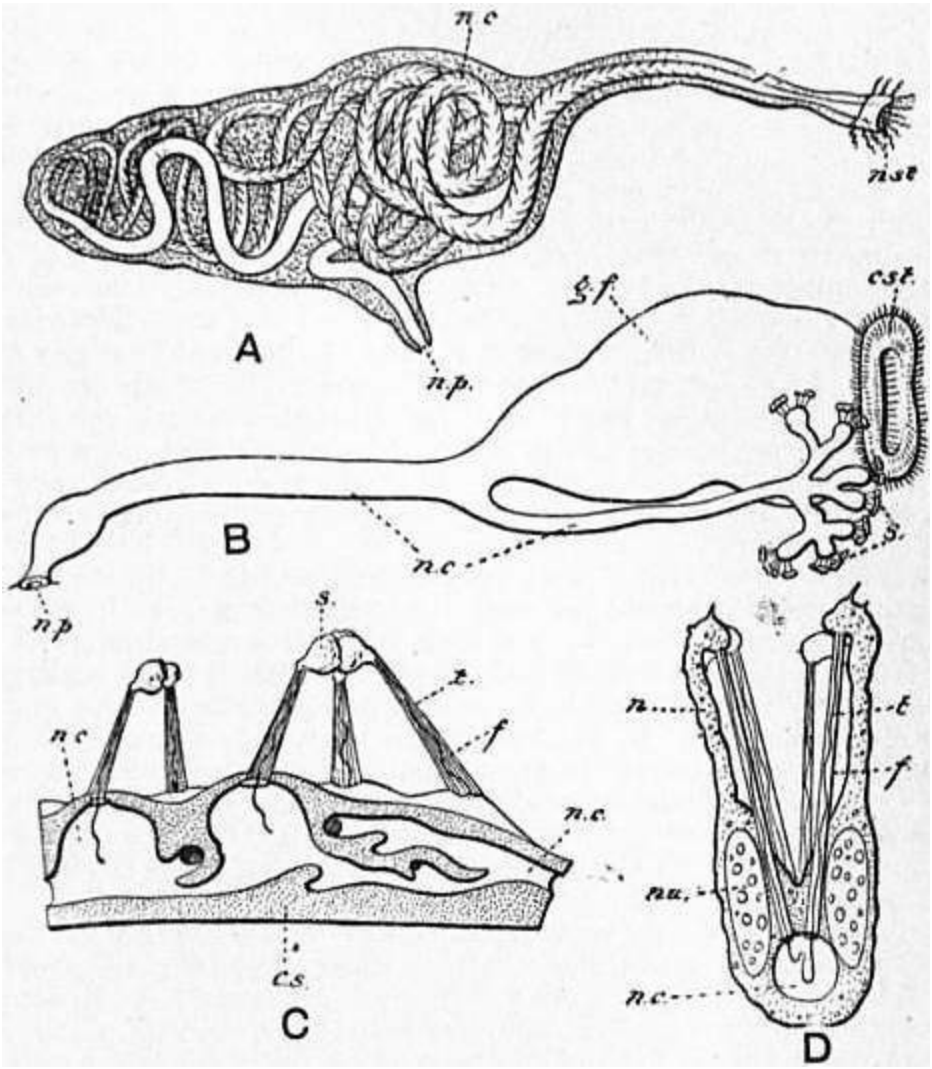


FIG. 2. (from Goodrich).

A, Diagram of the nephridium of *Nereis diversicolor*.

B, Diagram of the nephridium of *Alciope*, into which opens the large genital funnel (coelomostome).

C, Small portion of the nephridium of *Glycera siphonostoma*, showing the canal cut through, and the solenocytes on the outer surface.

D, Optical section of a branch of the nephridium of *Nephthys*

c.s, Cut surface.
cst, Coelomostome.
f, Flagellum.
g.f, Genital funnel.
n, Neck of solenocyte.
n.c, Nephridial canal.
n.p, Nephridiopore.
nst, Nephridiostome.
nu, Nucleus of solenocyte.
s, Solenocytes.
t, Tube.

scolopendroides.

I. *Nephridia*.—Excretory organs which are undisputed nephridia are practically universal among the Oligochaeta, Hirudinea and Archiannelida, and occur in many Polychaeta. Their total absence has been asserted definitely only in *Paranais littoralis*. Usually these organs are present to the number of a single pair per somite, and are commonly present in the majority of the segments of the body, failing often among the Oligochaeta in a varying number of the anterior segments. They are considerably reduced in number in certain Polychaeta. Essentially, a nephridium is a tube, generally very long and much folded upon itself, composed of a string of cells placed end to end in which the continuous lumen is excavated. Such cells are termed "drain pipe" cells. Frequently the lumen is branched and may form a complicated anastomosing network in these cells. Externally, the nephridium opens by a straight part of the tube, which is often very wide, and here the intracellular lumen becomes intercellular. Rarely the nephridium does not communicate with the coelom; in such cases the nephridium ends in a single cell, like the "flame cell" of a Platyhelminth worm, in which there is a lumen blocked at the coelomic end by a tuft of fine cilia projecting into the lumen. This is so with *Aeolosoma* (Vezhdovský). The condition is interesting as a persistence of the conditions obtaining in the provisional nephridia of *e.g. Rhynchelmis*, which afterwards become by an enlargement and opening up of the funnel the permanent nephridia of the adult worm. In some Polychaets (*e.g. Glycera*, see fig. 2) there are many of these flame cells to a single nephridium which are specialized in form, and have been termed "solenocytes" (Goodrich). They are repeated in *Polygordius*, and are exactly to be compared with similarly-placed cells in the nephridia of *Amphioxus*.

More usually, and indeed in nearly every other case among the Oligochaeta and Hirudinea, the coelomic aperture of the nephridium

consists of several cells, ciliated like the nephridium itself for a greater or less extent, forming a funnel. The funnel varies greatly in size and number of its component cells. There are so many differences of detail that no line can be drawn between the one-celled funnel of *Aeolosoma* and the extraordinarily large and folded funnel of the posterior nephridia in the Oligochaete *Thamnodrilus*. In the last-mentioned worm the funnels of the anterior nephridia are small and but few celled; it is only the nephridia in and behind the 17th segment of the body which are particularly large and with a sinuous margin, which recall the funnels of the gonad ducts (*i.e.* coelomoducts).

Among the Polychaeta the nephridium of *Nereis* (see fig. 2) is like that of the Oligochaeta and Hirudinea in that the coiled glandular tube has an intracellular duct which is ciliated in the same way in parts. The Polychaeta, however, present us with another form of nephridium seen, for example, in *Arenicola*, where a large funnel leads into a short and wide excretory tube whose lumen is intercellular. In the young stages of this worm which have been investigated by W.B. Benham, the tube, though smaller, and with a but little pronounced funnel, has still an intercellular duct. That these organs in Polychaeta serve for the removal of the generative products to the exterior is proved not only by the correspondence in number to them of the gonads, but by actual observation of the generative products in transit. This form of nephridia leads to the shorter but essentially similar organs in the Polychaete *Sternaspis*, and to those of the Echiuroidea (*q.v.*) and of the Gephyrea (*q.v.*).

Though the paired arrangement of the nephridia is the prevalent one in the Chaetopoda, there are many examples, among the Oligochaeta, of species and genera in which there are several, even many, nephridia in each segment of the body, which may or may not be connected among themselves, but have in any case separate orifices on to the exterior.

2. *Coelomoducis*.—In this category are included (by Goodrich and Lankester) the gonad ducts of the Oligochaeta, certain funnels without any aperture to the exterior that have been detected in *Nereis*, &c., funnels with wide and short ducts attached to nephridia in other Polychaeta, gonad ducts in the *Capitellidae*, the gonad ducts of the leeches. In all these cases we have a duct which has a usually wide, always intercellular, lumen, generally, if not always, ciliated, which opens directly into the coelom on the one hand and on to the exterior of the body on the other. These characters are plain in all the cases cited, excepting only the leeches which will be considered separately.

There is not a great deal of difference between most of these structures and true nephridia. It is not clear, for example, to which category it is necessary to refer the excretory organs of *Arenicola*, or *Polynoe*. Both series of organs consist essentially of a ciliated tube leading from the coelom to the exterior. Both series of organs grow back centrifugally from the funnel. In both the cavity originally or immediately continuous with the coelom appears first in the funnel and grows backwards. In some cases, *e.g.* oviducts of Oligochaeta, sperm ducts of *Phreoryctes*, the coelomoducts occupy, like the nephridia, two segments, the funnel opening into that in front of the segment which carries the external pore. It is by no means certain that a hard and fast line can be drawn between intra- and intercellular lumina. Finally, in function there are some points of likeness. The gonad ducts of *Lumbricus*, &c., must perform one function of nephridia; they must convey to the exterior some of the coelomic fluid with its disintegrated products of waste. There is no possibility that sperm and ova can escape by these tubes not in company with coelomic fluid. In the case of many Oligochaeta where there is no vascular network surrounding the nephridium, this function must be the chief one of those glands, the more elaborate process of excretion taking place in the case of nephridia surrounded by a rich plexus of blood capillaries. A consideration of the

mode of development and appearance of the coelomoducts that have thus far been enumerated (with the possible exception of those of the leeches) seems to show that there is a distinct though varying relation between them and the nephridia. It has been shown that in *Tubifex*, and some other aquatic Oligochaeta, the genital segments are at first provided with nephridia, and that these disappear on the appearance of the generative ducts, which are coelomoducts. In *Lumbricus* the connexion is a little closer; the funnel of the nephridium, in the segments in which the funnels of the gonad ducts are to be developed, persists and is continuous with the gonad duct funnels on their first appearance. In the development of the Acanthodrilid earthworm *Octochaetus* (F.E. Beddard) the funnels of the pronephridia disappear except in the genital segments, where they seem to be actually converted into the genital funnels. At the least there is no doubt that the genital funnels are developed precisely where the nephridial funnels formerly existed. If the genital funnels are not wholly or partly formed out of the nephridial funnels they have replaced them. In the genital segments of *Eudrilus* the nephridia are present, but the funnels have not been found though they are obvious in other segments. Here also the genital funnels have either replaced or been formed out of nephridial funnels. In *Haplotaxis heterogyne* (W.B. Benham) the sperm ducts are hardly to be distinguished from nephridia; they are sinuous tubes with an intra-cellular duct. But the funnel is large and thus differs from the funnels of the nephridia in adjoining segments. Here again the nephridial funnel seems to have been converted into or certainly replaced by a secondarily developed funnel. This example is similar to cases among the Polychaeta where a true nephridium is provided with a large funnel, coelomostome, according to the nomenclature of Lankester. The whole organ, having, as is thought but not known, this double origin, is termed a nephromixium. The various facts, however, seem to be susceptible of another interpretation. It may be pointed out that the several examples described recall a phenomenon which is not uncommon

and is well known to anatomists. That is the replacement of an organ by, sometimes coupled with its partial conversion into, a similar or slightly different organ performing the same or an analogous function. Thus the postcaval vein of the higher vertebrata is partly a new structure altogether, and is partly formed out of the pre-existing posterior cardinals. The more complete replacements, such as the nephridia of the genital segment of *Tubifex* by a subsequently formed genital duct, may be compared with the succession of the nesonephros to the pronephros in vertebrates, and of the metanephros to the mesonephros in the higher vertebrates. It might be well to term these structures, mostly serving as gonad ducts, which have an undoubted resemblance to nephridia, and for the most part an undoubted connexion with nephridia, "Nephrodinia," to distinguish them from another category of "ducts" which are communications between the coelom and the exterior, and which have no relation whatever to nephridia or to the organs just discussed. For these latter, the term coelomoducts might well be reserved. To this category belong certain sacs and pouches in many, perhaps most, genera of the Oligochaeta family, *Eudrilidae*, and possibly the gonad ducts in the Hirudinea. As an example of the former it has been shown (Beddard) that a large median sac in *Lybiodrilus* is at first freely open to the coelom, that it later becomes shut off from the same, that it then acquires an external orifice, and, finally, that it encloses the ovary or ovaries, between which and the exterior a passage is thus effected. To this category will belong the oviducts in Teleostean fishes and probably the gonad ducts in several groups of invertebrates.

POLYCHAETA.—This group may be thus defined and the definition contrasted and compared with those of the other divisions of the Chaetopoda. Setae always present and often very large, much varied in form and very numerous, borne by the dorsal and ventral parapodia (when present). The prostomium and the segments generally often bear processes sensory and branchial. Eyes often present and comparatively complicated in

structure. Clitellum not present as a definite organ, as in Oligochaeta. The anus is mostly terminal, and there are no anterior and posterior suckers. Nervous system often imbedded in the epidermis. Vascular system generally present forming a closed system of tubes. Alimentary canal rarely coiled, occasionally with glands which are simple caeca and sometimes serve as air reservoirs; jaws often present and an eversible pharynx. Nephridia sometimes of the type of those of the Oligochaeta; in other cases short, wide tubes with a large funnel serving also entirely or in part as gonad ducts. Frequently reduced in number of pairs; rarely (*Capitellidae*) more than one pair per segment. Gonads not so restricted in position as in Oligochaets, and often more abundant; the individuals usually unisexual. No specialized system of spermathecae, sperm reservoirs, and copulatory apparatus, as in Oligochaeta; development generally through a larval form; reproduction by budding also occurs. Marine (rarely fresh-water) in habit.

The Polychaeta contrast with the Oligochaeta by the great variety of outward form and by the frequency of specialization of different regions of the body. The head is always recognizable and much more conspicuous than in other Chaetopoda. As in the Oligochaeta the peristomial segment is often without setae, but this character is not by any means so constant as in the Oligochaeta. The prostomium bears often processes, both dorsal and ventral, which in the Sabellids are split into the circle of branchial plumes, which surround or nearly surround the mouth in those tube-dwelling Annelids. *Tomopteris* is remarkable for the fact that the hammer-shaped prostomium has paired ventral processes each with a single seta. It is held, however, that these are a pair of parapodia which have shifted forwards. The presence of parapodia distinguish this from other groups of Chaetopoda. Typically, the parapodium consists of two processes of the body on each side, each of which bears a bundle of setae; these two divisions of the “limb” are termed respectively notopodium and neuropodium. The notopodium may be rudimentary or absent and the entire

parapodium reduced to the merest ridge or even completely unrepresented. Naturally, it is among the free living forms that the parapodium is best developed, and least developed among the tubicolous Polychaeta. To each division of the parapodium belongs typically a long tentacle, the cirrus, which may be defective upon one or other of the notopodium or neuropodium, and may be developed into an arborescent gill or into a flat scale-like process, the elytron (in *Polynoe*, &c.). There are other gills developed in addition to those which represent the cirri.

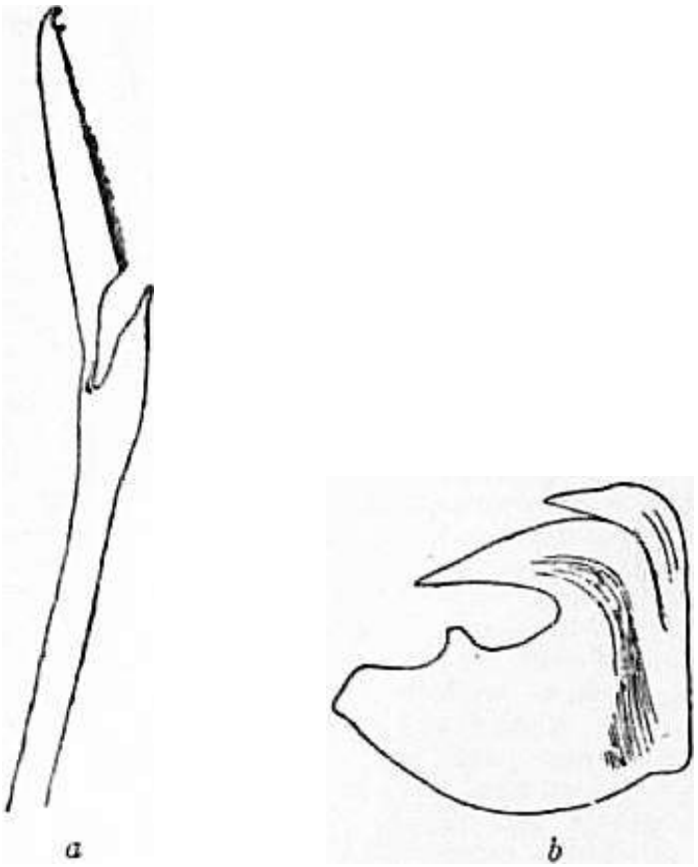


FIG. 3.—*a*, Bristle of *Pionosyllis Malmgreni*; *b*, Hook of *Terebella*.

Setae.—The setae of the Polychaeta are disposed in two bundles in many genera, but in only one bundle in such forms as have no notopodium (*e.g. Syllis*). In some genera the setae are in vertical rows, and in certain *Capitellidae* these rows so nearly meet that an arrangement occurs

reminiscent of the continuous circle of setae in the perichaetous Oligochaeta. The setae vary much in form and are often longer and stronger than in the Oligochaetes. Jointed setae and very short hooks or "uncini" (see fig. 3) are among the most remarkable forms. Simple bifid setae, such as those of Oligochaetes, are also present in certain forms.

Among the burrowing and tubicolous forms it is not uncommon for the body to be distinguishable into two or more regions; a "thorax," for example, is sharply marked off from an "abdomen" in the Sabellids. In these forms the bundles of setae are either capilliform or uncinate, and the dorsal setae of the thorax are like the ventral setae of the abdomen. It is a remarkable and newly-ascertained fact that in regeneration (in *Potamilla*) the thorax is not replaced by the growth of uninjured thoracic segments; but that the anterior segments of the abdomen take on the same characters, the setae dropping out and being replaced in accordance with the plan of the setae in the thorax of uninjured worms. Among the Oligochaeta the sexually mature worm is distinguished from the immature worm by the clitellum and by the development of genital setae. Among the Polychaeta the sexual worm is often more marked from the asexual form, so much so that these latter have been placed in different species or even genera. The alteration in form does not only affect structures used in generation; but the form of the parapodia, &c., alter. There are even dimorphic forms among the Syllids where the sexes are, as in many Polychaets, separate.

Nephridia.—The nephridia of the Polychaeta have been generally dealt with above in considering the nephridial system of the Chaetopoda as a whole. They contrast with those of the Oligochaeta and Hirudinea by reason of their frequently close association with the gonads, the same organ sometimes serving the two functions of excretion and conveyance of the ova and spermatozoa out of the body. On the hypothesis that such a form as *Dinophilus* (see Haplodrili) has preserved the characters of the primitive

Chaetopod more nearly than any existing Polychaet or Oligochaet, it is clear that the nephridia in the Oligochaeta have preserved the original features of those organs more nearly than most Polychaeta. Thus *Nereis* among the latter worms, from the resemblance which its excretory system bears to that of the Oligochaeta, may be made the starting-point of a series. In this worm the paired nephridia exist in most of the segments of the body, and their form (see fig. 2) is much like that of the nephridia in the *Enchytraeidae*. The funnel, which is not large, appears to open, as a rule at least, into the segment in front of that which bears the external orifice. Quite independent of these are certain large dorsally situate funnel-like folds of the coelomic epithelium, ciliated, but of which no duct has been discovered leading to the exterior. It is possible that we have here gonad ducts distinct from nephridia which at the time of sexual maturity do open on to the exterior.

In *Polynoe* the nephridia are short tubes with a slightly folded funnel whose lumen is intercellular, and this intercellular lumen is characteristic of the Polychaetes as contrasted with leeches and Oligochaetes. Among the Terebelloidea there is a remarkable differentiation of the nephridia into two series. One set lies in front of the diaphragm, which is the most anterior and complete septum, the rest having disappeared or being much less developed. The anterior nephridia, of which there are one to three pairs, contrast with the posterior series by their small funnels and large size, the posterior nephridia having a large funnel followed by a short tube. In *Chaetozone setosa* the anterior nephridia occupy five segments. There is usually a gap between the two series, several segments being without nephridia. It seems that the posterior nephridia are mainly gonad ducts, and the gonads are developed in close association with the funnels. The same arrangement is found in some other Polychaetes; for instance, in *Sabellaria* there is a single pair of large anterior nephridia, which open by a common pore, followed after an interval by large-funnelled and short nephridia. This

differentiation is not, however, peculiar to the Polychaetes; for in several Oligochaetes the anterior nephridia are of large size, and opening as they do into the buccal cavity clearly play a different function to those which follow. In *Thamnodrilus*, as has been pointed out, there are two series of nephridia which resemble those of the Terebelloidea in the different sizes of their funnels. In *Lanice conchilega* the posterior series of nephridia are connected by a thick longitudinal duct, which seems to be seen in its most reduced form in *Owenia*, where a duct on each side runs in the epidermis, being in parts a groove, and receives one short tubular nephridium only and occupies only one segment. This connexion of successive nephridia (in *Lanice*) has its counterpart in *Allolobophora, Lybiodrilus*, and apparently in the Lumbriculids *Teleuscolex* and *Styloscolex*, among the Oligochaeta. Among the *Capitellidae*, which in several respects resemble the Oligochaeta, wide and short gonad ducts coexist in the same segments with nephridia, the latter being narrower and longer. It is noteworthy that in this family only among the Polychaeta, the nephridia are not restricted to a single pair in each segment; so that the older view that the gonad ducts are metamorphosed nephridia is not at variance with the anatomical facts which have been just stated.

Alimentary Canal.—The alimentary canal of Polychaetes is usually a straight tube running from the anterior mouth to the posterior anus. But in some forms, *e.g. Sternaspis*, the gut is coiled. In others, again, *e.g. Cobangia*, the anus is anterior and ventral. A gizzard is present in a few forms. The buccal cavity is sometimes armed with jaws. The oesophagus is provided often with caeca which in Syllids and *Hesionidae* have been found to contain air, and possibly therefore perform the function of the fish's air-bladder. In other Polychaetes one or more pairs of similar outgrowths are glandular. The intestine is provided with numerous branched caeca in *Aphrodite*.

Reproduction.—As is the case with the Oligochaeta, the Polychaeta furnish examples of species which multiply asexually by budding. There is a further resemblance between the two orders of Chaetopoda in that this budding is not a general phenomenon, but confined to a few forms only. Budding, in fact, among the Polychaetes is limited to the family *Syllidae*. In the Oligochaetes it is only the families *Aeolosomatidae* and *Naididae* that show the same phenomenon. It has been mentioned that in the Nereids a sexual form occurs which differs structurally from the asexual worms, and was originally placed in a separate genus, *Heteronereis*; hence the name "Heteronereid" for the sexual worm. In *Syllis* there is also a "Heterosyllid" form in which the gonads are limited to a posterior region of the body which is further

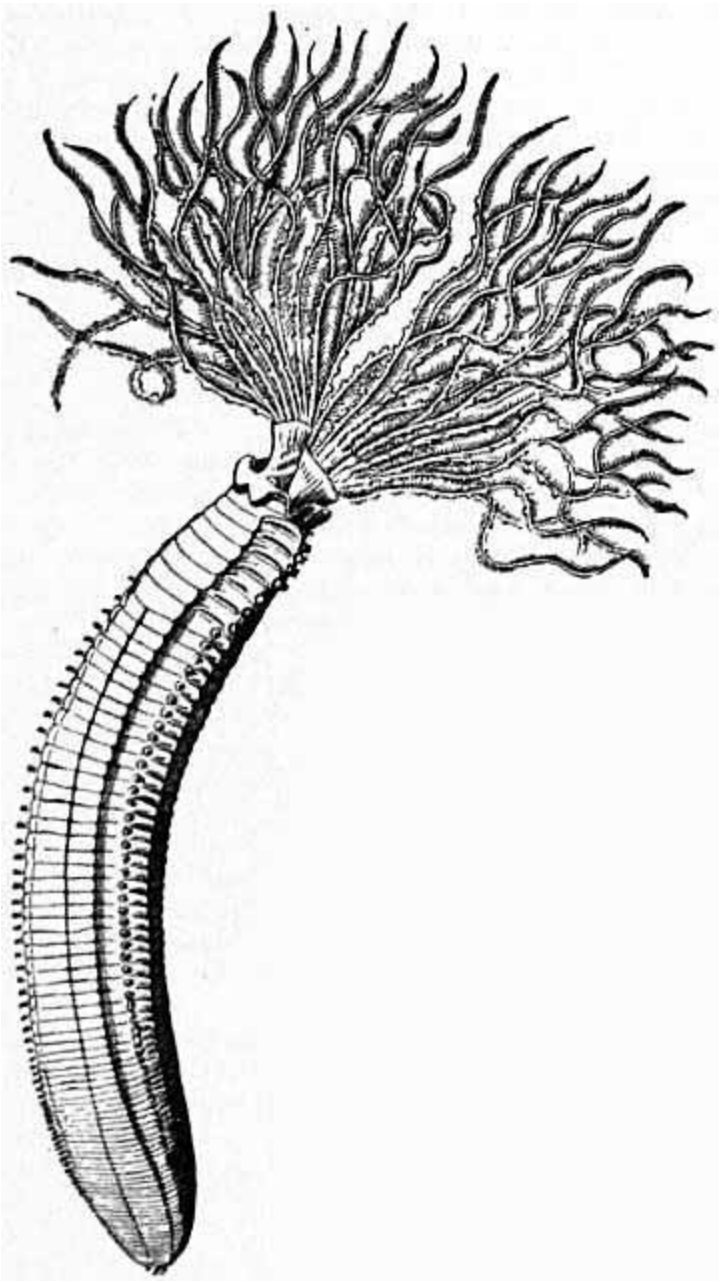


FIG. 4.—*Dasychone infracta*, Kr. (After Malmgren.)

marked off from the anterior non-sexual segments by the oak-like setae. In some Syllids this posterior region separates off from the rest, producing a new head; thus a process of fission occurs which has been termed schizogamy. A similar life history distinguishes certain Sabellid worms, *e.g.* *Filigrana*. Among the Syllids this simple state of affairs is further complicated. In *Autolytus* there is, to begin with, a conversion of the posterior half of the body to form a sexual zooid. But before this separates off a number of other zooids are formed from a zone of budding which appears between the two first-formed individuals. Ultimately, a chain of sexual zooids is thus formed. A given stock only produces zooids of one sex. In *Myrianida* there is a further development of this process. The conversion of the posterior end of the simple individual into a sexual region is dispensed with; but from a preanal budding segment a series of sexual buds are produced. The well-known Syllid, discovered during the voyage of the "Challenger," shows a modification of this form of budding. Here, however, the buds are lateral, though produced from a budding zone, and they themselves produce other buds, so that a ramifying colony is created.

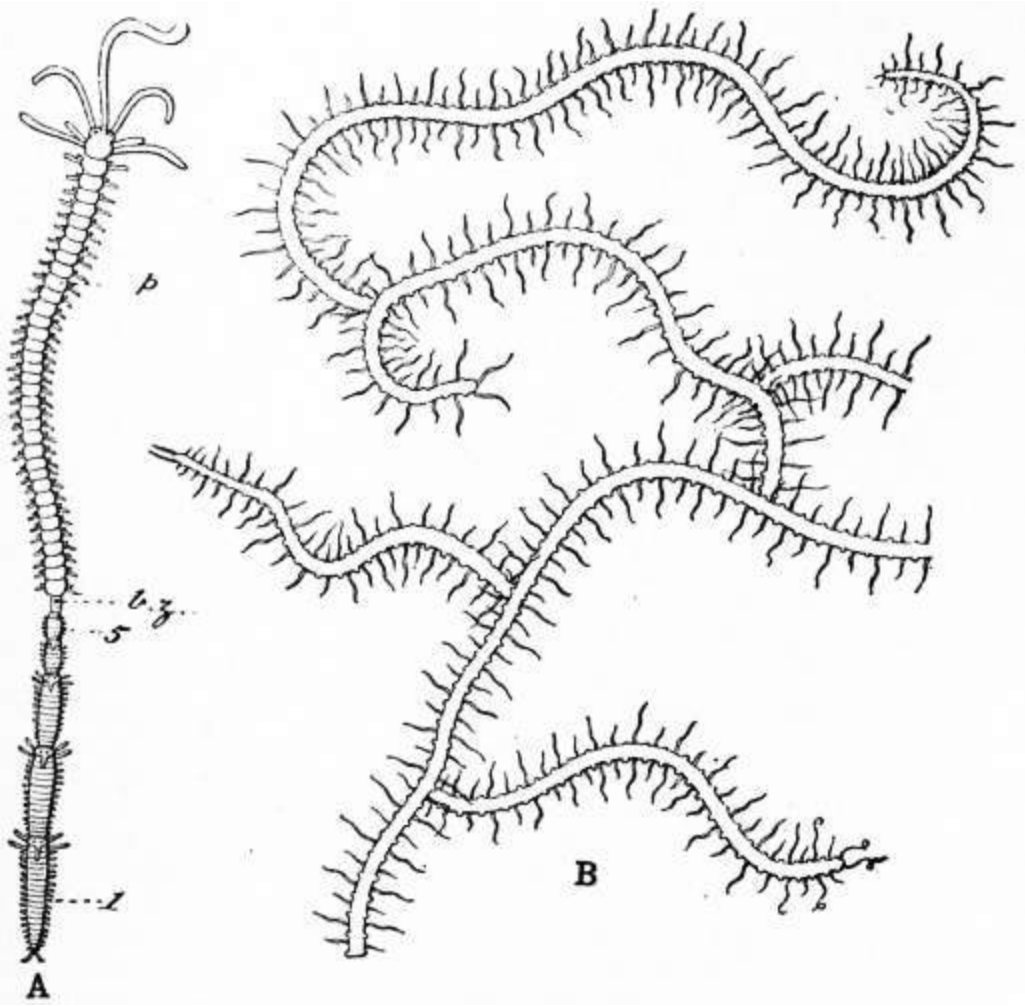


FIG. 5.—A, *Autolytus* (after Mensch) with numerous buds. B, Portion of a colony of *Syllis ramosa* (from M'Intosh). *b.z*, Budding zone; *p*, anterior region of the parent worm; 1-5, buds.

Quite recently, another mode of budding has been described in *Trypanosyllis gemmipara*, where a crowd of some fifty buds arising symmetrically are produced at the tail end of the worm. In some Syllids, such as *Pionosyllis gestans*, the ova are attached to the body of the parent in a regular line, and develop in situ; this process, which has been attributed to budding, is an "external gestation," and occurs in a number of species.

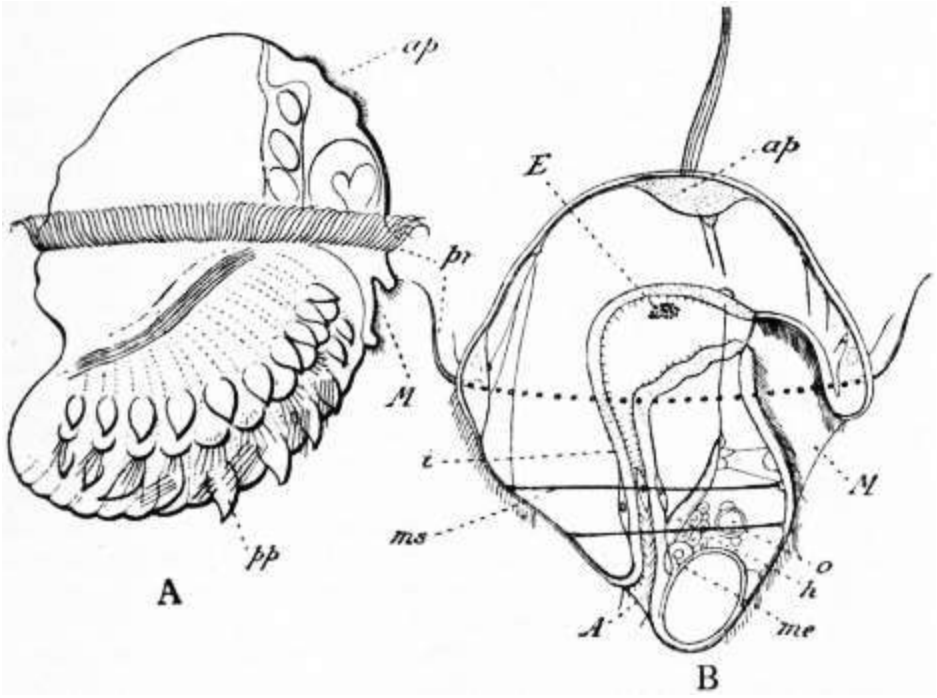


FIG. 6.—A, Side view of the larva of *Lopadorhynchus* (from Kleinenberg), showing the developing trunk region. B, Side view of the trochophore larva of *Eupomatus uncinatus* (from Hatschek).

A, Anus.
E, Eye.
M, Mouth.
ap, Apical organ.
h, "Head Kidney."
i, Intestine.
me, Mesoblast.
ms, Larval muscle.
o, Otocyst.
pp, Parapodium.
pr, Praeoral ciliated ring, or prototroch.

As is very frequently the case with marine forms, as compared with their fresh-water and terrestrial allies, the Polychaeta differ from the Oligochaeta and Hirudinea in possessing a free living larval form which is hatched at an early stage in development. This larva is termed the Trochosphere larva, and typically (as it is held) is an egg-shaped larva with two bands of cilia, one preoral and one postoral, with an apical nervous plate surmounted by a

tuft of longer cilia, and with a simple bent alimentary canal, with lateral mouth and posterior anus, between which and the ectoderm is a spacious cavity (blastocoel) traversed by muscular strands and often containing a larval kidney. The segmentation is of the mesoblast to begin with, and appears later behind the mouth, the part anterior to this becoming the prostomium of the adult. The chief modifications of this form are seen in the *Mitraria* larva of *Ammochares* with only the preoral band, which is much folded and which has provisional and long setae; the atrochous larva, where the covering of cilia is uniform and not split into bands; and the polytrochous larva where there are several bands surrounding the body. There are also other modifications.

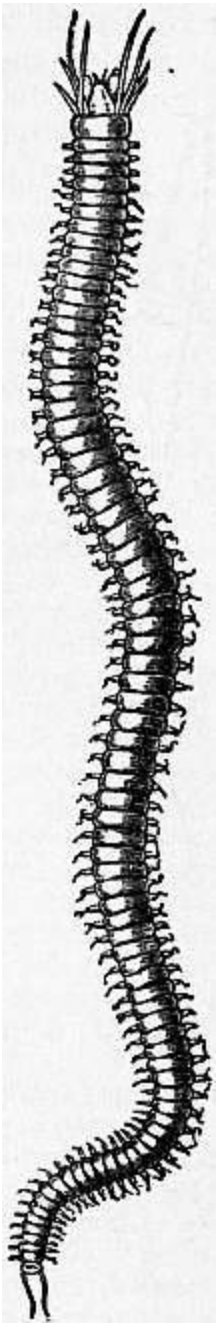


FIG. 7.—*Nereis pelagica*, L. (After Oersted.)

Classification.—The older arrangement of the Polychaeta into Errantia or free living and Tubicola or tube-dwelling forms will hardly fit the much increased knowledge of the group. W.B. Benham's division into Phanerocephala in which the prostomium is plain, and Crytocephala in which the prostomium is hidden by the peristomium adopted by Sedgwick, can only be justified by the character used; for the Terebellids, though phanerocephalous, have many of the features of the Sabellids. It is perhaps safer to subdivide the Order into 6 Suborders (in the number of these following Benham, except in combining the Sabelliformia and Hermelliformia). Of these 6, the two first to be considered are very plainly separable and represent the extremes of Polychaete organization, (1) *Nereidiformia*.

—"Errant" Polychaetes with well-marked prostomium possessing tentacles and palps with evident and locomotor parapodia, supported (with few exceptions) by strong spines, the aciculi; muscular pharynx usually armed with jaws; septa and nephridia regularly metameric and similar throughout body; free living and predaceous. (2) *Cryptocephala*.—Tube-dwelling with body divided into thorax and abdomen marked by the setae, which are reversed in position in the neuropodium and notopodium respectively in the two regions. Parapodia hardly projecting; palps of prosomium forming branched gills; no pharynx or eversible buccal region; no septa in thorax, septa in abdomen regularly disposed. Nephridia in two series; large, anterior nephridia followed by small, short tubes in abdomen. The remaining groups are harder to define, with the exception of the (3) *Capitelliformia*, which are mud-living worms of an "oligochaetous" appearance, and with some affinities to that order. The peristomium has no setae, and the setae generally are hair-like or uncinate, often forming almost complete rings. The genital ducts are limited to one segment (the 8th in *Capitella capitata*), and there are genital setae on this and the next segment. In other forms genital ducts and nephridia coexist in the same segment. The nephridia are sometimes numerous in each segment. There is no blood system, and the coelomic corpuscles contain haemoglobin. (4) *Terebelliformia*. These worms are in some respects like the Sabellids (Cryptocephala). The parapodia, as in the Capitellidae, are hardly developed. The buccal region is unarmed and not eversible. The prostomium has many long filaments which recall the gills of the Sabellids, &c. The nephridia are specialized into two series, as in the last-mentioned worms. (5) *Spioniformia* (including *Chaetopterus*, *Spio*, &c.) and (6) *Scoleciformia* (*Arenicola*, *Chloraema*, *Sternaspis*) are the remaining groups. In both, the nephridia are all alike; there are no jaws; the prostomium rarely has processes. The body is often divisible into regions.

FIG. 8.—*Sabella vesiculosa*, Mont. (After Montagu.)

FIG. 9. *Arenicola marina*, L.

LITERATURE.—W.B. Benham, "Polychaeta" in *Cambridge Natural History*; E. Claparède, *Annélides chétopodes du golfe de Naples* (1868 and 1870); E. Ehlers, *Die Börstenwürmer* (1868); H. Eisig, *Die Capitelliden* (Naples Monographs), and development of do. in *Mitth. d. zool. Stat. Neapel* (1898); W.C. M'Intosh, *"Challenger" Reports* (1885); E.R. Lankester, Introductory Chapter in *A Treatise on Zoology*; E.S. Goodrich, *Quart. Journ. Mic. Sci.* (1897-1900); E. Meyer, *Mitth. d. zool. Stat. Neapel* (1887, 1888), as well as numerous other memoirs by the above and by J.T. Cunningham, de St Joseph, A. Malaquin, A. Agassiz, A.T. Watson,

Malmgren, Bobretsky and A.F. Marion, E.A. Andrews, L.C. Cosmovici, R. Horst, W. Michaelsen, G. Gilson, F. Buchanan, H. Levinsen, Joyeux-Laffuie, F.W. Gamble, &c.

OLIGOCHAETA.—As contrasted with the other subdivisions of the Chaetopoda, the Oligochaeta may be thus defined. Setae very rarely absent (genus *Achaeta*) and as a rule not so large or so numerous in each segment as in the Polychaeta, and different in shape. Eyes rarely present and then rudimentary. Prostomium generally small, sometimes prolonged, but never bearing tentacles or processes. Appendages of body reduced to branchiae, present only in four species, and to the ventral copulatory appendages of *Alma* and *Criodrilus*. Clitellum always present, extending over two (many limicolous forms) to

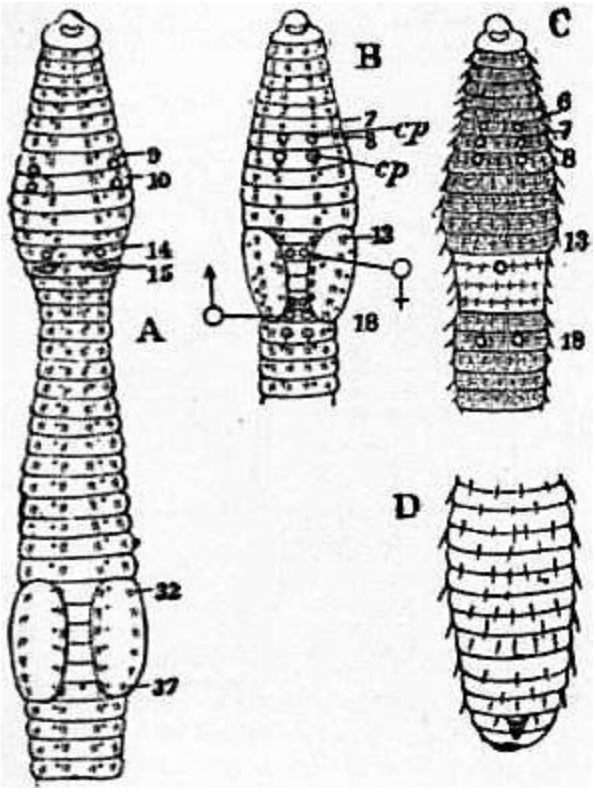


FIG. 10.—Diagrams of various Earthworms, to illustrate external characters. A, B, C, anterior segments from the ventral surface; D, hinder end of body of *Urochaeta*.

forty-five segments (*Alma*). Segments of body numerous and not distinctive of species, being irregular and not fixed in numbers. In terrestrial forms dorsal pores are usually present; in aquatic forms a head pore only. Anus nearly always terminal, rarely dorsal, at a little distance from end of body. Suckers absent. Nervous system rarely (*Aeolosoma*) in continuity with epidermis. Vascular system always present, forming a closed system, more complicated in the larger forms than in the aquatic genera. Several specially large contractile trunks in the anterior segments uniting the dorsal and ventral vessels. Nephridia generally paired, often very numerous in each segment, in the form of long, much-coiled tubes with intracellular lumen. Gonads limited in number of pairs, testes and ovaries always present in the same individual. Special sacs developed from the intersegmental septa lodge the developing ova and sperm. Special gonad ducts always present. Male ducts often open on to exterior through a terminal chamber which is variously specialized, and sometimes with a penis.

A, *Lumbricus*: 9, 10, segments containing spermathecae, the orifices of which are indicated; 14, segment bearing oviducal pores; 15, segment bearing male pores; 32, 37, first and last segments of clitellum.

B, *Acanthodrilus*: *cp*, orifices of spermathecae; ♀, oviducal pores; ♂, male pores; on 17th and 19th segments are the apertures of the atria.

C, *Perichaeta*: the spermathecal pores are between segments 6 and 7, 7 and 8, 8 and 9, the oviducal pores upon the 14th and the male pores upon the 18th segment.

In all the figures the nephridial pores are indicated by dots and the setae by strokes.

Generative pores usually paired, sometimes single and median. Spermathecae nearly always present. Alimentary canal straight, often with appended glands of complicated or simpler structure; no jaws. Eggs deposited in a cocoon after copulation. Development direct. Reproduction by budding also occurs. Fresh-water (rarely marine) and terrestrial.

The Oligochaeta show a greater variety of size than any other group of the Chaetopoda. They range from a millimetre or so (smaller species of *Aeolosoma*) to 6 ft. or even rather more (*Microchaeta rappi*, &c.) in length.

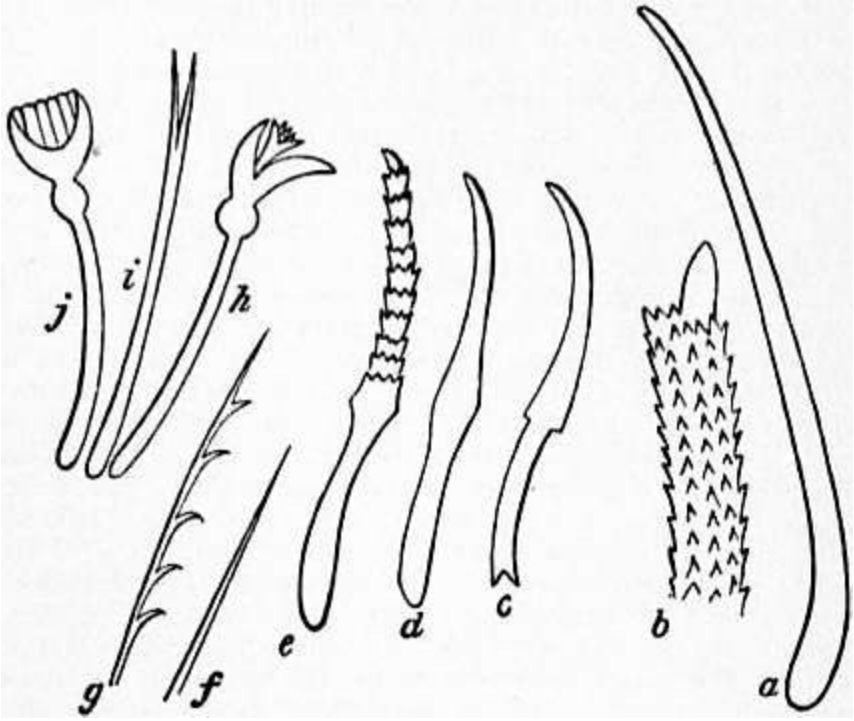


FIG. 11.—Setae of *Oligochaeta.*

a, Penial seta of *Perichaeta ceylonica.*
b, Extremity of penial seta of *Acanthodrilus* (after Horst).
c, Seta of *Urochaeta* (Perier).
d, Seta of *Lumbricus.*
e, Seta of *Criodrilus.*
f, *g*, Setae of *Bohemilla comata.*
h, *i*, *j*, Setae of *Psammoryctes barbatus* (f to j after Vezhdovský).

Setae.—The setae, which are always absent from the peristomial segment, are also sometimes absent from a greater number of the anterior segments of the body, and have completely disappeared in *Achaeta cameranoi.* When present they are either arranged in four bundles of from one to ten or even more setae, or are disposed in continuous lines completely encircling each segment of the body. This latter arrangement characterizes many genera of the family *Megascolicidae* and one genus

(*Periscolex*) of the *Glossoscolicidae.* It has been shown (Bourne) that the "perichaetous" condition is probably secondary, inasmuch as in worms which are, when adult, "perichaetous" the setae develop in pairs so that the embryo passes through a stage in which it has four bundles of setae, two to each bundle, the prevalent condition in the group. Rarely there is an irregular disposition of the setae which are not paired, though the total number is eight to a segment (fig. 10), *e.g. Pontoscolex.* The varying forms of the setae are illustrated in fig. 11.

Structure.—The body wall consists of an epidermis which secretes a delicate cuticle and is only ciliated in *Aeolosoma*, and in that genus only on the under surface of the prostomium. The epidermis contains numerous groups of sense cells; beneath the epidermis there is rarely (*Kynotus*) an extensive connective tissue dermis. Usually the epidermis is immediately followed by the circular layer of muscles, and this by the longitudinal coat. Beneath this again is a distinct peritoneum lining the coelom, which appears to be wanting as a special layer in some Polychaetes (Benham, Gilson). The muscular layers are thinner in the aquatic forms, which possess only a single row of longitudinal fibres, or (*Enchytracidae*) two layers. In the earthworms, on the other hand, this coat is thick and composed of many layers.

The clitellum consists of a thickening of the epidermis, and is of two forms among the Oligochaeta. In the aquatic genera the epidermis comes to consist entirely of glandular cells, which are, however, arranged in a single layer. In the earthworms, on the other hand, the epidermis becomes specialized into several layers of cells, all of which are glandular. It is therefore obviously much thicker than the clitellum in the limicolous forms. The position of the clitellum, which is universal in occurrence, varies much as does the number of component segments. As a rule—to which, however, there are exceptions—the clitellum consists of two or three segments only

in the small aquatic Oligochaeta, while in the terrestrial forms it is as a general rule, to which again there are exceptions, a more extensive, sometimes much more extensive, region.

In the Oligochaeta there is a closer correspondence between external metamerism and the divisions of the coelom than is apparent in some Chaetopods. The external segments are usually definable by the setae; and if the setae are absent, as in the anterior segments of several *Geoscolicidae*, the nephridiopores indicate the segments; to each segment corresponds internally a chamber of the coelom which is separated from adjacent segments by transverse septa, which are only unrecognizable in the genus *Aeolosoma* and in the head region of other Oligochaeta. In the latter case, the numerous bands of muscle attaching the pharynx to the parietes have obliterated the regular partition by means of septa.

Nephridia.—The nephridia in this group are invariably coiled tubes with an intracellular lumen and nearly invariably open into the coelom by a funnel. There are no renal organs with a wide intercellular lumen, such as occur in the Polychaeta, nor is there ever any permanent association between nephridia and ducts connected with the evacuation of the generative products, such as occur in *Alciope*, *Saccocirrus*, &c. In these points the Oligochaeta agree with the Hirudinea. They also agree in the general structure of the nephridia. It has been ascertained that the nephridia of Oligochaeta are preceded in the embryo by a pair of delicate and sinuous tubes, also found in the Hirudinea and Polychaeta, which are larval excretory organs. It is not quite certain whether these are to be regarded as the remnant of an earlier excretory system, replaced among the Oligochaeta by the subsequently developed paired structures, or whether these “head kidneys” are the first pair of nephridia precociously developed. The former view has been extensively held, and it is supported by the fact that in *Octochaetus* the first segment of the body has a pair of nephridia which is

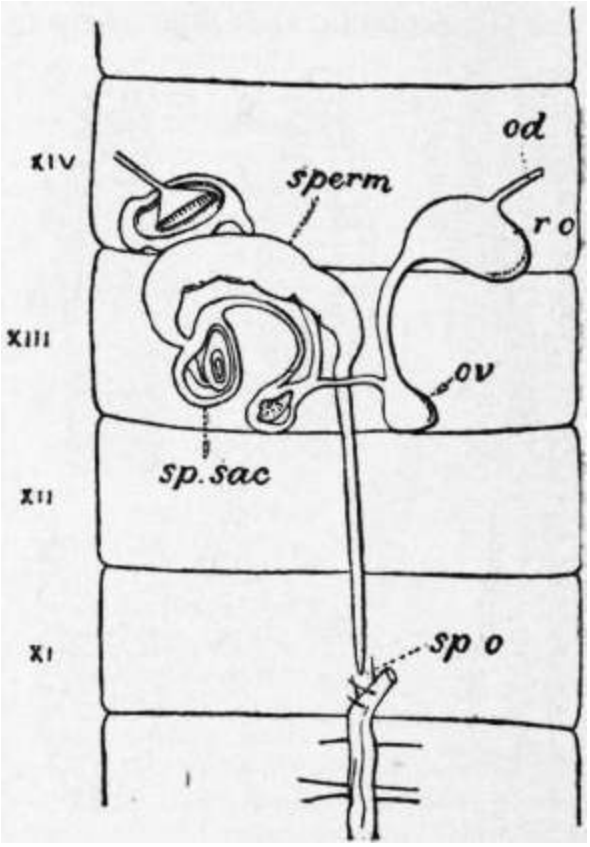
exactly like those which follow, and, like them, persists. On the other hand, in most Oligochaeta the first segment has in the adult no nephridium, and in the case of *Octochaetus* the existence of a "head kidney" antedating the subsequently developed nephridia of the first and other segments has neither been seen nor proved to be absent. In any case the nephridia which occupy the segments of the body generally are first of all represented by paired structures, the "pronephridia," in which the funnel is composed of but one cell, which is flagellate. This stage has at any rate been observed in *Rhynchelmis* and *Lumbricus* (in its widest sense) by Vezhdovský. It is further noticeable that in *Rhynchelmis* the covering of vesicular cells which clothes the drain-pipe cells of the adult nephridium is cut off from the nephridial cells themselves and is not a peritoneal layer surrounding the nephridium. Thus the nephridia, in this case at least, are a part of the coelom and are not shut off from it by a layer of peritoneum, as are other organs which lie in it, *e.g.* the gut. A growth both of the funnel, which becomes multicellular, and of the rest of the nephridium produces the adult nephridia of the genera mentioned. The paired disposition of these organs is the prevalent one among the Oligochaeta, and occurs in all of twelve out of the thirteen families into which the group is divided.

Among the *Megascolicidae*, however, which in number of genera and species nearly equals the remaining families taken together, another form of the excretory system occurs. In the genera *Pheretima, Megascolex*, *Dichogaster*, &c., each segment contains a large number of nephridia, which, on account of the fact that they are necessarily smaller than the paired nephridia of *e.g. Lumbricus*, have been termed micronephridia, as opposed to meganephridia; there is, however, no essential difference in structure, though micronephridia are not uncommonly (*e.g. Megascolides*, *Octochaetus*) unprovided with funnels. It is disputed whether these micronephridia are or are not connected together in each segment and from segment to segment. In any case they have been shown in three genera to

develop by the growth and splitting into a series of original paired pronephridia. A complex network, however, does occur in *Lybiodrilus* and certain other *Eudrilidae*, where the paired nephridia possess ducts leading to the exterior which ramify and anastomose on the thickness of the body wall. The network is, however, of the duct of the nephridium, possibly ectodermic in origin, and does not affect the glandular tubes which remain undivided and with one coelomic funnel each.

The Oligochaeta are the only Chaetopods in which undoubted nephridia may possess a relationship with the alimentary canal. Thus, in *Octochaetus multiporus* a large nephridium opens anteriorly into the buccal cavity, and numerous nephridia in the same worm evacuate their contents into the rectum. The anteriorly-opening and usually very large nephridia are not uncommon, and have been termed "peptonephridia."

Gonads and Gonad Ducts.—The Oligochaeta agree with the leeches and differ from most Polychaeta in that they are hermaphrodite. There is no exception to this generalization. The gonads are, moreover, limited and fixed in numbers, and are



practically invariably attached to the intersegmental septa, usually to the front septum of a segment, more rarely to the posterior septum. The prevalent number of testes is one pair in the aquatic genera and two pairs in earthworms. But there are exceptions; thus a species of *Lamprodrilus* has four pairs of testes. The ovaries are more usually one pair, but two are sometimes present. The segments occupied by the gonads are fixed, and are for earthworms invariably X, XI, or one of them for the testes, and XIII for the ovaries The position varies in the aquatic Oligochaeta. The Oligochaeta contrast with the Polychaeta in the general presence of outgrowths of the septa in the genital segments, which are either close to, or actually involve, the gonads, and into which may also open the funnels of the gonad ducts. These sacs contain the developing sperm cells or eggs, and are with very few exceptions universal in the group. The testes are more commonly thus involved than are the ovaries. It is indeed only among the *Eudrilidae* that the enclosure of the ovaries in septal sacs is at all general. Recently the same thing has been recorded in a few species of *Pheretima* (= *Perichaeta*), but details are as yet wanting. We can thus speak in these worms of *gonocoels*, *i.e.* coelomic cavities connected only with the generative system. These cavities communicate with the exterior through the gonad ducts, which have nothing to do with them, but whose coelomic funnels are taken up by them in the course of their growth. There are, however, in the *Eudrilidae*, as already mentioned, sacs envolving the ovaries which bore their own way to the exterior, and thus may be termed coelomoducts. These sacs are dealt with later under the description of the spermathecae, which function they appear to perform. The gonad ducts are male and female, and open opposite to or, rarely, alongside of the gonads, whose products they

FIG. 12.—Female reproductive system of *Heliodrilus*.—XI-XIV, eleventh to fourteenth segments, *sperm*, spermatheca; *sp.o*, its external orifice; *sp.sac*, spermathecal sac; *ov*, sac containing ovary; *r.o*, egg sac; *od*, oviduct.

convey to the exterior. The oviducts are always short trumpet-shaped tubes and are sometimes reduced (*Enchytraeidae*) to merely the external orifices. It is possible, however, that those oviducts belong to a separate morphological category, more comparable to the dorsal pores and to abdominal pores in some fishes. The sperm ducts are usually longer than the oviducts; but in Limicolae both series of tubes opening by the funnel into one segment and on to the exterior in the following segment. While the oviducts always open directly on to the exterior, it is the rule for the sperm ducts to open on to the exterior near to or through certain terminal chambers, which have been variously termed atrium and prostate, or spermiducal gland. The distal extremity of this apparatus is sometimes eversible as a penis. Associated with these glands are frequently to be found bundles or pairs of long and variously modified setae which are termed penial setae, to distinguish them from other setae sometimes but not always associated with rather similar glands which are found anteriorly to these, and often in the immediate neighbourhood of the spermathecae; the latter are spoken of as genital setae.

Spermathecae.—These structures appear to be absolutely distinctive of the Oligochaeta, unless the sacs which contain sperm and open in common with the nephridia of *Saccocirrus* (see HAPLODRILI) are similar. Spermathecae are generally present in the Oligochaeta and are absent only in comparatively few genera and species. Their position varies, but is constant for the species, and they are rarely found behind the gonads. They are essentially spherical, pear-shaped or oval sacs opening on to the exterior but closed at the coelomic end. In a few *Enchytraeidae* and *Lumbriculidae* the spermathecae open at the distal extremity into the oesophagus, which is a fact difficult of explanation. Among the aquatic Oligochaeta and many earthworms (the families *Lunibricidae*, *Geoscolicidae* and a few other genera) the spermathecae are simple structures, as has been described. In the majority of the *Megascolicidae* each sac is provided with one or more

diverticula, tubular or oval in form, of a slightly different histological character in the lining epithelium, and in them is invariably lodged the sperm.

The spermathecae are usually paired structures, one pair to each of the segments where they occur. In many *Geoscolicidae*, however, and certain *Lumbricidae* and *Perichaetidae*, there are several, even a large number, of pairs of very small spermathecae to each of the segments which contain them.

In the *Eudrilidae* there are spermathecae of different morphological value. In figs. 12 and 13 are shown the spermathecae of the genera *Hyperiodrilus* and *Heliodrilus*, which are simple sacs ending blindly as in other earthworms, but of which there is only one median opening in the thirteenth segment or in the eleventh. In *Heliodrilus* the blind extremity of the spermatheca is enclosed in a coelomic sac which is in connexion with the sacs envolving the ovaries and oviducts. In *Hyperiodrilus* the whole spermatheca is thus included in a corresponding sac, which is of great extent. In such other genera of the family as have been examined, the true spermatheca has entirely disappeared, and the sac which contains it in *Hyperiodrilus* alone remains. This sac has been already referred to as a coelomoduct. Its orifice on to the exterior is formed by an involution (as it appears) of the epidermis, and that it performs the function of a spermatheca is shown by its containing spermatozoa, or, in *Stuhlmannia*, a spermatophore. In *Polytoreutus*, also, spermatophores have been found in these spermathecal sacs. We have thus the replacement of a spermatheca, corresponding to those of the remaining families of Oligochaeta, and derived, as is believed, from the epidermis, by a structure performing the same function, but derived from the mesoblastic tissues, and with a cavity which is coelom.

Alimentary Canal.—The alimentary canal is always a straight tube, and the anus, save in the genera *Criodrilus* and *Dero*, is completely terminal. A buccal cavity, a pharynx, an oesophagus and an intestine are always distinguishable. Commonly among the terrestrial forms there is a gizzard, or two gizzards, or a larger number, in the oesophageal region. There is no armed protrusible pharynx, such as exists in some other Chaetopods. This may be associated with mud-eating habits; but it is not wholly certain that this is the case; for in *Chaetogaster* and *Agriodrilus*, which are predaceous worms, there is no protrusible pharynx, though in the latter the oesophagus is thickened through its extent with muscular fibres. The oesophagus is often furnished with glandular diverticula, the "glands of Morren," which are often of complex structure through the folding of their walls. Among the purely aquatic families such structures are very rare, and are represented by two caeca in the genus *Limnodriloides*. It is a remarkable fact, not yet understood, that in certain *Enchytraeidae* and *Lumbriculidae* the spermathecae open into the oesophagus as well as on to the exterior. The only comparable fact among other worms is the Laurer's canal or genito-intestinal canal in the

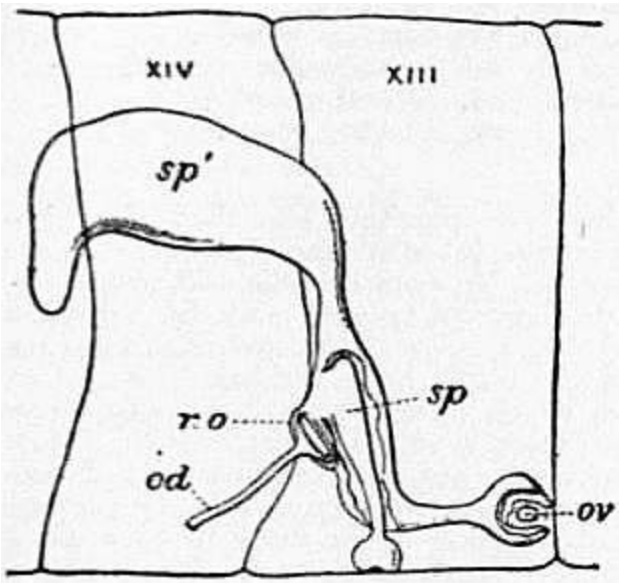


FIG. 13.—Female reproductive system of *Hyperiodrilus*.—XIII, XIV, thirteenth and fourteenth segments.

sp, Spermatheca.
sp', Spermathecal sac involving the last.
ov, Ovary.
r.o, Egg sac.
od, Oviduct.

Trematoda. The intestine is usually in the higher forms provided with a typhlosole, in which, in *Pontoscolex*, runs a ciliated canal or canals communicating with the intestine. It is possible that this represents the syphon or supplementary intestine of *Capitellidae*, which has been shown to develop as a grooving of the intestine ultimately cut off from it. The intestine has a pair of caeca or two or three pairs (but all lie in one segment) in the genus *Pheretima* and in one species of *Rhinodrilus*. In *Typhoeus* and *Megascolex* there are complex glands appended to the intestine.

In *Benhamia caecifera* and at least one other earthworm there are numerous caeca, one pair to each segment.

Classification.—The classifications of Adolf Eduard, Grube and Claparède separated into two subdivisions the aquatic and the terrestrial forms. This scheme, opposed by many, has been reinstated by Sedgwick. The chief difficulty in this scheme is offered by the Moniligastridae, which in some degree combine the characters of both the suborders, into neither of which will they fit accurately. The following arrangement is a compromise: —

Group I. *Aphaneura.*—This group is referred by A. Sedgwick to the Archiannelida. It is, however, though doubtless near to the base of the Oligochaetous series, most nearly allied in the reproductive system to the Oligochaeta. It contains but one family, *Aeolosomatidae*. There are three pairs of spermathecae situated in segments III-V, a testis in V and an ovary in VI. There are a clitellum and sperm ducts which though like nephridia have a larger funnel and a less complexly wound duct. This family consists of only one well-known genus, *Aeolosoma*, which contains several species. They are minute worms with coloured oil drops (green, olive green or orange) contained in the epidermis. The nervous system is embedded in the epidermis, and the pairs of ganglia are separated as in *Serpula*, &c.; each pair has a longish commissure between its two ganglia. The intersegmental

septa are absent save for the division of the first segment. The large prostomium is ciliated ventrally. The setae are either entirely capillary or there are in addition some sigmoid setae even with bifid free extremities. This genus also propagates asexually, like *Ctenodrilus*, which may possibly belong to the same family. Asexual reproduction universal.

Group II. *Limicolae.*—With a few exceptions the Limicolae are, as the name denotes, aquatic in habit. They are small to moderate-sized Oligochaeta, with a smaller number of segments than in the Terricolae. The alimentary canal is simple and a gizzard or oesophageal diverticula rarely developed. The vascular system is simple with as a rule direct communication between dorsal and ventral vessels in each segment. Nerve cord lies in coelom; brain in first segment or prostomium in many forms. Clitellum generally only two or three segments and more anterior in position than in Terricolae. Nephridia always paired and without plexus of blood capillaries. Spermatheca rarely with diverticula; sperm ducts as a rule occupying two segments only, usually opening by means of an atrium. Sperm sacs generally occupying a good many segments and with simple interior undivided by a network of trabeculae. Ova large and with much yolk. Asexual reproduction only in Naids. Egg sacs as large or nearly so as sperm sacs. Testes and ovaries always free. The following families constitute the group, viz. *Naididae*, *Enchytraeidae*, *Tubificidae*, *Lumbriculidae*, *Phreoryctidae*, *Phreodrilidae*, *Alluroididae*, the latter possibly not referable to this group.

Group III. *Moniligastres.*—Moderate-sized to very large Oligochaeta, terrestrial in habit, with the appearance of Terricolae. Generative organs anterior in position as in Limicolae. Sperm ducts and atria as in Limicolae; egg sacs large; body wall thick; vascular system and nephridia as in Terricolae. Only one family, *Moniligastridae*.

Group IV. *Terricolae.*—Earthworms, rarely aquatic in habit. Of small to very large size. Clitellum commonly extensive and more posterior in position than in other groups. Vascular system complicated without regular connexion between dorsal and ventral vessels, except in anterior segments. Nephridia as a rule with abundant vascular supply. Testes, and occasionally ovaries, enclosed in sacs. Sperm sacs generally limited to one or two segments with interior subdivided by trabeculae. Sperm ducts traverse several segments on their way to exterior. They open in common with, or near to, or, more rarely, into, glands which are not certainly comparable to the atria of the Limicolae. Egg sacs minute and functionless(?). Eggs minute with little yolk. Nephridia sometimes very numerous in each segment. Spermathecae often with diverticula.

Earthworms are divided into the following families, viz. *Megascolicidae*, *Geoscolicidae*, *Eudrilidae*, *Lumbricidae*.

As an appendix to the Oligochaeta, and possibly referable to that group, though their systematic position cannot at present be determined with certainty, are to be placed the *Bdellodrilidae* (*Discodrilidae* auct.), which are small parasites upon crayfish. These worms lay cocoons like the Oligochaeta and leeches, and where they depart from the structure of the Oligochaeta agree with that of leeches. The body is composed of a small and limited number of segments (not more than fourteen), and there is a sucker at each end of the body. There are no setae and apparently only two pairs of nephridia, of which the anterior pair open commonly by a common pore on the third segment after the head, whose segments have not been accurately enumerated. The intervening segments contain the genitalia, which are on the Oligochaeta plan in that the gonads are independent of their ducts and that there are special spermathecae, one pair. The male ducts are either one pair or two pairs, which open by a common and complicated efferent terminal apparatus furnished with a protrusible penis. The ganglia

are crowded at the posterior end of the body as in leeches, and there is much tendency to the obliteration of the coelom as in that group. *Pterodrilus* and *Cirrodrilus* bear a few, or circles of, external processes which may be branchiae; *Bdellodrilus* and *Astacobdella* have none. The vascular system is as in the lower Oligochaeta. There are two chitinous jaws in the buccal cavity, a dorsal and a ventral, which are of specially complicated structure in *Cirrodrilus*.

LITERATURE.—F.E. Beddard, *A Monograph of the Oligochaeta* (Oxford, 1895), also *Quart. Journ. Micr. Sci.*, 1886-1895, and *Proc. Zool. Soc.*, 1885-1906; W.B. Benham, *Quart. Journ. Micr. Sci.*, 1886-1905; W. Michaelsen, "Oligochaeta" in *Das Tierreich*, 1900, and *Mitth. Mus.* (Hamburg, 1890-1906); A.G. Bourne, *Quart. Journ. Micr. Sci.*, 1894; H.J. Moore, *Journ. Morph.*, 1895; F. Vezhdovský, *System d. Oligochaeten* (Prague, 1884), and *Entwicklungsgeschichtliche Untersuchungen*; and numerous papers by the above and by G. Eisen, E. Perrier, D. Rosa, R. Horst, L. Cognetti, U. Pierantoni, W. Baldwin Spencer, H. Ude, &c., and embryological memoirs by R.S. Bergh, E.B. Wilson, N. Kleinenberg, &c.

HIRUDINEA.—The leeches are more particularly to be compared with the Oligochaeta, and the following definition embraces the main features in which they agree and disagree with that group. Setae are only present in the genus *Acanthobdella*. Eyes are present, but hardly so complex as in certain genera of Polychaetes. The appendages of the body are reduced to branchiae, present in certain forms. A clitellum is present. The segments of body are few (not more than thirty-four) and fixed in number. The anus is dorsal. One or two (anterior and posterior) suckers always present. Nervous system always in coelom. Coelom generally reduced to a system of tubes, sometimes communicating with vascular system; in *Acanthobdella* and *Ozobranchus* a series of metamerically arranged chambers as in Oligochaeta. Nephridia always paired, rarely (*Pontobdella*) forming a

network communicating from segment to segment; lumen of nephridia always intracellular, funnels pervious or impervious. Alimentary canal sometimes with protrusible proboscis; never with gizzard or oesophageal glands; intestine with caeca as a rule. Jaws often present. Testes several pairs, rarely one pair, continuous with sperm ducts; ovaries, one pair, continuous with oviducts; generative pores single and median. No separate spermathecae or septal chambers for the development of the ova and sperm. Eggs deposited in a cocoon. Development direct. No asexual generation. Fresh-water, marine and terrestrial. Parasitic or carnivorous.

In external characters the Hirudinea are unmistakable and not to be confused with other Annelids, except perhaps with the *Bdellodrilidae*, which resemble them in certain particulars. The absence of setae—save in *Acanthobdella*, where five of the anterior segments possess each four pairs of setae with reserve setae placed close behind them (fig. 14), and the presence of an anterior and posterior sucker, produce a looping mode of progression similar to that of a Geometrid larva. The absence of setae and the great secondary annulation render the mapping of the segments a subject of some difficulty. The most reliable test appears to be the nerve ganglia, which are more distinct from the intervening connectives than in other Annelids.

In the middle of the body, where the limits of the somites can be checked by a comparison with the arrangement of the nephridia and the gonads, and where the ganglia are quite distinct and separated by long connectives, each ganglion is seen to consist of six masses of cells enclosed by capsules and to give off three nerves on each side. This corresponds to the usual presence (in the *Rhynchobdellidae*) of three annuli to each segment. Anteriorly and posteriorly separate ganglia have fused. The brain consists not only of a group of six capsules corresponding to the archicerebrum of the Oligochaeta, but of a further mass of cells surrounding and existing below

the alimentary canal, which can be analysed into five or six more separate ganglia. The whole mass lies in the seventh or eighth segment. At the posterior end of the body there are likewise seven separate ganglia partially fused to form a single ganglionic mass, which innervates the segments lying behind the anus and corresponding to the posterior sucker. So that a leech in which only twenty-seven segments are apparent by the enumeration of the annuli, separate ganglia, nephridia, lines of sensillae upon the body, really possesses an additional seven lying behind that which is apparently the last of the series and crowded together into a minute space. The annuli into which segments are externally divided are so deeply incised as to render it impossible to distinguish, as can be readily done in the Oligochaeta as a rule, the limits of an annulus from that of a true segment. As remarked, the prevalent number of annuli to a segment is three in the *Rhynchobdellidae*. But in that group (*Cystobranchus*) there may be as many as eight annuli. In the *Gnathobdellidae* the prevailing number of annuli to a segment is five; but here again the number is often increased, and *Trocheta* has no less than eleven. The reason for this excessive annulation has been seen in the limited number of segments (thirty-four) of which the body is composed, which are laid down early and do not increase. In the

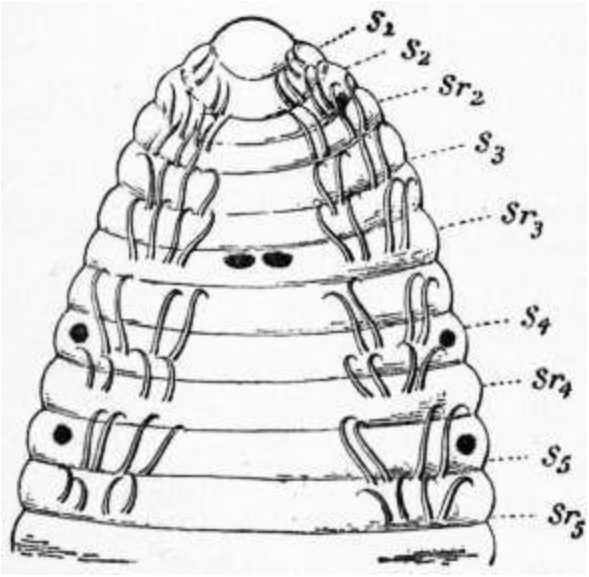


FIG. 14.—*Acanthobdella*, from the ventral surface, showing the five sets of setae (S_1 to S_5) and the replacing setae (*Sr*) behind them. The three pairs of pigmented spots show the position of the eyes on the dorsal surface. (After Kovalevsky.)

Oligochaeta, on the other hand, there is growth of new segments. It is important to notice that the metameric plan of growth of Chaetopods is still preserved.

The nephridia are like those of the Oligochaeta in general structure; that is to say, they consist of drain-pipe cells which are placed end to end and are perforated by their duct. The internal funnel varies in the same way as in the Oligochaeta in the number of cells which form it. In *Clepsine* (*Glossiphonia*) there are only three cells, and in *Nephelis* five to eight cells. In *Hirudo* the funnel is not pervious and is composed of a large number of cells. Externally, the nephridium opens by a vesicle, as in many Oligochaetes whose lumen is intercellular. In *Pontobdella* and *Branchellion* the nephridia form a network extending from segment to segment, but there is only one pair of funnels in each segment. Slight differences in form have been noted between nephridia of different segments; but the Hirudinea do not show the marked differentiation that is to be seen in some other Chaetopods; nor do the nephridia ever acquire any relations to the alimentary canal.

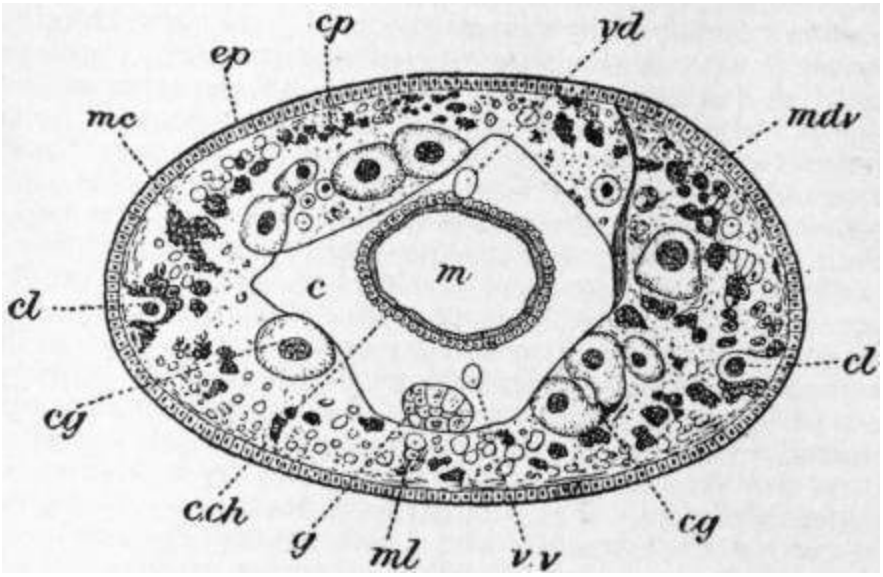


FIG. 15.—Section of *Acanthobdella* (after Kovalevsky).

c, Coelom.
c.ch, Coelomic epithelium (yellow-cells).
cg, Glandular cells.
cl, Muscle cells of lateral line.
cp, Pigment cells.
ep, Ectoderm.
g, Nerve cord.
m, Intestine.
mc, Circular muscle.
ml, Longitudinal muscle.
vd, Dorsal vessel.
vv, Ventral vessel.

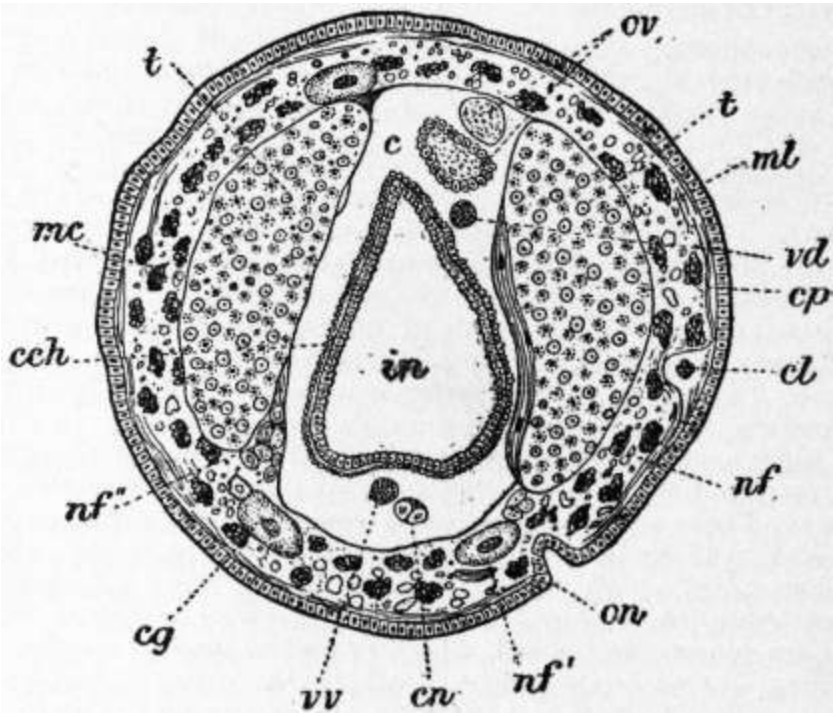


FIG. 16.—Section of *Acanthobdella* (after Kovalevsky). Identical letters as in fig. 2; in addition, *cn*, nerve cord; *in*, intestine; *nf*, parts of nephridium; *on*, external opening of nephridium; *ov*, ova; *t*, testis.

Coelom.—The coelom of the Hirudinea differs in most genera from that of the Oligochaeta and Polychaeta. The difference is that it is broken up into a complex sinus system. The least modified type is shown by *Acanthobdella*, a leech, parasitic upon fishes, in which transverse sections (see figs. 15 and 16) show the gut, the nervous system, &c., lying in a

spacious chamber which is the coelom. This coelom is lined by peritoneal cells and is divided into a series of metameres by septa which correspond to the segmentation of the body, the arrangement being thus precisely like that of typical Chaetopoda. Moreover, upon the intestine the coelomic cells are modified into chloragogen cells. In *Acanthobdella* the testes are, however, not contained in the general coelom, and the nephridia lie in the septa. It is remarkable, in view of the spaciousness of the coelom, that the funnels of the latter have not been seen. *Ozobranchus* possesses a coelom which is less typically chaetopodous than that of *Acanthobdella*, but more so than in other leeches. There is a spacious cavity surrounding the gut and containing also blood-vessels, and to some extent the generative organs, and the nervous cord. Furthermore, in the mid region of the body this coelom is broken up by metamerically arranged septa, as in *Acanthobdella*. These septa are, however, rather incomplete and are not fastened to the gut; and, as in *Acanthobdella*, the nephridia are embedded in them. In addition to the median lacuna there are two lateral lacunae, one upon each side. These regions of the coelom end at the ends of the body and communicate with each other by means of a branched system of coelomic sinuses, which are in places very fine tubes. Neither in this genus nor in the last is there any communication between coelom and vascular system. In *Clepsine* (*Glossiphonia*) there is a further breaking up of the coelom. The median lacuna no longer exists, but is represented by a dorsal and ventral sinus. The former lodges the dorsal, the latter the ventral, blood-vessel. The gut has no coelomic space surrounding it. A complex network places these sinuses and the lateral sinuses in communication. Here also the blood system has no communication with the sinus system of the coelom. In *Hirudo* and the *Gnathobdellidae* there is only one system of cavities which consist of four principal longitudinal trunks, of which the two lateral are contractile, which communicate with a network ramifying everywhere, even among the cells of the epidermis. The network is partly formed out of pigmented cells

which are excavated and join to form tubes, the so-called botryoidal tissue, not found among the *Rhynchobdellidae* at all. It seems clear from the recent investigations of A.G. Bourne and E.S. Goodrich that the vascular system and the coelom are in communication (as in vertebrates by means of the lymph system). On the other hand, it has been held that in these leeches there is no vascular system at all and that the entire system of spaces is coelom. In favour of regarding the vascular system as totally absent, is the fact that the median coelomic channels contain no dorsal and ventral vessel. In favour of seeing in the lateral trunks and their branches a vascular system, is the contractility of the former, and the fact of the intrusion of the latter into the epidermis, matched among the Oligochaeta, where undoubted blood capillaries perforate the epidermis. A further fact must be considered in deciding this question, which is the discovery of ramifying coelomic tubes, approaching close to, but not entering, the epidermis in the Polychaete *Arenicola*. These tubes are lined by flattened epithelium and often contain blood capillaries; they communicate with the coelom and are to be regarded as prolongation of it into the thickness of the body wall.

Gonads and Gonad Ducts.—The gonads and their ducts in the Hirudinea invariably form a closed system of cavities entirely shut off from the coelom in which they lie. There is thus a broad resemblance to the *Eudrilidae*, to which group of Oligochaeta the Hirudinea are further akin by reason of the invariably unpaired condition of the generative apertures, and the existence of a copulatory apparatus (both of which characters, however, are present occasionally in other Oligochaeta).

The testes are more numerous than the ovaries, of which latter there are never more than one pair. The testes vary in numbers of pairs. Four (*Ozobranchus*) to six (*Glossiphonia*) or ten (*Philaemon*) are common numbers. In *Acanthobdella*, however, the testes of each side of the body have grown together to form a continuous band, which extends in front of

external pore. Each testis communicates by means of an efferent duct with a common collecting duct of its side of the body, which opens on to the exterior by means of a protrusible penis, and to which is sometimes appended a seminal vesicle. The efferent ducts are ciliated, and there is a patch of cilia at the point where they communicate with the cavity of each testis. The ovaries are more extensive in some forms (*e.g. Ozobranchus*) than in others, where they are small rounded bodies. The two ducts continuous with the gonads open by a common vagina on to the exterior behind the male pores. This "vagina" is sometimes of exaggerated size. Thus, in *Philaemon pungens* (Lambert) it has the form of a large sac, into which open by a single orifice the conjoined oviducts. From this vagina arises a narrow duct leading to the exterior. In *Ozobranchus* the structures in question are still more complicated. The two long ovarian sacs communicate with each other by a transverse bridge before uniting to form the terminal canal. Into each ovarian sac behind the transverse junction opens a slender tube, which is greatly coiled, and, in its turn, opens into a spherical "spermathecal sac." From this an equally slender tube proceeds, which joins its fellow of the opposite side, and the two form a thick, walled tube, which opens on to the exterior within the bursa copulatrix through which the penis protrudes. These two last-mentioned types show features which can be, as it seems, matched in the Eudrilidae.

The gonads develop (O. Bürger) in coelomic spaces close to nephridial funnels, which have, however, no relation to the gonad ducts. The ovaries are solid bodies, of which the outer layer becomes separated from the plug of cells lying within; thus a cavity is formed which is clearly coelom. This cavity and its walls becomes prolonged to form the oviducts. A stage exactly comparable to the stage in the leeches, where the ovary is surrounded by a closed sac, has been observed in *Eudrilus*. In this Annelid later the sac in question joins its fellow, passing beneath the nerve cord exactly as in the leech, and also grows out to reach the exterior. The sole

difference is therefore that in *Eudrilus* the ovarian sac gives rise to a tube which bifurcates, one branch meeting a corresponding branch of the other ovary of the pair, while the second branch reaches the exterior. In the leech the two branches are fused into one. We have here clearly a case of a true coelomoduct performing the function of an oviduct in both leeches and *Eudrilidae*. The facts just referred to suggest further comparisons between the Hirudinea and *Eudrilidae*. The large sacs which have been termed vagina are suggestive of the large coelomic spermathecae in Eudrilids, a comparison which needs, however, embryological data, not at present forthcoming, for its justification. It is at least clear that in *Ozobranchus* this comparison is justifiable; but only probable, or perhaps possible, in the case of *Philaemon*. In the former, the duct, leading from the ovarian sac, and swelling along its course into the spherical sac, the "spermatheca," is highly suggestive of the oviduct and receptaculum of the *Eudrilidae*.

The testes during development become hollowed out and are prolonged into the vasa efferentia. These ducts therefore have not their exact counterparts in the Oligochaeta, unless we are to assume that they collectively are represented by the seminal vesicles of earthworms and the vasa deferentia. It is to be noted that the Hirudinea differ from the Oligochaeta in that the male pore is in advance of the gonads (except in *Acanthobdella*, which here, as in so many points, approximates to the Oligochaeta), whereas in Oligochaeta that pore is behind the gonads (again with an exception, *Allurus*).

Classification.—The Hirudinea may be divided into three families:—

(i.) *Rhynchobdellidae*.—A protrusible proboscis exists, but there are no jaws. The blood is colourless. *Pontobdella*, *Glossiphonia*, &c.

(ii.) *Gnathobdellidae*.—A proboscis absent, but jaws usually present. Blood coloured red with haemoglobin. *Hirudo*, *Nephelis*, &c.

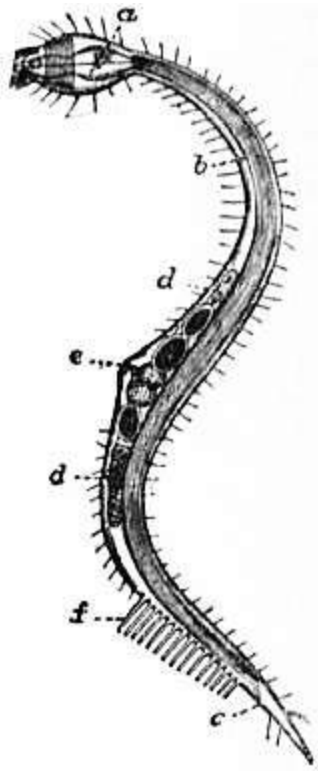
(iii.) *Acanthobdellidae*.—Proboscis present, but short. Paired setae of Oligochaetous pattern present in anterior segments. Blood red. *Acanthobdella*.

LITERATURE.—A.O. Kovalevsky, *Bull. Imp. Sci.* (St Petersburg, November 1896) (*Acanthobdella*); A.G. Bourne, *Quart. Journ. Micr. Sci.*, 1884; A. Oka, *Zeitschr. wiss. Zool.*, 1894; E.S. Goodrich, *Quart. Journ. Micr. Sci.*, 1899; W.E. Castle, *Bull. Mus. Comp. Zool.*, 1900; A.M. Lambert, *Proc. Roy. Soc.* (Victoria, 1897); C.O. Whitman, *Journ. Morph.*, 1889 and 1891; O. Bürger, *Zeitschr. wiss. Zool.*, 1902, and other memoirs by the above, and by St V. Apáthy, R. Blanchard, H. Bolsius, A. Dendy, R.S. Bergh, &c.

(F. E. B.)

CHAETOSOMATIDA, a small group of minute, free-living, aquatic organisms which are usually placed as an annex to the Nematoda. Indeed Mechnikov, to whom we owe much of our knowledge of these forms, calls them “creeping Nematoda.” They are usually found amongst seaweed in temperate seas, but they are probably widely distributed; some are fresh-water. The genus *Chaetosoma*, with the two species *Ch. claparedii* and *Ch. ophicephalum* and the genus *Tristicochaeta*, have swollen heads. The third genus *Rhabdogaster* has no such distinct head, though the body may be swollen anteriorly. The mouth is terminal and anterior and surrounded by a ring of spicules or a half-ring of hooks. Scattered hairs cover the body. Just in front of the anus there is in *Chaetosoma* a double, and in *Tristicochaeta* a triple row of about fifteen stout cylindrical projections upon which the animals creep. The females are a little larger than the males; in *Ch.*

claparedii the former attain a length of 1.5 mm., the latter of 1.12 mm. The mouth opens into an oesophagus which passes into an intestine; this opens by a ventral anus situated a little in front of the posterior end. The testis is single, and its duct opens with the anus, and is provided with a couple of spicules. The ovary is double, and the oviducts open by a median ventral pore about the middle of the body; in this region there is a second swelling both in *Chaetosoma* and in *Rhabdogaster*. The last-named form is in the female 0.36 mm. in length. In it the hairs are confined to the dorsal middle line and the creeping setae are hooked, of a finer structure than in *Chaetosoma*, and situated so far forward that the vagina opens amongst them. *Ch. ophicephalum* has been taken in the English Channel.



From *Cambridge Natural History*, vol. ii. "Worms." by permission of Macmillan & Co., Ltd.

Mature female of *Chaetosoma daparedii*, (From Mechnikov.) *a*, Oesophagus; *b*, intestine; *c*, anus; *d*, ovary; *e*, generative pore; *f*, ventral bristles.

See E. Mechnikov, *Zeitschr. wiss. Zool.* xvii., 1867, p. 537; Panceri, *Atti Acc. Napoli*, vii., 1878, p. 7.

(A. E. S.)

CHAFER, a word used in modern speech to distinguish the beetles of the family *Scarabaeidae*, and more especially those species which feed on leaves in the adult state. The word is derived from the O. Eng. *ceafor*, and it is interesting to note that the cognate Ger. *Käfer* is applied to beetles of all kinds. For the characters of the *Scarabaeidae* see COLEOPTERA. This family includes a large number of beetles, some of which feed on dung and others on vegetable tissues. The cockchafers and their near allies belong to the subfamily *Melolonthinae*, and the rose-chafers to the *Cetoniinae*; in both the beetles eat leaves, and their grubs spend a long life underground devouring roots. In Britain the Melolonthines that are usually noted as injurious are the two species of cockchafer (*Melolontha vulgaris* and *M. hippocastani*), large heavy beetles with black pubescent pro-thorax, brown elytra and an elongated pointed tail-process; the summer-chafer (*Rhizotrogus solstitialis*), a smaller pale brown chafer; and the still smaller garden-chafer or "cocker-bundy" (*Phyllopertha horticola*), which has a dark green pro-thorax and brown elytra. Of the Cetoniines, the beautiful metallic green rose-chafer, *Cetonia aurata*, sometimes causes damage, especially in gardens. The larvae of the chafers are heavy, soft-skinned grubs, with hard brown heads provided with powerful mandibles, three pairs of well-developed legs, and a swollen abdomen. As they grow, the larvae become strongly flexed towards the ventral surface, and lie curled up in their earthen cells, feeding on roots. The larval life lasts several years, and in hard frosts the grubs go deep down away from the surface. Pupation takes place in the autumn, and though the perfect insect emerges from the cuticle very soon afterwards, it remains in its underground cell for several months, not making its way to the upper air until the ensuing summer. After pairing, the female crawls down into the soil to lay her eggs. The grubs of chafers, when turned up by the plough, are greedily devoured by poultry, pigs and various wild birds. When the beetles become so numerous as to call for destruction, they are usually shaken off the trees where they rest on

to sheets or tarred boards. On the continent of Europe chafers are far more numerous than in the United Kingdom, and the rural governments in France give rewards for their destruction. D. Sharp states that in the department of Seine-inférieure 867,173,000 cockchafers and 647,000,000 larvae were killed in the four years preceding 1870.

The anatomy of *Melolontha* is very fully described in a classical memoir by H.E. Strauss-Dürckheim (Paris, 1828).

(G. H. C.)

CHAFF (from the A.S. *ceaf*, allied to the O. High Ger. *cheva*, a husk or pod), the husks left after threshing grain, and also hay and straw chopped fine as food for cattle; hence, figuratively, the refuse or worthless part of anything. The colloquial use of the word, to chaff, in the sense of to banter or to make fun of a person, may be derived from this figurative sense, or from "to chafe," meaning to vex or irritate.

CHAFFARINAS, or ZAITARINES, a group of islands belonging to Spain off the north coast of Morocco, near the Algerian frontier, 2½ m. to the north of Cape del Agna. The largest of these isles, Del Congreso, is rocky and hilly. It has a watch-house on the coast nearest to Morocco. Isabella II.,

the central island, contains several batteries, barracks and a penal convict settlement. The Spanish government has undertaken the construction of breakwaters to unite this island with the neighbouring islet of El Rey, with a view to enclose a deep and already sheltered anchorage. This roadstead affords a safe refuge for many large vessels. The Chaffarinas, which are the *Tres Insulae* of the Romans and the *Zafrān* of the Arabs, were occupied by Spain in 1848. The Spanish occupation anticipated by a few days a French expedition sent from Oran to annex the islands to Algeria. The population of the islands is under 1000.

CHAFFEE, ADNA ROMANZA (1842-), American general, was born at Orwell, Ohio, on the 14th of April 1842. At the outbreak of the Civil War he entered the United States cavalry as a private, and he rose to commissioned rank in 1863, becoming brevet captain in 1865. He remained in the army after the war and took part with distinction in many Indian campaigns. His promotion was, however, slow, and he was at the age of fifty-six still a lieutenant-colonel of cavalry. But in 1898, at the outbreak of the Spanish-American War, he was made brigadier-general and soon afterwards major-general of volunteers. In the Cuban campaign he won particular distinction, and the victory of the Americans in the action of El Caney was in large measure due to his careful personal reconnaissances of the ground to be attacked and to the endurance of his own brigade. After reverting for a time to the rank of brigadier-general, he was made a major-general U.S.V. again in 1900 and was appointed to command the United States contingent in China. He took a brilliant and successful part in the

advance on Peking and the relief of the Legations. In 1901 he became a major-general in the regular army, and in 1901-1902 commanded the Division of the Philippines. In 1902-1903 he commanded the Department of the East, and from 1904 to 1906 was chief of the general staff of the army. In 1904 he received the rank of lieutenant-general in the United States army, being the first enlisted man of the regular army to attain this, the highest rank in the service. He was retired at his own request on the 1st of February 1906, after more than forty years' service.

CHAFFINCH (*Fringilla coelebs*), the common English name of a bird belonging to the family *Fringillidae* (see FINCH), and distinguished, in the male sex, by the deep greyish blue of its crown feathers, the yellowish green of its rump, the white of the wing coverts, so disposed as to form two conspicuous bars, and the reddish brown passing into vinous red of the throat and breast. The female is drab, but shows the same white markings as the male, and the young males resemble the females until after the first autumn moult, when they gradually assume the plumage of their sex. The chaffinch breeds early in the season, and its song may often be heard in February. Its nest, which is a model of neatness and symmetry, it builds on trees and bushes, preferring such as are overgrown with moss and lichens. It is chiefly composed of moss and wool, lined internally with grass, wool, feathers, and whatever soft material the locality affords. The outside consists of moss and lichens, and according to Selby, "is always accordant with the particular colour of its situation." When built in the neighbourhood of towns the nest is somewhat slovenly and untidy, being often composed of

bits of dirty straw, pieces of paper and blackened moss; in one instance, near Glasgow, the author of the *Birds of the West of Scotland* found several postage-stamps thus employed. It lays four or five eggs of a pale purplish buff, streaked and spotted with purplish red. In spring the chaffinch is destructive to early flowers, and to young radishes and turnips just as they appear above the surface; in summer, however, it feeds principally on insects and their larvae, while in autumn and winter its food consists of grain and other seeds. On the continent of Europe the chaffinch is a favourite song-bird, especially in Germany, where great attention is paid to its training.

CHAFING-DISH (from the O. Fr. *chaufer*, to make warm), a kind of portable grate heated with charcoal, and used for cooking or keeping food warm. In a light form, and heated over a spirit lamp, it is also used for cooking various dainty dishes at table. The employment of the chafing-dish for the latter purpose has been largely restored in modern cookery.

CHAGOS, a group of atolls in the Indian Ocean, belonging to Britain, disposed in circular form round the Chagos bank, in 4° 44′ to 7° 39′ S., and 70° 55′ to 72° 52′ E. The atolls on the south and east side of the bank, which has a circumference of about 270 m., have disappeared through subsidence;

a few—Egmont, Danger, Eagle, and Three Brothers—still remain on the east side, but most of the population (about 700) is centred on Diego Garcia, which lies on the south-east side, and is nearly 13 m. long by 6 m. wide. The lagoon, which is enclosed by two coral barriers and accessible to the largest vessels on the north side, forms one of the finest natural harbours in the world. The group, which has a total land area of 76 sq. m., is dependent for administrative purposes on Mauritius, and is regularly visited by vessels from that colony. The only product is cocoa-nut oil, of which about 106,000 gallons are annually exported. The French occupied the islands in 1791 from Mauritius, and the oil industry (from which the group is sometimes called the Oil Islands) came into the hands of French Creoles.

CHAGRES, a village of the Republic of Panama, on the Atlantic coast of the Isthmus, at the mouth of the Chagres river, and about 8 m. W. of Colon. It has a harbour from 10 to 12 ft. deep, which is difficult to enter, however, on account of bars at its mouth. The port was discovered by Columbus in 1502, and was opened for traffic with Panama, on the Pacific coast, by way of the Chagres river, in the 16th century. With the decline of Porto Bello in the 18th century Chagres became the chief Atlantic port of the Isthmus, and was at the height of its importance during the great rush of gold-hunters across the Isthmus to California in 1849 and the years immediately following. With the completion of the Panama railway in 1855, however, travel was diverted to Colon, and Chagres soon became a village of miserable huts, with no evidence of its former importance. On a high rock at the mouth of the river stands the castle of Lorenzo, which was

destroyed by Sir Henry Morgan when he captured the town in 1671, but was rebuilt soon afterwards by the Spaniards. Chagres was again captured in 1740 by British forces under Admiral Edward Vernon.

CHAIN (through the O. Fr. *choeine*, *choene*, &c., from Lat. *catena*), a series of links of metal or other material so connected together that the whole forms a flexible band or cord. Chains are used for a variety of purposes, such as fastening, securing, or connecting together two or more objects, supporting or lifting weights, transmitting mechanical power, &c.; or as an ornament to serve as a collar, as a symbol of office or state, or as part of the insignia of an order of knighthood; or as a device from which to hang a jewelled or other pendant, a watch, &c. (see COLLAR). Ornamental chains are made with a great variety of links, but those intended for utilitarian purposes are mostly of two types. In stud chains a stud or brace is inserted across each link to prevent its sides from collapsing inwards under strain, whereas in open link chains the links have no studs. The addition of studs is reckoned to increase the load which the chain can safely bear by 50%. Small chains of the open-link type are to a great extent made by machinery. For larger sizes the smith cuts off a length of iron rod of suitable diameter, forms it while hot to the shape of the link by repeated blows of his hammer, and welds together the two ends of the link, previously slipped inside its fellow, by the aid of the same tool; in some cases the bending is done in a mechanical press and the welding under a power hammer (see also CABLE). Weldless chains are also made; in A.G. Strathern's process, for instance, cruciform steel bars are pressed, while hot, into links, each

without join and engaging with its neighbours. Chains used for transmitting power are known as pitch-chains; the chain of a bicycle (*q.v.*) is an example.

From the use of the chain as employed to bind or fetter a prisoner or slave, comes the figurative application to anything which serves as a constraining or restraining force; and from its series of connected links, to any series of objects, events, arguments, &c., connected by succession, logical sequence or reasoning. Specific uses are for a measuring line in land-surveying, consisting of 100 links, *i.e.* iron rods, 7.92 in. in length, making 22 yds. in all, hence a lineal measure of that length; and, as a nautical term, for the contrivance by which the lower shrouds of a mast are extended and secured to the ship's sides, consisting of dead-eyes, chain-plates, and chain-wale or "channel."

CHAIR (in. Mid. Eng. *choere*, through O. Fr. *chaëre* or *chaiere*, from Lat. *cathedra*, later *caledra*, Gr. καθέδρα, seat, cf. "cathedral"; the modern Fr. form *chaise*, a chair, has been adopted in English with a particular meaning as a form of carriage; *chaire* in French is still used of a professorial or ecclesiastical "chair," or *cathedra*), a movable seat, usually with four legs, for a single person, the most varied and familiar article of domestic furniture. The chair is of extreme antiquity, although for many centuries and indeed for thousands of years it was an appanage of state and dignity rather than an article of ordinary use. "The chair" is still extensively used as the emblem of authority in the House of Commons and in public meetings. It was not, in fact, until the 16th century that it became common anywhere. The chest, the bench and the stool were until then the ordinary

seats of everyday life, and the number of chairs which have survived from an earlier date is exceedingly limited; most of such examples are of ecclesiastical or seigneurial origin. Our knowledge of the chairs of remote antiquity is derived almost entirely from monuments, sculpture and paintings. A few actual examples exist in the British Museum, in the Egyptian museum at Cairo, and elsewhere. In ancient Egypt they appear to have been of great richness and splendour. Fashioned of ebony and ivory, or of carved and gilded wood, they were covered with costly stuffs and supported upon representations of the legs of beasts of the chase or the figures of captives. An arm-chair in fine preservation found in a tomb in the Valley of the Kings is astonishingly similar, even in small details, to that "Empire" style which followed Napoleon's campaign in Egypt. The earliest monuments of Nineveh represent a chair without a back but with tastefully carved legs ending in lions' claws or bulls' hoofs; others are supported by figures in the nature of caryatides or by animals. The earliest known form of Greek chair, going back to five or six centuries before Christ, had a back but stood straight up, front and back. On the frieze of the Parthenon Zeus occupies a square seat with a bar-back and thick turned legs; it is ornamented with winged sphinxes and the feet of beasts. The characteristic Roman chairs were of marble, also adorned with sphinxes; the curule chair was originally very similar in form to the modern folding chair, but eventually received a good deal of ornament.

The most famous of the very few chairs which have come down from a remote antiquity is the reputed chair of St Peter in St Peter's at Rome. The wooden portions are much decayed, but it would appear to be Byzantine work of the 6th century, and to be really an ancient *sedia gestatoria*. It has ivory carvings representing the labours of Hercules. A few pieces of an earlier oaken chair have been let in; the existing one, Gregorovius says, is of acacia wood. The legend that this was the curule chair of the senator Pudens is necessarily apocryphal. It is not, as is popularly supposed,

enclosed in Bernini's bronze chair, but is kept under triple lock and exhibited only once in a century. Byzantium, like Greece and Rome, affected the curule form of chair, and in addition to lions' heads and winged figures of Victory and dolphin-shaped arms used also the lyre-back which has been made familiar by the pseudo-classical revival of the end of the 18th century. The chair of Maximian in the cathedral of Ravenna is believed to date from the middle of the 6th century. It is of marble, round, with a high back, and is carved in high relief with figures of saints and scenes from the Gospels—the Annunciation, the Adoration of the Magi, the flight into Egypt and the baptism of Christ. The smaller spaces are filled with carvings of animals, birds, flowers and foliated ornament. Another very ancient seat is the so-called "Chair of Dagobert" in the Louvre. It is of cast bronze, sharpened with the chisel and partially gilt; it is of the curule or faldstool type and supported upon legs terminating in the heads and feet of animals. The seat, which was probably of leather, has disappeared. Its attribution depends entirely upon the statement of Suger, abbot of St Denis in the 12th century, who added a back and arms. Its age has been much discussed, but Viollet-le-Duc dated it to early Merovingian times, and it may in any case be taken as the oldest faldstool in existence. To the same generic type belongs the famous abbots' chair of Glastonbury; such chairs might readily be taken to pieces when their owners travelled. The *faldisterium* in time acquired arms and a back, while retaining its folding shape. The most famous, as well as the most ancient, English chair is that made at the end of the 13th century for Edward I., in which most subsequent monarchs have been crowned. It is of an architectural type and of oak, and was covered with gilded *gesso* which long since disappeared.

Passing from these historic examples we find the chair monopolized by the ruler, lay or ecclesiastical, to a comparatively late date. As the seat of authority it stood at the head of the lord's table, on his dais, by the side of his bed. The seigneurial chair, commoner in France and the Netherlands

than in England, is a very interesting type, approximating in many respects to the episcopal or abbatial throne or stall. It early acquired a very high back and sometimes had a canopy. Arms were invariable, and the lower part was closed in with panelled or carved front and sides—the seat, indeed, was often hinged and sometimes closed with a key. That we are still said to sit "in" an arm-chair and "on" other kinds of chairs is a reminiscence of the time when the lord or seigneur sat "in his chair." These throne-like seats were always architectural in character, and as Gothic feeling waned took the distinctive characteristics of Renaissance work. It was owing in great measure to the Renaissance that the chair ceased to be an appanage of state, and became the customary companion of whomsoever could afford to buy it. Once the idea of privilege faded the chair speedily came into general use, and almost at once began to reflect the fashions of the hour. No piece of furniture has ever been so close an index to sumptuary changes. It has varied in size, shape and sturdiness with the fashion not only of women's dress but of men's also. Thus the chair which was not, even with its arms purposely suppressed, too ample during the several reigns of some form or other of hoops and farthingale, became monstrous when these protuberances disappeared. Again, the costly laced coats of the dandy of the 18th and early 19th centuries were so threatened by the ordinary form of seat that a "conversation chair" was devised, which enabled the buck and the ruffler to sit with his face to the back, his valuable tails hanging unimpeded over the front. The early chair almost invariably had arms, and it was not until towards the close of the 16th century that the smaller form grew common.

The majority of the chairs of all countries until the middle of the 17th century were of oak without upholstery, and when it became customary to cushion them, leather was sometimes employed; subsequently velvet and silk were extensively used, and at a later period cheaper and often more durable materials. Leather was not infrequently used even for the costly and

elaborate chairs of the faldstool form—occasionally sheathed in thin plates of silver—which Venice sent all over Europe. To this day, indeed, leather is one of the most frequently employed materials for chair covering. The outstanding characteristic of most chairs until the middle of the 17th century was massiveness and solidity. Being usually made of oak, they were of considerable weight, and it was not until the introduction of the handsome Louis XIII. chairs with cane backs and seats that either weight or solidity was reduced. Although English furniture derives so extensively from foreign and especially French and Italian models, the earlier forms of English chairs owed but little to exotic influences. This was especially the case down to the end of the Tudor period, after which France began to set her mark upon the British chair. The squat variety, with heavy and sombre back, carved like a piece of panelling, gave place to a taller, more slender, and more elegant form, in which the framework only was carved, and attempts were made at ornament in new directions. The stretcher especially offered opportunities which were not lost upon the cabinet-makers of the Restoration. From a mere uncompromising cross-bar intended to strengthen the construction it blossomed, almost suddenly, into an elaborate scroll-work or an exceedingly graceful semicircular ornament connecting all four legs, with a vase-shaped knob in the centre. The arms and legs of chairs of this period were scrolled, the splats of the back often showing a rich arrangement of spirals and scrolls. This most decorative of all types appears to have been popularized in England by the cavaliers who had been in exile with Charles II. and had become familiar with it in the north-western parts of the European continent. During he reign of William and Mary these charming forms degenerated into something much stiffer and more rectangular, with a solid, more or less fiddle-shaped splat and a cabriole leg with pad feet. The more ornamental examples had cane seats and ill-proportioned cane backs. From these forms was gradually developed the Chippendale chair, with its elaborately interlaced back, its graceful arms

and square or cabriole legs, the latter terminating in the claw and ball or the pad foot. Hepplewhite, Sheraton and Adam all aimed at lightening the chair, which, even in the master hands of Chippendale, remained comparatively heavy. The endeavour succeeded, and the modern chair is everywhere comparatively slight. Chippendale and Hepplewhite between them determined what appears to be the final form of the chair, for since their time practically no new type has lasted, and in its main characteristics the chair of the 20th century is the direct derivative of that of the later 18th.

The 18th century was, indeed, the golden age of the chair, especially in France and England, between which there was considerable give and take of ideas. Even Diderot could not refrain from writing of them in his *Encyclopédie*. The typical Louis Seize chair, oval-backed and ample of seat, with descending arms and round-reeded legs, covered in Beauvais or some such gay tapestry woven with Boucher or Watteau-like scenes, is a very gracious object, in which the period reached its high-water mark. The Empire brought in squat and squabby shapes, comfortable enough no doubt, but entirely destitute of inspiration. English Empire chairs were often heavier and more sombre than those of French design. Thenceforward the chair in all countries ceased to attract the artist. The *art nouveau* school has occasionally produced something of not unpleasing simplicity; but more often its efforts have been frankly ugly or even grotesque. There have been practically no novelties, with the exception perhaps of the basket-chair and such like, which have been made possible by modern command over material. So much, indeed, is the present indebted to the past in this matter that even the revolving chair, now so familiar in offices, has a pedigree of something like four centuries (see also SEDAN-CHAIR).

(J. P.-B.)

CHAISE (the French for “chair,” through a transference from a “sedan-chair” to a wheeled vehicle), a light two- or four-wheeled carriage with a movable hood or “calash”; the “post-chaise” was the fast-travelling carriage of the 18th and early 19th centuries. It was closed and four-wheeled for two or four horses and with the driver riding postillion.

CHAKRATA, a mountain cantonment in the Dehra Dun district of the United Provinces of India, on the range of hills overlooking the valleys of the Jumna and the Tons, at an elevation of 7000 ft. It was founded in 1866 and first occupied in April 1869.

CHALCEDON, more correctly CALCHEDON (mod. *Kadikeui*), an ancient maritime town of Bithynia, in Asia Minor, almost directly opposite Byzantium, south of Scutari. It was a Megarian colony founded on a site so obviously inferior to that which was within view on the opposite shore, that it received from the oracle the name of “the City of the Blind.” In its early history it shared the fortunes of Byzantium, was taken by the satrap Otanes, vacillated long between the Lacedaemonian and the Athenian interests, and was at last bequeathed to the Romans by Attalus III. of Pergamum (133 B.C.). It was partly destroyed by Mithradates, but recovered during the Empire, and in A.D. 451 was the seat of the Fourth General Council. It fell

under the repeated attacks of the barbarian hordes who crossed over after having ravaged Byzantium, and furnished an encampment to the Persians under Chosroes, c. 616-626. The Turks used it as a quarry for building materials for Constantinople. The site is now occupied by the village of Kadikeui ("Village of the Judge"), which forms the tenth "cercle" of the municipality of Constantinople. Pop. about 33,000, of whom 8000 are Moslems. There is a large British colony with a church, and also Greek and Armenian churches and schools, and a training college for Roman Catholic Armenians. To the S. are the ruins of Panteichion (mod. *Pendik*), where Belisarius is said to have lived in retirement.

See J. von Hammer, *Constantinopolis* (Pesth, 1822); Murray's *Handbook for Constantinople* (London, 1900).

CHALCEDON, COUNCIL OF, the fourth ecumenical council of the Catholic Church, was held in 451, its occasion being the Eutychian heresy and the notorious "Robber Synod" (see EUTYCHES and EPHESUS, COUNCIL OF), which called forth vigorous protests both in the East and in the West, and a loud demand for a new general council, a demand that was ignored by the Eutychian Theodosius II., but speedily granted by his successor, Marcian, a "Flavianist." In response to the imperial summons, five to six hundred bishops, all Eastern, except the Roman legates and two Africans, assembled in Chalcedon on the 8th of October 451. The bishop of Rome claimed for his legates the right to preside, and insisted that any act that failed to receive their approval would be invalid. The first session was tumultuous; party feeling ran high, and scurrilous and vulgar epithets were

bandied to and fro. The acts of the Robber Synod were examined; fraud, violence and coercion were charged against it; its entire proceedings were annulled, and, at the third session, its leader, Dioscurus, was deposed and degraded. The emperor requested a declaration of the true faith; but the sentiment of the council was opposed to a new symbol. It contented itself with reaffirming the Nicene and Constantinopolitan creeds and the Ephesine formula of 431, and accepting, only after examination, the Christological statement contained in the *Epistola Dogmatica* of Leo I. (*q.v.*) to Flavianus. Thus the council rejected both Nestorianism and Eutychianism, and stood upon the doctrine that Christ had two natures, each perfect in itself and each distinct from the other, yet perfectly united in one person, who was at once both God and man. With this statement, which was formally subscribed in the presence of the emperor, the development of the Christological doctrine was completed, but not in a manner to obviate further controversy (see MONOPHYSITES and MONOTHELITES).

The remaining sessions, vii.-xvi., were occupied with matters of discipline, complaints, claims, controversies and the like. Canons were adopted, thirty according to the generally received tradition, although the most ancient texts contain but twenty-eight, and, as Hefele points out, the so-called twenty-ninth and thirtieth are properly not canons, but repetitions of proposals made in a previous session.

The most important enactments of the council of Chalcedon were the following: (1) the approval of the canons of the first three ecumenical councils and of the synods of Ancyra, Neo-Caesarea, Changra, Antioch and Laodicea; (2) forbidding trade, secular pursuits and war to the clergy, bishops not even being allowed to administer the property of their dioceses; (3) forbidding monks and nuns to marry or to return to the world; likewise forbidding the establishment of a monastery in any diocese without the consent of the bishop, or the disestablishment of a monastery once

consecrated; (4) punishing with deposition an ordination or clerical appointment made for money; forbidding "absolute ordination" (*i.e.* without assignment to a particular charge), the translation of clerics except for good cause, the enrolment of a cleric in two churches at once, and the performance of sacerdotal functions outside of one's diocese without letters of commendation from one's bishop; (5) confirming the jurisdiction of bishops over all clerics, regular and secular alike, and punishing with deposition any conspiracy against episcopal authority; (6) establishing a gradation of ecclesiastical tribunals, viz. bishop, provincial synod, exarch of the diocese, patriarch of Constantinople (obviously the council could not here have been legislating for the entire church); forbidding clerics to be running to Constantinople with complaints, without the consent of their respective bishops; (7) confirming the possession of rural parishes to those who had actually administered them for thirty years, providing for the adjudication of conflicting claims, and guaranteeing the integrity of metropolitan provinces; (8) confirming the third canon of the second ecumenical council, which accorded to Constantinople equal privileges (ἴσα πρεσβεῖα) with Rome, and the second rank among the patriarchates, and, in addition, granting to Constantinople patriarchal jurisdiction over Pontus, Asia and Thrace.

The Roman legates, who were absent (designedly?) when this famous twenty-eighth canon was adopted, protested against it, but in vain, the imperial commissioners deciding in favour of its regularity and validity. Leo I., although he recognized the council as ecumenical and confirmed its doctrinal decrees, rejected canon xxviii. on the ground that it contravened the sixth canon of Nicaea and infringed the rights of Alexandria and Antioch. In what proportion zeal for the ancient canons and the rights of others, and jealous fear of encroachment upon his own jurisdiction, were mixed in the motives of Leo, it would be interesting to know. The canon

was universally received in the East, and was expressly confirmed by the Quinisext Council, 692 (see CONSTANTINOPLE, COUNCILS OF).

The emperor Marcian approved the doctrinal decrees of the council and enjoined silence in regard to theological questions. Eutyches and Dioscurus and their followers were deposed and banished. But harmony was not thus to be restored; hardly had the council dissolved when the church was plunged into the Monophysite controversy.

See Mansi vi. pp. 529-1102, vii. pp. 1-868; Hardouin ii. pp. 1-772; Hefele (2nd ed.) ii. pp. 394-578 (English translation, iii. pp. 268-464); also extended bibliographies in Herzog-Hauck, *Realencyklopädie*, 3rd ed., *s.v.* "Eutyches" (by Loofs) and *s.v.* "Nestorianer" (by Kessler).

(T. F. C.)

CHALCEDONY, or CALCEDONY (sometimes called by old writers cassidoine), a variety of native silica, often used as an ornamental stone. The present application of the term is comparatively modern. The "chalcedonius" of Pliny was quite a different mineral, being a green stone from the copper-mines of Chalcedon, in Asia Minor, whence the name. There has been some confusion between chalcedony and the ancient "carcedonia," a stone which seems to have been a carbuncle from Africa, brought by way of Carthage (Καρχηδών). Our chalcedony was probably included by the ancients among the various kinds of jasper and agate, especially the varieties termed "leucachates" and "cerachates."

By modern mineralogists the name chalcedony is restricted to those kinds of silica which occur not in distinct crystals like ordinary quartz, but in concretionary, mammillated or stalactitic forms, which break with a fine splintery fracture, and display a delicate fibrous structure. Chalcedony may be regarded as a micro-crystalline form of quartz. It is rather softer and less dense than crystallized quartz, its hardness being about 6.5 and its specific gravity 2.6, the difference being probably due to the presence of a small amount of opaline silica between the fibres. Chalcedony is a translucent substance of rather waxy lustre, presenting great variety of colours, though usually white, grey, yellow or brown. A rare blue chalcedony is sometimes polished under the name of “sapphirine”—a term applied also to a distinct mineral (an aluminium-magnesium silicate) from Greenland.

Chalcedony occurs as a secondary mineral in volcanic rocks, representing usually the silica set free by the decomposition of various silicates, and deposited in cracks, forming veins, or in vesicular hollows, forming amygdales. Its occurrence gives the name to Chalcedony Park, Arizona. It is found in the basalts of N. Ireland, the Faroe Isles and Iceland: it is common in the traps of the Deccan in India, and in volcanic rocks in Uruguay and Brazil. Certain flat oval nodules from a decomposed lava (augite-andesite) in Uruguay present a cavity lined with quartz crystals and enclosing liquid (a weak saline solution), with a movable air-bubble, whence they are called “enhydros” or water-stones. Very fine examples of stalactitic chalcedony, in whimsical forms, have been yielded by some of the Cornish copper-mines. The surface of chalcedony is occasionally coated with a delicate bluish bloom. A chalcedonic deposit in the form of concentric rings, on fossils and fragments of limestone in S. Devon, is known as “orbicular silica” or “beekite,” having been named after Dr Henry Beeke, dean of Bristol, who first directed attention to such deposits. Certain pseudomorphs of chalcedony after datolite, from Haytor in Devonshire, have received the name of “haytorite.” Optical examination of many

chalcedonic minerals by French mineralogists has shown that they are aggregates of various fibrous crystalline bodies differing from each other in certain optical characters, whence they are distinguished as separate minerals under such names as calcedonite, pseudocalcedonite, quartzine, lutecite and lussatite. Many coloured and variegated chalcedonies are cut and polished as ornamental stones, and are described under special headings. Chalcedony has been in all ages the commonest of the stones used by the gem-engraver.

See AGATE, BLOODSTONE, CARNELIAN, CHRYSOPRASE, HELIOTROPE, MOCHA STONE, ONYX, SARD and SARDONYX.

(F. W. R.*)

CHALCIDICUM, in Roman architecture, the vestibule or portico of a public building opening on to the forum; as in the basilica of Eumactria at Pompeii, and the basilica of Constantine at Rome, where it was placed at one end.

CHALCIS, the chief town of the island of Euboea in Greece, situated on the strait of the Euripus at its narrowest point. The name is preserved from antiquity and is derived from the Greek χαλκός (copper, bronze), though

there is no trace of any mines in the neighbourhood. Chalcis was peopled by an Ionic stock which early developed great industrial and colonizing activity. In the 8th and 7th centuries it founded thirty town-ships on the peninsula of Chalcidice, and several important cities in Sicily (*q.v.*). Its mineral produce, metal-work, purple and pottery not only found markets among these settlements, but were distributed over the Mediterranean in the ships of Corinth and Samos. With the help of these allies Chalcis engaged the rival league of its neighbour Eretria (*q.v.*) in the so-called Lelantine War, by which it acquired the best agricultural district of Euboea and became the chief city of the island. Early in the 6th century its prosperity was broken by a disastrous war with the Athenians, who expelled the ruling aristocracy and settled a cleruchy on the site. Chalcis subsequently became a member of both the Delian Leagues. In the Hellenistic period it gained importance as a fortress by which the Macedonian rulers controlled central Greece. It was used by kings Antiochus III. of Syria (192) and Mithradates VI. of Pontus (88) as a base for invading Greece. Under Roman rule Chalcis retained a measure of commercial prosperity; since the 6th century A.D. it again served as a fortress for the protection of central Greece against northern invaders. From 1209 it stood under Venetian control; in 1470 it passed to the Ottomans, who made it the seat of a pasha. In 1688 it was successfully held against a strong Venetian attack. The modern town has about 10,000 inhabitants, and maintains a considerable export trade which received an impetus from the establishment of railway connexion with Athens and Peiraeus (1904). It is composed of two parts—the old walled town towards the Euripus, called the Castro, where the Jewish and Turkish families who have remained there mostly dwell; and the more modern suburb that lies outside it, which is chiefly occupied by the Greeks. A part of the walls of the Castro and many of the houses within it were shaken down by the earthquake of 1894; part has been demolished in the widening of the Euripus. The most interesting object is the church of St Paraskeve, which

was once the chief church of the Venetians; it dates from the Byzantine period, though many of its architectural features are Western. There is also a Turkish mosque, which is now used as a guard-house.

AUTHORITIES.—Strabo vii. fr. 11, x. p. 447; Herodotus v. 77; Thucydides i. 15; *Corpus Inscr. Atticarum*, iv. (1) 27a, iv. (2) 10, iv. (2) p. 22; W.M. Leake, *Travels in Northern Greece* (London, 1835), ii. 254-270; E. Curtius in *Hermes*, x. (1876), p. 220 sqq.; A. Holm, *Lange Fehde* (Berlin, 1884); H. Dondorff, *De Rebus Chalcidensium* (Göttingen, 1869); for coinage, B.V. Head, *Historia Numorum* (Oxford, 1887), pp. 303-5; and art. NUMISMATICS: *Greek* § Euboea.

CHALCONDYLES[1] (or CHALCOCONDYLAS), **LAONICUS,** the only Athenian Byzantine writer. Hardly anything is known of his life. He wrote a history, in ten books, of the period from 1298-1463, describing the fall of the Greek empire and the rise of the Ottoman Turks, which forms the centre of the narrative, down to the conquest of the Venetians and Mathias, king of Hungary, by Mahommed II. The capture of Constantinople he rightly regarded as an historical event of far-reaching importance, although the comparison of it to the fall of Troy is hardly appropriate. The work incidentally gives a quaint and interesting sketch of the manners and civilization of England, France and Germany, whose assistance the Greeks sought to obtain against the Turks. Like that of other Byzantine writers, Chalcondyles' chronology is defective, and his adherence to the old Greek geographical nomenclature is a source of confusion. For his account of earlier events he was able to obtain information from his father, who was

one of the most prominent men in Athens during the struggles between the Greek and Frankish nobles. His model is Thucydides (according to Bekker, Herodotus); his language is tolerably pure and correct, his style simple and clear. The text, however, is in a very corrupt state.

Editio princeps, ed. J.B. Baumbach (1615); in Bonn *Corpus Scriptorum Hist. Byz.* ed. I. Bekker (1843); Migne, *Patrologia Graeca*, clix. There is a French translation by Blaise de Vigenère (1577, later ed. by Artus Thomas with valuable illustrations on Turkish matters); see also F. Gregorovius, *Geschichte der Stadt Athen im Mittelalter*, ii. (1889); Gibbon, *Decline and Fall*, ch. 66; C. Krumbacher, *Geschichte der byzantinischen Litteratur* (1897). There is a biographical sketch of Laonicus and his brother in Greek by Antonius Calosynas, a physician of Toledo, who lived in the latter part of the 16th century (see C. Hopf, *Chroniques gréco-romanes*, 1873).

His brother, Demetrius Chalcondyles[1] (1424-1511), was born in Athens. In 1447 he migrated to Italy, where Cardinal Bessarion gave him his patronage. He became famous as a teacher of Greek letters and the Platonic philosophy; in 1463 he was made professor at Padua, and in 1479 he was summoned by Lorenzo de' Medici to Florence to fill the professorship vacated by John Argyropoulos. In 1492 he removed to Milan, where he died in 1511. He was associated with Marsilius Ficinus, Angelus Politianus, and Theodorus Gaza, in the revival of letters in the western world. One of his pupils at Florence was the famous John Reuchlin. Demetrius Chalcondyles published the editio princeps of Homer, Isocrates, and Suidas, and a Greek grammar (*Erotemata*) in the form of question and answer.

See H. Hody, *De Graecis illustribus* (1742); C. Hopf, *Chroniques gréco-romanes* (1873); E. Legrand, *Bibliographic hellénique*, i. (1885).

---

1 A shortened form of Chalcocondyles, from χαλκός, copper, and κόνδυλος, knuckle.

CHALDAEA. The expressions "Chaldaea'" and "Chaldaeans" are frequently used in the Old Testament as equivalents for "Babylonia" and "Babylonians." Chaldaea was really the name of a country, used in two senses. It was first applied to the extreme southern district, whose ancient capital was the city of *Bīt Yakīn*, the chief seat of the renowned Chaldaean rebel Merodach-baladan, who harassed the Assyrian kings Sargon and Sennacherib. It is not as yet possible to fix the exact boundaries of the original home of the Chaldaeans, but it may be regarded as having been the long stretch of alluvial land situated at the then separate mouths of the Tigris and Euphrates, which rivers now combine to flow into the Persian Gulf in the waters of the majestic *Shatt el 'Arab*.

The name "Chaldaea," however, soon came to have a more extensive application. In the days of the Assyrian king Rammān-nirāri III. (812-783 B.C.), the term *mat Kaldū* covered practically all Babylonia. Furthermore, Merodach-baladan was called by Sargon II. (722-705 B.C.) "king of the land of the Chaldaeans" and "king of the land of Bīt Yakīn" after the old capital city, but there is no satisfactory evidence that Merodach-baladan had the right to the title "Babylonian." The racial distinction between the Chaldaeans and the Babylonians proper seems to have existed until a much later date, although it is almost certain that the former were originally a Semitic people. That they differed from the Arabs and Aramaeans is also seen from the distinction made by Sennacherib (705-681 B.C.) between the Chaldaeans and these races. Later, during the period covering the fall of Assyria and the rise of the Neo-Babylonian empire, the term *mat Kaldū* was not only applied to all Babylonia, but also embraced the territory of certain

foreign nations who were later included by Ezekiel (xxiii. 23) under the expression “Chaldaeans.”

As already indicated, the Chaldaeans were most probably a Semitic people. It is likely that they first came from Arabia, the supposed original home of the Semitic races, at a very early date along the coast of the Persian Gulf and settled in the neighbourhood of Ur (“Ur of the Chaldees,” Gen. xi. 28), whence they began a series of encroachments, partly by warfare and partly by immigration, against the other Semitic Babylonians. These aggressions after many centuries ended in the Chaldaean supremacy of Nabopolassar and his successors (c. 626 ff.), although there is no positive proof that Nabopolassar was purely Chaldaean in blood. The sudden rise of the later Babylonian empire under Nebuchadrezzar, the son of Nabopolassar, must have tended to produce so thorough an amalgamation of the Chaldaeans and Babylonians, who had theretofore been considered as two kindred branches of the same original Semite stock, that in the course of time no perceptible differences existed between them. A similar amalgamation, although in this case of two peoples originally racially distinct, has taken place in modern times between the Manchu Tatars and the Chinese. It is quite evident, for example, from the Semitic character of the Chaldaean king-names, that the language of these Chaldaeans differed in no way from the ordinary Semitic Babylonian idiom which was practically identical with that of Assyria. Consequently, the term “Chaldaean” came quite naturally to be used in later days as synonymous with “Babylonian.” When subsequently the Babylonian language went out of use and Aramaic took its place, the latter tongue was wrongly termed “Chaldee” by Jerome, because it was the only language known to him used in Babylonia. This error was followed until a very recent date by many scholars.

The derivation of the name "Chaldaean" is extremely uncertain. Peter Jensen has conjectured with slight probability that the Chaldaeans were Semitized Sumerians, *i.e.* a non-Semitic tribe which by contact with Semitic influences had lost its original character. There seems to be little or no evidence to support such a view. Friedrich Delitzsch derived the name "Chaldaean" = *Kasdīm* from the non-Semitic Kaššites who held the supremacy over practically all Babylonia during an extended period (c. 1783-1200 B.C.). This theory seems also to be extremely improbable. It is much more likely that the name "Chaldaean" is connected with the Semitic stem *kasādu* (conquer), in which case *Kaldi-Kašdi*, with the well-known interchange of *l* and *š*, would mean "conquerors." It is also possible that *Kašdu-Kaldu* is connected with the proper name Chesed, who is represented as having been the nephew of Abraham (Gen. xxii. 22). There is no connexion whatever between the Black Sea peoples called "Chaldaeans" by Xenophon (*Anab*. vii. 25) and the Chaldaeans of Babylonia.

In Daniel, the term "Chaldaeans" is very commonly employed with the meaning "astrologers, astronomers," which sense also appears in the classical authors, notably in Herodotus, Strabo and Diodorus. In Daniel i. 4, by the expression "tongue of the Chaldaeans," the writer evidently meant the language in which the celebrated Babylonian works on astrology and divination were composed. It is now known that the literary idiom of the Babylonian wise men was the non-Semitic Sumerian; but it is not probable that the late author of Daniel (c. 168 B.C.) was aware of this fact.

The word "Chaldaean" is used in Daniel in two senses. It is applied as elsewhere in the Old Testament as a race-name to the Babylonians (Dan. iii. 8, v. 30, ix. 1); but the expression is used oftener, either as a name for some special class of magicians, or as a term for magicians in general (ix. 1). The transfer of the name of the people to a special class is perhaps to be explained in the following manner. As just shown, "Chaldaean" and

"Babylonian" had become in later times practically synonymous, but the term "Chaldaean" had lived on in the secondary restricted sense of "wise men." The early *Kaldi* had seized and held from very ancient times the region of old Sumer, which was the centre of the primitive non-Semitic culture. It seems extremely probable that these Chaldaean Semites were so strongly influenced by the foreign civilization as to adopt it eventually as their own. Then, as the Chaldaeans soon became the dominant people, the priestly caste of that region developed into a Chaldaean institution. It is reasonable to conjecture that southern Babylonia, the home of the old culture, supplied Babylon and other important cities with priests, who from their descent were correctly called "Chaldaeans." This name in later times, owing to the racial amalgamation of the Chaldaeans and Babylonians, lost its former national force, and became, as it occurs in Daniel, a distinctive appellation of the Babylonian priestly class. It is possible, though not certain, that the occurrence of the word *kalū* (priest) in Babylonian, which has no etymological connexion with *Kaldū*, may have contributed paronomastically towards the popular use of the term "Chaldaeans" for the Babylonian Magi. (See also ASTROLOGY.)

LITERATURE.—Delattre, *Les Chaldéens jusqu'à la fond. de l'emp. de Nebuch.* (1889); Winckler, *Untersuchungen zur altor. Gesch.* (1889), pp. 49 ff.; *Gesch. Bab. u. Assyr.* (1892), pp. 111 ff.; Prince, *Commentary on Daniel* (1899), pp. 59-61; see also BABYLONIA AND ASSYRIA and SUMER AND SUMERIAN.
(J. D. PR.)

CHALDEE, a term sometimes applied to the Aramaic portions of the biblical books of Ezra and Daniel or to the vernacular paraphrases of the Old Testament (see TARGUM). The explanation formerly adopted and embodied in the name Chaldee is that the change took place in Babylon. That the so-called Biblical Chaldee, in which considerable portions of the books of Ezra and Daniel are written, was really the language of Babylon was supposed to be clear from Dan. ii. 4, where the Chaldaeans are said to have spoken to the king in Aramaic. But the cuneiform inscriptions show that the language of the Chaldaeans was Assyrian; and an examination of the very large part of the Hebrew Old Testament written later than the exile proves conclusively that the substitution of Aramaic for Hebrew as the vernacular of Palestine took place very gradually. Hence scholars are now agreed that the term "Chaldee" is a misnomer, and that the dialect so called is really the language of the South-Western Arameans, who were the immediate neighbours of the Jews (W. Wright, *Comparative Grammar of the Semitic Languages*, p. 16). (See SEMITIC LANGUAGES.)

CHALICE (through a central O. Fr. form of the Lat. *calix*, *calicis*, cup), a drinking-vessel of the cup or goblet form, now only used of the cup used in the celebration of the Eucharist (*q.v.*). For the various forms which the "chalice" so used has taken, see DRINKING-VESSELS and PLATE. When, in the eucharistic service, water is mixed with the wine, the "chalice" is known as the "mixed chalice." This has been customary both in the Eastern and Western Churches from early times. The Armenian Church does not use the "mixed chalice." It was used in the English Church before the Reformation. According to the present law of the English Church, the mixing of the water with wine is lawful, if this is not done as part of or during the services, *i.e.* if it is not done ceremonially (*Martin* v. *Mackonochie*, 1868, L.R. 2 P.C. 365; *Read* v. *Bp. of Lincoln*, 1892, A C. 664).

CHALIER, JOSEPH (1747-1793), French Revolutionist. He was destined by his family for the church, but entered business, and became a partner in a firm at Lyons for which he travelled in the Levant, in Italy, Spain and Portugal. He was in Paris in 1789, and entered into relations with Marat, Camille Desmoulins and Robespierre. On his return to Lyons, Chalier was the first to be named member of the municipal bureau. He organized the national guard, applied the civil constitution of the clergy, and regulated the finances of the city so as to tax the rich heavily and spare the poor. Denounced to the Legislative Assembly by the directory of the department of Rhone-et-Loire for having made a nocturnal domiciliary perquisition, he was sent to the bar of the Assembly, which approved of his conduct. In the election for mayor of Lyons, in November 1792, he was defeated by a Royalist. Then Chalier became the orator and leader of the Jacobins of Lyons, and induced the other revolutionary clubs and the commune of his city to arrest a great number of Royalists in the night of the 5th and 6th of February 1793. The mayor, supported by the national guard, opposed this project. Chalier demanded of the Convention the establishment of a revolutionary tribunal and the levy of a revolutionary army at Lyons. The Convention refused, and the anti-revolutionary party, encouraged by this refusal, took action. On the 29th and 30th of May 1793 the sections rose; the Jacobins were dispossessed of the municipality and Chalier arrested. On the 15th of July, in spite of the order of the Convention, he was brought before the criminal tribunal of the Rhone-et-Loire, condemned to death, and guillotined the next day. The Terrorists paid a veritable worship to his memory, as to a martyr of Liberty.

See N. Wahl, "Étude sur Chalier," in *Revue historique*, t. xxxiv.; and *Les Premières Années de la Révolution à Lyon* (Paris, 1894).

CHALK, the name given to any soft, pulverulent, pure white limestone. The word is an old one, having its origin in the Saxon *cealc*, and the hard form "kalk" is still in use amongst the country folk of Lincolnshire. The German *Kalk* comprehends all forms of limestone; therefore a special term, *Kreide*, is employed for chalk—French *craie*. From being used as a common name, denoting a particular material, the word was subsequently utilized by geologists as an appellation for the *Chalk formation*; and so prominent was this formation in the eyes of the earlier workers that it imposed its name upon a whole system of rocks, the Cretaceous (Lat. *creta*, chalk), although this rock itself is by no means generally characteristic of the system as a whole.

The Chalk formation, in addition to the typical chalk material—*creta scriptoria*—comprises several variations; argillaceous kinds—*creta marga* of Linnaeus—known locally as malm, marl, clunch, &c.; and harder, more stony kinds, called rag, freestone, rock, hurlock or harrock in different districts. In certain parts of the formation layers of nodular flints (*q.v.*) abound; in parts, it is inclined to be sandy, or to contain grains of glauconite which was originally confounded with another green mineral, chlorite, hence the name "chloritic marl" applied to one of the subdivisions of the chalk. In its purest form chalk consists of from 95 to 99% of calcium carbonate (carbonate of lime); in this condition it is composed of a mass of

fine granular particles held together by a somewhat feeble calcareous cement. The particles are mostly the broken tests of foraminifera, along with the débris of echinoderm and molluscan shells, and many minute bodies, like coccoliths, of somewhat obscure nature.

The earliest attempts at subdivision of the Chalk formation initiated by Wm. Phillips were based upon lithological characters, and such a classification as "Upper Chalk with Flints," "Lower Chalk without Flints," "Chalk marl or Grey chalk," was generally in use in England until W. Whitaker established the following order in 1865:—

Upper Chalk, with flints	
Lower Chalk	chalk rock chalk with few flints chalk without flints
Chalk Marl	Totternhoe stone Totternhoe marl

In France, a similar system of classification was in vogue, the subdivisions being *craie blanche*, *craie tufan*, *craie chloritée*, until 1843 when d'Orbigny proposed the term *Senonien* for the Upper Chalk and *Turonien* for the Lower; later he divided the *Turonien*, giving the name *Cénomanien* to the lower portion. The subdivisions of d'Orbigny were based upon the fossil contents and not upon the lithological characters of the rocks. In 1876 Prof. Ch. Barrois showed how d'Orbigny's classification might be applied to the British chalk rocks; and this scheme has been generally adopted by geologists, although there is some divergence of opinion as to the exact position of the base line of the Cenomanian.

The accompanying table shows the classification now adopted in England, with the zonal fossils and the continental names of the substages:—

Zonal fossils used in Britain.	Stages.	N. France and Belgium.*	S.E. and S. France.
Ostrea lunata (Norfolk) *Belemnitella mucronata* A. *Actinocamax quadratus* = *Inoceramus lingua* in Yorkshire *Marsupites testudinarium* {*Marsupites*, *Uintacrinus*}	Danian? (Trimingham) Upper Chalk Senonian *Craie blanche*	Flint-bearing chalk.	Marls, sandstones and limestones (not chalky) with *Hippurites*.
B. *Micraster cor-anguinum* *Micraster cor-testudinarium*			

Holaster planus, Chalk rock			
Terebratulina gracilis *Rhynchonella Cuvieri*, Melbourne rock	Middle Chalk Turonian *Craie marneuse*		
Actinocamax plenus *Holaster subglobosus*, Totternhoe stone. *Schloenbachia varians*.	Lower Chalk, Chalk Marl and Cambridge Greensand Cenomanian *Craie glauconieuse*	Marly chalk.	

*(See table in article CRETACEOUS SYSTEM.)

Since Prof. Barrois introduced the zonal system of subdivision (C. Evans had used a similar scheme six years earlier), our knowledge of the English chalk has been greatly increased by the work of Jukes-Browne and William Hill, and particularly by the laborious studies of Dr A.W. Rowe. Instead of employing the mixed assemblage of animals indicated as zone fossils in the table, A. de Grossouvre proposed a scheme for the north of France based upon ammonite faunas alone, which he contended would be of more general applicability (*Recherches sur la Craie Supérieure*, Paris, 1901).

The Upper Chalk has a maximum thickness in England of about 1000 ft., but post-cretaceous erosion has removed much of it in many districts. It is more constant in character, and more typically chalky than the lower stages; flints are abundant, and harder nodular beds are limited to the lower portions, where some of the compact limestones are known as "chalk rock." The thickness of the Middle Chalk varies from about 100 to 240 ft.; flints become scarcer in descending from the upper to the lower portions. The whole is more compact than the upper stage, and nodular layers are more frequent—the "chalk rock" of Dorset and the Isle of Wight belong to this stage. At the base is the hard "Melbourne rock." The thickness of the Lower Chalk in England varies from 60 to 240 ft. This stage includes part of the "white chalk without flints," the "chalk marl," and the "grey chalk." The Totternhoe stone is a hard freestone found locally in this stage. The basement bed in Norfolk is a pure limestone, but very frequently it is marly with grains of sand and glauconite, and often contains phosphatic nodules; this facies is equivalent to the "Cambridge Greensand" of some districts and the "chloritic marl" of others. In Devonshire the Lower Chalk has become thin sandy calcareous series.

The chalk can be traced in England from Flamborough Head in Yorkshire, in a south-westerly direction, to the coast of Dorset; and it not only underlies the whole of the S.E. corner, where it is often obscured by Tertiary deposits, but it can be followed across the Channel into northern France. Rocks of the same age as the chalk are widespread (see CRETACEOUS SYSTEM); but the variety of limestone properly called by this name is almost confined to the Anglo-Parisian basin. Some chalk occurs in the great Cretaceous deposits of Russia, and in Kansas, Iowa, Nebraska and S. Dakota in the United States. Hard white chalk occurs in Ireland in Antrim, and on the opposite shore of Scotland in Mull and Morven.

Economic Products of the Chalk.—Common chalk has been frequently used for rough building purposes, but the more important building stones are "Beer stone," from Beer Head in Devonshire, "Sutton stone" from a little north of Beer, and the "Totternhoe stone." It is burned for lime, and when mixed with some form of clay is used for the manufacture of cement; chalk marl has been used alone for

this purpose. As a manure, it has been much used as a dressing for clayey land. Flints from the chalk are used for road metal and concrete, and have been employed in building as a facing for walls. Phosphatic nodules for manure have been worked from the chloritic marl and Cambridge Greensand, and to some extent from the Middle Chalk. The same material is worked at Ciply in Belgium and Picardy in France. Chalk is employed in the manufacture of carbonate of soda, in the preparation of carbon dioxide, and in many other chemical processes; also for making paints, crayons and tooth-powder. *Whiting* or *Spanish white*, used to polish glass and metal, is purified chalk prepared by triturating common chalk with a large quantity of water, which is then decanted and allowed to deposit the finely-divided particles it holds in suspension.

Chalk Scenery.—Where exposed at the surface, chalk produces rounded, smooth, grass-covered hills as in the Downs of southern England and the Wolds of Yorkshire and Lincolnshire. The hills are often intersected by clean-cut dry valleys. It forms fine cliffs on the coast of Kent, Yorkshire and Devonshire.

Chalk is employed medicinally as a very mild astringent either alone or more usually with other astringents. It is more often used, however, for a purely mechanical action, as in the preparation hydrargyrum cum creta. As an antacid its use has been replaced by other drugs.

Black chalk or *drawing slate* is a soft carbonaceous schist, which gives a black streak, so that it can be used for drawing or writing. *Brown chalk* is a kind of umber. *Red chalk* or *reddle* is an impure earthy variety of haematite. *French chalk* is a soft variety of steatite, a hydrated magnesium silicate.

The most comprehensive account of the British chalk is contained in the *Memoirs of the Geological Survey of the United Kingdom*, "The Cretaceous Rocks of Britain," vol. ii. 1903, vol. iii. 1904 (with bibliography), by Jukes-Browne and Hill. See also "The White Chalk of the English Coast," several papers in the *Proceedings of the Geologists' Association*, London, (1) Kent and Sussex, xvi. 1900, (2) Dorset, xvii., 1901, (3) Devon, xviii., 1903, (4) Yorkshire, xviii., 1904.

(J. A. H.)

CHALKHILL, JOHN (fl. 1600?), English poet. Two songs by him are included in Izaak Walton's *Compleat Angler*, and in 1683 appeared "Thealma and Clearchus. A Pastoral History in smooth and easie Verse. Written long since by John Chalkhill, Esq., an Acquaintant and Friend of Edmund Spencer" (1683), with a preface written five years earlier by Walton. Another poem, "Alcilia, Philoparthens Loving Follie" (1595, reprinted in vol. x. of the *Jahrbuch des deutschen Shakespeare-Vereins*), was at one time attributed to him. Nothing further is known of the poet, but a person of his name occurs as one of the coroners for Middlesex in the later years of Queen Elizabeth's reign. Professor Saintsbury, who included *Thealma and Clearchus* in vol. ii. of his *Minor Poets of the Caroline Period* (Oxford, 1906), points out a marked resemblance between his work and that of William Chamberlayne.

CHALKING THE DOOR, a Scottish custom of landlord and tenant law. In former days the law was that "a burgh officer, in presence of witnesses, chalks the most patent door forty days before Whit Sunday, having made out an execution of 'chalking,' in which his name must be inserted, and which must be subscribed by himself and two witnesses." This ceremony now proceeds simply on the verbal order of the proprietor. The execution of chalking is a warrant under which decree of removal will be pronounced by the burgh court, in virtue of which the tenant may be ejected on the expiration of a charge of six days.

CHALLAMEL, JEAN BAPTISTE MARIUS AUGUSTIN (1818-1894), French historian, was born in Paris on the 18th of March 1818. His writings consist chiefly of popular works, which enjoyed great success. The value of some of his books is enhanced by numerous illustrations, *e.g. Histoire-museé de la Révolution française*, which appeared in 50 numbers in 1841-1842 (3rd ed., in 72 numbers, 1857-1858); *Histoire de la mode en France; la toilette des femmes depuis l'époque gallo-romaine jusqu'à nos jours* (1874, with 12 plates; new ed., 1880, with 21 coloured plates). His *Mémoires du peuple française* (1865-1873) and *La France et les Français a travers les siécles* (1882) at least have the merit of being among the first books written on the social history of France. In this sense Challamel was a pioneer, of no great originality, it is true, but at any rate of fairly wide information. He died on the 20th of October 1894.

CHALLEMEL-LACOUR, PAUL AMAND (1827-1896), French statesman, was born at Avranches on the 19th of May 1827. After passing through the École Normale Supérieure he became professor of philosophy successively at Pau and at Limoges. The *coup d'état* of 1851 caused his expulsion from France for his republican opinions. He travelled on the continent, and in 1856 settled down as professor of French literature at the Polytechnic of Zürich. The amnesty of 1859 enabled him to return to France, but a projected course of lectures on history and art was immediately suppressed. He now supported himself by his pen, and became a regular contributor to the reviews. On the fall of the Second Empire in September 1870 the government of national defence appointed him prefect of the department of the Rhone, in which capacity he had to suppress the Communist rising at Lyons. Resigning his post on the 5th of February 1871, he was in January 1872 elected to the National Assembly, and in 1876 to the Senate. He sat at first on the Extreme Left; but his philosophic and critical temperament was not in harmony with the recklessness of French radicalism, and his attitude towards political questions underwent a steady modification, till the close of his life saw him the foremost representative of moderate republicanism. During Gambetta's lifetime, however, Challemel-Lacour was one of his warmest supporters, and he was for a time editor of Gambetta's organ, the *République française*. In 1879

he was appointed French ambassador at Bern, and in 1880 was transferred to London; but he lacked the suppleness and command of temper necessary to a successful diplomatist. He resigned in 1882, and in February 1883 became minister of foreign affairs in the Jules Ferry cabinet, but retired in November of the same year. In 1890 he was elected vice-president of the Senate, and in 1893 succeeded Jules Ferry as its president. His influence over that body was largely due to his clear and reasoned eloquence, which placed him at the head of contemporary French orators. In 1893 he also became a member of the French Academy. He distinguished himself by the vigour with which he upheld the Senate against the encroachments of the chamber, but in 1895 failing health forced him to resign, and he died in Paris on the 26th of October 1896. He published a translation of A. Heinrich Ritter's *Geschichte der Philosophie* (1861); *La Philosophie individualiste: étude sur Guillaume de Humboldt* (1864); and an edition of the works of Madame d'Épinay (1869).

In 1897 appeared Joseph Reinach's edition of the *Œuvres oratoires de Challemel-Lacour*.

CHALLENGE (O. Fr. *chalonge, calenge*, &c., from Lat. *calumnia*, originally meaning trickery, from *calvi*, to deceive, hence a false accusation, a "calumny"), originally a charge against a person or a claim to anything, a defiance. The term is now particularly used of an invitation to a trial of skill in any contest, or to a trial by combat as a vindication of personal honour (see DUEL), and, in law, of the objection to the members of a jury allowed in a civil action or in a criminal trial (see JURY).

"CHALLENGER" EXPEDITION. The scientific results of several short expeditions between 1860 and 1870 encouraged the council of the Royal Society to approach the British government, on the suggestion of Sir George Richards, hydrographer to the admiralty, with a view to commissioning a vessel for a prolonged cruise for oceanic exploration. The government detailed H.M.S. "Challenger," a wooden corvette of 2306 tons, for the purpose. Captain (afterwards Sir) George Nares was placed in command, with a naval crew; and a scientific staff was selected by the society with Professor (afterwards Sir) C. Wyville Thomson as director. The staff included Mr (afterwards Sir) John Murray and Mr H.N. Moseley, biologists; Dr von Willemoes-Suhm, Commander Tizard, and Mr J.Y. Buchanan, chemist and geologist. A complete scheme of instructions was drawn up by the society. The "Challenger" sailed from Portsmouth in December 1872. For nearly a year the work of the expedition lay in the Atlantic, which was crossed several times. Teneriffe, the Bermudas, the Azores, Madeira, the Cape Verd Islands, Bahia and Tristan da Cunha were successively visited, and in October 1873 the ship reached Cape Town. Steering then south-east and east she visited the various islands between 45° and 50° S., and reached

Kerguelen Island in January 1874. She next proceeded southward about the meridian of 80° E. She was the first steamship to cross the Antarctic circle, but the attainment of a high southerly latitude was not an object of the voyage, and early in March the ship left the south polar regions and made for Melbourne. Extensive researches were now made in the Pacific. The route led by New Zealand, the Fiji Islands, Torres Strait, the Banda Sea, and the China Sea to Hong Kong. The western Pacific was then explored northward to Yokohama, after which the "Challenger" struck across the ocean by Honolulu and Tahiti to Valparaiso. She then coasted southward, penetrated the Straits of Magellan, touched at Montevideo, recrossed the Atlantic by Ascension and the Azores, and reached Sheerness in May 1876. This voyage is without parallel in the history of scientific research. The *"Challenger" Report* was issued in fifty volumes (London, 1880-1895), mainly under the direction of Sir John Murray, who succeeded Wyville Thomson in this work in 1882. Specialists in every branch of science assisted in its production. The zoological collections alone formed the basis for the majority of the volumes; the deep-sea soundings and samples of the deposits, the chemical analysis of water samples, the meteorological, water-temperature, magnetic, geological, and botanical observations were fully worked out, and a summary of the scientific results, narrative of the cruise and indices were also provided.

See also Lord G. Campbell, *Log Letters from the "Challenger"*, (1876); W.J.J. Spry, *Cruise of H.M.S. "Challenger"* (1876); Sir C. Wyville Thomson, *Voyage of the "Challenger," The Atlantic, Preliminary Account of General Results* (1877); J.J. Wild, *At Anchor; Narrative of Experiences afloat and ashore during the Voyage of H.M.S. "Challenger"* (1878); H.N. Moseley, *Notes by a Naturalist on the "Challenger"* (1879).

CHALLONER, RICHARD (1691-1781), English Roman Catholic prelate, was born at Lewes, Sussex, on the 29th of September 1691. After the death of his father, who was a rigid Dissenter, his mother, left in poverty, lived with some Roman Catholic families. Thus it came about that he was brought up as a Roman Catholic, chiefly at the seat of Mr Holman at Warkworth, Northamptonshire, where the Rev. John Gother, a celebrated controversialist, officiated as chaplain. In 1704 he was sent to the English College at Douai, where he was ordained a priest in 1716, took his degrees in divinity, and was appointed professor in that faculty. In 1730 he was sent on the English mission and stationed in London. The controversial treatises which he published in rapid succession attracted much attention, particularly his *Catholic Christian Instructed* (1737), which was prefaced by a witty reply to Dr Conyers Middleton's *Letters from Rome, showing an Exact Conformity between Popery and Paganism*. Middleton is said to have been so irritated that he endeavoured to put the penal laws in force against his antagonist, who prudently withdrew from London. In 1741 Challoner was raised to the episcopal dignity at Hammersmith, and nominated co-adjutor with right of succession to Bishop Benjamin Petre, vicar-apostolic of the London district, whom he succeeded in 1758. He resided principally in London, but was obliged to retire into the country during the "No Popery" riots of 1780. He died on the 12th of January 1781, and was buried at Milton, Berkshire. Bishop Challoner was the author of numerous controversial

and devotional works, which have been frequently reprinted and translated into various languages. He compiled the *Garden of the Soul* (1740 ?), which continues to be the most popular manual of devotion among English-speaking Roman Catholics, and he revised an edition of the Douai version of the Scriptures (1749-1750), correcting the language and orthography, which in many places had become obsolete. Of his historical works the most valuable is one which was intended to be a Roman Catholic antidote to Foxe's well-known martyrology. It is entitled *Memoirs of Missionary Priests and other Catholicks of both Sexes who suffered Death or Imprisonment in England on account of their Religion, from the year 1577 till the end of the reign of Charles II.* (2 vols. 1741, frequently reprinted). He also published anonymously, in 1745, the lives of English, Scotch and Irish saints, under the title of *Britannia Sancta*, an interesting work which has, however, been superseded by that of Alban Butler.

For a complete list of his writings see J. Gillow's *Bibl. Dict. of Eng. Cath.* i. 452-458; Barnard, *Life of R. Challoner* (1784); Flanagan, *History of the Catholic Church in England* (1857); there is also a critical history of Challoner by Rev. E. Burton.

CHALMERS, ALEXANDER (1750-1834), Scottish writer, was born in Aberdeen on the 29th of March 1759. He was educated as a doctor, but gave up this profession for journalism, and he was for some time editor of the *Morning Herald*. Besides editions of the works of Shakespeare, Beattie, Fielding, Johnson, Warton, Pope, Gibbon, Bolingbroke, he published *A General Biographical Dictionary* in 32 vols.(1812-1817); a *Glossary to Shakspeare* (1797); an edition of Steevens's Shakespeare (1809); and the *British Essayists*, beginning with the *Tatler* and ending with the *Observer*, with biographical and historical prefaces and a general index. He died in London on the 19th of December 1834.

CHALMERS, GEORGE (1742-1825), Scottish antiquarian and political writer, was born at Fochabers, a village in the county of Moray, in 1742. His father, James Chalmers, was a grandson of George Chalmers of Pittensear, a small estate in the parish of Lhanbryde, now St Andrews-Lhanbryde, in the same county, possessed by the main line of the family from about the beginning of the 17th to the middle of the 18th century. After completing the usual course at King's College, Aberdeen, young Chalmers studied law in Edinburgh for several years. Two uncles on the father's side having settled in America, he visited Maryland in 1763, with the view, it is said, of assisting to recover a tract of land of some extent about which a dispute had arisen, and was in this way induced to commence practice as a lawyer at Baltimore, where for a time he met with much success. Having, however, espoused the cause of the Royalist party on the breaking out of the American War of Independence, he found it expedient to

abandon his professional prospects in the New World, and return to his native country. For the losses he had sustained as a colonist he received no compensation, and several years elapsed before he obtained an appointment that placed him in a state of comfort and independence.

In the meantime Chalmers applied himself with great diligence and assiduity to the investigation of the history and establishment of the English colonies in North America; and enjoying free access to the state papers and other documents preserved among what were then termed the plantation records, he became possessed of much important information. His work entitled *Political Annals of the present United Colonies from their Settlement to the Peace of 1763*, 4to, London, 1780, was to have formed two volumes; but the second, which should have contained the period between 1688 and 1763, never appeared. The first volume, however, is complete in itself, and traces the original settlement of the different American colonies, and the progressive changes in their constitutions and forms of government as affected by the state of public affairs in the parent kingdom. Independently of its value as being compiled from original documents, it bears evidence of great research, and has been of essential benefit to later writers. Continuing his researches, he next gave to the world *An Estimate of the Comparative Strength of Britain during the Present and Four Preceding Reigns*, London, 1782, which passed through several editions. At length, in August 1786, Chalmers, whose sufferings as a Royalist must have strongly recommended him to the government of the day, was appointed chief clerk to the committee of privy council on matters relating to trade, a situation which he retained till his death in 1825, a period of nearly forty years. As his official duties made no great demands on his time, he had abundant leisure to devote to his favourite studies,—the antiquities and topography of Scotland having thenceforth special attractions for his busy pen.

Besides biographical sketches of Defoe, Sir John Davies, Allan Ramsay, Sir David Lyndsay, Churchyard and others, prefixed to editions of their respective works, Chalmers wrote a life of Thomas Paine, the author of the *Rights of Man*, which he published under the assumed name of Francis Oldys, A.M., of the University of Pennsylvania; and a life of Ruddiman, in which considerable light is thrown on the state of literature in Scotland during the earlier part of the last century. His life of Mary, Queen of Scots, in two 4to vols., was first published in 1818. It is founded on a MS. left by John Whitaker, the historian of Manchester; but Chalmers informs us that he found it necessary to rewrite the whole. The history of that ill-fated queen occupied much of his attention, and his last work, *A Detection of the Love-Letters lately attributed in Hugh Campbell's work to Mary Queen of Scots*, is an exposure of an attempt to represent as genuine some fictitious letters said to have passed between Mary and Bothwell which had fallen into deserved oblivion. In 1797 appeared his *Apology for the Believers in the Shakespeare Papers which were exhibited in Norfolk Street*, followed by other tracts on the same subject. These contributions to the literature of Shakespeare are full of curious matter, but on the whole display a great waste of erudition, in seeking to show that papers which had been proved forgeries might nevertheless have been genuine. Chalmers also took part in the Junius controversy, and in *The Author of Junius Ascertained, from a Concatenation of Circumstances amounting to Moral Demonstration*, Lond. 1817, 8vo, sought to fix the authorship of the celebrated letters on Hugh Boyd. In 1824 he published *The Poetical Remains of some of the Scottish Kings, now first collected*; and in the same year he edited and presented as a contribution to the Bannatyne Club *Robene and Makyne and the Testament of Cresseid, by Robert Henryson*. His political writings are equally numerous. Among them may be mentioned *Collection of*

Treaties between Great Britain and other Powers, Lond. 1790, 2 vols. 8vo; *Vindication of the Privileges of the People in respect to the Constitutional Right of Free Discussion*, &c., Lond. 1796, 8vo, published anonymously; *A Chronological Account of Commerce and Coinage in Great Britain from the Restoration till 1810*, Lond. 1810, 8vo; *Opinions of Eminent Lawyers on various points of English Jurisprudence, chiefly concerning the Colonies, Fisheries, and Commerce of Great Britain*, Lond. 1814, 2 vols. 8vo; *Comparative Views of the State of Great Britain before and since the War*, Lond. 1817, 8vo.

But Chalmers's greatest work is his *Caledonia*, which, however, he did not live to complete. The first volume appeared in 1807, and is introductory to the others. It is divided into four books, treating successively of the Roman, the Pictish, the Scottish and the Scoto-Saxon periods, from 80 to 1306 A.D. In these we are presented, in a condensed form, with an account of the people, the language and the civil and ecclesiastical history, as well as the agricultural and commercial state of Scotland during the first thirteen centuries of our era. Unfortunately the chapters on the Roman period are entirely marred by the author's having accepted as genuine Bertram's forgery *De Situ Britanniae*; but otherwise his opinions on controverted topics are worthy of much respect, being founded on a laborious investigation of all the original authorities that were accessible to him. The second volume, published in 1810, gives an account of the seven south-eastern counties of Scotland—Roxburgh, Berwick, Haddington, Edinburgh, Linlithgow, Peebles and Selkirk—each of them being treated of as regards name, situation and extent, natural objects, antiquities, establishment as shires, civil history, agriculture, manufactures and trade, and ecclesiastical history. In 1824, after an interval of fourteen years, the third volume appeared, giving, under the same headings, a description of the seven south-western counties—Dumfries, Kirkcudbright, Wigtown, Ayr, Lanark, Renfrew and Dumbarton. In the preface to this volume the author states that the materials for the history of the central and northern counties were collected, and that he expected the work would be completed in two years, but this expectation was not destined to be realized. He had also been engaged on a history of Scottish poetry and a history of printing in Scotland. Each of them he thought likely to extend to two large quarto volumes, and on both he expended an unusual amount of enthusiasm and energy. He had also prepared for the press an elaborate history of the life and reign of David I. In his later researches he was assisted by his nephew James, son of Alexander Chalmers, writer in Elgin.

George Chalmers died in London on the 31st of May 1825. His valuable and extensive library he bequeathed to his nephew, at whose death in 1841 it was sold and dispersed. Chalmers was a member of the Royal and Antiquarian Societies of London, an honorary member of the Antiquarian Society of Scotland, and a member of other learned societies. In private life he was undoubtedly an amiable man, although the dogmatic tone that disfigures portions of his writings procured him many opponents. Among his avowed antagonists in literary warfare the most distinguished were Malone and Steevens, the Shakespeare editors; Mathias, the author of the *Pursuits of Literature*; Dr Jamieson, the Scottish lexicographer; Pinkerton, the historian; Dr Irving, the biographer of the Scottish poets; and Dr Currie of Liverpool, But with all his failings in judgment Chalmers was a valuable writer. He uniformly had recourse to original sources of information; and he is entitled to great praise for his patriotic and self-sacrificing endeavours to illustrate the history, literature and antiquities of his native country.

(J. M'D.)

CHALMERS, GEORGE PAUL (1836-1878), Scottish painter, was born at Montrose, and studied at Edinburgh. His landscapes are now more valued than the portraits which formed his earlier work. The best of these are “The End of the Harvest” (1873), “Running Water” (1875), and “The Legend” (in the National Gallery, Edinburgh). He became an associate (1867) and a full member (1871) of the Scottish Academy.

CHALMERS, JAMES (1841-1901), Scottish missionary to New Guinea, was born at Ardrishaig in Argyll. After serving in the Glasgow City Mission he passed through Cheshunt College, and, being accepted by the London Missionary Society, was appointed to Rarotonga in the South Pacific in 1866. Here the natives gave him the well-known name “Tamate.” After ten years’ service, especially in training native evangelists, he was transferred to New Guinea. In addition to his enthusiastic but sane missionary work, Chalmers did much to open up the island, and, with his colleague W.G. Lawes, gave valuable aid in the British annexation of the south-east coast of the island. On the 8th of April 1901, in company with a brother missionary, Oliver Tomkins, he was killed by cannibals at Goaribari Island. R.L. Stevenson has left on record his high appreciation of Chalmers’s character and work.

Chalmers’s *Autobiography and Letters* were edited by Richard Lovett in 1902, who also wrote a popular life called *Tamate*.

CHALMERS, THOMAS (1780-1847), Scottish divine, was born at Anstruther in Fifeshire, on the 17th of March 1780. At the age of eleven he was entered as a student at St Andrews, where he devoted himself almost exclusively to mathematics. In January 1799 he was licensed as a preacher of the Gospel by the St Andrews presbytery. In May 1803, after attending further courses of lectures in Edinburgh, and acting as assistant to the professor of mathematics at St Andrews, he was ordained as minister of Kilmany in Fifeshire, about 9 m. from the university town, where he continued to lecture. His mathematical lectures roused so much enthusiasm that they were discontinued by order of the authorities, who disliked the disturbance of the university routine which they involved. Chalmers then opened mathematical classes on his own account which attracted many students; at the same time he delivered a course of lectures on chemistry, and ministered to his parish at Kilmany. In 1805 he became a candidate for the vacant professorship of mathematics at Edinburgh, but was unsuccessful. In 1808 he published an *Inquiry into the Extent and Stability of National Resources*, a contribution to the discussion created by Bonaparte’s commercial policy. Domestic bereavements and a severe illness then turned his thoughts in another direction. At his own request the article on Christianity was assigned to him in Dr Brewster’s

Edinburgh Encyclopaedia, and in studying the credentials of Christianity he received a new impression of its contents. His journal and letters show how he was led from a sustained effort to attain the morality of the Gospel to a profound spiritual revolution. After this his ministry was marked by a zeal which made it famous. The separate publication of his article in the *Edinburgh Encyclopaedia*, and contributions to the *Edinburgh Christian Instructor* and the *Eclectic Review*, enhanced his reputation as an author. In 1815 he became minister of the Tron Church, Glasgow, in spite of determined opposition to him in the town council on the ground of his evangelical teaching. From Glasgow his repute as a preacher spread throughout the United Kingdom. A series of sermons on the relation between the discoveries of astronomy and the Christian revelation was published in January 1817, and within a year nine editions and 20,000 copies were in circulation. When he visited London Wilberforce wrote, “all the world is wild about Dr Chalmers.”

In Glasgow Chalmers made one of his greatest contributions to the life of his own time by his experiments in parochial organization. His parish contained about 11,000 persons, and of these about one-third were unconnected with any church. He diagnosed this evil as being due to the absence of personal influence, spiritual oversight, and the want of parochial organizations which had not kept pace in the city, as they had done in rural parishes, with the growing population. He declared that twenty new churches, with parishes, should be erected in Glasgow, and he set to work to revivify, remodel and extend the old parochial economy of Scotland. The town council consented to build one new church, attaching to it a parish of 10,000 persons, mostly weavers, labourers and factory workers, and this church was offered to Dr Chalmers that he might have a fair opportunity of testing his system.

In September 1819 he became minister of the church and parish of St John, where of 2000 families more than 800 had no connexion with any Christian church. He first addressed himself to providing schools for the children. Two school-houses with four endowed teachers were established, where 700 children were taught at the moderate fees of 2s. and 3s. per quarter. Between 40 and 50 local Sabbath schools were opened, where more than 1000 children were taught the elements of secular and religious education. The parish was divided into 25 districts embracing from 60 to 100 families, over each of which an elder and a deacon were placed, the former taking oversight of their spiritual, the latter of their physical needs. Chalmers was the mainspring of the whole system, not merely superintending the visitation, but personally visiting all the families, and holding evening meetings, when he addressed those whom he had visited. This parochial machinery enabled him to make a singularly successful experiment in dealing with the problem of poverty. At this time there were not more than 20 parishes north of the Forth and Clyde where there was a compulsory assessment for the poor, but the English method of assessment was rapidly spreading. Chalmers believed that compulsory assessment ended by swelling the evil it was intended to mitigate, and that relief should be raised and administered by voluntary means. His critics replied that this was impossible in large cities. When he undertook the management of the parish of St John’s, the poor of the parish cost the city £1400 per annum, and in four years, by the adoption of his method, the pauper expenditure was reduced to £280 per annum. The investigation of all new applications for relief was committed to the deacon of the district, and every effort was made to enable the poor to help themselves. When once the system was in operation it was found that a deacon, by spending an hour a week among the families committed to his charge, could keep himself acquainted with their character and condition.

In 1823, after eight years of work at high pressure, he was glad to accept the chair of moral philosophy at St Andrews, the seventh academic offer made to him during his eight years in Glasgow. In his lectures he excluded mental philosophy and included the whole sphere of moral obligation, dealing with man's duty to God and to his fellow-men in the light of Christian teaching. Many of his lectures are printed in the first and second volumes of his published works. In ethics he made contributions to the science in regard to the place and functions of volition and attention, the separate and underived character of the moral sentiments, and the distinction between the virtues of perfect and imperfect obligation. His lectures kindled the religious spirit among his students, and led some of them to devote themselves to missionary effort. In November 1828 he was transferred to the chair of theology in Edinburgh. He then introduced the practice of following the lecture with a viva voce examination on what had been delivered. He also introduced text-books, and came into stimulating contact with his people; perhaps no one has ever succeeded as he did by the use of these methods in communicating intellectual, moral and religious impulse to so many students.

These academic years were prolific also in a literature of various kinds. In 1826 he published a third volume of the *Christian and Civic Economy of Large Towns*, a continuation of work begun at St John's, Glasgow. In 1832 he published a *Political Economy*, the chief purpose of which was to enforce the truth that the right economic condition of the masses is dependent on their right moral condition, that character is the parent of comfort, not vice versa. In 1833 appeared a treatise on *The Adaptation of External Nature to the Moral and Intellectual Constitution of Man*. In 1834 Dr Chalmers was elected fellow of the Royal Society of Edinburgh, and in the same year he became corresponding member of the Institute of France; in 1835 Oxford conferred on him the degree of D.C.L. In 1834 he became leader of the evangelical section of the Scottish Church in the General Assembly. He was appointed chairman of a committee for church extension, and in that capacity made a tour through a large part of Scotland, addressing presbyteries and holding public meetings. He also issued numerous appeals, with the result that in 1841, when he resigned his office as convener of the church extension committee, he was able to announce that in seven years upwards of £300,000 had been contributed, and 220 new churches had been built. His efforts to induce the Whig government to assist in this effort were unsuccessful.

In 1841 the movement which ended in the Disruption was rapidly culminating, and Dr Chalmers found himself at the head of the party which stood for the principle that "no minister shall be intruded into any parish contrary to the will of the congregation" (see Free Church of Scotland). Cases of conflict between the church and the civil power arose in Auchterarder, Dunkeld and Marnoch; and when the courts made it clear that the church, in their opinion, held its temporalities on condition of rendering such obedience as the courts required, the church appealed to the government for relief. In January 1843 the government put a final and peremptory negative on the church's claims for spiritual independence. On the 18th of May 1843 470 clergymen withdrew from the general assembly and constituted themselves the Free Church of Scotland, with Dr Chalmers as moderator. He had prepared a sustentation fund scheme for the support of the seceding ministers, and this was at once put into successful operation. On the 30th of May 1847, immediately after his return from the House of Commons, where he had given evidence as to the refusal of sites for Free Churches by Scottish landowners, he was found dead in bed.

Dr Chalmers' action throughout the Free Church controversy was so consistent in its application of Christian principle and so free from personal or party animus, that his writings are a valuable source for argument and illustration on the question of Establishment. "I have no veneration," he said to the royal commissioners in St Andrews, before either the voluntary or the non-intrusive controversies had arisen, "for the Church of Scotland *qua* an establishment, but I have the utmost veneration for it *qua* an instrument of Christian good." He was transparent in character, chivalrous, kindly, firm, eloquent and sagacious; his purity of motive and unselfishness commanded absolute confidence; he had originality and initiative in dealing with new and difficult circumstances, and great aptitude for business details.

During a life of incessant activity Chalmers scarcely ever allowed a day to pass without its modicum of composition; at the most unseasonable times, and in the most unlikely places, he would occupy himself with literary work. His writings occupy more than 30 volumes. He would have stood higher as an author had he written less, or had he indulged less in that practice of reiteration into which he was constantly betrayed by his anxiety to impress his ideas upon others. As a political economist he was the first to unfold the connexion that subsists between the degree of the fertility of the soil and the social condition of a community, the rapid manner in which capital is reproduced (see Mill's *Political Economy*, i. 94), and the general doctrine of a limit to all the modes by which national wealth may accumulate. He was the first also to advance that argument in favour of religious establishments which meets upon its own ground the doctrine of Adam Smith, that religion like other things should be left to the operation of the natural law of supply and demand. In the department of natural theology and the Christian evidences he ably advocated that method of reconciling the Mosaic narrative with the indefinite antiquity of the globe which William Buckland (1784-1856) advanced in his Bridgewater Treatise, and which Dr Chalmers had previously communicated to him. His refutation of Hume's objection to the truth of miracles is perhaps his intellectual *chef-d'œuvre*. The distinction between the laws and dispositions of matter, as between the ethics and objects of theology, he was the first to indicate and enforce, and he laid great emphasis on the superior authority as witnesses for the truth of Revelation of the Scriptural as compared with the Extra-Scriptural writers, and of the Christian as compared with the non-Christian testimonies. In his *Institutes of Theology*, no material modification is attempted on the doctrines of Calvinism, which he received with all simplicity of faith as revealed in the Divine word, and defended as in harmony with the most profound philosophy of human nature and of the Divine providence.

For biographical details see Dr W. Hanna's *Memoirs* (Edinburgh, 4 vols., 1849-1852); there is a good short *Life* by Mrs Oliphant (1893).

(W. Ha.; D. Mn.)

CHALONER, SIR THOMAS (1521-1565), English statesman and poet, was the son of Roger Chaloner, mercer of London, a descendant of the Denbighshire Chaloners. No details are known of his youth except that he was educated at both Oxford and Cambridge. In 1540 he went, as secretary to Sir

Henry Knyvett, to the court of Charles V., whom he accompanied in his expedition against Algiers in 1541, and was wrecked on the Barbary coast. In 1547 he joined in the expedition to Scotland, and was knighted, after the battle of Musselburgh, by the protector Somerset, whose patronage he enjoyed. In 1549 he was a witness against Dr Bonner, bishop of London; in 1551 against Stephen Gardiner, bishop of Winchester; in the spring of the latter year he was sent as a commissioner to Scotland, and again in March 1552. In 1553 he went with Sir Nicholas Wotton and Sir William Pickering on an embassy to France, but was recalled by Queen Mary on her accession. In spite of his Protestant views, Chaloner was still employed by the government, going to Scotland in 1555-1556, and providing carriages for troops in the war with France, 1557-1558. In 1558 he went as Elizabeth's ambassador to the emperor Ferdinand at Cambrai, from July 1559 to February 1559/60 he was ambassador to King Philip at Brussels, and in 1561 he went in the same capacity to Spain. His letters are full of complaints of his treatment there, but it was not till 1564, when in failing health, that he was allowed to return home. He died at his house in Clerkenwell on the 14th of October 1565. He acquired during his years of service three estates, Guisborough in Yorkshire, Steeple Claydon in Buckinghamshire, and St Bees in Cumberland. He married (1) Joan, widow of Sir Thomas Leigh; and (2) Etheldreda, daughter of Edward Frodsham, of Elton, Cheshire, by whom he had one son, Sir Thomas Chaloner (1561-1615), the naturalist. Chaloner was the intimate of most of the learned men of his day, and with Lord Burghley he had a life-long friendship. Throughout his busy official life he occupied himself with literature, his Latin verses and his pastoral poems being much admired by his contemporaries. Chaloner's "Howe the Lorde Mowbray ... was ... banyshed the Realme," printed in the 1559 edition of William Baldwin's *Mirror for Magistrates* (repr. in vol. ii. pt. 1 of Joseph Haslewood's edition of 1815), has sometimes been attributed to Thomas Churchyard. His most important work, *De Rep. Anglorum instauranda libri decem*, written while he was in Spain, was first published by William Malim (1579, 3 pts.), with complimentary Latin verses in praise of the author by Burghley and others. Chaloner's epigrams and epitaphs were also added to the volume, as well as *In laudem Henrici octavi ... carmen Panegericum*, first printed in 1560. Amongst his other works are *The praise of folie, Moriae encomium* ... by Erasmus.... Englished by Sir Thomas Chaloner, Knight (1549, ed. Janet E. Ashbee, 1901); *A book of the Office of Servantes* (1543), translated from Gilbert Cognatus; and *An homilie of Saint John Chrysostome*.... Englished by T.C. (1544).

See "The Chaloners, Lords of the Manor of St Bees," by William Jackson, in *Transactions of the Cumberland Assoc. for the Advancement of Literature and Science*, pt. vi. pp. 47-74, 1880-1881.

CHÂLONS-SUR-MARNE, a town of north-eastern France, capital of the department of Marne, 107 m. E. of Paris on the main line of the Eastern railway to Nancy, and 25 m. S.S.E. of Reims. Pop. (1906) 22,424. Châlons is situated in a wide level plain principally on the right bank of the Marne, its suburb of Marne, which contains the railwaystations of the Eastern and Est-État railways, lying on the left bank. The town proper is bordered on the west by the lateral canal of the Marne, across which lies a strip of ground separating it from the river itself. Châlons is traversed by branches of the canal and by small

streams, and its streets are for the most part narrow and irregular, but it is surrounded by ample avenues and promenades, the park known as the Jard, in the south-western quarter, being especially attractive. Huge barracks lie to the north and east. There are several interesting churches in the town. The cathedral of St Étienne dates chiefly from the 13th century, but its west façade is in the classical style and belongs to the 17th century. There are stained-glass windows of the 13th century in the north transept. Notre-Dame, of the 12th and 13th centuries, is conspicuous for its four Romanesque towers, two flanking the apse; the other two, surmounted by tall lead spires, flanking the principal façade. The churches of St. Alpin, St Jean and St Loup date from various periods between the 11th and the 17th centuries. The hôtel-de-ville (1771), facing which stands a monument to President Carnot; the prefecture (1750-1764), once the residence of the intendants of Champagne; the college, once a Jesuit establishment; and a training college which occupies the Augustinian abbey of Toussaints (16th and 17th centuries), are noteworthy civil buildings. The houses of Châlons are generally ill-built of timber and plaster, or rough-cast, but some old mansions, dating from the 15th to the 16th centuries, remain. The church of Ste Pudentienne, on the left bank of the river, is a well-known place of pilgrimage. The town is the seat of a bishop and a prefect, and headquarters of the VI. army corps; it has tribunals of first instance and of commerce, a chamber of commerce, a board of trade-arbitrators, a museum, a library, training colleges, a higher ecclesiastical seminary, a communal college and an important technical school. The principal industry is brewing, which is carried on in the suburb of Marne. Galleries of immense length, hewn in a limestone hill and served by lines of railway, are used as store-houses for beer. The preparation of champagne, the manufacture of boots and shoes, brushes, wire-goods and wall-paper also occupy many hands. There is trade in cereals.

Châlons-sur-Marne occupies the site of the chief town of the Catalauni, and some portion of the plains which lie between it and Troyes was the scene of the defeat of Attila in the conflict of 451. In the 10th and following centuries it attained great prosperity as a kind of independent state under the supremacy of its bishops, who were ecclesiastical peers of France. In 1214 the militia of Châlons served at the battle of Bouvines; and in the 15th century the citizens maintained their honour by twice (1430 and 1434) repulsing the English from their walls. In the 16th century the town sided with Henry IV., king of France, who in 1589 transferred thither the parlement of Paris, which shortly afterwards burnt the bulls of Gregory XIV. and Clement VIII. In 1856 Napoleon III. established a large camp, known as the Camp of Châlons, about 16 m. north of the town by the railway to Reims. It was situated in the immediate neighbourhood of Grand Mourmelon and Petit Mourmelon, and occupied an area of nearly 30,000 acres. The “Army of Châlons,” formed by Marshal MacMahon in the camp after the first reverses of the French in 1870, marched thence to the Meuse, was surrounded by the Germans at Sedan, and forced to capitulate. The camp is still a training-centre for troops.

About 5 m. E. of Châlons is L’Epine, where there is a beautiful pilgrimage church (15th and 16th centuries, with modern restoration) with a richly-sculptured portal. In the interior there is a fine choir-screen, an organ of the 16th century, and an ancient and much-venerated statue of the Virgin.

CHALON-SUR-SAÔNE, a town of east-central France, capital of an arrondissement in the department of Saône-et-Loire, 81 m. N. of Lyons by the Paris-Lyon railway. Pop. (1906) 26,538. It is a well-built town, with fine quays, situated in an extensive plain on the right bank of the Saône at its junction with the Canal du Centre. A handsome stone bridge of the 15th century, decorated in the 18th century with obelisks, connects it with the suburb of St Laurent on an island in the river. The principal building is the church of St Vincent, once the cathedral. It dates mainly from the 12th to the 15th centuries, but the façade is modern and unpleasing. The old bishop's palace is a building of the 15th century. The church of St Pierre, with two lofty steeples, dates from the late 17th century. Chalon preserves remains of its ancient ramparts and a number of old houses. The administrative buildings are modern. An obelisk was erected in 1730 to commemorate the opening of the canal. There is a statue of J.N. Niepce, a native of the town. Chalon is the seat of a sub-prefect and a court of assizes, and there are tribunals of first instance and commerce, a branch of the Bank of France, a chamber of commerce, communal colleges for boys and girls, a school of drawing, a public library and a museum. Chalon ranks next to Le Creusot among the manufacturing towns of Burgundy; its position at the junction of the Canal du Centre and the Saône, and as a railway centre for Lyons, Paris, Dôle, Lons-le-Saunier and Roanne, brings it a large transit trade. The founding and working of copper and iron is its main industry; the large engineering works of Petit-Creusot, a branch of those of Le Creusot, construct bridges, tug-boats and torpedo-boats; distilleries, glass-works, chemical works, straw-hat manufactories, oil-works, tile-works and sugar refineries also occupy many hands. Wine, grain, iron, leather and timber are among the many products for which the town is an entrepôt. About 2 m. east of Chalon is St Marcel (named after the saint who in the 2nd century preached Christianity at Chalon), which has a church of the 12th century, once belonging to a famous abbey.

Chalon-sur-Saône is identified with the ancient *Cabillonum*, originally an important town of the Aedui. It was chosen in the 6th century by Gontram, king of Burgundy, as his capital; and it continued till the 10th to pay for its importance by being frequently sacked. The bishopric, founded in the 4th century, was suppressed at the Revolution. In feudal times Chalon was the capital of a countship. In 1237 it was given in exchange for other fiefs in the Jura by Jean le Sage, whose descendants nevertheless retained the title. Hugh IV., duke of Burgundy, the other party to the exchange, gave the citizens a communal charter in 1256. In its modern history the most important event was the resistance offered to a division of the Austrian army in 1814.

CHALUKYA, the name of an Indian dynasty which ruled in the Deccan from A.D. 550 to 750, and again from 973 to 1190. The Chalukyas themselves claimed to be Rajputs from the north who imposed their rule on the Dravidian inhabitants of the Deccan tableland, and there is some evidence for connecting them with the Chapas, a branch of the foreign Gurjaras. The dynasty was founded by a chief named Pulakesin I., who mastered the town of Vatapi (now Badami, in the Bijapur district) about 550. His sons extended their principality east and west; but the founder of the Chalukya greatness was his grandson

Pulakesin II., who succeeded in 608 and proceeded to extend his rule at the expense of his neighbours. In 609 he established as his viceroy in Vengi his brother Kubja Vishnuvardhana, who in 615 declared his independence and established the dynasty of Eastern Chalukyas, which lasted till 1070. In 620 Pulakesin defeated Harsha (*q.v.*), the powerful overlord of northern India, and established the Nerbudda as the boundary between the South and North. He also defeated in turn the Chola, Pandya and Kerala kings, and by 630 was beyond dispute the most powerful sovereign in the Deccan. In 642, however, his capital was taken and he himself killed by the Pallava king Narasimhavarman. In 655 the Chalukya power was restored by Pulakesin's son Vikramaditya I.; but the struggle with the Pallavas continued until, in 740, Vikramaditya II. destroyed the Pallava capital. In 750 Vikramaditya's son, Kirtivarman Chalukya, was overthrown by the Rashtrakutas.

In 973, Taila or Tailapa II. (d. 995), a scion of the royal Chalukya race, succeeded in overthrowing the Rashtrakuta king Kakka II., and in recovering all the ancient territory of the Chalukyas with the exception of Gujarat. He was the founder of the dynasty known as the Chalukyas of Kalyani. About A.D. 1000 a formidable invasion by the Chola king Rajaraja the Great was defeated, and in 1052 Somesvara I., or Ahamavalla (d. 1068), the founder of Kalyani, defeated and slew the Chola Rajadhiraja. The reign of Vikramaditya VI., or Vikramanka, which lasted from 1076 to 1126, formed another period of Chalukya greatness. Vikramanka's exploits against the Hoysala kings and others, celebrated by the poet Bilhana, were held to justify him in establishing a new era dating from his accession. With his death, however, the Chalukya power began to decline. In 1156 the commander-in-chief Bijjala (or Vijjana) Kalachurya revolted, and he and his sons held the kingdom till 1183. In this year Somesvara IV. Chalukya recovered part of his patrimony, only to succumb, about 1190, to the Yadavas of Devagiri and the Hoysalas of Dorasamudra. Henceforth the Chalukya rajas ranked only as petty chiefs.

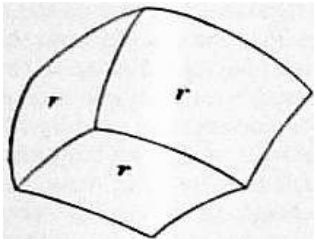
See J.F. Fleet, *Dynasties of the Kanarese Districts*; Prof. R.G. Bhandarker, "Early History of the Deccan," in the *Bombay Gazetteer* (1896), vol. i. part ii.; Vincent A. Smith, *Early Hist. of India* (Oxford, 1908), pp. 382 ff.

CHALYBÄUS, HEINRICH MORITZ (1796-1862), German philosopher, was born at Pfaffroda in Saxony. For some years he taught at Dresden, and won a high reputation by his lectures on the history of philosophy in Germany. In 1839 he became professor in Kiel University, where, with the exception of one brief interval, when he was expelled with several colleagues because of his German sympathies, he remained till his death. His first published work, *Historische Entwickelung der spekulativen Philosophic von Kant bis Hegel* (1837, 5th ed. 1860), which still ranks among the best expositions of modern German thought, has been twice translated into English, by A. Tulk (London, 1854), and by A. Edersheim (Edinburgh, 1854). His chief works are *Entwurf eines Systems der Wissenschaftslehre* (Kiel, 1846) and *System der spekulativen Ethik* (2 vols., 1850). He opposed both the extreme realism of Herbart and what he regarded as the one-sided idealism of Hegel, and endeavoured to find a mean between them, to

discover the ideal or formal principle which unfolds itself in the real or material world presented to it. His *Wissenschaftslehre*, accordingly, divides itself into (1) *Principlehre*, or theory of the one principle; (2) *Vermittelungslehre*, or theory of the means by which this principle realizes itself; and (3) *Teleologie*. The most noticeable point is the position assigned by Chalybäus to the "World Ether," which is defined as the infinite in time and space, and which, he thinks, must be posited as necessarily coexisting with the Infinite Spirit or God. The fundamental principle of the *System der Ethik* is carried out with great strength of thought, and with an unusually complete command of ethical material.

See J.E. Erdmann, *Grundriss der Gesch. d. Philos.* ii. 781-786; K. Prantl, in *Allgem. deutsch. Biog.*

CHALYBITE, a mineral species consisting of iron carbonate ($FeCO_3$) and forming an important ore of iron. It was early known as spathose iron, spathic iron or steel ore. F.S. Beudant in 1832 gave the name siderose (from σίδηρος, iron), which was modified by W. Haidinger in 1845 to siderite. Chalybite (from χάλυψ, χάλυβος, Lat. *chalybs*, steel) is of slightly later date, having been given by E.F. Glocker in 1847. The name siderite is in common use, but it is open to objection since it had earlier been applied to several other species, and is also now used as a group name for meteoric irons. Chalybite crystallizes in the rhombohedral system and is isomorphous with calcite; like this it possesses perfect cleavages parallel to the faces of the primitive rhombohedron, the angles between which are 73° 0′. Crystals are usually rhombohedral in habit, and the primitive rhombohedron *r*{100} is a common form, the faces being often curved as represented in the figure. Acute rhombohedra in combination with the basal pinacoid are also frequent, giving crystals of octahedral aspect. The mineral often occurs in cleavable masses with a coarse or fine granular texture; also in botryoidal or globular (sphaerosiderite) and oolitic forms. When compact and mixed with much clay and sand it constitutes the well-known clay ironstone. Chalybite is usually yellowish-grey or brown in colour; it is translucent and has a vitreous lustre. Hardness 3½; sp. gr. 3.8. The double refraction ($\omega - \varepsilon = 0.241$) is stronger than that of calcite. When pure it contains 48.2% of iron, but this is often partly replaced isomorphously by manganese, magnesium or calcium: the varieties known as oligon-spar or oligonite, sideroplesite and siderodote contain these elements respectively in large amount. These varieties form a passage to ankerite (*q.v.*) and mesitite, and all are referred to loosely as brown-spar.



Crystal of Chalybite.

Chalybite is a common gangue mineral in metalliferous veins, and well-crystallized specimens are found with ores of copper, lead, tin, &c., in Cornwall, the Harz, Saxony and many other places. It also occurs alone as large masses in veins and beds in rocks of various kinds. The clay ironstone so extensively worked as an ore of iron occurs as nodules and beds in the Coal Measures of England and the United States, and the oolitic iron ore of the Cleveland district in Yorkshire forms beds in the Lias. The

mineral is occasionally found as concretionary masses (sphaerosiderite) in cavities in basic igneous rocks such as dolerite.

(L. J. S.)

CHAMBA, a native state of India, within the Punjab, amid the Himalayas, and lying on the southern border of Kashmir. It has an area of 3216 sq. m. Pop. (1901) 127,834. The sanatorium of Dalhousie, though within the state, is attached to the district of Gurdaspur. Chamba is entirely mountainous; in the east and north, and in the centre, are snowy ranges. The valleys in the west and south are fertile. The chief rivers are the Chandra and Ravi. The country is much in favour with sportsmen. The principal crops are rice, maize and millet. Mineral ores of various kinds are known, but unworked. Trade is chiefly in forest produce. The capital of the state is Chamba (pop. 6000), situated above the gorge of the Ravi. External communications are entirely by road. The state was founded in the 6th century, and, though sometimes nominally subject to Kashmir and afterwards tributary to the Mogul empire, always practically maintained its independence. Its chronicles are preserved in a series of inscriptions, mostly engraved on copper. It first came under British influence in 1846, when it was declared independent of Kashmir. The line of the rajas of Chamba was founded in the 6th century A.D. by Marut, of an ancient family of Rajputs. In 1904 Bhuri Singh, K.C.S.I., C.I.E., an enlightened and capable ruler, succeeded.

CHAMBAL, a river of India, one of the principal tributaries of the Jumna. Rising amid the summits of the Vindhya mountains in Malwa, it flows north, and after being joined by the Chambla and Sipra, passes through the gorges of the Mokandarra hills. After receiving the waters of the Kali-Sind, Parbati and Banas, its principal confluents, the Chambal becomes a great river, enters the British district of Etawah, and joins the Jumna 40 m. below Etawah town, its total length being 650 m.

CHAMBERLAIN, JOSEPH (1836-), British statesman, third son of Joseph Chamberlain, master of the Cordwainers' Company, was born at Camberwell Grove, London, on the 8th of July 1836. His father was a well-to-do man of business, a Unitarian in religion and a Liberal in politics. Young Chamberlain was educated at Canonbury from 1845 to 1850, and at University College school, London,

from 1850 to 1852. After two years in his father's office in London, he was sent to Birmingham to join his cousin Joseph Nettlefold in a screw business in which his father had an interest; and by degrees, largely owing to his own intelligent management, this business became very successful. Nettlefold & Chamberlain employed new methods of attracting customers, and judiciously amalgamated rival firms with their own so as to reduce competition, with the result that in 1874, after twenty-two years of commercial life, Mr Chamberlain was able to retire with an ample fortune. Meanwhile he had in 1861 married his first wife, Miss Harriet Kenrick (she died in 1863), and had gradually come to take an increasingly important part in the municipal and political life of Birmingham. He was a constant speaker at the Birmingham and Edgbaston Debating Society; and when in 1868 the Birmingham Liberal Association was reorganized, he became one of its leading members. In 1869 he was elected chairman of the executive council of the new National Education League, the outcome of Mr George Dixon's movement for promoting the education of the children of the lower classes by paying their school fees, and agitating for more accommodation and a better national system. In the same year he was elected a member of the town council, and married his second wife—a cousin of his first—Miss Florence Kenrick (d. 1875).

In 1870 he was elected a member of the first school board for Birmingham; and for the next six years, and especially after 1873, when he became leader of a majority and chairman, he actively championed the Nonconformist opposition to denominationalism. He was then regarded as a Republican—the term signifying rather that he held advanced Radical opinions, which were construed by average men in the light of the current political developments in France, than that he really favoured Republican institutions. His programme was "free Church, free land, free schools, free labour." At the general election of 1874 he stood as a parliamentary candidate for Sheffield, but without success. Between 1869 and 1873 he was a prominent advocate in the Birmingham town council of the gospel of municipal reform preached by Mr Dawson, Dr Dale and Mr Bunce (of the *Birmingham. Post*); and in 1873 his party obtained a majority, and he was elected mayor, an office he retained until June 1876. As mayor he had to receive the prince and princess of Wales on their visit in June 1874, an occasion which excited some curiosity because of his reputation as a Republican; but those who looked for an exhibition of bad taste were disappointed, and the behaviour of the Radical mayor satisfied the requirements alike of *The Times* and of *Punch*.

The period of his mayoralty was one of historic importance in the growth of modern Birmingham. New municipal buildings were erected, Highgate Park was opened as a place of recreation, the free library and art gallery were developed. But the great work carried through by Mr Chamberlain for Birmingham was the municipalization of the supply of gas and water, and the improvement scheme by which slums were cleared away and forty acres laid out in new streets and open spaces. The prosperity of modern Birmingham dates from 1875 and 1876, when these admirably administered reforms were initiated, and by his share in them Mr Chamberlain became not only one of its most popular citizens but also a man of mark outside. An orator of a business-like, straightforward type, cool and hard-hitting, his spare figure, incisive features and single eye-glass soon made him a favourite subject for the caricaturist; and in later life his aggressive personality, and the peculiarly irritating effect it had on his opponents, made his actions and speeches the object of more controversy than was the lot of any other politician of his time. His hobby for orchid-growing at his house "Highbury" near Birmingham also became famous. In private life his loyalty to his friends, and his "genius for friendship" (as John Morley said) made a

curious contrast to his capacity for arousing the bitterest political hostility. It may be added here that the interest taken by him in Birmingham remained undiminished during his life, and he was largely instrumental in starting the Birmingham University (1900), of which he became chancellor. His connexion with Birmingham University was indeed peculiarly appropriate to his character as a man of business; but in spite of his representing a departure among men of the front rank in politics from the "Eton and Oxford" type, his general culture sometimes surprised those who did not know him. In later life Oxford and Cambridge gave him their doctors' degrees; and in 1897 he was made lord rector of Glasgow University (delivering an address on "Patriotism" at his installation).

In 1876 Mr Dixon resigned his seat in parliament, and Mr Chamberlain was returned for Birmingham in his place unopposed, as John Bright's colleague. He made his maiden speech in the House of Commons on the 4th of August 1876, on Lord Sandon's Education Bill. At this period, too, he paid much attention to the question of licensing reform, and in 1876 he examined the Gothenburg system in Sweden, and advocated a solution of the problem in England on similar lines. During 1877 the new federation of Liberal Associations which became known as the "Caucus" was started under Mr Chamberlain's influence in Birmingham—its secretary, Mr Schnadhorst, quickly making himself felt as a wire-puller of exceptional ability; and the new organization had a remarkable effect in putting life into the Liberal party, which since Mr Gladstone's retirement in 1874 had been much in need of a stimulus. When the general election came in 1880, Mr Schnadhorst's powers were demonstrated in the successes won under his auspices. The Liberal party numbered 349, against 243 Conservatives and 60 Irish Nationalists; and the Radical section of the Liberal party, led by Mr Chamberlain and Sir Charles Dilke, was recognized by Mr Gladstone by his inclusion of the former in his cabinet as president of the Board of Trade, and the appointment of the latter as under secretary for foreign affairs. In his new capacity Mr Chamberlain was responsible for carrying such important measures as the Bankruptcy Act 1883, and the Patents Act. Another bill which he had much at heart, on merchant shipping, had to be abandoned, and a royal commission substituted, but the subsequent legislation in 1888-1894 owed much to his efforts. The Franchise Act of 1884 was also one in which he took a leading part as a champion of the opinions of the labouring class. At this time he took the current advanced Radical views of both Irish and foreign policy, hating "coercion," disliking the occupation of Egypt, and prominently defending the Transvaal settlement after Majuba. Both before and after the defeat of Mr Gladstone's government on the Budget in June 1885, he associated himself with what was known as the "Unauthorized Programme," *i.e.* free education, small holdings, graduated taxation and local government. In June 1885 he made a speech at Birmingham, treating the reforms just mentioned as the "ransom" that property must pay to society for the security it enjoys—for which Lord Iddesleigh called him "Jack Cade"; and he continually urged the Liberal party to take up these Radical measures. At the general election of November 1885 Mr Chamberlain was returned for West Birmingham. The Liberal strength generally was, however, reduced to 335 members, though the Radical section held their own; and the Irish vote became necessary to Mr Gladstone if he was to command a majority. In December it was stated that Mr Gladstone intended to propose Home Rule for Ireland, and in January Lord Salisbury's ministry was defeated on the Address, on an amendment moved by Mr Chamberlain's Birmingham henchman, Mr Jesse Collings (b. 1831), embodying the "three acres and a cow" of the Radical programme. Unlike Lord Hartington (afterwards duke of Devonshire) and other Liberals, who declined to join Mr Gladstone in view of the altered attitude he was adopting towards Ireland, Mr Chamberlain entered the cabinet as president of the Local Government Board (with Mr Jesse

Collings as parliamentary secretary), but on the 15th of March 1886 he resigned, explaining in the House of Commons (8th April) that, while he had always been in favour of the largest possible extension of local government to Ireland consistently with the integrity of the empire and the supremacy of parliament, and had therefore joined Mr Gladstone when he believed that this was what was intended, he was unable to consider that the scheme communicated by Mr Gladstone to his colleagues maintained those limitations. At the same time he was not irreconcilable, and he invited Mr Gladstone even then to modify his bill so as to remove the objections made to it. This indecisive attitude did not last long, and the split in the party rapidly widened. At Birmingham Mr Chamberlain was supported by the "Two Thousand," but deserted by the "Caucus" and Mr Schnadhorst. In May the Radicals who followed Mr Bright and Mr Chamberlain, and the Whigs who took their cue from Lord Hartington, decided to vote against the second reading of the Home Rule Bill, instead of allowing it to be taken and then pressing for modifications in committee, and on 7th June the bill was defeated by 343 to 313, 94 Liberal Unionists—as they were generally called—voting against the government. Mr Chamberlain was the object of the bitterest attacks from the Gladstonians for his share in this result; he was stigmatized as "Judas," and open war was proclaimed by the Home Rulers against the "dissentient Liberals"—the description used by Mr Gladstone. The general election, however, returned to parliament 316 Conservatives, 78 Liberal Unionists, and only 276 Gladstonians and Nationalists, Birmingham returning seven Unionist members. When the House met in August, it was decided by the Liberal Unionists, under Lord Hartington's leadership, that their policy henceforth was essentially to combine with the Tories to keep Mr Gladstone out. The old Liberal feeling still prevailing among them was too strong, however, for their leaders to take office in a coalition ministry. It was enough for them to be able to tie down the Conservative government to such measures as were not offensive to Liberal Unionist principles. It still seemed possible, moreover, that the Gladstonians might be brought to modify their Home Rule proposals, and in January 1887 a Round Table conference (suggested by Mr Chamberlain) was held between Mr Chamberlain, Sir G. Trevelyan, Sir William Harcourt, Mr Morley and Lord Herschell. But no *rapprochement* was effected, and reconciliation became daily more and more difficult. The influence of Liberal Unionist views upon the domestic legislation of the government was steadily bringing about a more complete union in the Unionist party, and destroying the old lines of political cleavage. Before 1892 Mr Chamberlain had the satisfaction of seeing Lord Salisbury's ministry pass such important acts, from a progressive point of view, as those dealing with Coal Mines Regulation, Allotments, County Councils, Housing of the Working Classes, Free Education and Agricultural Holdings, besides Irish legislation like the Ashbourne Act, the Land Act of 1891, and the Light Railways and Congested Districts Acts. In October 1887 Mr Chamberlain, Sir L. Sackville West and Sir Charles Tupper were selected by the government as British plenipotentiaries to discuss with the United States the Canadian fisheries dispute, and a treaty was arranged by them at Washington on the 15th of February 1888. The Senate refused to ratify it; but a protocol provided for a *modus vivendi* pending ratification, giving American fishing vessels similar advantages to those contemplated in the treaty; and on the whole Mr Chamberlain's mission to America was accepted as a successful one in maintaining satisfactory relations with the United States. He returned to England in March 1888, and was presented with the freedom of the borough of Birmingham. The visit also resulted, in November 1888, in his marriage with his third wife, Miss Endicott, daughter of the United States secretary of war in President Cleveland's first administration.

At the general election of 1892 Mr Chamberlain was again returned, with an increased majority, for West Birmingham; but the Unionist party as a whole came back with only 315 members against 355 Home Rulers. In August Lord Salisbury's ministry was defeated; and on the 13th of February 1893 Mr Gladstone introduced his second Home Rule Bill, which was eventually read a third time on the 1st of September. During the eighty-two days' discussion in the House of Commons Mr Chamberlain was the life and soul of the opposition, and his criticisms had a vital influence upon the attitude of the country when the House of Lords summarily threw out the bill. His chief contribution to the discussions during the later stages of the Gladstone and Rosebery ministries was in connexion with Mr Asquith's abortive Employers' Liability Bill, when he foreshadowed the method of dealing with this question afterwards carried out in the Compensation Act of 1897. Outside parliament he was busy formulating proposals for old age pensions, which had a prominent place in the Unionist programme of 1895. In that year, on the defeat of Lord Rosebery, the union of the Unionists was sealed by the inclusion of the Liberal Unionist leaders in Lord Salisbury's ministry; and Mr Chamberlain became secretary of state for the colonies. There had been much speculation as to what his post would be, and his nomination to the colonial office, then considered one of secondary rank, excited some surprise; but Mr Chamberlain himself realized how important that department had become. He carried with him into the ministry his close Birmingham municipal associates, Mr Jesse Collings (as under secretary of the home office), and Mr J. Powell-Williams (1840-1904) as financial secretary to the war office. Mr Chamberlain's influence in the Unionist cabinet was soon visible in the Workmen's Compensation Act and other measures. This act, though in Sir Matthew White Ridley's charge as home secretary, was universally and rightly associated with Mr Chamberlain; and its passage, in the face of much interested opposition from highly-placed, old-fashioned conservatives and capitalists on both sides, was principally due to his determined advocacy. Another "social" measure of less importance, which formed part of the Chamberlain programme, was the Small Houses Acquisition Act of 1899; but the problem of old age pensions was less easily solved. This subject had been handed over in 1893 to a royal commission, and further discussed by a select committee in 1899 and a departmental committee in 1900, but both of these threw cold water on the schemes laid before them—a result which, galling enough to one who had made so much play with the question in the country, offered welcome material to his opponents for electioneering recrimination, as year by year went by between 1895 and 1900 and nothing resulted from all the confident talk on the subject in which Mr Chamberlain had indulged when out of office. Eventually it was the Liberal and not the Unionist party that carried an Old Age Pensions scheme through parliament, during the 1908 session, when Mr Chamberlain was *hors de combat*.

From January 1896 (the date of the Jameson Raid) onwards South Africa demanded the chief attention of the colonial secretary (see SOUTH AFRICA, and for details TRANSVAAL). In his negotiations with President Kruger one masterful temperament was pitted against another. Mr Chamberlain had a very difficult part to play, in a situation dominated by suspicion on both sides, and while he firmly insisted on the rights of Great Britain and of British subjects in the Transvaal, he was the continual object of Radical criticism at home. Never has a statesman's personality been more bitterly associated by his political opponents with the developments they deplored. Attempts were even made to ascribe financial motives to Mr Chamberlain's actions, and the political atmosphere was thick with suspicion and scandal. The report of the Commons committee (July 1897) definitely acquitted both Mr Chamberlain and the colonial office of any privity in the Jameson Raid, but Mr Chamberlain's detractors continued to assert the contrary.

Opposition hostility reached such a pitch that in 1899 there was hardly an act of the cabinet during the negotiations with President Kruger which was not attributed to the personal malignity and unscrupulousness of the colonial secretary. The elections of 1900 (when he was again returned, unopposed, for West Birmingham) turned upon the individuality of a single minister more than any since the days of Mr Gladstone's ascendancy, and Mr Chamberlain, never conspicuous for inclination to turn his other cheek to the smiter, was not slow to return the blows with interest.

Apart from South Africa, his most important work at this time was the successful passing of the Australian Commonwealth Act (1900), in which both tact and firmness were needed to settle certain differences between the imperial government and the colonial delegates.

Mr Chamberlain's tenure of the office of colonial secretary between 1895 and 1900 must always be regarded as a turning-point in the history of the relations between the British colonies and the mother country. His accession to office was marked by speeches breathing a new spirit of imperial consolidation, embodied either in suggestions for commercial union or in more immediately practicable proposals for improving the "imperial estate"; and at the Diamond Jubilee of 1897 the visits of the colonial premiers to London emphasized and confirmed the new policy, the fruits of which were afterwards seen in the cordial support given by the colonies in the Boer War. Even in what Mr Chamberlain called his "Radical days" he had never supported the "Manchester" view of the value of a colonial empire; and during the Gladstone ministry of 1882-1885 Mr Bright had remarked that the junior member for Birmingham was the only Jingo in the cabinet—meaning, no doubt, that he objected to the policy of *laissez-faire* and the timidity of what was afterwards known as "Little Englandism." While he was still under Mr Gladstone's influence these opinions were kept in subordination; but Mr Chamberlain was always an imperial federationist, and from 1887 onwards he constantly gave expression to his views on the desirability of drawing the different parts of the empire closer together for purposes of defence and commerce. In 1895 the time for the realization of these views had come; and Mr Chamberlain's speeches, previously remarkable chiefly for debating power and directness of argument, were now dominated by a new note of constructive statesmanship, basing itself on the economic necessities of a world-wide empire. Not the least of the anxieties of the colonial office during this period was the situation in the West Indies, where the cane-sugar industry was being steadily undermined by the European bounties given to exports of continental beet; and though the government restricted themselves to attempts at removing the bounties by negotiation and to measures for palliating the worst effects in the West Indies, Mr Chamberlain made no secret of his repudiation of the Cobden Club view that retaliation would be contrary to the doctrines of free trade, and he did his utmost to educate public opinion at home into understanding that the responsibilities of the mother country are not merely to be construed according to the selfish interests of a nation of consumers. As regards foreign affairs, Mr Chamberlain more than once (and particularly at Leicester on 30th November 1899) indicated his leanings towards a closer understanding between the British empire, the United States and Germany,—a suggestion which did not save him from an extravagant outburst of German hostility during the Boer War. The unusually outspoken and pointed expression, however, of his disinclination to submit to Muscovite duplicity or to "pin-pricks" or "unmannerliness" from France was criticized on the score of discretion by a wider circle than that of his political adversaries.

During the progress of the Boer War from 1899 to 1902, Mr Chamberlain, as the statesman who had represented the cabinet in the negotiations which led to it, remained the object of constant attacks from his Radical opponents—the "little Englanders" and "Pro-Boers," as he called them—and he was supported by the Imperialist and Unionist party with at least equal ardour. But as colonial secretary, except in so far as his consistent support of Lord Milner and his enthusiastic encouragement of colonial assistance were concerned, he naturally played only a subordinate part during the carrying out of the military operations. Among domestic statesmen he was felt, however, to be the backbone of the party in power. He was the hero of the one side, just as he was the bugbear of the other. On the 13th of February 1902 he was presented with an address in a gold casket by the city corporation, and entertained at luncheon at the Mansion House, an honour not unconnected with the strong feeling recently aroused by his firm reply (at Birmingham, January 11) to some remarks made by Count von Büllow, the German chancellor, in the Reichstag (January 8), reflecting the offensive allegations current in Germany against the conduct of the army in South Africa. Mr Chamberlain's speech, in answer to what had been intended as a contemptuous rebuke, was universally applauded. His own imperialism was intensified by the way in which England's difficulties resulted in calling forth colonial assistance and so cementing the bonds of empire. The domestic crisis, and the sharp cleavage between parties at home, had driven the bent of his mind and policy further and further away from the purely municipal and national ideals which he had followed so keenly before he became colonial minister. The problems of empire engrossed him, and a new enthusiasm for imperial projects arose in the Unionist party under his inspiration. No English statesman probably has ever been, at different times in his career, so able an advocate of absolutely contradictory policies, and his opponents were not slow to taunt him with quotations from his earlier speeches. As the war drew to its end, new plans for imperial consolidation were maturing in his brain. Subsidiary points of utility, such as the formation of the London and Liverpool schools of tropical medicine from 1899 onwards, were taken up by him with characteristic vigour. But the next step was to prove a critical one indeed for the loyalty of the party which had so far been unanimous in his favour.

The settlement after the war was full of difficulties, financial and others, in South Africa. When Mr Arthur Balfour succeeded Lord Salisbury as prime minister in July 1902, Mr Chamberlain agreed to serve loyally under him, and the friendship between the two leaders was indeed one of the most marked features of the political situation. In November 1902 it was arranged that Mr Chamberlain should go out to South Africa, and it was hoped, not without reason, that his personality would effect more good than any ordinary official negotiations. At the time the best results appeared to be secured. He went from place to place in South Africa (December 26-February 25); arranged with the leading Transvaal financiers that in return for support from the British government in raising a Transvaal loan they would guarantee a large proportion of a Transvaal debt of £30,000,000, which should repay the British treasury so much of the cost of the war; and when he returned in March 1903, satisfaction was general in the country over the success of his mission. But meantime two things had happened. He had looked at the empire from the colonial point of view, in a way only possible in a colonial atmosphere; and at home some of his colleagues had gone a long way, behind the scenes, to destroy one of the very factors on which the question of a practical scheme for imperial commercial federation seemed to hinge. In the budget of 1902 a duty of a shilling a quarter on imported corn had been reintroduced. This small tax was regarded as only a registration duty. Even by free-trade ministers like Gladstone it had been left up to 1869 untouched, and its removal by Robert Lowe (Lord Sherbrooke) had since then been widely regarded as a

piece of economic pedantry. Its reimposition, officially supported for the sake of necessary revenue in war-time, and cordially welcomed by the Unionist party, had justified itself, as they contended, in spite of the criticisms of the Opposition (who raised the cry of the "dear loaf"), by proving during the year to have had no general or direct effect on the price of bread. And the more advanced Imperialists, as well as the more old-fashioned protectionists (like Mr Chaplin) who formed an integral body of the Conservative party, had looked forward to this tax being converted into a differential one between foreign and colonial corn, so as to introduce a scheme of colonial preference and commercial consolidation between the colonies and the mother country. In South Africa—as in any other British colony, since all of them were accustomed to tariffs of a protectionist nature, and the idea of a preference (already started by Canada) was fairly popular—Mr Chamberlain had found this view well established. The agitation in England against the tax had now blown over. The Unionist rank and file were committed to its support,—many even advocating its increase to two shillings at least. But Mr Ritchie, the chancellor of the exchequer, having a surplus in prospect and taxation to take off, carried the cabinet in favour of again remitting this tax on corn. Mr Chamberlain himself had proposed only to take it off as regards colonial, and not foreign corn,—thus inaugurating a preferential system. But a majority of the cabinet supported Mr Ritchie. The remission of this tax, after all the conviction with which its restoration had been supported a year before, was very difficult for the party itself to stomach, and on any ground it was a distasteful act, loyally as the party followed their leaders. But to those who had looked to it as providing a lever for a gradual change in the established fiscal system, the *volte-face* was a bitter blow, and at once there began, though not at first openly, a split between the more rigid free-traders—advocates of cheap food and free imports—and those who desired to use the opportunities of a tariff, of however moderate a kind, for attaining national and imperial and not merely revenue advantages. This idea, which had for some time been floating in Mr Chamberlain's mind (see especially his speech at Birmingham of May 16, 1902), now took full possession of it. For the moment he remained in the cabinet, but the seed of dissension was sown. The first public intimation of his views was given in a speech to his constituents at Birmingham (May 15, 1903), when he outlined a plan for raising more money by a rearranged tariff, partly to obtain a preferential system for the empire and partly to produce funds for social reform at home. On May 28th in the House of Commons he spoke on the same subject, and declared "if you are to give a preference to the colonies, you must put a tax on food." Considered in the light of after events, this putting the necessity of food-taxes in the forefront was decidedly injudicious; but imperialist conviction and enthusiasm were more conspicuous than electioneering tact in the launching of Mr Chamberlain's new scheme.

The movement grew quickly, its supporters including a number of the cleverest younger politicians and journalists in the Unionist party. The idea of tariff reform—to broaden the basis of taxation, to introduce a preference, and to stimulate home industries and increase employment—took firm root; and the political economists of the party—Prof. W. Cunningham, Prof. W. Ashley and Prof. W.A.S. Hewins, in particular—brought effective criticism to bear on the one-sided "free trade" in vogue. The first demand was for inquiry. The country was still bearing an income-tax of elevenpence in the pound; it appeared that the old sources of revenue were inadequate; and meanwhile the statistics of trade, it was argued, showed that the English free-import system hampered English trade while providing the foreigner with a free market. Mr Chamberlain and his supporters argued that since 1870 certain other countries (Germany and the United States), with protective tariffs, had increased their trade in much larger proportion, while English trade had only been maintained by the increased business done with British colonies. A scientific

inquiry into the facts was needed. By the Opposition, who now found themselves the defenders of conservatism in the established fiscal policy of the country, this whole argument was scouted; but for a time the demand merely for inquiry, and the production of figures, gave no sufficient occasion for dissension among Unionists, even when, like Sir M. Hicks Beach, they were convinced free-importers on purely economic grounds; and Mr Balfour (*q.v.*), as premier, managed to hold his colleagues and party together by taking the line that particular opinions on economic subjects should not be made a test of party loyalty. The Board of Trade was set to work to produce fiscal Blue-books, and hum-drum politicians who had never shown any genius for figures suddenly blossomed out into arithmeticians of the deepest dye. The Tariff Reform League was founded in order to further Mr Chamberlain's policy, holding its inaugural meeting on July 21st; and it began to take an active part in issuing leaflets and in work at by-elections. Discussion proceeded hotly on the merits of a preferential tariff, and on August 15th a manifesto appeared against it signed by fourteen professors or lecturers on political economy, including Mr Leonard Courtney, Professor Edgeworth, Professor Marshall, Professor Bastable, Professor Smart, Professor J.S. Nicholson, Professor Conner, Mr Bowley, Mr E. Cannan and Mr L.R. Phelps,—men of admitted competence, yet, after all, of no higher authority than the economists supporting Mr Chamberlain, such as Dr Cunningham and Professor Ashley.

Meanwhile, the death of Lord Salisbury (August 22) removed a weighty figure from the councils of the Unionist party. The cabinet met several times at the beginning of September, and the question of their attitude towards the fiscal problem became acute. The public had its first intimation of impending events in the appearance on September 16th of Mr Balfour's *Economic Notes on Insular Free Trade*, which had been previously circulated as a cabinet memorandum. The next day appeared the Board of Trade Fiscal Blue-book. And on the 18th the resignations were announced, not only of the more rigid free-traders in the cabinet, Mr Ritchie and Lord George Hamilton, but also of Mr Chamberlain. Letters in cordial terms were published, which had passed between Mr Chamberlain (September 9) and Mr Balfour (September 16). Mr Chamberlain pointed out that he was committed to a preferential scheme involving new duties on food, and could not remain in the government without prejudice while it was excluded from the party programme; remaining loyal to Mr Balfour and his general objects, he could best promote this course from outside, and he suggested that the government might confine its policy to the "assertion of our freedom in the case of all commercial relations with foreign countries." Mr Balfour, while reluctantly admitting the necessity of Mr Chamberlain's taking a freer hand, expressed his agreement in the desirability of a closer fiscal union with the colonies, but questioned the immediate practicability of any scheme; he was willing to adopt fiscal reform so far as it covered retaliatory duties, but thought that the exclusion of taxation of food from the party programme was in existing circumstances necessary, so long as public opinion was not ripe. At the same time he welcomed the fact that Mr Chamberlain's son, Mr Austen Chamberlain, was ready to remain a member of the government. Mr Austen Chamberlain (b. 1863) accordingly became the new chancellor of the exchequer; he was already in the cabinet as postmaster-general, having previously made his mark as civil lord of the admiralty (1895-1900), and financial secretary to the treasury (1900-1902).

From the turning-point of Mr Chamberlain's resignation, it is not necessary here to follow in detail the discussions and dissensions in the party as a whole in its relations with the prime minister (see BALFOUR, A.J.). It is sufficient to say that while Mr Balfour's sympathetic "send off" appeared to indicate his

inclination towards Mr Chamberlain's programme, if only further support could be gained for it, his endeavour to keep the party together, and the violent opposition which gathered against Mr Chamberlain's scheme, combined to make his real attitude during the next two years decidedly obscure, both sections of the party—free-traders and tariff reformers—being induced from time to time to regard him as on their side. The tariff reform movement itself was now, however, outside the purely official programme, and Mr Chamberlain (backed by a majority of the Unionist members) threw himself with impetuous ardour into a crusade on its behalf, while at the same time supporting Mr Balfour in parliament, and leaving it to him to decide as to the policy of going to the country when the time should be ripe. In his own words, he went in front of the Unionist army as a pioneer, and if his army was attacked he would go back to it; in no conceivable circumstances would he allow himself to be put in any sort of competition, direct or indirect, with Mr Balfour, his friend and leader, whom he meant to follow (October 6).

On October 6th he opened his campaign with a speech at Glasgow. Analysing the trade statistics as between 1872 and 1902, he insisted that British progress involved a relative decline compared with that of protectionist foreign countries like Germany and the United States; Great Britain exported less and less of manufactured goods, and imported more and more; the exports to foreign countries had decreased, and it was only the increased exports to the colonies that maintained the British position. This was the outcome of the working of a one-sided free-trade system. Now was the time, and it might soon be lost, for consolidating British trade relations with the colonies. If the mother country and her daughter states did not draw closer, they would inevitably drift apart. A further increase of £26,000,000 a year in the trade with the colonies might be obtained by a preferential tariff, and this meant additional employment at home for 166,000 workmen, or subsistence for a population of a far larger number. His positive proposals were: (1) no tax on raw materials; (2) a small tax on food other than colonial, *e.g.* two shillings a quarter on foreign corn but excepting maize, and 5% on meat and dairy produce excluding bacon; (3) a 10% general tariff on imported manufactured goods. To meet any increased cost of living, he proposed to reduce the duties on tea, sugar and other articles of general consumption, and he estimated that his scheme would in no case increase a working-man's expenditure, and in most cases would reduce it. "The colonies," he said, "are prepared to meet us; in return for a very moderate preference, they will give us a substantial advantage in their markets." This speech, delivered with characteristic vigour and Imperialistic enthusiasm, was the type of others which followed in quick succession during the year. At Greenock next day he emphasized the necessity of retaliating against foreign tariffs—"I never like being hit without striking back." The practice of "dumping" must be fairly met; if foreign goods were brought into England to undersell British manufacturers, either the Fair Wages Clause and the Factory Acts and the Compensation Act would have to be repealed, or the workmen would have to take lower wages, or lose their work. "Agriculture has been practically destroyed, sugar has gone, silk has gone, iron is threatened, wool is threatened, cotton will go! How long are you going to stand it?" On October 20th he spoke at Newcastle, on the 21st at Tynemouth, on the 27th at Liverpool, insisting that free-trade had never been a working-class measure and that it could not be reconciled with trade-unionism; on November 4th at Birmingham, on the 20th at Cardiff, on the 21st at Newport, and on December 16th at Leeds. In all these speeches he managed to point his argument by application to local industries. In the Leeds speech he announced that, with a view to drawing up a scientific model tariff, a non-political commission of representative experts would be appointed under the auspices of the Tariff Reform League

to take evidence from every trade; it included many heads of businesses, and Mr Charles Booth, the eminent student of social and industrial London, with Sir Robert Herbert as chairman, and Professor W.A.S. Hewins as secretary. The name of "Tariff Commission," given to this voluntary and unofficial body, was a good deal criticized, but though flouted by the political free-traders it set to work in earnest, and accumulated a mass of evidence as to the real facts of trade, which promised to be invaluable to economic inquirers. On January 18th, 1904, Mr Chamberlain ended his series of speeches by a great meeting at the Guildhall, in the city of London, the key-note being his exhortation to his audience to "think imperially."

All this activity on Mr Chamberlain's part represented a great physical and intellectual feat on the part of a man now sixty-seven years of age; but his bodily vigour and comparatively youthful appearance were essential features of his personality. Nothing like this campaign had been known in the political world since Mr Gladstone's Midlothian days; and it produced a great public impression, stirring up both supporters and opponents. Free-trade unionists like Lord Goschen and Lord Hugh Cecil, and the Liberal leaders—for whom Mr Asquith became the principal spokesman, though Lord Rosebery's criticisms also had considerable weight—found new matter in Mr Chamberlain's speeches for their contention that any radical change in the traditional English fiscal policy, established now for sixty years, would only result in evil. The broad fact remained that while Mr Chamberlain's activity gathered round him the bulk of the Unionist members and an enthusiastic band of economic sympathizers, the country as a whole remained apathetic and unconvinced. One reason was the intellectual difficulty of the subject and the double-faced character of all arguments from statistics, which were either incomprehensible or disputable; another was the fact that substantially this was a political movement, and that tariff reform was, after all, only one in a complexity of political issues, most of which during this period were being interpreted by the electorate in a sense hostile to the Unionist party. Mr Chamberlain had relied on his personal influence, which from 1895 to 1902 had been supreme; but his own resignation, and the course of events, had since 1903 made his personality less authoritative, and new interests—such as the opposition to the Education Act, to the heavy taxation, and to Chinese labour in the Transvaal, and indignation over the revelations concerned with the war—were monopolizing attention, to the weakening of his hold on the public. The revival in trade, and the production of new statistics which appeared to stultify Mr Chamberlain's prophecies of progressive decline, enabled the free-trade champions to reassure their audiences as to the very foundation of his case, and to represent the whole tariff reform movement as no less unnecessary than risky. Moreover, the split in the Unionist party brought the united Liberal party in full force into the field, and at last the country began to think that the danger of Irish Home Rule was practically over, and that a Liberal majority might be returned to power in safety, with the prospect of providing an alternative government which would assure commercial repose (Lord Rosebery's phrase), relief from extravagant expenditure, and—as the working-classes were led to believe—a certain amount of labour legislation which the Tory leaders would never propose. On the other hand the colonies took a great interest in the new movement, though without putting any such pressure on the home public as Mr Chamberlain might have expected. At the opening of 1904 he was officially invited by Mr Deakin, the prime minister of the Commonwealth, to pay a visit to Australia, in order to expound his scheme, being promised an enthusiastic welcome "as the harbinger of commercial reciprocity between the mother country and her colonies." Mr Chamberlain, however, declined; his work at home was too pressing.

From the end of Mr Chamberlain's series of expository speeches on his scheme of tariff reform, onwards during the various fiscal debates and discussions of 1904, it is unnecessary to follow events in detail. The scheme was now before the country, and Mr Chamberlain was anxious to take its verdict. Time was not on his side at his age, and if he had to be beaten at one election he was anxious to get rid of the other issues which would encumber the popular vote, and to press on to a second when he would be on the attacking side. But he would make no move which would embarrass Mr Balfour in parliament, and adhered to his promise of loyalty. The result was a long drawn out interval, while the government held on and its supporters became more embittered over their differences. Mr Chamberlain needed a rest, and was away in Italy and Egypt from March to May, and again in November. He made three important speeches at Welbeck (August 4), at Luton (October 5), and at Limehouse (December 15), but he had nothing substantial to add to his case, and the party situation continued in all its embarrassments. Mr Balfour's introduction of his promise (at Edinburgh on October 3) to convene an imperial conference after the general election if the Unionists came back to power, in order to discuss a scheme for fiscal union, represented an academic rather than a practical advance, since the by-elections showed that the Unionists were certain to be defeated. The one important new development concerned the Liberal-Unionist organization. In January some correspondence was published between Mr Chamberlain and the duke of Devonshire, dating from the previous October, as to difficulties arising from the central Liberal-Unionist organization subsidizing local associations which had adopted the programme of tariff reform. The duke objected to this departure from neutrality, and suggested that it was becoming "impossible with any advantage to maintain under existing circumstances the existence of the Liberal-Unionist organization." Mr Chamberlain retorted that this was a matter for a general meeting of delegates to decide; if the duke was outvoted he might resign his presidency; for his own part he was prepared to allow the local associations to be subsidized impartially, so long as they supported the government, but he was not prepared for the violent disruption, which the duke apparently contemplated, of an association so necessary to the success of the Unionist cause. The duke was in a difficult position as president of the organization, since most of the local associations supported Mr Chamberlain, and he replied that the differences between them were vital, and he would not be responsible for dividing the association into sections, but would rather resign. Mr Chamberlain then called a general meeting on his own responsibility in February, when a new constitution was proposed; and in May, at the annual meeting of the Liberal-Unionist council, the free-food Unionists, being in a minority, retired, and the association was reorganized under Mr Chamberlain's auspices, Lord Lansdowne and Lord Selborne (both of them cabinet ministers) becoming vice-presidents. On July 14th the reconstituted Liberal-Unionist organization held a great demonstration in the Albert Hall, and Mr Chamberlain's success in ousting the duke of Devonshire and the other free-trade members of the old Liberal-Unionist party, and imposing his own fiscal policy upon the Liberal-Unionist caucus, was now complete.

During the spring and summer of 1905 Mr Chamberlain's more active supporters were in favour of forcing a dissolution by leaving the government in a minority, but he himself preferred to leave matters to take their course, so long as the prime minister was content to be publicly identified with the policy of eventually fighting on tariff reform lines. Speaking at the Albert Hall in July Mr Chamberlain pushed somewhat further than before his "embrace" of Mr Balfour; and in the autumn, when foreign affairs no longer dominated the attention of the government, the crisis rapidly came to a head. In reply to Mr Balfour's appeal for the sinking of differences (Newcastle, November 14), Mr Chamberlain insisted at

Bristol (November 21) on the adoption of his fiscal policy; and Mr Balfour resigned on December 4. on the ground that he no longer retained the confidence of the party. At the crushing Unionist defeat in the general election which followed in January 1906, Mr Chamberlain was triumphantly returned for West Birmingham, and all the divisions of Birmingham returned Chamberlainite members. Amid the wreck of the party—Mr Balfour and several of his colleagues themselves losing their seats—he had the consolation of knowing that the tariff reformers won the only conspicuous successes of the election. But he had no desire to set himself up as leader in Mr Balfour's place, and after private negotiations with the ex-prime minister, a common platform was arranged between them, on which Mr Balfour, for whom a seat was found in the City of London, should continue to lead the remnant of the party. The formula was given in a letter from Mr Balfour of February 14th (see BALFOUR, A.J.) which admitted the necessity of making fiscal reform the first plank in the Unionist platform, and accepted a general tariff on manufactured goods and a small duty on foreign corn as "not in principle objectionable."

It may be left to future historians to attempt a considered judgment on the English tariff reform movement, and on Mr Chamberlain's responsibility for the Unionist *débâcle* of 1906. But while his enemies taunted him with having twice wrecked his party—first the Radical party under Mr Gladstone, and secondly the Unionist party under Mr Balfour—no well-informed critic doubted his sincerity, or failed to recognize that in leaving the cabinet and embarking on his fiscal campaign he showed real devotion to an idea. In championing the cause of imperial fiscal union, by means involving the abandonment of a system of taxation which had become part of British orthodoxy, he followed the guidance of a profound conviction that the stability of the empire and the very existence of the hegemony of the United Kingdom depended upon the conversion of public opinion to a revision of the current economic doctrine. There were doubtless miscalculations at the outset as to the resistance to be encountered. But from the purely party point of view he was entitled to say that he followed the path of loyalty to Mr Balfour which he had marked out from the moment of his resignation, and that he persistently, refused to be put in competition with him as leader. Even in the absence of the new issue, defeat was foredoomed for Mr Balfour's administration by the ordinary course of political events; and it might fairly be claimed that "Chinese slavery," "passive resistance," and labour irritation at the Taff Vale judgment (see TRADE UNIONS) were mainly responsible for the Unionist collapse. Time alone would show whether the system of free imports could be permanently reconciled with British imperial policy or commercial prosperity. It remained the fact that Mr Chamberlain staked an already established position on his refusal to compromise with his convictions on a question which appeared to him of vital and immediate importance.

Mr Chamberlain's own activity in the political field was cut short in the middle of the session of 1906 by a serious attack of gout, which was at first minimized by his friends, but which, it was gradually discovered, had completely crippled him. Though encouragement was given to the idea that he might return to the House of Commons, where he continued to retain his seat for Birmingham, he was quite incapacitated for any public work; and this invalid condition was protracted throughout 1907, 1908 and 1909. But he remained in the background as the inspirer and adviser of the Tariff Reformers. The cause made continuous headway at by-elections, and though the general election of January 1910 gave the Unionists no majority it saw them returned in much increased strength, which was chiefly due to the

support obtained for tariff reform principles. Mr Chamberlain himself was returned unopposed for West Birmingham again.

(H. Ch.)

CHAMBERLAIN, JOSHUA LAWRENCE (1828-), American soldier and educationalist, was born at Brewer, Maine, on the 8th of September 1828. He graduated at Bowdoin College in 1852, and at the Bangor Theological Seminary in 1855, and was successively tutor in logic and natural theology (1855-1856), professor of rhetoric and oratory (1856-1861), and professor of modern languages (1861-1865), at Bowdoin. In 1862 he entered the Federal army as lieutenant-colonel of the 20th Maine Infantry. His military career was marked by great personal bravery and energy and intrepidity as a leader. He was six times wounded, and participated in all the important battles in the East from Antietam onwards, including Fredericksburg, Chancellorsville, Gettysburg, the Wilderness, Cold Harbor, Petersburg and Five Forks. For his conduct at Petersburg, where he was severely wounded, he was promoted to be brigadier-general of volunteers. He was breveted major-general of volunteers on the 29th of March 1865, and led the Federal advance in the final operations against General R.E. Lee. In 1893 he received a Congressional medal of honour "for daring heroism and great tenacity in holding his position on the Little Round Top and carrying the advance position on the Great Round Top at the Battle of Gettysburg." After the war he was again professor of rhetoric and oratory at Bowdoin in 1865-1866, and in 1867-1870 was governor of Maine, having been elected as a Republican. From 1871 to 1883 he was president of Bowdoin College, and during 1874-1879 was professor of mental and moral philosophy also. Appointed in 1880 by Alonzo Garcelon, the retiring governor, to protect the property and institutions of the state until a new governor should be duly qualified, and acting as major-general of the state militia, Chamberlain did much to avert possible civil war, at a time of great political excitement and bitter partisan feeling. (See Maine: *History*.) In 1883-1885 he was a lecturer on political science and public law at Bowdoin, and in 1900 became surveyor of customs for the district of Portland, Maine. He published *Maine, Her Place in History* (1877), and edited *Universities and Their Sons* (6 vols., 1898).

CHAMBERLAIN, SIR NEVILLE BOWLES (1820-1902), British field marshal, was the third son of Sir Henry Chamberlain, first baronet, consul-general and chargé d'affaires in Brazil, and was born at Rio on the 10th of January 1820. He entered the Indian army in 1837, served as a subaltern in the first Afghan War (1839-42), and was wounded on six occasions. He was attached to the Governor-General's Bodyguard at the battle of Maharajpur, in the Gwalior campaign of 1843, was appointed military secretary to the governor of Bombay in 1846, and honorary aide-de-camp to the governor-general of

India in 1847. He served on the staff throughout the Punjab campaign of 1848-49, and was given a brevet majority. In 1850 he was appointed commandant of the Punjab military police, and in 1852 military secretary to the Punjab government. Promoted lieut.-colonel in 1854, he was given the command of the Punjab Frontier Force with rank of brigadier-general, and commanded in several expeditions against the frontier tribes. In the Indian Mutiny he succeeded Colonel Chester as adjutant-general of the Indian army, and distinguished himself at the siege of Delhi, where he was severely wounded. He was rewarded with a brevet-colonelcy, the appointment of A.D.C. to the queen, and the C.B. He was reappointed to the command of the Punjab Frontier Force in 1858, and commanded in the Umbeyla campaign (1863), in which he was severely wounded. He was now made major-general for distinguished service and a K.C.B. He was made K.C.S.I. in 1866, lieut.-general in 1872, G.C.S.I. in 1873, G.C.B in 1875, and general in 1877. From 1876 to 1881 he was commander-in-chief of the Madras army, and in 1878 was sent on a mission to the amir of Afghanistan, whose refusal to allow him to enter the country precipitated the second Afghan War. He was for some time acting military member of the council of the governor-general of India. He retired in 1886, was made a field marshal in 1900, and died on the 18th of February 1902.

An excellent biography by G.W. Forrest appeared in 1909.

CHAMBERLAIN (O. Fr. *chamberlain, chamberlenc*, Mod. Fr. *chambellan*, from O.H. Ger. *Chamarling, Chamarlinc*, whence also the Med. Lat. *cambellanus, camerlingus, camerlengus*; Ital. *camerlingo*; Span, *camerlengo*, compounded of O.H. Ger. *Chamara, Kamara* [Lat. *camera*, “chamber”], and the Ger. suffix *-ling*), etymologically, and also to a large extent historically, an officer charged with the superintendence of domestic affairs. Such were the chamberlains of monasteries or cathedrals, who had charge of the finances, gave notice of chapter meetings, and provided the materials necessary for the various services. In these cases, as in that of the apostolic chamberlain of the Roman see, the title was borrowed from the usage of the courts of the western secular princes. A royal chamberlain is now a court official whose function is in general to attend on the person of the sovereign and to regulate the etiquette of the palace. He is the representative of the medieval *camberlanus, cambellanus*, or *cubicularius*, whose office was modelled on that of the *praefectus sacri cubiculi* or *cubicularius* of the Roman emperors. But at the outset there was another class of chamberlains, the *camerarii*, *i.e.* high officials charged with the administration of the royal treasury (*camera*). The *camerarius* of the Carolingian emperors was the equivalent of the *hordere* or *thesaurarius* (treasurer) of the Anglo-Saxon kings; he develops into the *Erzkämmerer* (*archicamerarius*) of the Holy Roman Empire, an office held by the margraves of Brandenburg, and the *grand chambrier* of France, who held his *chamberie* as a fief. Similarly in England after the Norman conquest the *hordere* becomes the chamberlain. This office was of great importance. Before the Conquest he had been, with the marshal, the principal officer of the king’s court; and under the Norman sovereigns his functions were manifold. As he had charge of the administration of the royal household, his office was of financial importance, for a portion of the royal revenue was paid, not into the exchequer, but in *camera regis*. In course of time the office became hereditary and titular, but the

complexities of the duties necessitated a division of the work, and the office was split up into three: the hereditary and sinecure office of *magister camerarius* or lord great chamberlain (see LORD GREAT CHAMBERLAIN), the more important domestic office of *camerarius regis*, king's chamberlain or lord chamberlain (see LORD CHAMBERLAIN), and the chamberlains (*camerarii*) of the exchequer, two in number, who were originally representatives of the chamberlain at the exchequer, and afterwards in conjunction with the treasurer presided over that department. In 1826 the last of these officials died, when by an act passed forty-four years earlier they disappeared.

In France the office of *grand chambrier* was early overshadowed by the *chamberlains (cubicularii, cambellani*, but sometimes also *camerarii*), officials in close personal attendance on the king, men at first of low rank, but of great and ever-increasing influence. As the office of *grand chambrier*, held by great feudal nobles seldom at court, became more and more honorary, the chamberlains grew in power, in numbers and in rank, until, in the 13th century, one of them emerges as a great officer of state, the *chambellan de France* or *grand chambellan* (also *magister cambellanorum, mestre chamberlenc*), who at times shares with the *grand chambrier* the revenues derived from certain trades in the city of Paris (see *Regestum Memoralium Camerae computorum*, quoted in du Cange, s. *Cameranus*). The honorary office of *grand chambrier* survived till the time of Henry II., who was himself the last to hold it before his accession; that of *grand chambellan*, which in its turn soon became purely honorary, survived till the Revolution. Among the prerogatives of the *grand chambellan* which survived to the last not the least valued was the right to hand the king his shirt at the ceremonial levée. The offices of *grand chambellan, premier chambellan*, and *chambellan* were revived by Napoleon, continued under the Restoration, abolished by Louis Philippe, and again restored by Napoleon III.

In the papal Curia the apostolic chamberlain (Lat. *camerarius*, Ital. *camerlingo*) occupies a very important position. He is at the head of the treasury (*camera thesauraria*) and, in the days of the temporal power, not only administered the papal finances but possessed an extensive civil and criminal jurisdiction. During a vacancy of the Holy See he is at the head of the administration of the Roman Church. The office dates from the 11th century, when it superseded that of archdeacon of the Roman Church, and the close personal relations of the *camerarius* with the pope, together with the fact that he is the official guardian of the ceremonial vestments and treasures, point to the fact that he is also the representative of the former *vestararius* and *vice-dominus*, whose functions were merged in the new office, of which the idea and title were probably borrowed from the usage of the secular courts of the West (Hinschius, *Kirchenrecht*, i. 405, &c.). There are also attached to the papal household (*famiglia pontificia*) a large number of chamberlains whose functions are more or less ornamental. These are divided into several categories: privy chamberlains (*camerieri segreti*), chamberlains, assistant and honorary chamberlains. These are gentlemen of rank and belong to the highest class of the household (*famiglia nobile*).

In England the modern representatives of the *cubicularii* are the gentlemen and grooms of the bed-chamber, in Germany the *Kammerherr* (*Kämmerer*, from *camerarius*, in Bavaria and Austria) and *Kammerjunker*. The insignia of their office is a gold key attached to their coats behind.

Many corporations appoint a chamberlain. The most important in England is the chamberlain of the corporation of the city of London, who is treasurer of the corporation, admits persons entitled to the

freedom of the city, and, in the chamberlain's court, of which he and the vice-chamberlain are judges, exercises concurrent jurisdiction with the police court in determining disputes between masters and apprentices. Formerly nominated by the crown, since 1688 he has been elected annually by the liverymen. He has a salary of £2000 a year. Similarly in Germany the administration of the finances of a city is called the *Kämmerei* and the official in charge of it the *Kämmerer*.

See also STATE, GREAT OFFICERS OF; HOUSEHOLD, ROYAL; Du Cange, *Glossarium*, s. "Camerarius" and "Cambellanus"; Père Anselme (Pierre de Guibours), *Hist. généalogique et chronologique de la maison royale de France, &c.* (9 vols., 3rd ed., 1726-1733); A. Luchaire, *Manuel des institutions françaises* (Paris, 1892); W.R. Anson, *Law and Custom of the Constitution* (Oxford, 1896); Hinschius, *Kirchenrecht*, i. 405 (Berlin, 1869).

CHAMBERLAYNE, WILLIAM (1619-1679), English poet, was born in 1619. Nothing is known of his history except that he practised as a physician at Shaftesbury in Dorsetshire, and fought on the Royalist side at the second battle of Newbury. He died on the 11th of July 1679. His works are: *Pharonnida* (1659), a verse romance in five books; *Love's Victory* (1658), a tragi-comedy, acted under another title in 1678 at the Theatre Royal; *England's Jubilee* (1660), a poem in honour of the Restoration. A prose version of *Pharonnida*, entitled *Eromena*, or the *Noble Stranger*, appeared in 1683. Southey speaks of him as "a poet to whom I am indebted for many hours of delight." *Pharonnida* was reprinted by S.W. Singer in 1820, and again in 1905 by Prof. G. Saintsbury in *Minor Poets of the Caroline Period* (vol. i.). The poem is loose in construction, but contains some passages of great beauty.

CHAMBERS, EPHRAIM (d. 1740), English encyclopaedist, was born at Kendal, Westmorland, in the latter part of the 17th century. He was apprenticed to a globe-maker in London, but having conceived the plan of his Cyclopaedia, or *Universal Dictionary of Arts and Sciences*, he devoted himself entirely to it. The first edition appeared by subscription in 1728, in two vols. fol., and dedicated to the king (see ENCYCLOPAEDIA). The *Encyclopédie* of Diderot and d'Alembert owed its inception to a French translation of Chambers's work. In addition to the *Cyclopaedia*, Chambers wrote for the *Literary Magazine* (1735-1736), and translated the *History and Memoirs of the Royal Academy of Sciences at Paris* (1742), and the *Practice of Perspective* from the French of Jean Dubreuil. He died on the 15th of May 1740.

CHAMBERS, GEORGE (1803-1840), English marine painter, born at Whitby, Yorkshire, was the son of a seaman, and for several years he pursued his father's calling. While at sea he was in the habit of sketching the different classes of vessels. His master, observing this, gratified him by cancelling his indentures, and thus set him free to follow his natural bent. Chambers then apprenticed himself to an old woman who kept a painter's shop in Whitby, and began by house-painting. He also took lessons of a drawing-master, and found a ready sale for small and cheap pictures of shipping. Coming afterwards to London, he was employed by Thomas Horner to assist in painting the great panorama of London for the Colosseum (the exhibition building in Regent's Park, demolished towards 1860), and he next became scene-painter at the Pavilion theatre. In 1834 he was elected an associate, and in 1836 a full member, of the Water-colour Society. His best works represent naval battles. Two of these—the "Bombardment of Algiers in 1816," and the "Capture of Porto Bello"—are in Greenwich hospital. Not long before his death he was introduced to William IV., and his professional prospects brightened; but his constitution, always frail, gave way, and he died on the 28th of October 1840.

A *Life*, by John Watkins, was published in 1841.

CHAMBERS, ROBERT (1802-1871), Scottish author and publisher, was born at Peebles on the 10th of July 1802. He was sent to the local schools, and gave evidence of unusual literary taste and ability. A small circulating library in the town, and a copy of the *Encyclopaedia Britannica* which his father had purchased, furnished him with stores of reading of which he eagerly availed himself. Long afterwards he wrote of his early years—"Books, not playthings, filled my hands in childhood. At twelve I was deep, not only in poetry and fiction, but in encyclopaedias." Robert had been destined for the church, but this design had to be abandoned for lack of means. The family removed to Edinburgh in 1813, and in 1818 Robert began business as a bookstall-keeper in Leith Walk. He was then only sixteen, and his whole stock consisted of a few old books belonging to his father. In 1819 his elder brother William had begun a similar business, and the two eventually united as partners in the publishing firm of W. & R. Chambers. Robert Chambers showed an enthusiastic interest in the history and antiquities of Edinburgh, and found a most congenial task in his *Traditions of Edinburgh* (2 vols., 1824), which secured for him the approval and the personal friendship of Sir Walter Scott. A *History of the Rebellions in Scotland from 1638 to 1745* (5 vols., 1828) and numerous other works followed.

In the beginning of 1832 William Chambers started a weekly publication under the title of *Chambers's Edinburgh Journal* (known since 1854 as *Chambers's Journal of Literature, Science and Arts*), which speedily attained a large circulation. Robert was at first only a contributor. After fourteen numbers had appeared, however, he was associated with his brother as joint-editor, and his collaboration contributed more perhaps than anything else to the success of the *Journal*.

Among the other numerous works of which Robert was in whole or in part the author, the *Biographical Dictionary of Eminent Scotsmen* (4 vols., Glasgow, 1832-1835), the *Cyclopaedia of English*

Literature (1844), the *Life and Works of Robert Burns* (4 vols., 1851), *Ancient Sea Margins* (1848), the *Domestic Annals of Scotland* (3 vols., 1859-1861) and the *Book of Days* (2 vols., 1862-1864) were the most important. *Chambers's Encyclopaedia* (1859-1868), with Dr Andrew Findlater as editor, was carried out under the superintendence of the brothers (see ENCYCLOPAEDIA). The *Cyclopaedia of English Literature*[1] contains a series of admirably selected extracts from the best authors of every period, "set in a biographical and critical history of the literature itself." For the *Life of Burns* he made diligent and laborious original investigations, gathering many hitherto unrecorded facts from the poet's sister, Mrs Begg, to whose benefit the whole profits of the work were generously devoted. Robert Chambers was a scientific geologist, and availed himself of tours in Scandinavia and Canada for the purpose of geological exploration. The results of his travels were embodied in *Tracings of the North of Europe* (1851) and *Tracings in Iceland and the Faroe Islands* (1856). His knowledge of geology was one of the principal grounds on which the authorship of the *Vestiges of the Natural History of Creation* (2 vols., 1843-1846) was eventually assigned to him. The book was published anonymously. Robert Chambers was aware of the storm that would probably be raised at the time by a rational treatment of the subject, and did not wish to involve his firm in the discredit that a charge of heterodoxy would bring with it. The arrangements for publication were made through Alexander Ireland of Manchester, and the secret was so well kept that such different names as those of Prince Albert and Sir Charles Lyell were coupled with the book. Ireland in 1884 issued a 12th edition, with a preface giving an account of its authorship, which there was no longer any reason for concealing. The *Book of Days* was Chambers's last publication, and perhaps his most elaborate. It was a miscellany of popular antiquities in connexion with the calendar, and it is supposed that his excessive labour in connexion with this book hastened his death, which took place at St Andrews on the 17th of March 1871. Two years before, the university of St Andrews had conferred upon him the degree of doctor of laws, and he was elected a member of the Athenaeum club in London. It is his highest claim to distinction that he did so much to give a healthy tone to the cheap popular literature which has become so important a factor in modern civilization.

His brother, WILLIAM CHAMBERS (1800-1883) was born at Peebles, on the 16th of April 1800. He was the financial genius of the publishing firm. He laid the city of Edinburgh under the greatest obligations by his public spirit and munificence. As lord provost he procured the passing in 1867 of the Improvement Act, which led to the reconstruction of a great part of the Old Town, and at a later date he proposed and carried out, largely at his own expense, the restoration of the noble and then neglected church of St Giles, making it in a sense "the Westminster Abbey of Scotland." This service was fitly acknowledged by the offer of a baronetcy, which he did not live to receive, dying on the 20th of May 1883, three days before the reopening of the church. He was the author of a history of St Giles's, of a memoir of himself and his brother (1872), and of many other useful publications. On his death in 1883 Robert Chambers (1832-1888), son of Robert Chambers, succeeded as head of the firm, and edited the *Journal* until his death. His eldest son, Charles Edward Stuart Chambers (b. 1859), became editor of the *Journal* and chairman of W. & R. Chambers, Limited.

See also *Memoir of Robert Chambers, with Autobiographic Reminiscences of William Chambers* (1872), the 13th ed. of which (1884) has a supplementary chapter; Alexander Ireland's preface to the 12th ed. (1884) of the *Vestiges of Creation*; the *Story of a Long and Busy Life* (1884), by William Chambers; and some discriminating appreciation in James Payn's *Some Literary Recollections* (1884), chapter v. The *Select Writings of Robert Chambers* were published in 7 vols. in 1847, and a complete list of the works of the brothers is added to *A Catalogue of Some of the Rarer Books ... in the Collection of C.E.S. Chambers* (Edinburgh, 1891).

---

1 A new and enlarged edition of this work, edited by David Patrick, LL. D., appeared in 1903.

CHAMBERS, SIR WILLIAM (1726-1796), British architect, was the grandson of a rich merchant who had financed the armies of Charles XII., but was paid in base money, and whose son remained in Sweden many years endeavouring to obtain redress. In 1728 the latter returned to England and settled at Ripon, where William, who was born in Stockholm, was educated. At the age of sixteen he became supercargo to the Swedish East India Company, and voyaging to Canton made drawings of Chinese architecture, furniture and costume which served as basis for his *Designs for Chinese Buildings*, &c. (1757). Two years later he quitted the sea to study architecture seriously, and spent a long time in Italy, devoting special attention to the buildings of classical and Renaissance architects. He also

studied under Clérisseau in Paris, with whom and with the sculptor Wilton he lived at Rome. In 1755 he returned to England with Cipriani and Wilton, and married the beautiful daughter of the latter. His first important commission was a villa for Lord Bessborough at Roehampton, but he made his reputation by the grounds he laid out and the buildings he erected at Kew between 1757 and 1762 for Augusta, princess dowager of Wales. Some of them have since been demolished, but the most important, the pagoda, still survives. The publication in a handsome volume of the designs for these buildings assured his position in the profession. He was employed to teach architectural drawing to the prince of Wales (George III.), and gained further professional distinction in 1759 by the publication of his *Treatise of Civil Architecture*. He began to exhibit with the Society of Artists in 1761 at Spring Gardens, and was one of the original members and treasurer of the Royal Academy when it was established in 1768. In 1772 he published his *Dissertation on Oriental Gardening*, which attempted to prove the inferiority of European to Chinese landscape gardening. As a furniture designer and internal decorator he is credited with the creation of that "Chinese Style" which was for a time furiously popular, although Thomas Chippendale (*q.v.*) had published designs in that manner at a somewhat earlier date. It is not unreasonable to count the honours as divided, since Chippendale unquestionably adapted and altered the Chinese shapes in a manner better to fit them for European use. To the rage for every possible form of *chinoiserie*, for which he is chiefly responsible, Sir William Chambers owed much of his success in life. He became architect to the king and queen, comptroller of his majesty's works, and afterwards surveyor-general. In 1775 he was appointed architect of Somerset House, his greatest monument, at a salary of £2000 a year. He also designed town mansions for Earl Gower at Whitehall and Lord Melbourne in Piccadilly, built Charlemont House, Dublin, and Duddingston House near Edinburgh. He designed the market house at Worcester, was employed by the earl of

Pembroke at Wilton, by the duke of Marlborough at Blenheim, and by the duke of Bedford in Bloomsbury. The state coach of George III., his constant patron, was his work; it is now in the Victoria and Albert Museum. Although his practice was mainly Classic, he made Gothic additions to Milton Abbey in Dorset. Sir William Chambers achieved considerable distinction as a designer of furniture. In addition to his work in the Chinese style and in the contemporary fashions, he was the author of what is probably the most ambitious and monumental piece of furniture ever produced in England. This was a combined bureau, dressing-case, jewel-cabinet and organ, made for Charles IV., king of Spain, in 1793. These combination pieces were in the taste of the time, and the effort displays astonishing ingenuity and resource. The panels were painted by W. Hamilton, R.A., with representations of the four seasons, night and morning, fire and water, Juno and Ceres, together with representations of the Golden Fleece and the Immaculate Conception. The organ, in the domed top, is in a case decorated with ormolu and Wedgwood. This remarkable achievement, which possesses much sober elegance, formed part of the loan collection of English furniture at the Franco-British Exhibition in London in 1908. Sir William Chambers numbered among his friends Dr Johnson, Goldsmith, Sir Joshua Reynolds, David Garrick and Dr Burney.

CHAMBERS (the Fr. *chambre*, from Lat. *camera*, a room), a term used generally of rooms or apartments, but especially in law of the offices of a lawyer or the semi-private rooms in which judges or judicial officers deal

with questions of practice and other matters not of sufficient importance to be dealt with in court. It is a matter of doubt at what period the practice of exercising jurisdiction "in chambers" commenced in England; there is no statutory sanction before 1821, though the custom can be traced back to the 17th century. An act of 1821 provided for sittings in chambers between terms, and an act of 1822 empowered the sovereign to call upon the judges by warrant to sit in chambers on as many days in vacation as should seem fit, while the Law Terms Act 1830 defined the jurisdiction to be exercised at chambers. The Judges' Chambers Act 1867 was the first act, however, to lay down proper regulations for chamber work, and the Judicature Act 1873 preserved that jurisdiction and gave power to increase it as might be directed or authorized by rules of court to be thereafter made. (See CHANCERY; KING'S BENCH, COURT OF.)

CHAMBERSBURG, a borough and the county-seat of Franklin county, Pennsylvania, U.S.A., at the confluence of Conoco-cheague Creek and Falling Spring, 52 m. S.W. of Harrisburg. Pop. (1890) 7863; (1900) 8864, of whom 769 were negroes; (1910) 11,800. It is served by the Cumberland Valley and the Western Maryland railways, and is connected by electric lines with Greencastle, Waynesboro, Caledonia, a beautiful park in the Pennsylvania timber reservation, on South Mountain, 12 m. east of Chambersburg, and Pen Mar, a summer resort, on South Mountain, near the boundary line between Pennsylvania and Maryland. Chambersburg is built on an elevated site in the broad and fertile Cumberland Valley, and commands a fine view of the distant hills and dales. The borough is the seat

of Chambersburg Academy, a preparatory school; Penn Hall, a school for girls; and Wilson College, a Presbyterian institution for women, opened in 1870. The Wilson College campus, the former estate of Col. A.K. McClure (1828-1909), a well-known journalist, was laid out by Donald G. Mitchell ("Ik Marvel"), who was an enthusiastic landscape gardener. The shops of the Cumberland Valley railway are at Chambersburg, and among the borough's manufactures are milling machinery, boilers, engines, hydraulic presses, steam-hammers, engineering and bridge supplies, hosiery, shoes, gloves, furniture, flour, paper, leather, carriages and agricultural implements; the total value of its factory product in 1905 was $1,085,185. The waterworks and the electric-lighting plant are owned and operated by the municipality. A settlement was founded here in 1730 by Benjamin Chambers, in whose honour the borough was named, and who, immediately after General Edward Braddock's defeat in 1755, built a stone fort and surrounded it with a stockade for the protection of the community from the Indians. Chambersburg was laid out in 1764 and was incorporated as a borough in 1803. On the 30th of July 1864 Chambersburg was occupied by a Confederate cavalry force under General McCausland (acting under General Jubal A. Early's orders), who, upon the refusal of the citizens to pay $100,000 for immunity, burned a large part of the borough.

CHAMBÉRY, a city of France, capital of the department of Savoie, pleasantly situated in a fertile district, between two hills, on the rivers Leysse and Albane, 79 m. by rail S.S.W. of Geneva. Pop. (1906) town, 16,852; commune, 23,027. The town is irregularly built, and has only two

good streets—the Place Saint-Léger and the Rue de Boigne, the latter being named after General Benoît Boigne (1741-1830), who left a fortune of 3,400,000 francs (accumulated in India) to the town. The principal buildings are the cathedral, dating from the 14th and 15th centuries; the Hôtel-Dieu, founded in 1647; the castle, a modern building serving as the prefecture, and preserving only a great square tower belonging to the original structure; the palace of justice, the theatre, the barracks, and the covered market, which dates from 1863. Several of the squares are adorned with fountains; the old ramparts of the city, destroyed during the French Revolution, have been converted into public walks; and various promenades and gardens have been constructed. Chambéry is the seat of an archbishop (raised to that dignity from a bishopric in 1817) and of a superior tribunal. It has also a Jesuit college, a royal academical society, a society of agriculture and commerce, a public library with 60,000 volumes, a museum (antiquities and paintings), a botanic garden, and many charitable institutions. It manufactures silk-gauze, lace, leather and hats, and has a considerable trade in liqueurs, wine, lead, copper and other articles. Overlooking the town on the north is the Rocher de Lémenc, which derives its name from the *Lemincum* of the Romans; and in the vicinity is Les Charmettes, for some time (1736-1740) the residence of Rousseau.

The origin of Chambéry is unknown, but its lords are mentioned for the first time in 1029. In 1232 it was sold to the count of Savoy, Thomas I., who bestowed several important privileges on the inhabitants. As capital of the duchy of Savoy, it has passed through numerous political vicissitudes. Between 1536 and 1713 it was several times occupied by the French; in 1742 it was captured by a Franco-Spanish army; and in 1792 it was occupied by the Republican forces, and became the capital of the department of Mont Blanc. Restored to the house of Savoy by the treaties of Vienna and Paris, it was again surrendered to France in 1860. Among the famous men whom it has given to France, the most important are Vaugelas

(1585-1650), Saint-Réal (1639-1692), and the brothers Joseph (1754-1821) and Xavier (1763-1852) de Maistre.

CHAMBORD, HENRI CHARLES FERDINAND MARIE DIEUDONNÉ Comte de (1820-1883), the "King Henry V." of the French legitimists, was born in Paris on the 29th of September 1820. His father was the duc de Berry, the elder son of the comte d'Artois (afterwards Charles X.); his mother was the princess Caroline Ferdinande Louise of Naples. Born seven months after the assassination of his father, he was hailed as the "enfant du miracle," and was made the subject of one of Lamartine's most famous poems. He was created duc de Bordeaux, and in 1821, as the result of a subscription organized by the government, received the château of Chambord. He was educated by tutors inspired by detestation of the French Revolution and its principles, and from the duc de Damas in particular imbibed those ideas of divine right and of devotion to the Church to which he always remained true. After the revolution of July, Charles X. vainly endeavoured to save the Bourbon cause by abdicating in his favour and proclaiming him king under the title of Henry V. (August 2, 1830). The comte de Chambord accompanied his grandfather into exile, and resided successively at Holyrood, Prague, and Görz. In 1841, during an extensive tour through Europe, he broke his leg—an accident that resulted in permanent lameness. The death of his grandfather, Charles X., in 1836, and of his uncle, the duc d'Angoulême, in 1844, left him the last male representative of the elder branch of the Bourbon family; and his marriage with the archduchess Maria Theresa, eldest daughter of the duke of Modena

(November 7, 1846), remained without issue. The title to the throne thus passed to the comte de Paris, as representative of the Orleans branch of the house of Bourbon, and the history of the comte de Chambord's life is largely an account of the efforts made to unite the Royalist party by effecting a reconciliation between the two princes. Though he continued to hold an informal court, both on his travels and at his castle of Frohsdorf, near Vienna, yet he allowed the revolution of 1848 and the *coup d'état* of 1851 to pass without any decisive assertion of his claims. It was the Italian war of 1859, with its menace to the pope's independence, that roused him at last to activity. He declared himself ready "to pay with his blood for the triumph of a cause which was that of France, the Church, and God himself." Making common cause with the Church, the Royalists now began an active campaign against the Empire. On the 9th of December 1866 he addressed a manifesto to General Saint-Priest, in which he declared the cause of the pope to be that of society and liberty, and held out promises of retrenchment, civil and religious liberty, "and above all honesty." Again, on the 4th of September 1870, after the fall of the Empire, he invited Frenchmen to accept a government "whose basis was right and whose principle was honesty," and promised to drive the enemy from French soil. These vague phrases, offered as a panacea to a nation fighting for its life, showed conclusively his want of all political genius; they had as little effect on the French as his protest against the bombardment of Paris had on the Germans. Yet fortune favoured him. The elections placed the Republican party in a minority in the National Assembly; the abrogation of the law of exile against the royal family permitted him to return to his castle of Chambord; and it was thence that on the 5th of July 1871 he issued a proclamation, in which for the first time he publicly posed as king, and declared that he would never abandon the white standard of the Bourbons, "the flag of Henry IV., Francis I., and Joan of Arc," for the tricolour of the Revolution. He again quitted France, and answered the attempts to make

him renounce his claims in favour of the comte de Paris by the declaration (January 25, 1872) that he would never abdicate. In the following month he held a great gathering of his adherents at Antwerp, which was the cause of serious disturbances. A constitutional programme, signed by some 280 members of the National Assembly, was presented for his acceptance, but without result. The fall of Thiers in May 1873, however, offered an opportunity to the Royalists by which they hastened to profit. The comte de Paris and the prince de Joinville journeyed to Frohsdorf, and were formally reconciled with the head of the family (August 5). The Royalists were united, the premier (the duc de Broglie) an open adherent, the president (MacMahon) a benevolent neutral. MM. Lucien Brun and Chesnelong were sent to interview the comte de Chambord at Salzburg, and obtain the definite assurances that alone were wanting. They returned with the news that he accepted the principles of the French Revolution and the tricolour flag. But a letter to Chesnelong, dated Salzburg, 27th of October, declared that he had been misunderstood: he would give no guarantees; he would not inaugurate his reign by an act of weakness, nor become “le roi légitime de la Révolution.” “Je suis le pilote nécessaire,” he added, “le seul capable de conduire le navire au port, parce que j’ai mission et autorité pour cela.” This outspoken adherence to the principle of divine right did credit to his honesty, but it cost him the crown. The duc de Broglie carried the septennate, and the Republic steadily established itself in popular favour. A last effort was made in the National Assembly in June 1874 by the duc de la Rochefoucauld-Bisaccia, who formally moved the restoration of the monarchy. The comte de Chambord on the 2nd of July issued a fresh manifesto, which added nothing to his former declarations. The motion was rejected by 272 to 79, and on the 25th of February 1875 the Assembly definitely adopted the Republic as the national form of government. From this time the comte de Chambord, though continuing to publish letters on

political affairs, made no further effort to regain the throne. He died at Frohsdorf on the 24th of August 1883.

See *Manifestes et programmes politiques de M. le comte de Chambord, 1848-1873* (1873), and *Correspondance de la famille royale et principalement de Mgr. le comte de Chambord avec le comte de Bouillé* (1884). Of the enormous literature relating to him, mention may be made of *Henri V et la monarchie traditionnelle* (1871), *Le Comte de Chambord étudié dans ses voyages et sa correspondance* (1880), and *Henri de France*, by H. de Pène (1885).

(H. Sy.)

CHAMBORD, a village of central France, in the department of Loir-et-Cher, on the left bank of the Cosson, 10 m. E. by N. of Blois by road. The village stands in the park of Chambord, which is enclosed by a wall 21 m. in circumference. The celebrated château (see ARCHITECTURE: *Renaissance Architecture in France*) forms a parallelogram flanked at the angles by round towers and enclosing a square block of buildings, the façade of which forms the centre of the main front. The profusion of turrets, pinnacles, and dormer windows which decorates the roof of this, the chief portion of the château, constitutes the main feature of the exterior, while in the interior are a well-preserved chapel of the 16th century and a famous double staircase, the construction of which permits two people to ascend and descend respectively without seeing one another. There are 440 apartments, containing pictures of the 17th century and souvenirs of the comte de Chambord. The château was originally a hunting-box of the counts of Blois,

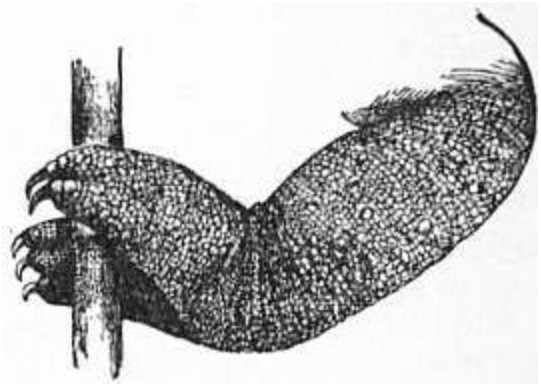
the rebuilding of which was begun by Francis I. in 1526, and completed under Henry II. It was the residence of several succeeding monarchs, and under Louis XIV. considerable alterations were made. In the same reign Molière performed *Monsieur de Pourceaugnac* and *Le Bourgeois gentilhomme* for the first time in the theatre. Stanislaus, king of Poland, lived at Chambord, which was bestowed by his son-in-law, Louis XV., upon Marshal Saxe. It was given by Napoleon to Marshal Berthier, from whose widow it was purchased by subscription in 1821, and presented to the duc de Bordeaux, the representative of the older branch of the Bourbons, who assumed from it the title of comte de Chambord. On his death in 1883 it came by bequest into the possession of the family of Parma.

CHAMBRE ARDENTE (Fr. “burning chamber”), the term for an extraordinary court of justice in France, mainly held for the trials of heretics. The name is perhaps an allusion to the fact that the proceedings took place in a room from which all daylight was excluded, the only illumination being from torches, or there may be a reference to the severity of the sentences in *ardente*, suggesting the burning of the prisoners at the stake. These courts were originated by the Cardinal of Lorraine, the first of them meeting in 1535 under Francis I. The *Chambre Ardente* co-operated with an inquisitorial tribunal also established by Francis I., the duty of which was to discover cases of heresy and hand them over for final judgment to the *Chambre Ardente*. The reign of Henry II. of France was particularly infamous for the cruelties perpetrated by this court on the

Huguenots. The marquise de Brinvilliers (*q.v.*) and her associates were tried in the *Chambre Ardente* in 1680. The court was abolished in 1682.

See N. Weiss, *La Chambre Ardente* (Paris, 1889), and F. Ravaisson, *Archives de la Bastille* (Paris, 1866-1884, 16 vols.).

CHAMELEON, the common name of one of the three suborders of Lacertilia or lizards. The chief genus is *Chamaeleon*, containing most of the fifty to sixty species of the whole group, and with the most extensive range, all through Africa and Madagascar into Arabia, southern India and Ceylon. The Indian species is *Ch. calcaratus*; the dwarf chameleon of South Africa is *Ch. pumilus*; the giant of the whole tribe, reaching a total length of 2 ft., is *Ch. parsoni* of Madagascar. The commonest species in the trade is *Ch. vulgaris* of North Africa, introduced into southern Andalusia. A few queer genera, with much stunted tail, *e.g. Rhampholeon*, in tropical Africa and *Brookesia* in Madagascar are the most aberrant. The common chameleon is the most typical. The head is raised into a pyramidal crest far beyond the occiput, there is no outer ear, nor a drum-cavity. The limbs are very long and slender, and the digits form stout grasping bundles; on the hand the first three form an inner bundle, opposed to the remaining two; on the foot the



Left Forefoot of *Chamaeleon o'shaughenesii*, outer view.

inner bundle is formed by the first and second toe, the outer by the other three toes. The tail is prehensile, by being rolled downwards; it is not brittle and cannot be renewed. The eyeballs are large, but the lids are united into one concentric fold, leaving only the small pupil visible. The right and left eyes are incessantly moved separately from each other and literally in every direction, up and down, forwards and straight backwards, producing the most terrible squinting. Chameleons alone of all reptiles can focus their eyes upon one spot, and conformably they alone possess a retinal *macula centralis*, or spot of acutest, binocular vision. The tongue has attained an extraordinary development. It is club-shaped, covered with a sticky secretion, and based upon a very narrow root, which is composed of extremely elastic fibres and telescoped over the much elongated, style-shaped, copular piece of the hyoid. The whole apparatus is kept in a contracted state like a spring in a tube. When the spring is released, so to speak, by filling the apparatus with blood and by the play of the hyoid muscles, the heavy thick end shoots out upon the insect prey and is withdrawn by its own elasticity. The whole act is like a flash. An ordinary chameleon can shoot a fly at the distance of fully 6 in., and it can manage even a big sphinx moth.

Another remarkable feature is their changing of colour. This proverbial power is greatly exaggerated. They cannot assume in succession all the colours of the rainbow, nor are the changes quick. The common chameleon may be said to be greenish grey, changing to grass-green or to dull black, with or without maroon red, or brown, lateral series of patches. At night the same specimen assumes as a rule a more or less uniform pale straw-colour. After it has been watched for several months, when all its possibilities seem exhausted, it will probably surprise us by a totally new combination, for instance, a black garb with many small yellow specks, or green with many black specks. Pure red and blue are not in the register of this species, but they are rather the rule upon the dark green ground colour of the South

African dwarf chameleon. The changes are partly under control of the will, partly complicated reflex actions, intentionally adaptive to the physical and psychical surroundings. The mechanism is as follows. The cutis contains several kinds of specialized cells in many layers, each filled with minute granules of guanine. The upper cells are the smallest, most densely filled with crystals, and cause the white colour by diffusion of direct light; near the Malpighian layer the cells are charged with yellow oil drops; the deeper cells are the largest, tinged light brown, and acting as a turbid medium they cause a blue colour, which, owing to the superimposed yellow drops, reaches our eye as green; provided always that there is an effective screen at the back, and this is formed by large chromatophores which lie at the bottom and send their black pigment half-way up, or on to the top of the layers of guanine and oil containing cells. When all the pigment is shifted towards the surface, as near the epidermis as possible, the creature looks black; when the black pigment is withdrawn into the basal portions of the chromatophores the skin appears yellow.

The lungs are very capacious, and end in several narrow blind sacs which extend far down into the body cavity, so that not only the chest but the whole body can be blown up. This happens when the animals hiss and fight, as they often do. But when they know themselves discovered, they make themselves as thin as possible by compressing the chest and belly vertically by means of their peculiarly elongated ribs. The whole body is then put into such a position that it presents only its narrow edge to the enemy, and with the branch of the tree or shrub interposed. They are absolutely arboreal, but they hibernate in the ground.

The usual mode of propagation is by eggs, which are oval, numerous, provided with a calcareous shell, and buried in humus, whence they are hatched about four months later. But a few species, *e.g.* the dwarf chameleon, are viviparous.

Chameleons are insectivorous. They prefer locusts, grass-hoppers and lepidoptera, but are also fond of flies and mealworms. They are notoriously difficult to keep in good health. They want not only warmth, but sunshine, and they must have water, which they lick up in drops from the edges of wet leaves whenever they have a chance. The silliness of the fable that they live on air is shown by the fact that they usually die in an absolutely emaciated and parched condition after three or four months' starvation.

(H. F. G.)

In astronomy, "Chamaeleon" is a constellation situated near the south pole and surrounded by the constellations of Octans, Mensa, Piscis volans, Carina (Nauta), Musca and Apus. In chemistry, "chameleon mineral" is a name applied to the green mass which is obtained when pyrolusite (manganese dioxide) is fused with nitre, since a solution in water assumes a purple tint on exposure to the air; this change is due to the oxidation of the manganate, which is first formed, to a permanganate.

CHAMFER, CHAMPFER or CHAUMFER (Fr. *chanfrein*; possibly from Lat. *cantus*, corner, and *frangere*, to break), an architectural term; when the edge or arris of any work is cut off at an angle of 45° in a small degree, it is said to be "chamfered," while it would be "canted" if on a large scale. The chamfer is much used in medieval work, and is sometimes plain, sometimes hollowed out and sometimes moulded. Chamfers are sometimes "stopped" by a bead or some moulding, but when cut short by a slope they are generally known as "stop chamfer."

CHAMFORT, SEBASTIEN ROCH NICOLAS (1741-1794), French man of letters, was born at a little village near Clermont in Auvergne in 1741. He was, according to a baptismal certificate found among his papers, the son of a grocer named Nicolas. A journey to Paris resulted in the boy's obtaining a bursary at the Collège des Grassins. He worked hard, although he wrote later in one of his most contemptuous epigrams—*"Ce que j'ai appris je ne le sais plus; le peu que je sais je l'ai diviné."* His college career ended, Chamfort assumed the dress of a *petit abbé. "C'est un costume, et non point un état,"* he said; and to the principal of his college who promised him a benefice, he replied that he would never be a priest, inasmuch as he preferred honour to honours—*"j'aime l'honneur et non les honneurs."* About this time he assumed the name of Chamfort.

For some time he contrived to exist by teaching and as a booksellers' hack. His good looks and ready wit, however, soon brought him into notice; but though endowed with immense strength—"Hercule sous la figure d'Adonis," Madame de Craon called him—he lived so hard that he was glad of the chance of doing a "cure" at Spa when the Belgian minister in Paris, M. van Eyck, took him with him to Germany in 1761. On his return to Paris he produced a comedy, *La Jeune Indienne* (1764), which was performed with some success, and this was followed by a series of "epistles" in verse, essays and odes. It was not, however, until 1769, when he won the prize of the French Academy for his *Éloge* on Molière, that his literary reputation was established.

Meanwhile he had lived from hand to mouth, mainly on the hospitality of people who were only too glad to give him board and lodging in exchange for the pleasure of the conversation for which he was famous. Thus Madame Helvétius entertained him at Sèvres for some years. In 1770 another comedy, *Le Marchand de Smyrne*, brought him still further into notice, and he seemed on the road to fortune, when he was suddenly smitten

with a horrible disease. His distress was relieved by the generosity of a friend, who made over to him a pension of 1200 livres charged on the *Mercure de France*. With this assistance he was able to go to the baths of Contrexéville and to spend some time in the country, where he wrote an *Éloge* on La Fontaine which won the prize of the Academy of Marseilles (1774). In 1775, while taking the waters at Barèges, he met the duchesse de Grammont, sister of Choiseul, through whose influence he was introduced at court. In 1776 his poor tragedy, *Mustapha et Zeangir*, was played at Fontainebleau before Louis XVI. and Marie Antoinette; the king gave him a further pension of 1200 livres, and the prince de Condé made him his secretary. But he was a Bohemian naturally and by habit, the restraints of the court irked him, and with increasing years he was growing misanthropical. After a year he resigned his post in the prince's household and retired into solitude at Auteuil. There, comparing the authors of old with the men of his own time, he uttered the famous *mot* that proclaims the superiority of the dead over the living as companions; and there too he presently fell in love. The lady, attached to the household of the duchesse du Maine, was forty-eight years old, but clever, amusing, a woman of the world; and Chamfort married her. They left Auteuil, and went to Vaucouleurs, where in six months Madame Chamfort died. Chamfort lived in Holland for a time with M. de Narbonne, and returning to Paris received in 1781 the place at the Academy left vacant by the death of La Curne de Sainte-Palaye, the author of the *Dictionnaire des antiquités françaises*. In 1784, through the influence of Calonne, he became secretary to the king's sister, Madame Elizabeth, and in 1786 he received a pension of 2000 livres from the royal treasury. He was thus once more attached to the court, and made himself friends in spite of the reach and tendency of his unalterable irony; but he quitted it for ever after an unfortunate and mysterious love affair, and was received into the house of M. de Vaudreuil. Here in 1783 he had met Mirabeau, with whom he remained to the last on terms of intimate

friendship. whom he assisted with money and influence, and one at least of whose speeches—that on the Academies—he wrote.

The outbreak of the Revolution made a profound change in the relations of Chamfort's life. Theoretically he had long been a republican, and he now threw himself into the new movement with almost fanatical ardour, devoting all his small fortune to the revolutionary propaganda. His old friends of the court he forgot. "Those who pass the river of revolutions," he said, "have passed the river of oblivion." Until the 31st of August 1791 he was secretary of the Jacobin club; he became a street orator and entered the Bastille among the first of the storming party. He worked for the *Mercure de France*, collaborated with Ginguené in the *Feuille villageoise*, and drew up for Talleyrand his *Adresse au peuple français*.

With the reign of Marat and Robespierre, however, his uncompromising Jacobinism grew critical, and with the fall of the Girondins his political life came to an end. But he could not restrain the tongue that had made him famous; he no more spared the Convention than he had spared the court. His notorious republicanism failed to excuse the sarcasms he lavished on the new order of things, and denounced by an assistant in the Bibliothèque Nationale, to a share in the direction of which he had been appointed by Roland, he was taken to the Madelonnettes. Released for a moment, he was threatened again with arrest; but he had determined to prefer death to a repetition of the moral and physical restraint to which he had been subjected. He attempted suicide with pistol and with poniard; and, horribly hacked and shattered, dictated to those who came to arrest him the well-known declaration—*"Moi, Sebastien-Roch-Nicolas Chamfort, déclare avoir voulu mourir en homme libre plutôt que d'être reconduit en esclave dans une maison d'arrêt"*—which he signed in a firm hand and in his own blood. He did not die at once, but lingered on until the 13th of April 1794 in charge of a gendarme, for whose wardship he paid a crown a day. To the

Abbé Sieyès Chamfort had given fortune in the title of a pamphlet ("*Qu'est-ce que le Tiers-État? Tout. Qu'a-t-il? Rien*"), and to Sieyès did Chamfort retail his supreme sarcasm, the famous "*Je m'en vais enfin de ce monde où il faut que le cœur se brise ou se bronze.*" The maker of constitutions followed the dead wit to the grave.

The writings of Chamfort, which include comedies, political articles, literary criticisms, portraits, letters, and verses, are colourless and uninteresting in the extreme. As a talker, however, he was of extraordinary force. His *Maximes et Pensées*, highly praised by John Stuart Mill, are, after those of La Rochefoucauld, the most brilliant and suggestive sayings that have been given to the modern world. The aphorisms of Chamfort, less systematic and psychologically less important than those of La Rochefoucauld, are as significant in their violence and iconoclastic spirit of the period of storm and preparation that gave them birth as the *Réflexions* in their exquisite restraint and elaborate subtlety are characteristic of the tranquil elegance of their epoch; and they have the advantage in richness of colour, in picturesqueness of phrase, in passion, in audacity. Sainte-Beuve compares them to "well-minted coins that retain their value," and to keen arrows that "*arrivent brusquement et sifflent encore.*"

An edition of his works—*Œuvres complètes de Nicolas Chamfort*—Was published at Paris in five volumes in 1824-1825. Selections—*Œuvres de Chamfort*—in one volume, appeared in 1852, with a biographical and critical preface by Arsène Houssaye, reprinted from the *Revue des deux mondes*; and *Oeuvres choisies* (2 vols.), with a preface and notes by M. de Lescure (1879). See also Sainte-Beuve, *Causeries du Lundi*.

CHAMIER, FREDERICK (1796-1870), English novelist, was the son of an Anglo-Indian official. In 1809 he entered the navy, and was in active service until 1827. He retired in 1833, and was promoted to be captain in 1856. On his retirement he settled near Waltham Abbey, and wrote several nautical novels on the lines popularized by Marryat, that had considerable success. These were *The Life of a Sailor* (1832), *Ben Brace* (1836), *The Arethusa* (1837), *Jack Adams* (1838), *Tom Bowling* (1841) and *Jack Malcolm's Log* (1846). He wrote a number of other books, and edited and brought down to 1827 James's *Naval History* (1837).

CHAMILLART, MICHEL (1652-1721), French statesman, minister of Louis XIV., was born at Paris of a family of the noblesse of recent elevation. Following the usual career of a statesman of his time he became in turn councillor of the parlement of Paris (1676), master of requests (1686), and intendant of the generality of Rouen (January 1689). Affable, of polished manners, modest and honest, Chamillart won the confidence of Madame de Maintenon and pleased the king. In 1690 he was made intendant of finances, and on the 5th of September 1699 the king appointed him controller-general of finances, to which he added on the following 7th of January the ministry of war. From the first Chamillart's position was a difficult one. The deficit amounted to more than 53 million livres, and the credit of the state was almost exhausted. He lacked the great intelligence and energy necessary for the situation, and was unable to moderate the king's warlike tastes, or to inaugurate economic reforms. He could only employ the usual expedients of the time—the immoderate sale of offices,

the debasement of the coinage (five times in six years), reduction of the rate of interest on state debts, and increased taxation. He attempted to force into circulation a kind of paper money, *billets de monnaie*, but with disastrous results owing to the state of credit. He studied Vauban's project for the royal tithe and Boisguillebert's proposition for the *taille*, but did not adopt them. In October 1706 he showed the king that the debts immediately due amounted to 288 millions, and that the deficit already foreseen for 1707 was 160 millions. In October 1707 he saw with consternation that the revenue for 1708 was already entirely eaten up by anticipation, so that neither money nor credit remained for 1708. In these conditions Chamillart, who had often complained of the overwhelming burden he was carrying, and who had already wished to retire in 1706, resigned his office of controller-general. Public opinion attributed to him the ruin of the country, though he had tried in 1700 to improve the condition of commerce by the creation of a council of commerce. As secretary of state for war he had to place in the field the army for the War of the Spanish Succession, and to reorganize it three times, after the great defeats of 1704, 1706 and 1708. With an empty treasury he succeeded only in part, and he frankly warned the king that the enemy would soon be able to dictate the terms of peace. He was reproached with having secured the command of the army which besieged Turin (1706) for his son-in-law, the incapable duc de la Feuillade. Madame de Maintenon even became hostile to him, and he abandoned his position on the 10th of June 1709, retiring to his estates. He died on the 14th of April 1721.

Chamillart's papers have been published by G. Esnault, *Michel Chamillart, contrôleur général et secrétaire d'état de la guerre, correspondance et papiers inédits* (2 vols., Paris, 1885); and by A. de Boislisle in vol. 2 of his *Correspondance des contrôleurs généraux* (1883). See D'Auvigny, *Vies des hommes illustres* (1739), tome vi. pp. 288-402; E. Moret, *Quinze années du règne de Louis XIV* (Paris, 1851); and the new edition of the *Mémoires de St-Simon*, by A. de Boislisle.

CHAMINADE, CÉCILE (1861-), French musical composer, was born at Paris on the 8th of August 1861. She studied in Paris, her musical talent being shown at the age of eight by the writing of some church music which attracted Bizet's attention; and at eighteen she came out in public as a pianist. Her own compositions, both songs (in large numbers) and instrumental pieces, were soon produced in profusion: melodious and interesting, and often charming, they became very popular, without being entitled to rank with the greater style of music. Both in Paris and in England Mlle Chaminade and her works became well known at the principal concerts. In 1908 she visited America and was warmly welcomed.

CHAMISSO, ADELBERT VON [LOUIS CHARLES ADELAIDE DE] (1781-1838), German poet and botanist, was born at the château of Boncourt in Champagne, France, the ancestral seat of his family, on the 30th of January 1781. Driven from France by the Revolution, his parents settled in Berlin, where in 1796 young Chamisso obtained the post of page-in-waiting to the queen, and in 1798 entered a Prussian infantry regiment as ensign. His family were shortly afterwards permitted to return to France; he, however, remained behind and continued his career in the army. He had but little education, but now sought distraction from the soulless routine of the Prussian military service in assiduous study. In collaboration with

Varnhagen von Ense, he founded in 1803 the *Berliner Musenalmanach*, in which his first verses appeared. The enterprise was a failure, and, interrupted by the war, it came to an end in 1806. It brought him, however, to the notice of many of the literary celebrities of the day and established his reputation as a rising poet. He had become lieutenant in 1801, and in 1805 accompanied his regiment to Hameln, where he shared in the humiliations following the treasonable capitulation of that fortress in the ensuing year. Placed on parole he went to France, where he found that both his parents were dead; and, returning to Berlin in the autumn of 1807, he obtained his release from the service early in the following year. Homeless and without a profession, disillusioned and despondent, he lived in Berlin until 1810, when, through the services of an old friend of the family, he was offered a professorship at the *lycée* at Napoléonville in La Vendée. He set out to take up the post, but drawn into the charmed circle of Madame de Staël, followed her in her exile to Coppet in Switzerland, where, devoting himself to botanical research, he remained nearly two years. In 1812 he returned to Berlin, where he continued his scientific studies. In the summer of the eventful year, 1813, he wrote the prose narrative *Peter Schlemihl*, the man who sold his shadow. This, the most famous of all his works, has been translated into most European languages (English by W. Howitt). It was written partly to divert his own thoughts and partly to amuse the children of his friend Hitzig. In 1815 Chamisso was appointed botanist to the Russian ship “Rurik,” which Otto von Kotzebue (son of August von Kotzebue) commanded on a scientific voyage round the world. His diary of the expedition (*Tagebuch*, 1821) affords some interesting glimpses of England and English life. On his return in 1818 he was made custodian of the botanical gardens in Berlin, and was elected a member of the Academy of Sciences, and in 1820 he married. Chamisso’s travels and scientific researches restrained for a while the full development of his poetical talent, and it was not until his forty-eighth year that he turned again to literature. In

1829, in collaboration with Gustav Schwab, and from 1832 in conjunction with Franz von Gaudy, he brought out the *Deutsche Musenalmanach*, in which his later poems were mainly published. He died on the 21st of August 1838.

As a scientist Chamisso has not left much mark, although his *Bemerkungen und Ansichten*, published in an incomplete form in O. von Kotzebue's *Entdeckungsreise* (Weimar, 1821) and more completely in Chamisso's *Gesammelte Werke* (1836), and the botanical work, *Übersicht der nutzbarsten und schädlichsten Gewächse in Norddeutschland* (1829) are esteemed for their careful treatment of the subjects with which they deal. As a poet Chamisso's reputation stands high, *Frauen Liebe und Leben* (1830), a cycle of lyrical poems, which was set to music by Schumann, being particularly famous. Noteworthy are also *Schloss Boncourt* and *Salas y Gomez*. In estimating his success as a writer, it should not be forgotten that he was cut off from his native speech and from his natural current of thought and feeling. He often deals with gloomy and sometimes with ghastly and repulsive subjects; and even in his lighter and gayer productions there is an undertone of sadness or of satire. In the lyrical expression of the domestic emotions he displays a fine felicity, and he knew how to treat with true feeling a tale of love or vengeance. *Die Löwenbraut* may be taken as a sample of his weird and powerful simplicity; and *Vergeltung* is remarkable for a pitiless precision of treatment.

The first collected edition of Chamisso's works was edited by J.E. Hitzig, 6 vols. (1836); 6th edition (1874); there are also excellent editions by M. Koch (1883) and O.F. Walzel (1892). On Chamisso's life see J.E. Hitzig, "Leben und Briefe von Adelbert yon Chamisso" (in the *Gesammelte Werke*); K. Fulda, *Chamisso und seine Zeit* (1881); G. Hofmeister, *Adelbert von Chamisso* (1884); and, for the scientific side of Chamisso's life, E. du Bois-Raymond, *Adelbert von Chamisso als Naturforscher* (1889).

CHAMKANNI, a small Pathan tribe on the Kohat border of the North-West Province of India. They inhabit the western part of the Kurmana Valley in the Orakzai portion of Tirah, but are supposed to be a distinct race. They took part in the frontier risings of 1897, and during the Tirah expedition of that year a brigade under General Gaselee was sent to punish them.

CHAMOIS, the Franco-Swiss name of an Alpine ruminant known in the German cantons as *Gemse*, and to naturalists as *Rupicapra tragus* or *R. rupicapra tragus*. It is the only species of its genus, and typifies a subfamily, *Rupicaprinae*, of hollow-horned ruminants in some degree intermediate between antelopes and goats (see ANTELOPE). About equal in height to a roebuck, and with a short black tail, the chamois is readily distinguishable from all other ruminants by its vertical, backwardly-hooked, black horns, which are common to males and females, although smaller in the latter. Apart from black and white face-markings, and the black tail and dorsal stripe, the prevailing colour of the Alpine chamois is chestnut brown in summer, but lighter and greyer in winter. In the Pyrenees the species is represented by a small race locally known as the izard; a very brightly-coloured form, *R.t. picta*, inhabits the Apennines; the Carpathian chamois is very dark-coloured, and the one from the Caucasus is the representative of

yet another race. A thick under-fur is developed in the winter-coat, as in all other ruminants dwelling at high altitudes. Chamois are gregarious, living in herds of 15 or 20, and feeding generally in the morning or evening. The old males, however, live alone except in the rutting season, which occurs in October, when they join the herds, driving off the younger bucks, and engaging in fierce contests with each other, that often end fatally for one at least of the combatants. The period of gestation is twenty weeks, when the female, beneath the shelter generally of a projecting rock, produces one and sometimes two young. In summer they ascend to the limits of perpetual snow, being only exceeded in the loftiness of their haunts by the ibex; and during that season they show their intolerance of heat by choosing such browsing-grounds as have a northern exposure. In winter they descend to the wooded districts that immediately succeed the region of glaciers, and it is there only they can be successfully hunted. Chamois are exceedingly shy; and their senses, especially those of sight and smell, very acute. The herd never feeds without having a sentinel posted on some prominence to give notice of the approach of danger; which is done by stamping on the ground with the forefeet, and uttering a shrill whistling note, thus putting the entire herd on the alert. No sooner is the object of alarm scented or seen than each one seeks safety in the most inaccessible situations, which are often reached by a series of astounding leaps over crevasses, up the faces of seemingly perpendicular rocks, or down the sides of equally precipitous chasms. The chamois will not hesitate, it is said, thus to leap down 20 or even 30 ft., and this it effects with apparent ease by throwing itself forward diagonally and striking its feet several times in its descent against the face of the rock. Chamois-shooting is most successfully pursued when a number of hunters form a circle round a favourite feeding ground, which they gradually narrow; the animals, scenting the hunters to windward, fly in the opposite direction, only to encounter those coming from leeward. Chamois-hunting, in spite of, or perhaps owing to the great danger attending it, has always

been a favourite pursuit among the hardy mountaineers of Switzerland and Tirol, as well as of the amateur sportsmen of all countries, with the result that the animal is now comparatively rare in many districts where it was formerly common. Chamois feed in summer on mountain-herbs and flowers, and in winter chiefly on the young shoots and buds of fir and pine trees. They are particularly fond of salt, and in the Alps sandstone rocks containing a saline impregnation are often met with hollowed by the constant licking of these creatures. The skin of the chamois is very soft; made into leather it was the original *shammy*, which is now made, however, from the skins of many other animals. The flesh is prized as venison.

(R. L.*)

CHAMOMILE, or CAMOMILE FLOWERS, the *flores anthemidis* of the British Pharmacopoeia, the flower-heads of *Anthemis nobilis* (Nat. Ord. *Compositae*), a herb indigenous to England and western Europe. It is cultivated for medicinal purposes in Surrey, at several places in Saxony, and in France and Belgium,—that grown in England being much more valuable than any of the foreign chamomiles brought into the market. In the wild plant the florets of the ray are ligulate and white, and contain pistils only, those of the disk being tubular and yellow; but under cultivation the whole of the florets tend to become ligulate and white, in which state the flower-heads are said to be double. The flower-heads have a warm aromatic odour, which is characteristic of the entire plant, and a very bitter taste. In addition to a bitter extractive principle, they yield about 2% of a volatile liquid, which on its first extraction is of a pale blue colour, but becomes a yellowish brown on exposure to light. It has the characteristic odour of the

flowers, and consists of a mixture of butyl and amyl angelates and valerates. Angelate of potassium has been obtained by treatment of the oil with caustic potash, and angelic acid may be isolated from this by treatment with dilute sulphuric acid. Chamomile is used in medicine in the form of its volatile oil, of which the dose is ½-3 minims. There is an official extract which is never used. Like all volatile oils the drug is a stomachic and carminative. In large doses the infusion is a simple emetic.

Wild chamomile is *Matricaria Chamomilla*, a weed common in waste and cultivated ground especially in the southern counties of England. It has somewhat the appearance of true chamomile, but a fainter scent.

CHAMONIX, a mountain valley in south-east France, its chief village, of the same name, being the capital of a canton of the arrondissement of Bonneville in the department of Haute-Savoie. The valley runs from N.E. to S.W., and is watered by the Arve, which rises in the Mer de Glace. On the S.E. towers the snowclad chain of Mont Blanc, and on the N.W. the less lofty, but rugged chain of the Brévent and of the Aiguilles Rouges. Near the head of the valley is the village of Argentière (4101 ft.), which is connected with Switzerland by “char” (light carriage) roads over the Tête Noire and past Salvan, and by a mule path over the Col de Balme, which joins the Tête Noire route near Trient and then crosses by a “char” road the Col de la Forclaz to Martigny in the Rhone valley. The principal village, Chamonix (3416 ft.), is 6 m. below Argentière by electric railway (which continues via Finhaut to Martigny) and is visited annually by a host of tourists, as it is the best starting-point for the exploration of the glaciers of the Mont Blanc

chain, as well as for the ascent of Mont Blanc itself. It is connected with Geneva by a railway (55 m.). In 1906 the population of the village was 806, of the commune 3482.

The valley is first heard of about 1091, when it was granted by the count of the Genevois to the great Benedictine house of St Michel de la Cluse, near Turin, which by the early 13th century established a priory therein. But in 1786 the inhabitants bought their freedom from the canons of Sallanches, to whom the priory had been transferred in 1519. In 1530 the inhabitants obtained from the count of the Genevois the privilege of holding two fairs a year, while the valley was often visited by the civil officials and by the bishops of Geneva (first recorded visit in 1411, while St Francis de Sales came thither in 1606). But travellers for pleasure were long rare. The first party to publish (1744) an account of their visit was that of Dr R. Pococke, Mr W. Windham and other Englishmen who visited the Mer de Glace in 1741. In 1742 came P. Martel and several other Genevese, in 1760 H.B. de Saussure, and rather later Bourrit.

See J.A. Bonnefoy and A. Perrin, *Le Prieuré de Chamonix* (2 vols., Chambery, 1879 and 1883); A. Perrin, *Histoire de la vallée et du prieuré de Chamonix* (Chambéry, 1887); L. Kurz and X. Imfeld, *Carte de la chaîne du Mont Blanc* (1896; new ed., 1905); L. Kurz, *Climbers' Guide to the Chain of Mont Blanc* (London, 1892); also works referred to under BLANC, MONT.

(W. A. B. C.)

CHAMPAGNE, an ancient province of the kingdom of France, bounded N. by Liége and Luxemburg; E. by Lorraine; S. by Burgundy; and W. by

Picardy and Isle de France. It now forms the departments of Ardennes, Marne, Aube and Haute Marne, with part of Aisne, Seine-et-Marne, Yonne and Meuse. Its name—in Latin Campania, "country of plains"—is derived from the immense plains near Reims, Châlons and Troyes. It was constituted towards the end of the middle ages by joining to the countship of Champagne the ecclesiastical duchies of Reims and Langres, together with the ecclesiastical countship of Châlons. Documents of the 12th and 13th centuries make it possible to determine the territorial configuration of the countship of Champagne with greater accuracy than in the case of any other fief of the crown of France. Formed at random by the acquisitions of the counts of the houses of Vermandois and Blois, Champagne reckoned among its dependencies, from 1152 to 1234, the countship of Blois and Chartres, of which Touraine was a fief, the countship of Sancerre, and various scattered fiefs in the Bourbonnais and in Burgundy. Officially called the "countship of Champagne and Brie" since 1217, this state was formed by the union of the countships of Troyes and Meaux, to which the greater part of the districts embraced in the country known, since the beginning of the middle ages, by the name of Champagne and Brie came in course of time to be attached. Placed under the authority of a single count in 960, the countships of Troyes and Meaux were not again separated after 1125. For the counts of Troyes before the 11th century see TROYES. We confine ourselves here to the counts of Champagne of the house of Blois.

About 1020 Eudes or Odo I. (Odo II., count of Blois) became count of Champagne. He disputed the kingdom of Burgundy with the emperor Conrad, and died in 1037, in a battle near Bar-le-Duc. In 1037 he was succeeded by his younger son, Stephen II. About 1050 Odo II., son of Stephen II., became count. This prince, guilty of murder, found refuge in Normandy, where he received the castle of Aumale. He took part in 1066 in the conquest of England, and became earl of Holderness. About 1063 Theobald (Thibaud) I., count of Blois and Meaux, eldest son of Odo I.,

became count of Champagne. In 1077 he seized the countships of Vitry and Bar-sur-Aube, left vacant by Simon of Valois, who had retired to a monastery. In 1089 Odo III., second son of Theobald II., became count, and was succeeded about 1093 by his younger brother, Hugh, who became a templar in 1125, and gave up the countship to his suzerain, the count of Blois. In 1125 the countship of Champagne passed to Theobald II. the Great, already count of Blois and Meaux, and one of the most powerful French barons of his time. He was related to the royal house of England, and incurred the displeasure of the king of France, who in 1142 invaded Champagne and burnt the town of Vitry. After Theobald the Great the countship of Blois ceased to be the dominant fief of his house and became the appanage of a younger branch. In 1152 Henry the Liberal, eldest son of Theobald II., became count of Champagne; he married Mary, daughter of Louis VII. of France, and went to the crusade in 1178. He was taken prisoner by the Turks, recovered his liberty through the good offices of the emperor of the East, and died a few days after his return to Champagne. In 1181 his eldest son, Henry II., succeeded him under the tutelage of Mary of France. In 1190 he went to the Holy Land, and became king of Jerusalem in 1192 by his marriage with Isabelle, widow of the marquis of Montferrat. He died in 1197 in his town of Acre from the results of an accident. In 1197 Theobald III., younger son of Henry I., became count, and was succeeded in 1201 by Theobald IV., “le Chansonnier” (the singer), who was the son of Theobald III. and Blanche of Navarre, and was born some days after the death of his father. From 1201 to 1222 he remained under the tutelage of his mother, who governed Champagne with great sagacity. The reign of this prince was singularly eventful. The two daughters of count Henry II. successively claimed the countship, so that Theobald had to combat the claims of Philippa, wife of Erard of Brienne, seigneur of Rameru, from 1216 to 1222, and those of Alix, queen dowager of Cyprus, in 1233 and 1234. In 1226 he followed king Louis VII. to the siege of Avignon, and

after the death of that monarch played a prominent part during the reign of St Louis. At first leagued with the malcontent barons, he allowed himself to be gained over by the queen-mother, and thus came into collision with his old allies. He became king of Navarre in 1234 by the death of his maternal uncle, Sancho VII. but by the onerous treaty which he concluded in that year with the queen of Cyprus he was compelled to cede to the king, in return for a large sum of money, the overlordship of the countships of Blois, Chartres and Sancerre, and the viscounty of Châteaudun. In 1239 and 1240 he took part in an expedition to the Holy Land, probably accompanied St Louis in 1242 in the campaign of Saintonge against the English, and died on the 14th of July 1254 at Pampeluna. If the author of the *Grandes chroniques de France* can be believed, Theobald IV. conceived a passion for Queen Blanche, the mother of St Louis,—a passion which she returned, and which explains the changes in his policy; but this opinion apparently must be relegated to the category of historical fables. The witty and courtly songs he composed place him in the front rank of the poets of that class, in which he showed somewhat more originality than his rivals. In 1254 Theobald V. the Young, eldest son of Theobald IV. and, like his father, king of Navarre, became count of Champagne. He married Isabelle of France, daughter of St Louis, and followed his father-in-law to Tunis to the crusade, dying on his return. In 1270 he was succeeded by Henry III. the Fat, king of Navarre. Henry was succeeded in 1274 by his only daughter, Joan of Navarre, under the tutelage of her mother, Blanche of Artois, and afterwards of Edmund, earl of Lancaster, her mother’s second husband. In 1284 she married the heir-presumptive to the throne of France, Philip the Fair, to whom she brought the countship of Champagne as well as the kingdom of Navarre. She became queen of France in 1285, and died on the 4th of April 1305, when her eldest son by King Philip, Louis Hutin, became count of Champagne. He was the last independent count of the province, which

became attached to the French crown on his accession to the throne of France in 1314.

The celebrated fairs of Champagne, which flourished in the 12th and 13th centuries, were attended by merchants from all parts of civilized Europe. They were six in number: two at Troyes, two at Provins, one at Lagny-sur-Marne, and one at Bar-sur-Aube. They formed a kind of continuous market, divided into six periods, and passed in turn from Lagny to Bar, from Bar to Provins, from Provins to Troyes, from Troyes to Provins and from Provins to Troyes, to complete the year. It was, in fact, a perpetual fair, which had at once unity and variety, offering to the different parts of the countship the means of selling successively the special productions of their soil or their industry, and of procuring in exchange riches and comforts. These fairs had special legislation; and special magistrates, called "masters of the fairs," had control of the police.

For the wine "champagne" see WINE.

AUTHORITIES.—H. d'Arbois de Jubainville, *Histoire des ducs et des comtes de Champagne* (1859-1866); A. Longnon, *Documents relatifs au comté de Champagne et de Brie* (1901 seq.; vol. i. with map); F. Bourquelot, *Études sur les foires de Champagne* (1865).

(A. Lo.)

CHAMPAGNY, JEAN BAPTISTE NOMPÈRE DE (1756-1834), French politician, was born at Roanne, and entered the navy in 1774. He fought through the war in America and resigned in 1787. Elected deputy by

the *noblesse* of Forex to the states-general in 1789, he went over to the third estate on the 21st of June and collaborated in the work of the Constituent Assembly, especially occupying himself with the reorganization of the navy. A political career seems to have attracted him little; he remained in private life from 1791 to 1799, when Napoleon named him member of the council of state. From July 1801 to August 1804 he was ambassador of France at Vienna, and directed with great intelligence the incessant negotiations between the two courts. In August 1804 Napoleon made him minister of the interior, and in this position, which he held for three years, he proved an administrator of the first order. In addition to the ordinary charges of his office, he had to direct the recruitment of the army, organize the industrial exhibition of 1808, and to complete the public works undertaken in Paris and throughout France. He was devoted to Napoleon, on whom he lavished adulation in his speeches. In August 1807 the emperor chose him to succeed Talleyrand as minister for foreign affairs. He directed the annexation of the Papal States in April 1808, worked to secure the abdication of Charles IV. of Spain in May 1808, negotiated the peace of Vienna (1809) and the marriage of Napoleon. In April 1811 a quarrel with the emperor led to his retirement, and he obtained the sinecure office of intendant general of the crown. In 1814, after the abdication, the empress sent him on a fruitless mission to the emperor of Austria. Then he went over to the Bourbons. During the Hundred Days he again joined Napoleon. This led to his exclusion by Louis XVIII., but in 1819 he recovered his dignity of peer. He died in Paris in 1834. He had three sons who became men of distinction. François (1804-1882) was a well-known author, who was made a member of the French Academy in 1869. His great work was a history of the Roman empire, in three parts, (1) *Les Césars* (1841-1843, 4 vols.), (2) *Les Antonins* (1863, 3 vols.), (3) *Les Césars du IIIe siècle* (1870, 3 vols.). Napoléon (1806-1872) published a *Traité de la police municipale* in 4 volumes (1844-1861), and was a deputy in the Corps Législatif from 1852

to 1870. Jérome Paul (1809-1886) was also deputy in the Corps Législatif from 1853 to 1870, and was made honorary chamberlain in 1859. He worked at the official publication of the correspondence of Napoleon I.

CHAMPAIGN, a city of Champaign county, Illinois, U.S.A., about 125 m. S. by W. of Chicago, on the head-waters of the Vermilion river. Pop. (1890) 5839; (1900) 9098, of whom 973 were foreign-born; (1910 census) 12,421. It is served by the Cleveland, Cincinnati, Chicago & St Louis, the Wabash, and the Illinois Central railways (the last having repair shops here), and by the Illinois (electric) Traction System from Danville, Illinois, to St Louis, Missouri. In 1906 the city covered 3.5 sq. m.; it is situated in a rich agricultural region, and has small manufacturing interests. Immediately east of Champaign is the city of Urbana, the county-seat of Champaign county, served by the Wabash and the Cleveland, Cincinnati, Chicago & St Louis railways, with repair shops of the latter. In 1890 the population of Urbana was 3511; in 1900, 5728 (300 foreign-born); in 1910, 8245. Partly in Urbana and partly in Champaign is the University of Illinois (see ILLINOIS); immediately south of its campus is the 400-acre farm of the university. Each city has a public library, and in Champaign are the Burnham Athenaeum, the Burnham hospital, the Garwood home for old ladies, and several parks, all gifts of former citizens. Champaign was founded in 1855, incorporated as a city in 1860, and re-chartered in 1883. Urbana secured a city charter in 1855.

CHAMPAIGNE, PHILIPPE DE (1602-1674), Belgian painter of the French school, was born at Brussels of a poor family. He was a pupil of J. Fouquières; and, going to Paris in 1621, was employed by N. Du Chesne to paint along with Nicholas Poussin in the palace of the Luxembourg. His best works are to be found at Vincennes, and in the church of the Carmelites at Paris, where is his celebrated Crucifix, a signal perspective success, on one of the vaultings. After the death of Du Chesne, Philippe became first painter to the queen of France, and ultimately rector of the Academy of Paris. As his age advanced and his health failed, he retired to Port Royal, where he had a daughter cloistered as a nun, of whom (along with Catherine Agnès Arnauld) he painted a celebrated picture, now in the Louvre, highly remarkable for its solid unaffected truth. This, indeed, is the general character of his work,—grave reality, without special elevation or depth of character, or charm of warm or stately colour. He produced an immense number of paintings, religious and other subjects as well as portraits, dispersed over various parts of France, and now over the galleries of Europe. Philippe was a good man, indefatigable, earnest and scrupulously religious. He died on the 12th of August 1674.

CHAMPARAN, or CHUMPARUN, a district of British India, in the Patna division of Bengal, occupying the north-west corner of Behar, between the two rivers Gandak and Baghmati and the Nepal hills. It has an area of 3531 sq. m. In 1901 the population was 1,790,463, showing a decrease of 4% in the decade. A broad grass-covered road or embankment defines the Nepal frontier, except where rivers or streams form a natural boundary. The

district is a vast level except in the N. and N.W., where it undulates, and gradually assumes a rugged appearance as it approaches the mountains and forests of Nepal. Wide uncultivated tracts cover its north-western corner; the southern and western parts are carefully cultivated, and teem with an active agricultural population. The principal rivers are the Gandak, navigable all the year round, the Buri Gandak, Panch Nadi, Lalbagia, Koja and Teur. Old beds of rivers intersect Champaran in every direction, and one of these forms a chain of lakes which occupy an area of 139 sq. m. in the centre of the district. Champaran, with the rest of Bengal and Behar, was acquired by the British in 1765. Up to 1866 it remained a subdivision of Saran. In that year it was separated and formed into a separate district. The administrative headquarters are at Motihari (population, 13,730); Bettia is the centre of a very large estate; Segauli, still a small military station, was the scene of a massacre during the Mutiny. Champaran was the chief seat of indigo planting in Behar before the decline of that industry. There are about 40 saltpetre refineries. The district suffered severely from drought in 1866 and 1874, and again in 1897. In the last year a small government canal was opened, and a canal from the Gandak has also been constructed. The district is traversed almost throughout its length to Bettia by the Tirhoot state railway. A considerable trade is conducted with Nepal.

CHAMPEAUX, WILLIAM OF [GULIELMUS CAMPELLENSIS] (c. 1070-1121), French philosopher and theologian was born at Champeaux near Melun. After studying under Anselm of Laon and Roscellinus, he taught in the school of the cathedral of Notre Dame, of which he was made canon in

1103. Among his pupils was Abelard. In 1108 he retired into the abbey of St Victor, where he resumed his lectures. He afterwards became bishop of Châlons-sur-Marne, and took part in the dispute concerning investitures as a supporter of Calixtus II., whom he represented at the conference of Mousson. His only printed works are a fragment on the Eucharist (inserted by Jean Mabillon in his edition of the works of St Bernard), and the *Moralia Abbreviata* and *De Origine Animae* (in E. Martène's *Thesaurus novus Anecdotorum*, 1717, vol. 5). In the last of these he maintains that children who die unbaptized must be lost, the pure soul being denied by the grossness of the body, and declares that God's will is not to be questioned. He upholds the theory of Creatianism (that a soul is specially created for each human being). Ravaisson-Mollien has discovered a number of fragments by him, among which the most important is the *De Essentia Dei et de Substantia Dei*; a *Liber Sententiarum*, consisting of discussions on ethics and Scriptural interpretation, is also ascribed to Champeaux. He is reputed the founder of Realism. For his views and his controversy with Abelard, see SCHOLASTICISM and ABELARD.

See Victor Cousin, introduction to his *Ouvrages inédits d'Abélard* (1836), and *Fragments pour servir à l'histoire de la philosophie* (1865); G.A. Patru, *Wilhelmi Campellensis de natura et de origine rerum placita* (1847); E. Michaud, *Guillaume de Champeaux et les écoles de Paris au XIIe siècle* (2nd ed., 1868); "William of Champeaux and his Times" in *Christian Observer*, lxxii. 843; B. Hauréau, *De la philosophie scolastique* (Paris, 1850); Opuscula in J.P. Migne's *Patrologia*, clxiii.

CHAMPERTY, or CHAMPARTY (Lat. *campi partitio*, O. Fr. *champ parti*), in English law, a bargain between a plaintiff or defendant in a cause and another person, to divide the land (*campum partiri*) or other matter sued for, if they prevail, in consideration of that person carrying on or defending the suit at his own expense. It is a misdemeanour punishable by fine or imprisonment. It differs only from maintenance (*q.v.*), in that the recompense for the service which has been given is always part of the matter in suit, or some profit growing out of it. So an agreement by a solicitor not to charge costs on condition of retaining for himself a share of the sums recovered would be illegal and void. It is not, however, champerty to charge the subject-matter of a suit in order to obtain the means of prosecuting it.

See *Fifth Report of the Criminal Law Commissioners*, pp. 34-9.

CHAMPION (Fr. *champion*, Late Lat. *campio* from *campus*, a field or open space, *i.e.* one "who takes the field" or fights; cf. Ger. *Kampf*, battle, and *Kämpfer*, fighter), in the judicial combats of the middle ages the substitute for a party to the suit disabled from bearing arms or specially exempt from the duty to do so (see WAGER). Hence the word has come to be applied to any one who "champions," or contends on behalf of, any person or cause. In the laws of the Lombards (lib. ii. tit. 56 §§ 38, 39), those who by reason of youth, age or infirmity could not bear arms were allowed to nominate champions, and the same provision was made in the case of women (lib. i. tit. 3 § 6, tit. 16, §2). This was practically the rule laid down in all subsequent legislation on the subject. Thus the *Assize of Jerusalem*

(cap. 39) says: “These are the people who may defend themselves through champions; a woman, a sick man, a man who has passed the age of sixty, &c.” The clergy, too, whether as individuals or corporations, were represented by champions; in the case of bishops and abbots this function was part of the duties of the *advocatus* (see ADVOCATE). Du Cange gives instances of mercenary champions (*campiones conductitii*), who were regarded as “infamous persons” and sometimes, in case of defeat, were condemned to lose hand or foot. Sometimes championships were “serjeanties,” *i.e.* rendered service to lords, churches or cities in consideration of the grant of certain fiefs, or for annual money payments, the champion doing homage to the person or corporation represented by him (*campiones homagii*).

The office of “king’s champion” (*campio regis*) is peculiar to England. The function of the king’s champion, when the ceremonial of the coronation was carried out in its completeness, was to ride, clad in complete armour, on his right the high constable, on his left the earl marshal, into Westminster Hall during the coronation banquet, and challenge to single combat any who should dispute the king’s right to reign. The challenge was thrice repeated by the herald, at the entrance to the hall, in the centre, and at the foot of the dais. On picking up his gauntlet for the third time the champion was pledged by the king in a gilt-covered cup, which was then presented to him as his fee by the king. If he had had occasion to fight, and was victorious, his fee would have been the armour he wore and the horse he rode, the second best in the royal stables; but no such occasion has ever arisen. This picturesque ceremonial was last performed at the coronation of George IV. The office of king’s champion is of great antiquity, and its origins are involved in great obscurity. It is said to have been held under William the Conqueror by Robert or Roger Marmion, whose ancestors had been hereditary champions in Normandy. The first authentic record, however is a charter of Henry I., signed by Robert Marmion (*Robertus de*

Bajucis campio regis). Of the actual exercise of the office the earliest record dates from the coronation of Richard II. On this occasion the champion, Sir John Dymoke, appeared at the door of the Abbey immediately after the coronation mass, but was peremptorily told to go away and return later; moreover, in his bill presented to the court of claims, he stated that the champion was to ride in the procession before the service, and make his challenge to all the world. This seems to show that the ceremony, as might be expected, was originally performed *before* the king's coronation, when it would have had some significance. The office of king's champion is hereditary, and is now held by the family of Dymoke (*q.v.*).

See Du Cange, *Glossarium*, *s.v.* "Campio"; L.G. Wickham Legg, *English Coronation Records* (Westminster, 1901); J.H.T. Perkins, *The Coronation Book* (London, 1902).

CHAMPIONNET, JEAN ÉTIENNE (1762-1800), French general, enlisted in the army at an early age and served in the great siege of Gibraltar. When the Revolution broke out he took a prominent part in the movement, and was elected by the men of a battalion to command them. In May 1793 he was charged with the suppression of the disturbances in the Jura, which he quelled without bloodshed. Under Pichegru he took part in the Rhine campaign of that year as a brigade commander, and at Weissenburg and in the Palatinate won the warm commendation of Lazare Hoche. At Fleurus his stubborn fighting in the centre of the field contributed greatly to Jourdan's victory. In the subsequent campaigns he commanded the left wing of the French armies on the Rhine between Neuwied and

Düsseldorf, and took a great part in all the successful and unsuccessful expeditions to the Lahn and the Main. In 1798 Championnet was named commander-in-chief of the "army of Rome" which was protecting the infant Roman republic against the Neapolitan court and the British fleet. Nominally 32,000 strong, the army scarcely numbered 8000 effectives, with a bare fifteen cartridges per man. The Austrian general Mack had a tenfold superiority in numbers, but Championnet so well held his own that he ended by capturing Naples itself and there setting up the Parthenopean Republic. But his intense earnestness and intolerance of opposition soon embroiled him with the civilians, and the general was recalled in disgrace. The following year, however, saw him again in the field as commander-in-chief of the "army of the Alps." This, too, was at first a mere paper force, but after three months' hard work it was able to take the field. The campaign which followed was uniformly unsuccessful, and, worn out by the unequal struggle, Championnet died at Antibes on the 9th of January 1800. In 1848 a statue was erected in his honour at Valence.

See A.R.C. de St Albin, *Championnet, ou les Campagnes de Hollande, de Rome et de Naples* (Paris, 1860).

CHAMPLAIN, SAMUEL DE (1567-1635), French explorer, colonial pioneer and first governor of French Canada, was born at Brouage, a small French port on the Bay of Biscay, in 1567. His father was a sea captain, and the boy was early skilled in seamanship and navigation. He entered the army of Henry IV., and served in Brittany under Jean d'Aumont, François de St Luc and Charles de Brissac. When the army of the League was

disbanded he accompanied his uncle, who had charge of the ships in which the Spanish allies were conveyed home, and on reaching Cadiz secured (1599) the command of one of the vessels about to make an expedition to the West Indies. He was gone over two years, visiting all the principal ports and pushing inland from Vera Cruz to the city of Mexico. The MS. account of his adventures, *Bref Discours des Choses plus remarquables que Samuel Champlain de Brouage a recognues aux Indes Occidentales*, is in the library at Dieppe. It was not published in French until 1870, although an English translation was printed by the Hakluyt Society in 1859. It contains a suggestion of a Panama Canal, "by which the voyage to the South Sea would be shortened by more than 1500 leagues." In 1603 Champlain made his first voyage to Canada, being sent out by Aymar de Clermont, seigneur de Chastes, on whom the king had bestowed a patent. Champlain at once established friendly relations with the Indians and explored the St Lawrence to the rapids above Montreal. On his return he published an interesting and historically valuable little book, *Des sauvages, ou voyage de Samuel Champlain de Brouage fait en la France Nouvelle*. During his absence de Chastes had died, and his privileges and fur trade monopolies were conferred upon Pierre de Guast, sieur de Monts (1560-1611). With him, in 1604, Champlain was engaged in exploring the coast as far south as Cape Cod, in seeking a site for a new settlement, and in making surveys and charts. They first settled on an island near the mouth of the St Croix river, and then at Port Royal—now Annapolis, N.S.

Meanwhile the Basques and Bretons, asserting that they were being ruined by de Monts' privileges, got his patent revoked, and Champlain returned with the discouraged colonists to Europe. When, however, in modified form, the patent was re-granted to his patron Champlain induced him to abandon Acadia and establish a settlement on the St Lawrence, of the commercial advantages of which, perhaps even as a western route to China and Japan, he soon convinced him. Champlain was placed in

command of one of the two vessels sent out. He was to explore and colonize, while the other vessel traded, to pay for the expedition. Champlain fixed on the site of Quebec and founded the first white settlement there in July 1608, giving it its present name. In the spring he joined a war party of Algonquins and Hurons, discovered the great lake that bears his name, and, near the present Ticonderoga, took with his arquebus an important part in the victory which his savage friends obtained over the Iroquois. The Iroquois naturally turned first to the Dutch and then to the English for allies. "Thus did new France rush into collision with the redoubted warriors of the Five Nations. Here was the beginning, and in some measure doubtless the cause, of a long suite of murderous conflicts, bearing havoc and flame to generations yet unborn" (Parkman). Champlain returned to France and again related to Henry IV.—who had previously learned his worth and had pensioned him—his exciting adventures. De Monts failed to secure a renewal of his patent, but resolved to proceed without it. Champlain was again (1611) in Canada, fighting for and against the Indians and establishing a trading post at Mont Royal (see MONTREAL). He was the third white man to descend, and the second to descend successfully, the Lachine Rapids. De Monts, now governor of Paris, was too busy to occupy himself in the waning fortunes of the colony, and left them entirely to his associate. An influential protector was needed; and Champlain prevailed upon Charles de Bourbon, comte de Soissons, to interest himself to obtain from the king the appointment of lieutenant-general in New France. The comte de Soissons died almost immediately, and was succeeded in the office by Henri de Bourbon, prince de Condé, and he, like his predecessors and successors, retained Champlain as lieutenant-governor. "In Champlain alone was the life of New France. By instinct and temperament he was more impelled to the adventurous toils of exploration than to the duller task of building colonies. The profits of trade had value in his eyes only as means to these ends, and settlements were important

chiefly as a base of discovery. Two great objects eclipsed all others,—to find a route to the Indies, and to bring the heathen tribes into the embraces of the Church, since, while he cared little for their bodies, his solicitude for their souls knew no bounds" (Parkman).

In 1613 Champlain again crossed the Atlantic and endeavoured to confirm Nicolas de Vignau's alleged discovery of a short route to the ocean by the Ottawa river, a great lake at its source, and another river flowing north therefrom. That year he got as far as Allumette Island in the Ottawa, but two years later, with a "Great War Party" of Indians, he crossed Lake Nipissing and the eastern ends of Lakes Huron and Ontario, and made a fierce but unsuccessful attack on an Onondaga fortified town a few miles south of Lake Oneida. This was the end of his wanderings. He now devoted himself to the growth and strengthening of Quebec. Every year he went to France with this end in view. He was one of the hundred associates of the Company of New France, created by Richelieu to reform abuses and take over all his country's interests in the new world. These ill-defended possessions England now prepared to seize. Three ships were sent out under letters of marque commanded by David, Lewis and Thomas Kirke, and Quebec, already on the verge of starvation, was compelled to surrender (1629). Champlain was taken to England a prisoner, but when Canada was restored to the French he returned (1633) to his post, where he died on the 25th of December 1635. He had married in 1610, Hélène Boullé, then but twelve years old. She did not leave France for Canada, however, until ten years later. After his death she became a nun.

Champlain's complete works in 6 vols. were published under the patronage of the university of Laval in 1870. There is a careful translation of *Champlain's Voyages*, by Professor and Mrs E.G. Bourne in the "Trailmaker" series edited by Prof. J.B. McMaster. See F. Parkman,

Pioneers of France in the New World (1865); J. Winsor, *Cartier to Frontenac* (1894); N.E. Dionne, *Champlain* (1905). (N. E. D.)

CHAMPLAIN, a lake lying between the states of New York and Vermont, U.S.A., and penetrating for a few miles into Canada. It extends about 130 m. from N. to S., varies from ¼ m. to 1 m. in width for 40 m. from its S. terminus, and then widens until it reaches a maximum width of about 11 m. near Ausable Point. Its area is about 500 sq. m. Its surface is 96 ft. above the sea. In the north part it is generally from 200 to 300 ft. deep; opposite Essex, N.Y., near its middle, the depth increases to 400 ft.; but farther south it is much less; throughout the greater part of the lake there is a depth of water of more than 100 ft. Since the lake is caused by the ponding of water in a broad irregular valley, the shore line is nearly everywhere much broken, and in the northern portion are several islands, both large and small, most of which belong to Vermont. These islands divide the lake's northern end into two large arms which extend into Canada. From the western arm the Richelieu river flows out, carrying the water of Champlain to the St Lawrence. The waters abound in salmon, salmon-trout, sturgeon and other fish, and are navigated from end to end by large steamboats and vessels of considerable tonnage. The lake was formerly the seat of extensive traffic, especially in lumber, but navigation has greatly decreased; the tonnage entering and clearing at the lake was twice as great in the early '70's as it was thirty years later. The principal ports are Burlington, Vt., and Plattsburg, N.Y. Lake Champlain lies in a valley from 1 to 30 m. wide, between the Green Mountains on the east and

the Adirondack Mountains on the west, and the scenery is most picturesque. On the east side is a rather gradual ascent for 20 m. or more from shore to summit, while on the west side the ascent is by a succession of hills, in some places from the water's edge. North of Crown Point low mountains rise 1000 to 1600 ft. above the lake, and behind these are the higher peaks of the Adirondacks, reaching an elevation of more than 5000 ft. Lake George is a tributary on the south, several small streams flow in from each side; the Champlain Canal, 63 m. in length, connects the lake with the Hudson river; and through the Richelieu it has a natural outlet to the north into the St Lawrence.

Lake Champlain was named from Samuel de Champlain, who discovered it in July 1609. The valley is a natural pathway between the United States and Canada, and during the various wars which the English have waged in America it had great strategic importance. In 1731 the French built a fort at Crown Point; in 1756, another at Ticonderoga; and both were important strategic points in the French and Indian War as well as in the American War of Independence. On the 11th of October 1776, the first battle between an American and a British fleet, the battle of Valcour Island, was fought on the lake. Benedict Arnold, the American commander, with a decidedly inferior force, withstood the British under Thomas Pringle for about seven hours, and then during the night escaped through the enemy's line. Although overtaken the next day he again, after a fight of a few hours, made a successful retreat.

At the beginning of the War of 1812 the American naval force on the lake, though very small, was superior to that of the British, but on the 3rd of June 1813 the British captured two American sloops in the narrow channel at the northern end and gained supremacy. Both sides now began to build and equip vessels for a decisive contest; by May 1814 the Americans had regained supremacy, and four months later a British land force of 11,000

men under Sir George Prevost (1767-1816) and a naval force of 16 vessels of about 2402 tons with 937 men and 92 guns under Captain George Downie (d. 1814) confronted an American land force of 1500 men under Brigadier-General Alexander Macomb (1782-1841), strongly entrenched at Plattsburg, and an American naval force (anchored in Plattsburg Bay) of 14 vessels of about 2244 tons with 882 men and 86 guns under Commodore Thomas Macdonough (1783-1825). In the open lake the British naval force should have been the superior, but at anchor in the bay the Americans had a decided advantage. Expecting the British land force to drive the American fleet from its anchorage, Captain Downie, on the 11th of September 1814, began the battle of Lake Champlain. It had continued only fifteen minutes when he was killed; the land force failed to co-operate, and after a severe fight at close range for 2½ hours, during which the British lost about 300 men, the Americans 200 and the vessels of both sides were greatly shattered, the British retreated both by land and by water, abandoning their plan of invading New York.

See C.E. Peet, "Glacial and Post-Glacial History of the Hudson and Champlain Valleys," in vol. xii. of the *Journal of Geology* (Chicago, 1904); P.S. Palmer, *History of Lake Champlain* (Albany. 1866); and Capt. A.T. Mahan, *Sea Power in its Relations to the War of 1812* (2 vols., Boston, 1905).

CHAMPMESLÉ, MARIE (1642-1698), French actress, was born in Rouen of a good family. Her father's name was Desmares. She made her first appearance on the stage at Rouen with Charles Chevillet (1645-1701),

who called himself sieur de Champmeslé, and they were married in 1666. By 1669 they were playing in Paris at the Théatre du Marais, her first appearance there being as Venus in Boyer's *Fête de Venus*. The next year, as Hermione in Racine's *Andromaque*, she had a great success at the Hôtel de Bourgogne. Her intimacy with Racine dates from then. Some of his finest tragedies were written for her, but her repertoire was not confined to them, and many an indifferent play—like Thomas Corneille's *Ariane* and *Comte d'Essex*—owed its success to "her natural manner of acting, and her pathetic rendering of the hapless heroine." *Phèdre* was the climax of her triumphs, and when she and her husband deserted the Hôtel de Bourgogne (see BÉJART *ad fin.*), it was selected to open the Comédie Française on the 26th of August 1680. Here, with Mme Guérin as the leading comedy actress, she played the great tragic love parts for more than thirty years, dying on the 15th of May 1698. La Fontaine dedicated to her his novel *Belphégor*, and Boileau immortalized her in verse. Her husband distinguished himself both as actor and playwright, and his *Parisien* (1682) gave Mme Guérin one of her greatest successes.

Her brother, the actor NICOLAS DESMARES (c. 1650-1714), began as a member of a subsidized company at Copenhagen, but by her influence he came to Paris and was received in 1685 *sans début*—the first time such an honour had been accorded—at the Comédie Française, where he became famous for peasant parts. His daughter, to whom Christian V. and his queen stood sponsors, CHRISTINE ANTOINETTE CHARLOTTE DESMARES (1682-1753), was a fine actress in both tragedy and soubrette parts. She made her début at the Comédie Française in 1699, in La Grange Chancel's *Oreste et Pylade*, and was at once received as *sociétaire*. She retired in 1721.

CHAMPOLLION, JEAN FRANÇOIS (1790-1832), French Egyptologist, called LE JEUNE to distinguish him from Champollion-Figeac (*q.v.*), his elder brother, was born at Figeac, in the department of Lot, on the 23rd of December 1790. He was educated by his brother, and was then appointed government pupil at the Lyceum, which had recently been founded. His first work (1804) was an attempt to show by means of their names that the giants of the Bible and of Greek mythology were personifications of natural phenomena. At the age of sixteen (1807) he read before the academy of Grenoble a paper in which he maintained that the Coptic was the ancient language of Egypt. He soon after removed to Paris, where he enjoyed the friendship of Langlès, De Sacy and Millin. In 1809 he was made professor of history in the Lyceum of Grenoble, and there published his earlier works. Champollion's first decipherment of hieroglyphics dates from 1821. In 1824 he was sent by Charles X. to visit the collections of Egyptian antiquities in the museums of Turin, Leghorn, Rome and Naples; and on his return he was appointed director of the Egyptian museum at the Louvre. In 1828 he was commissioned to undertake the conduct of a scientific expedition to Egypt in company with Rosellini, who had received a similar appointment from Leopold II., grand duke of Tuscany. He remained there about a year. In March 1831 he received the chair of Egyptian antiquities, which had been created specially for him, in the Collège de France. He was engaged with Rosellini in publishing the results of Egyptian researches at the expense of the Tuscan and French governments, when he was seized with a paralytic disorder, and died at Paris in 1832. Champollion, whose claims were hotly disputed for many years after his death, is now universally acknowledged to have been the founder of Egyptology.

He wrote *L'Égypte sous les Phraons* (2 vols. 8vo, 1814); *Sur l'écriture hiératique* (1821); *Sur l'écriture démotique*; *Précis du systéme hiéroglyphique*, &c. (1824); *Panthéon égyptien, ou collection des*

personnages mythologiques de l'ancienne Egypte (incomplete); *Monumens de l'Égypte et de la Nubie considérés par rapport a l'histoire, la religion, &c.*; *Grammaire égyptienne* (1836), and *Dictionnaire égyptienne*(1841), edited by his brother; *Analyse méthodique du texte démotique de Rosette*; *Aperçu des résultats historiques de la découverte de l'alphabet hiéroglyphique* (1827); *Mémoires sur les signes employés par les Égyptiens dans leurs trois systèmes graphiques à la notation des principales divisions du temps*; *Lettres ecrites d'Égypte et de Nubie* (1833); and also seveial letters on Egyptian subjects, addressed at different periods to the duc de Blacas and others.

See H. Hartleben, *Champollion, sein Leben und sein Werk* (2 vols., 1906); also EGYPT: *Language and Writing* (*ad init.*).

CHAMPOLLION-FIGEAC, JACQUES JOSEPH (1778-1867), French archaeologist, elder brother of Jean François Champollion, was born at Figeac in the department of Lot, on the 5th of October 1778. He became professor of Greek and librarian at Grenoble, but was compelled to retire in 1816 on account of the part he had taken during the Hundred Days. He afterwards became keeper of manuscripts at the Bibliothèque Nationale in Paris, and professor of palaeography at the École des Chartes. In 1849 he became librarian of the palace of Fontainebleau. He edited several of his brother's works, and was also author of original works on philological and historical subjects, among which may be mentioned *Nouvelles recherches sur les patois ou idiomes vulgaires de la France* (1809), *Annales de Lagides* (1819) and *Chartes latines sur papyrus du VIe siècle de l'ère chrétienne*.

His son AIMÉ (1812-1894) became his father's assistant at the Bibliothèque Nationale, and besides a number of works on historical subjects wrote a biographical and bibliographical study of his family in *Les Deux Champollion* (Grenoble, 1887).

CHANCE (through the O. Fr. *chéance*, from the Late Lat. *cadentia*, things happening, from *cadere*, to fall out, happen; cf. "case"), an accident or event, a phenomenon which has no apparent or discoverable cause; hence an event which has not been expected, a piece of good or bad fortune. From the popular idea that anything of which no assignable cause is known has therefore no cause, chance (Gr. τύχη) was regarded as having a substantial objective existence, being itself the source of such uncaused phenomena. For the philosophic theories relating to this subject see ACCIDENTALISM.

"Chance," in the theory of probability, is used in two ways. In the stricter, or mathematical usage, it is synonymous with probability; *i.e.* if a particular event may occur in *n* ways in an aggregate of *p* events, then the "chance" of the particular event occurring is given by the fraction *n/p*. In the second usage, the "chance" is regarded as the ratio of the number of ways which a particular event may occur to the number of ways in which it may not occur; mathematically expressed, this chance is *n/(p-n)* (see PROBABILITY). In the English law relating to gaming and wagering a distinction is drawn between games of chance and games of skill (see GAMING AND WAGERING).

CHANCEL (through O. Fr. from Lat. plur. *cancelli*, dim. of *cancer*, grating, lattice, probably connected with an Indo-European root *Kar*-, to bend; cf. circus, curve, &c.), in the earliest and strictest sense that part of a church near the altar occupied by the deacons and sub-deacons assisting the officiating priest, this space having originally been separated from the rest of the church by *cancelli* or lattice work. The word *cancelli* is used in classical Latin of a screen, bar or the like, set to mark off an enclosed space in a building or in an open place. It is thus used of the bar in a court of justice (Cicero, *Verres*, ii. 3 seq.). It is particularly used of the lattice or screen in the ancient basilica, which separated the *bema*, or raised tribunal, from the rest of the building. The use of the name in ecclesiastical buildings is thus natural, for the altar stood in the place occupied by the *bema* in the apse of the basilica. From the screen the term was early transferred to the space *inter cancellos*, *i.e.* the *locus altaris cancellis septus*. This railed-off space is now generally known among Roman Catholics as the "sanctuary," the word chancel being little used. In the Church of England, however, the word chancel survived the Reformation, and is applied, both in the ecclesiastical and the architectural sense, to that part of the church occupied by the principal altar or communion table and by the clergy and singers officiating at the chief services; it thus includes presbytery, chancel proper and choir (*q.v.*), and in this sense, in the case of cathedrals and other large churches, is often used synonymously with choir. In this more inclusive sense the early basilican churches had no chancels, which were a comparatively late development; the *cancelli*, *e.g.* of such a church as San Clemente at Rome are equivalent not to the "chancel screen" of a medieval church but to the "altar rails" that divide off the sanctuary. In churches of the type that grew to its perfection in the middle ages the chancels are clearly differentiated from the nave by structural features: by the raising of the floor level, by the presence of a "chancel arch," and by a chancel or rood screen (see ROOD). The chancel screen might be no more than a low

barrier, some 4 ft. high, or a light structure of wood or wrought iron; sometimes, however, they were massive stone screens, which in certain cases were continued on either side between the piers of the choir and (on the European continent) round the east end of the sanctuary, as in the cathedrals of Paris, Bourges, Limoges, Amiens and Chartres. These screens served the purpose, in collegiate and conventual churches, of cutting off the space reserved for the services conducted for and by the members of the chapter or community. For popular services a second high altar was usually set up to the west of the screen, as formerly at Westminster Abbey. In parish churches the screen was set, partly to differentiate the space occupied by the clergy from that reserved for the laity, partly to support the representation of the crucifixion known as the Rood. In these churches, too, the chancel is very usually structurally differentiated by being narrower and, sometimes, less high than the nave.

In the Church of England, the duty of repairing the chancel falls upon the parson by custom, while the repair of the body of the church falls on the parishioners. In particular cases, as in certain London churches, the parishioners also have to repair the chancel. Where there are both a rector and a vicar the repairs are shared between them, and this is also the case where the rector is a lay impropriator. By the rubric of the English Prayer Book "the chancels shall remain as they have done in times past," *i.e.* distinguished from the body of the church by some partition sufficient to separate the two without interfering with the view of the congregation. At the Reformation, and for some time after, this distinction was regarded by the dominant Puritan party as a mark of sacerdotalism, and services were commonly said in other parts of the church, the chancels being closed and disused. The rubric, however, directs that "'Morning and Evening Prayer' shall be used in the accustomed place in the church, chapel or chancel, except it shall be otherwise determined by the Ordinary." Chancel screens,

with or without gates, are lawful, but chancellors of dioceses have refused to grant a faculty to erect gates, as unnecessary or inexpedient.

CHANCELLOR (M. Eng. and Anglo-Fr. *canceler*, *chanceler*, Fr. *chancelier*, Lat. *cancellarius*), an official title used by most of the peoples whose civilization has arisen directly or indirectly out of the Roman empire. At different times and in different countries it has stood and stands for very various duties, and has been, and is, borne by officers of various degrees of dignity. The original chancellors were the *cancelarii* of Roman courts of justice, ushers who sat at the *cancelli* or lattice work screens of a "basilica" or law court, which separated the judge and counsel from the audience (see CHANCEL). In the later Eastern empire the *cancellarii* were promoted at first to notarial duties. The barbarian kingdoms which arose on the ruin of the empire in the West copied more or less intelligently the Roman model in all their judicial and financial administration. Under the Frankish kings of the Merovingian dynasty the *cancellarii* were subordinates of the great officer of state called the *referendarius*, who was the predecessor of the more modern chancellor. The office became established under the form *archi-cancellarius*, or chief of the *cancellarii*. Stubbs says that the Carolingian chancellor was the royal notary and the arch-chancellor keeper of the royal seal. His functions would naturally be discharged by a cleric in times when book learning was mainly confined to the clergy. From the reign of Louis the Pious the post was held by a bishop. By an equally natural process he became the chief secretary of the king and of the queen, who also had her chancellor. Such an office possessed an obvious capacity for developing on

the judicial as well as the administrative side. Appeals and petitions of aggrieved persons would pass through the chancellor's hands, as well as the political correspondence of the king. Nor was the king the only man who had need of a chancellor. Great officers and corporations also had occasion to employ an agent to do secretarial, notarial and judicial work for them, and called him by the convenient name of chancellor. The history of the office in its many adaptations to public and private service is the history of its development on judicial, administrative, political, secretarial and notarial lines.

The chancellor in England.

The model of the Carolingian court was followed by the medieval states of Western Europe. In England the office of chancellor dates back to the reign of Edward the Confessor, the first English king to use the Norman practice of sealing instead of signing documents; and from the Norman Conquest onwards the succession of chancellors is continuous. The chancellor was originally, and long continued to be, an ecclesiastic, who combined the functions of the most dignified of the royal chaplains, the king's secretary in secular matters, and keeper of the royal seal. From the first, then, though at the outset overshadowed by that of the justiciar, the office of chancellor was one of great influence and importance. As chaplain the chancellor was keeper of the king's conscience; as secretary he enjoyed the royal confidence in secular affairs; as keeper of the seal he was necessary to all formal expressions of the royal will. By him and his staff of chaplains the whole secretarial work of the royal household was conducted, the accounts were kept under the justiciar and treasurer, writs were drawn up and sealed, and the royal correspondence was carried on. He was, in fact, as Stubbs puts it, a sort of secretary of state for all departments. "This is he," wrote John of Salisbury (d. 1180), "who cancels (*cancellat*) the evil laws of the realm, and makes equitable (*aequa*) the commands of a pious prince," a curious anticipation of the chancellor's later equitable jurisdiction. Under

Henry II., indeed, the chancellor was already largely employed in judicial work, either in attendance on the king or in provincial visitations; though the peculiar jurisdiction of the chancery was of later growth. By this time, however, the chancellor was "great alike in Curia and Exchequer"; he was *secundus a rege*, *i.e.* took precedence immediately after the justiciar, and nothing was done either in the Curia or the exchequer without his consent. So great was his office that William FitzStephen, the biographer of Becket, tells us that it was not purchasable (*emenda non est*), a statement which requires modification, since it was in fact more than once sold under Henry I., Stephen, Richard and John (Stubbs, *Const. Hist.* i. pp. 384-497; Gneist, *Const. Hist. of England*, p. 219), an evil precedent which was, however, not long followed.

The judicial duties of the chancellor grew out of the fact that all petitions addressed to the king passed through his hands. The number and variety of these became so great that in 1280, under Edward I., an ordinance was issued directing the chancellor and the justices to deal with the greater number of them; those which involved the use of the great seal being specially referred to the chancellor. The chancellor and justices were to determine which of them were "so great, and of grace, that the chancellor and others would not despatch them without the king," and these the chancellor and other chief ministers were to carry in person to the king (Stubbs ii. 263, note, and p. 268). At this period the chancellor, though employed in equity, had ministerial functions only; but when, in the reign of Edward III., the chancellor ceased to follow the court, his tribunal acquired a more definite character, and petitions for grace and favour began to be addressed primarily to him, instead of being merely examined and passed on by him to the king; and in the twenty-second year of this reign matters which were of grace were definitely committed to the chancellor for decision. This is the starting-point of the equitable jurisdiction of the chancellor, whence developed that immense body of rules, supplementing

the deficiencies or modifying the harshness of the common law, which is known as Equity (*q.v.*).

The position of the chancellor as speaker or prolocutor of the House of Lords dates from the time when the ministers of the royal Curia formed *ex officio* a part of the *commune concilium* and parliament. The chancellor originally attended with the other officials, and he continued to attend *ex officio* after they had ceased to do so. If he chanced to be a bishop, he was summoned regularly *qua* bishop; otherwise he attended without summons. When not a peer the chancellor had no place in parliament except as chancellor, and the act of 31 Henry VIII. cap. 10 (1539) laid down that, if not a peer, he had "no interest to give any assent or dissent in the House." Yet Sir Robert Bourchier (d. 1349), the first lay chancellor, had protested in 1341 against the first statute of 15 Edward III. (on trial by peers, &c.), on the ground that it had not received his assent and was contrary to the laws of the realm. From the time, however, of William, Lord Cowper (first lord high chancellor of Great Britain in 1705, created Baron Cowper in 1706), all chancellors have been made peers on their elevation to the woolsack. Sometimes the custody of the great seal has been transferred from the chancellor to a special official, the lord keeper of the great seal (see LORD KEEPER); this was notably the case under Queen Elizabeth (cf. the French *garde des sceaux*, below). Sometimes it is put into commission, being affixed by lords commissioners of the great seal. By the Catholic Emancipation Act of 1829 it was enacted that none of these offices could be held by a Roman Catholic (see further under LORD HIGH CHANCELLOR). The office of lord chancellor of Ireland, and that of chancellor of Scotland (who ceased to be appointed after the Act of Union of 1707) followed the same lines of development.

The chancellor in parliament.

The title of chancellor, without the predicates “high” or “lord,” is also applied in the United Kingdom to a number of other officials and functionaries of varying rank and importance. Of these the most important is the chancellor of the exchequer, an office which originated in the separation of the chancery from the exchequer in the reign of Henry III. (1216-1272). His duties consisted originally in the custody and employment of the seal of the exchequer, in the keeping of a counter-roll to check the roll kept by the treasurer, and in the discharge of certain judicial functions in the exchequer of account. So long as the treasury board was in active working, the chancellorship of the exchequer was an office of small importance, and even during a great part of the 19th century was not necessarily a cabinet office, unless held in conjunction with that of first lord of the treasury. At the present time the chancellor of the exchequer is minister of finance, and therefore always of cabinet rank (see EXCHEQUER).

Chancellor of the exchequer.

The chancellor of the duchy of Lancaster is the representative of the crown in the management of its lands and the control of its courts in the duchy of Lancaster, the property of which is scattered over several counties. These lands and privileges, though their inheritance has always been vested in the king and his heirs, have always been kept distinct from the hereditary revenues of the sovereign, whose palatine rights as duke of Lancaster were distinct from his rights as king. The Judicature Act of 1873 left only the chancery court of the duchy, but the chancellor can appoint and dismiss the county court judges within the limits of the duchy; he is responsible also for the land revenues of the duchy, which are the private property of the sovereign, and keeps the seal of the duchy. His appointment is by letters patent, and his salary is derived from the revenue of the duchy. As the judicial and estate work is done by subordinate officials, the office is practically a sinecure and is usually given to a minister whose assistance is

Chancellor of the duchy.

necessary to a government, but who for one reason or another cannot undertake the duties of an important department. John Bright described him as the maid-of-all-work of the cabinet.

Ecclesiastical chancellors.

The chancellor of a diocese is the official who presides over the bishop's court and exercises jurisdiction in his name. This use of the word is comparatively modern, and, though employed in acts of parliament, is not mentioned in the commission, having apparently been adopted on the analogy of the like title in the state. The chancellor was originally the keeper of the archbishop or bishop's seals; but the office, as now understood, includes two other offices distinguished in the commission by the titles of vicar-general and official principal (see ECCLESIASTICAL JURISDICTION). The chancellor of a diocese must be distinguished from the chancellor of a cathedral, whose office is the same as that of the ancient *scholasticus* (see CATHEDRAL).

Academic, &c.

The chancellor of an order of knighthood discharges notarial duties and keeps the seal. The chancellor of a university is an official of medieval origin. The appointment was originally made by the popes, and the office from the first was one of great dignity and originally of great power. The chancellor was, as he remains, the head of the university; he had the general superintendence of its studies and of its discipline, could make and unmake laws, try and punish offences, appoint to professorial chairs and admit students to the various degrees (see Du Cange, s. "*Cancellarii Academiarum*"). In England the chancellorship of the universities is now a more or less ornamental office and is conferred on noblemen or statesmen of distinction, whose principal function is to look after the general interests of the university, especially in its relations with the government. The chancellor is represented in the university by a vice-chancellor, who performs the

administrative and judicial functions of the office. In the United States the heads of certain educational establishments have the title of chancellor. In Scotland the foreman of a jury is called its chancellor. In the United States the chancellors are judges of the chancery courts of the states, *e.g.* Delaware and New Jersey, where these courts are still maintained as distinct from the courts of common law. In other states, *e.g.* New York since 1847, the title has been abolished, and there is no federal chancellor.

In diplomacy generally the chancellor of an embassy or legation is an official attached to the suite of an ambassador or minister. He performs the functions of a secretary, archivist, notary and the like, and is at the head of the chancery, or chancellery (Fr. *chancellerie*), of the mission. The functions of this office are the transcribing and registering of official despatches and other documents, and generally the transaction of all the minor business, *e.g.* marriages, passports and the like, connected with the duties of a diplomatic agent towards his nationals in a foreign country. The dignified connotation of the title chancellor has given to this office a prestige which in itself it does not deserve; and "chancery" or "chancellery" is commonly used as though it were synonymous with embassy, while diplomatic style is sometimes called *style de chancellerie*, though as a matter of fact the chanceries have nothing to do with it.

France.—The country in which the office of chancellor followed most closely the same lines as in England is France. He had become a great officer under the Carolingians, and he grew still greater under the Capetian sovereigns. The great chancellor, *summus cancellarius* or *archi-cancellarius*, was a dignitary who had indeed little real power. The post was commonly filled by the archbishop of Reims, or the bishop of Paris. The *cancellarius*, who formed part of the royal court and administration, was officially known as the *sub-cancellarius* in relation to the *summus cancellarius*, but as *proto-cancellarius* in regard to his subordinate

cancellarii. He was a very great officer, an ecclesiastic who was the chief of the king's chaplains or king's clerks, who administered all ecclesiastical affairs; he had judicial powers, and from the 12th century had the general control of foreign affairs. The chancellor in fact became so great that the Capetian kings, who did not forget the mayor of the palace, grew afraid of him. Few of the early ecclesiastical chancellors failed to come into collision with the king, or parted with him on good terms. Philip Augustus suspended the chancellorship throughout the whole of his reign, and appointed a keeper of the seals (*garde des sceaux*). The office was revived under Louis VIII., but the ecclesiastical chancellorship was finally suppressed in 1227. The king of the 13th century employed only keepers of the seal. Under the reign of Philip IV. le Bel lay chancellors were first appointed. From the reign of Charles V. to that of Louis XI. the French *chancelier* was elected by the royal council. In the 16th century he became irremovable, a distinction more honourable than effective, for though the king could not dismiss him from office he could, and on some occasions did, deprive him of the right to exercise his functions, and entrusted them to a keeper of the seal. The *chancelier* from the 13th century downwards was the head of the law, and performed the duties which are now entrusted to the minister of justice. His office was abolished when in 1790 the whole judicial system of France was swept away by the Revolution. The smaller *chanceliers* of the provincial parlements and royal courts disappeared at the same time. But when Napoleon was organizing the empire he created an arch-chancellor, an office which was imitated rather from the *Erz-Kanzler* of the Holy Roman Empire than from the old French *chancelier*. At the Restoration the office of chancellor of France was restored, the chancellor being president of the House of Peers, but it was finally abolished at the revolution of 1848. The administration of the Legion of Honour is presided over by a *grand chancelier*, who is a grand cross of the order, and who advises the head of the state in matters concerning the affairs of the order. The title of

chancelier continues also to be used in France for the large class of officials who discharge notarial duties in some public offices, in embassies and consulates. They draw up diplomas and prepare all formal documents, and have charge of the registration and preservation of the archives.

Spain.—In Spain the office of chancellor, *canciller*, was introduced by Alphonso VII. (1126-1157), who adopted it from the court of his cousins of the Capetian dynasty of France. The *canciller* did not in Spain go beyond being the king's notary. The chancellor of the privy seal, *canciller del sello de la puridad* (literally the secret seal), was the king's secretary, and sealed all papers other than diplomas and charters. The office was abolished in 1496, and its functions were transferred to the royal secretaries. The *cancelario* was the chancellor of a university. The *canciller* succeeded the *maesescuela* or *scholasticus* of a church or monastery. *Canciller mayor de Castilla* is an honorary title of the archbishops of Toledo. The *gran canciller de las Indias*, high chancellor of the Indies, held the seal used for the American dominions of Spain, and presided at the council in the absence of the president. The office disappeared with the loss of Spain's empire in America.

Italy, Germany, &c.—In central and northern Europe, and in Italy, the office had different fortunes. In southern Italy, where Naples and Sicily were feudally organized, the chancellors of the Norman kings, who followed Anglo-Norman precedents very closely, and, at least in Sicily, employed Englishmen, were such officers as were known in the West. The similarity is somewhat concealed by the fact that these sovereigns also adopted names and offices from the imperial court at Constantinople. Their chancellor was officially known as Protonotary and Logothete, and their example was followed by the German princes of the Hohenstaufen family, who acquired the kingdoms of Naples and Sicily. The papal or apostolic chancery is dealt with in the article on the Curia Romana (*q.v.*). It may be

pointed out here, however, that the close connexion of the papacy with the Holy Roman Empire is illustrated by the fact that the archbishop of Cologne, who by right of his see was the emperor's arch-chancellor (*Erz-Kanzler*) for Italy, was confirmed as papal arch-chancellor by a bull of Leo IX. in 1052. The origin and duration of this connexion are, however, obscure; it appears to have ceased before 1187. The last record of a papal chancellor in the middle ages dates from 1212, from which time onward, for reasons much disputed, the head of the papal chancery bore the title vice-chancellor (Hinschius i. 439), until the office of chancellor was restored by the constitution *Sapientius* of Pius X. in 1908.

The title of arch-chancellor (*Erz-Kanzler*) was borne by three great ecclesiastical dignitaries of the Holy Roman Empire. The archbishop of Mainz was arch-chancellor for Germany. The archbishop of Cologne held the dignity for Italy, and the archbishop of Trier for Gaul and the kingdom of Arles. The second and third of these dignities became purely formal with the decline of the Empire in the 13th century. But the arch-chancellorship of Germany remained to some extent a reality till the Empire was finally dissolved in 1806. The office continued to be attached to the archbishopric of Mainz, which was an electorate. Karl von Dalberg, the last holder of the office, and the first prince primate of the Confederation of the Rhine, continued to act in show at least as chancellor of that body, and was after a fashion the predecessor of the *Bundes Kanzler*, or chancellor of the North German Confederation. The duties imposed on the imperial chancery by the very complicated constitution of the Empire were, however, discharged by a vice-chancellor who was attached to the court of the emperor. The abbot of Fulda was chancellor to the empress.

The house of Austria in their hereditary dominions, and in those of their possessions which they treated as hereditary, even where the sovereignty was in theory elective, made a large and peculiar use of the title chancellor.

The officers so called were of course distinct from the arch-chancellor and vice-chancellor of the Empire, although the imperial crown became in practice hereditary in the house of Habsburg. In the family states their administration was, to use a phrase familiar to the French, "polysynodic." As it was when fully developed, and as it remained until the March revolution of 1848, it was conducted through boards presided over by a chancellor. There were three aulic chancellorships for the internal affairs of their dominions, "a united aulic chancellorship for all parts of the empire (*i.e.* of Austria, not the Holy Roman) not belonging to Hungary or Transylvania, and a separate chancellorship for each of those last-mentioned provinces" (Hartig, *Genesis of the Revolution in Austria*). There were also a house, a court, and a state chancellor for the business of the imperial household and foreign affairs, who were not, however, the presidents of a board. These "aulic" (*i.e.* court) officers were in fact secretaries of the sovereign, and administrative or political rather than judicial in character, though the boards over which they presided controlled judicial as well as administrative affairs. In the case of such statesmen as Kaunitz and Metternich, who were house, court, and state chancellors as well as "united aulic" chancellors, the combination of offices made them in practice prime ministers, or rather lieutenants-general, of the sovereign. The system was subject to modifications, and in the end it broke down under its own complications. We are not dealing here with the confusing history of the Austrian administration, and these details are only quoted to show how it happened that in Austria the title chancellor came to mean a political officer and minister. There is obviously a vast difference between such an official as Kaunitz, who as house, court, and state chancellor was minister of foreign affairs, and as "united aulic" chancellor had a general superiority over the whole machinery of government, and the lord high chancellor in England, the *chancelier* in France, or the *canciller mayor* in Castile, though the title was the same. The development of the office in Austria must be

understood in order to explain the position and functions of the imperial chancellor (*Reichs Kanzler*) of the modern German empire. Although the present empire is sometimes rhetorically and absurdly spoken of as a revival of the medieval Empire, it is in reality an adaptation of the Austrian empire, which was a continuation under a new name of the hereditary Habsburg monarchy. The *Reichs Kanzler* is the immediate successor of the *Bundes Kanzler*, or chancellor of the North German Confederation (*Bund*). But the *Bundes Kanzler*, who bore no sort of resemblance except in mere name to the *Erz-Kanzler* of the old Empire, was in a position not perhaps actually like that of Prince Kaunitz, but capable of becoming much the same thing. When the German empire was established in 1871 Prince Bismarck, who was *Bundes Kanzler* and became *Reichs Kanzler*, took care that his position should be as like as possible to that of Prince Kaunitz or Prince Metternich. The constitution of the German empire is separately dealt with, but it may be pointed out here that the *Reichs Kanzler* is the federal minister of the empire, the chief of the federal officials, and a great political officer, who directs the foreign affairs, and superintends the internal affairs, of the empire.

In these German states the title of chancellor is also given as in France to government and diplomatic officials who do notarial duties and have charge of archives. The title of chancellor has naturally been widely used in the German and Scandinavian states, and in Russia since the reign of Peter the Great. It has there as elsewhere wavered between being a political and a judicial office. Frederick the Great of Prussia created a *Gross Kanzler* for judicial duties in 1746. But there was in Prussia a state chancellorship on the Austrian model. It was allowed to lapse on the death of Hardenberg in 1822. The Prussian chancellor after his time was one of the four court ministries (*Hofämter*) of the Prussian monarchy.

AUTHORITIES.—Du Cange, *Glossarium*, *s.v.* "Cancellarius"; W. Stubbs, *Const. Hist. of England* (1874-1878); Rudolph Gneist, *Hist. of the English Constitution* (Eng. trans., London, 1891); L.O. Pike, *Const. Hist. of the House of Lords* (London, 1894); Sir William R. Anson, *The Law and Custom of the Constitution*, vol. ii. part i. (Oxford, 1907); A. Luchaire, *Manuel des institutions françaises* (Paris, 1892); K.F. Stumpf, *Die Reichs Kanzler* (3 vols., Innsbruck, 1865-1873); G. Sceliger, *Erzkanzler und Reichskanzleien* (ib. 1889); P. Hinschius, *Kirchenrecht* (Berlin, 1869); Sir R.J. Phillimore, *Eccles. Law* (London, 1895); P. Pradier-Fodéré, *Cours de droit diplomatique*, ii. 542 (Paris, 1899).

CHANCELLORSVILLE, a village of Spottsylvania county, Virginia, U.S.A., situated almost midway between Washington and Richmond. It was the central point of one of the greatest battles of the Civil War, fought on the 2nd and 3rd of May 1863, between the Union Army of the Potomac under Major-General Hooker, and the Confederate Army of Northern Virginia under General Lee. (See AMERICAN CIVIL WAR, and WILDERNESS.) General "Stonewall" Jackson was mortally wounded in this battle.

CHANCE-MEDLEY (from the A.-Fr. *chance-medlée*, a mixed chance, and not from *chaude-medlée*, a hot affray), an accident of a mixed

character, an old term in English law for a form of homicide arising out of a sudden affray or quarrel. The homicide has not the characteristic of "malice prepense" which would raise the death to murder, nor the completely accidental nature which would reduce it to homicide by misadventure. It was practically identical, therefore, with manslaughter.

CHANCERY, in English law, the court of the lord chancellor of England, consolidated in 1873 along with the other superior courts in the Supreme Court of Judicature. Its origin is noticed under the head of Chancellor.

It has been customary to say that the court of chancery consists of two distinct tribunals—one a court of common law, the other a court of equity. From the former have issued all the original writs passing under the great seal, all commissions of sewers, lunacy, and the like—some of these writs being originally kept in a *hanaper* or hamper (whence the "hanaper office"), and others in a little sack or bag (whence the "petty-bag office"). The court had likewise power to hold pleas upon *scire facias* (*q.v.*) for repeal of letters patent, &c. "So little," says Blackstone, "is commonly done on the common law side of the court that I have met with no traces of any writ of error being actually brought since the fourteenth year of Queen Elizabeth."

The equitable jurisdiction of the court of chancery was founded on the supposed superiority of conscience and equity over the strict law. The appearance of equity in England is in harmony with the general course of legal history in progressive societies. What is remarkable is that, instead of

being incorporated with or superseding the common law, it gave rise to a wholly independent set of tribunals. The English dislike of the civil law, and the tendency to follow precedent which has never ceased to characterize English lawyers, account for this unfortunate separation. The claims of equity in its earlier stages are well expressed in the little treatise called *Doctor and Student*, published in the reign of Henry VIII.:—"Conscience never resisteth the law nor addeth to it, but only when the law is directly in itself against the *law of God*, or *law of reason*." So also King James, speaking in the Star Chamber, says: "Where the rigour of the law in many cases will undo a subject, then the chancery tempers the law with equity, and so mixes mercy with justice, as it preserves a man from destruction." This theory of the essential opposition between law and equity, and of the natural superiority of the latter, remained long after equity had ceased to found itself on natural justice, and had become as fixed and rigid as the common law itself. The jealousy of the common lawyers came to a head in the time of Lord Ellesmere, when Coke disputed the right of the chancery to give relief against a judgment of the court of queen's bench obtained by gross fraud and imposition. James I., after consultation, decided in favour of the court of equity. The substitution of lay for clerical chancellors is regarded by G. Spence (*Equitable Jurisdiction of the Court of Chancery*, 2 vols., 1846-1849) as having at first been unfortunate, inasmuch as the laymen were ignorant of the principles on which their predecessors had acted. Lord Nottingham (1621-1682) is usually credited with the first attempt to reduce the decisions of the court to order, and his work was continued by Lord Hardwicke (1690-1764). By the time of Lord Eldon equity had become fixed, and the judges, like their brethren in the common law courts, strictly followed the precedents. Henceforward chancery and common law courts have exhibited the anomaly of two co-ordinate sets of tribunals, empowered to deal with the same matters, and compelled to proceed in many cases on wholly different principles. The court of chancery

could in most cases prevent a person from taking advantage of a common law right, not approved of by its own system. But if a suitor chose to go to a court of common law, he might claim such unjust rights, and it required the special intervention of the court of equity to prevent his enforcing them. In many cases also a special application had to be made to chancery for facilities which were absolutely necessary to the successful conduct of a case at common law. Another source of difficulty and annoyance was the uncertainty in many cases whether the chancery or common law courts were the proper tribunal, so that a suitor often found at the close of an expensive and protracted suit that he had mistaken his court and must go elsewhere for relief. Attempts more or less successful were made to lessen those evils by giving the powers to both sets of courts; but down to the consolidation effected by the Judicature Act, the English judicial system justified the sarcasm of Lord Westbury, that one tribunal was set up to do injustice and another to stop it.

The equitable jurisdiction of chancery was commonly divided into *exclusive*, *concurrent* and *auxiliary*. Chancery had exclusive jurisdiction when there were no forms of action by which relief could be obtained at law, in respect of rights which ought to be enforced. Trusts were the most conspicuous example of this class. It also included the rights of married women, infants and lunatics. Chancery had concurrent jurisdiction when the common law did not give *adequate* relief, *e.g.* in cases of fraud, accident, mistake, specific performance of contracts, &c. It had auxiliary jurisdiction when the administrative machinery of the law courts was unable to procure the necessary evidence.

The Judicature Act 1873 enacted (§ 24) that in every civil cause or matter commenced in the High Court of Justice, law and equity should be administered by the High Court of Justice and the court of appeal respectively, according to the rules therein contained, which provide for

giving effect in all cases to "equitable rights and other matters of equity." The 25th section declared the law hereafter to be administered in England on certain points, and ordained that "generally in all matters not hereinbefore particularly mentioned in which there is any conflict or variance between the rules of equity and the rules of the common law with reference to the same matter, the rules of equity shall prevail." The 34th section specifically assigned to the chancery division the following causes and matters:—The administration of the estates of deceased persons; the dissolution of partnerships, or the taking of partnership, or other accounts; the redemption or foreclosure of mortgages; the raising of portions, or other charges on land; the sale and distribution of the proceeds of property subject to any lien or charge; the execution of trusts, charitable or private; the rectification, or setting aside, or cancellation of deeds or other written instruments; the specific performance of contracts between vendors and purchasers of real estates, including contracts for leases; the partition or sale of real estates; the wardship of infants and the care of infants' estates.

The chancery division originally consisted of the lord chancellor as president and the master of the rolls, and the three vice-chancellors. The master of the rolls was also a member of the court of appeal, but Sir George Jessel, who held that office when the new system came into force, regularly sat as a judge of first instance until 1881, when, by the act of that year (sec. 2), the master of the rolls became a member of the court of appeal only, and provision was made for the appointment of a judge to supply the vacancy thus occasioned (sec. 3). Sir James Bacon (1798-1895) was the last survivor of the vice-chancellors. He retained his seat on the bench until the year 1886, when he retired after more than seventeen years' judicial service. For some reason the solicitors, when they had the choice, preferred to bring their actions in the chancery division. The practice introduced by the Judicature Act of trying actions with oral evidence instead of affidavits, and the comparative inexperience of the chancery judges and counsel in that

mode of trial, tended to lengthen the time required for the disposal of the business. Demand was consequently made for more judges in the chancery division. By an act of 1877 the appointment of an additional judge in that division was authorized, and Sir Edward Fry (afterwards better known as a lord justice) was appointed. In August 1899 the crown consented to the appointment of a new judge of the High Court in the chancery division on an address from both Houses of Parliament, pursuant to the 87th section of the Appellate Jurisdiction Act 1876. The chancery division, therefore, consists of the lord chancellor and six puisne judges. The latter are styled and addressed in the same manner as was customary in the old common law courts.[1] Formerly there were only four judges of this division (being the successors of the master of the rolls and the three vice-chancellors) to whom chambers were attached. The fifth judge heard only causes with witnesses transferred to him from the overflowing of the lists of his four brethren. In each set of chambers there were three chief clerks, with a staff of assistant clerks under them. The chief clerks had no original jurisdiction, but heard applications only on behalf of the judge to whose chambers they belonged, and theoretically every suitor had the right to have his application heard by the judge himself in chambers. But the appointment of a sixth judge enabled the lord chancellor to carry out a reform recommended by a departmental committee which reported in 1885. The great difficulty in the chancery division always was to secure the continuous hearing of actions with witnesses, as nearly one-half of the judge's time was taken up with cases adjourned to him from chambers and other administrative business and non-witness actions and motions. The interruption of a witness action for two or three days, particularly in a country case, occasioned great expense, and had other inconveniences. It was a simple remedy to link the judges in pairs with one list of causes and one set of chambers assigned to each pair. This reform was effected by the alteration of a few words in certain rules of court. There are therefore, only three sets of chambers, each

containing four chief clerks, or, as they are now styled, masters of the Supreme Court, and one of the linked judges, by arrangement between themselves, continuously tries the witness actions in their common list, while the other attends in chambers, and also hears the motions, petitions, adjourned summonses and non-witness cases.

Although styled masters it does not appear that the chief clerks have any larger or different jurisdiction than they had before. They are still the representatives of and responsible to the judges to whom the chambers are attached. The judge may either hear an application in chambers, or may direct any matter which he thinks of sufficient importance to be argued before him in court, or a party may move in court to discharge an order made in chambers with a view to an appeal, but this is not required if the judge certifies that the matter was sufficiently discussed before him in chambers.

Under the existing rules of court many orders can now be made on summons in chambers which used formerly to require a suit or petition in court (see Order LV. as to foreclosure, administration, payment out of money in court and generally). The judge is also enabled to decide any particular question arising in the administration of the estate of a deceased person or execution of the trusts of a settlement without directing administration of the whole estate or execution of the trusts generally by the court (Order LV. rule 10), and where an application for accounts is made by a dissatisfied beneficiary or creditor to order the accounts to be delivered out of court, and the application to stand over till it can be seen what questions (if any) arise upon the accounts requiring the intervention of the court (Order LV. 2, 10a). Delay and consequent worry and expense are thus saved to the parties, and, at the same time, a great deal of routine administration is got rid of and a larger portion of the judicial term can be devoted to hearing actions and deciding any question of importance in

court. The work of the chambers staff of the judges has probably been increased; but, on the other hand, it has been lightened by the removal of the winding-up business. The chancery division has also inherited from the court of chancery a staff of registrars and taxing masters.

In the United States "chancery" is generally used as the synonym of "equity." Chancery practice is practice in cases of equity. Chancery courts are equity courts (see EQUITY). For the diplomatic sense of chancery (chancellery) see CHANCELLOR.

1 The comte de Franqueville comments on the misuse of the title "Lord" in addressing judges as another anomaly which only adds to the confusion, but perhaps unnecessarily. According to Foss (vol. viii. p. 200) it was only in the 18th century that the judges began to be addressed by the title of "Your Lordship." In the Year Books (he adds) they are constantly addressed by the title of "Sir." "Sir, vous voyez bien," &c.

CHANDA, a town and district of British India, in the Nagpur division of the Central Provinces. In 1901 the town had a population of 17,803. It is situated at the junction of the Virai and Jharpat rivers. It was the capital of the Gond kingdom of Chanda, which was established on the ruins of a Hindu state in the 11th or 12th century, and survived until 1751 (see GONDWANA). The town is still surrounded by a stone wall 5½m. in circuit. It has several old temples and tombs, and the district at large is rich in remains of antiquity. There are manufactures of cotton, silk, brass-ware and leather slippers, and a considerable local trade.

The DISTRICT OF CHANDA has an area of 10,156 sq. m. Excepting in the extreme west, hills are thickly dotted over the country, sometimes in detached ranges, occasionally in isolated peaks rising sheer out from the plain. Towards the east they increase in height, and form a broad tableland, at places 2000 ft. above sea-level. The Wainganga river flows through the district from north to south, meeting the Wardha river at Seoni, where their streams unite to form the Pranhita. Chanda is thickly studded with fine tanks, or rather artificial lakes, formed by closing the outlets of small valleys, or by throwing a dam across tracts intersected by streams. The broad clear sheets of water thus created are often very picturesque in their surroundings of wood and rock. The chief architectural objects of interest

are the cave temples at Bhandak, Winjbasani, Dewala and Ghugus; a rock temple in the bed of the Wardha river below Ballalpur; the ancient temples at Markandi, Ambgaon and elsewhere; the forts of Wairagarh and Ballalpur; and the old walls of the city of Chanda, its system of waterworks, and the tombs of the Gond kings. In 1901 the population was 601,533, showing a decrease of 15% in the decade. The principal crops are rice, millet, pulse, wheat, oil-seeds and cotton. The district contains the coalfield of Warora, which was worked by government till 1906, when it was closed. Other fields are known, and iron ores also occur. The district suffered severely from famine in 1900, when in April the number of persons relieved rose to 90,000.

CHANDAUSI, a town of British India, in the Moradabad district of the United Provinces, 28 m. south of Moradabad. Pop. (1901) 25,711. It is an important station on the Oudh & Rohilkhand railway, with a junction for Aligarh. Its chief exports are of cotton, hemp, sugar and stone. There is a factory for pressing cotton.

CHAND BARDAI (fl. c. 1200), Hindu poet, was a native of Lahore, but lived at the court of Prithwi Raja (Prithiraj), the last Hindu sovereign of Delhi. His *Prithiraj Rasau*, a poem of some 100,000 stanzas, chronicling

his master's deeds and the contemporary history of his part of India, is valuable not only as historical material but as the earliest monument of the Western Hindi language, and the first of the long series of bardic chronicles for which Rajputana is celebrated. It is written in ballad form, and portions of it are still sung by itinerant bards throughout north-western India and Rajputana.

See Lieut.-Col. James Tod, *Annals and Antiquities of Rajast'han* (2 vols., London, 1829-1832; repub. by Lalit Mohan Auddy, 2 vols. ib., 1894-1895), where good translations are given.

CHANDELIER, a frame of metal, wood, crystal, glass or china, pendent from roof or ceiling for the purpose of holding lights. The word is French, but the appliance has lost its original significance of a candle-holder, the chandelier being now chiefly used for gas and electric lighting. Clusters of hanging lights were in use as early as the 14th century, and appear originally to have been almost invariably of wood. They were, however, so speedily ruined by grease that metal was gradually subsituted, and fine and comparatively early examples in beaten iron, brass, copper and even silver are still extant. Throughout the 17th century the hanging candle-holder of brass or bronze was common throughout northern Europe, as innumerable pictures and engravings testify. In the great periods of the art of decoration in France many magnificent chandeliers were made by Boulle, and at a later date by Gouthière and Thomire and others among the extraordinarily clever *fondeurs-ciseleurs* of the second half of the 18th century. The chandelier in rock crystal and its imitations had come in at least a hundred years before

their day, and continued in favour to the middle of the 19th century, or even somewhat later. It reached at last the most extreme elaboration of banality, with ropes of pendants and hanging faceted drops often called lustres. When many lights were burning in one of these chandeliers an effect of splendour was produced that was not out of place in a ballroom, but the ordinary household varieties were extremely ugly and inartistic. The more purely domestic chandelier usually carries from two to six lights. The rapidly growing use of electricity as an illuminating medium and the preference for smaller clusters of lights have, however, pushed into the background an appliance which had grown extremely commonplace in design, and had become out of character with modern ideas of household decoration.

CHANDERNAGORE, or CHANDARNAGAR, a French settlement in India, with a small adjoining territory, situated on the right bank of the river Hugli, 20 m. above Calcutta, in 22° 51′ 40″ N, and 88° 24′ 50″ E. Area 3 sq. m.; pop. (1901) 25,000. Chandernagore has played an important part in the European history of Bengal. It became a permanent French settlement, in 1688, but did not rise to any importance till the time of Dupleix, during whose administration more than two thousand brick houses were erected in the town and a considerable maritime trade was carried on. In 1757 Chandernagore was bombarded by an English fleet under Admiral Watson and captured; the fortifications and houses were afterwards demolished. On peace being established the town was restored to the French in 1763. When hostilities afterwards broke out in 1794, it was again taken possession of by the English, and was held by them till 1816, when it was a second time

given up to the French; it has ever since remained in their possession. All the former commercial grandeur of Chandernagore has now passed away, and at present it is little more than a quiet suburb of Calcutta, without any external trade. The European town is situated at the bottom of a beautiful reach of the Hugli, with clean wide thoroughfares, and many elegant residences along the river-bank. The authorities of Chandernagore are subject to the jurisdiction of the governor-general of Pondicherry, to whom is confided the general government of all the French possessions in India.

CHANDLER, HENRY WILLIAM (1828-1889), English scholar, was born in London on the 31st of January 1828. In 1848 he entered Pembroke College, Oxford, where he was elected fellow in 1853. In 1867 he succeeded H.L. Mansel as Waynflete professor of moral and metaphysical philosophy, and in 1884 was appointed curator of the Bodleian library. He died by his own hand in Oxford on the 16th of May 1889. He was chiefly known as an Aristotelian scholar, and his knowledge of the Greek commentators on Aristotle was profound. He collected a vast amount of material for an edition of the fragments of his favourite author, but on the appearance of Valentine Rose's work in 1886 he abandoned the idea. Two works on the bibliography of Aristotle, *A Catalogue of Editions of Aristotle's Nicomachean Ethics and of Works illustrative of them printed in the 15th century* (1868), and *A Chronological Index to Editions of Aristotle's Nicomachean Ethics, and of Works illustrative of them from the Origin of Printing to 1799* (1878), are of great value. Chandler's collection of works on Aristotelian literature is now in the library of Pembroke

College. His *Practical Introduction to Greek Accentuation* (1862, ed. min. 1877) is the standard work in English.

CHANDLER, RICHARD (1738-1810), British antiquary, was born in 1738 at Elson in Hampshire, and educated at Winchester and at Queen's and Magdalen Colleges, Oxford. His first work consisted of fragments from the minor Greek poets, with notes (*Elegiaca Graeca*, 1759); and in 1763 he published a fine edition of the Arundelian marbles, *Marmora Oxoniensia*, with a Latin translation, and a number of suggestions for supplying the lacunae. He was sent by the Dilettanti Society with Nicholas Revett, an architect, and Pars, a painter, to explore the antiquities of Ionia and Greece (1763-1766); and the result of their work was the two magnificent folios of Ionian antiquities published in 1769. He subsequently held several church preferments, including the rectory of Tylehurst, in Berkshire, where he died on the 9th of February 1810. Other works by Chandler were *Inscriptiones Antiquae pleraeque nondum editae* (Oxford, 1774); *Travels in Asia Minor* (1775); *Travels in Greece* (1776); *History of Ilium* (1803), in which he asserted the accuracy of Homer's geography. His *Life of Bishop Waynflete*, lord high chancellor to Henry VI., appeared in 1811.

A complete edition (with notes by Revett) of the *Travels in Asia Minor and Greece* was published by R. Churton (Oxford, 1825), with an "Account of the Author."

CHANDLER, SAMUEL (1693-1766), English Nonconformist divine, was born in 1693 at Hungerford, in Berkshire, where his father was a minister. He was sent to school at Gloucester, where he began a lifelong friendship with Bishop Butler and Archbishop Secker; and he afterwards studied at Leiden. His talents and learning were such that he was elected fellow of the Royal and Antiquarian Societies, and was made D.D. of Edinburgh and Glasgow. He also received offers of high preferment in the Church of England. These he refused, remaining to the end of his life in the position of a Presbyterian minister. He was moderately Calvinistic in his views and leaned towards Arianism. He took a leading part in the deist controversies of the time, and discussed with some of the bishops the possibility of an act of comprehension. From 1716 to 1726 he preached at Peckham, and for forty years he was pastor of a meeting-house in Old Jewry. During two or three years, having fallen into pecuniary distress through the failure of the South Sea scheme, he kept a book-shop in the Poultry. On the death of George II. in 1760 Chandler published a sermon in which he compared that king to King David. This view was attacked in a pamphlet entitled *The History of the Man after God's own Heart*, in which the author complained of the parallel as an insult to the late king, and, following Pierre Bayle, exhibited King David as an example of perfidy, lust and cruelty. Chandler condescended to reply first in a review of the tract (1762) and then in *A Critical History of the Life of David*, which is perhaps the best of his productions. This work was just completed when he died, on the 8th of May 1766. He left 4 vols. of sermons (1768), and a paraphrase of the Epistles to the Galatians and Ephesians (1777), several works on the evidences of Christianity, and various pamphlets against Roman Catholicism.

CHANDLER, ZACHARIAH (1813-1879), American politician, was born at Bedford, New Hampshire, on the 10th of December 1813. In 1833 he removed to Detroit, Michigan, where he became a prosperous dry-goods merchant. He took a prominent part as a Whig in politics (serving as mayor in 1851), and, impelled by his strong anti-slavery views, actively furthered the work of the "Underground Railroad," of which Detroit was one of the principal "transfer" points. He was one of the organizers in Michigan of the Republican party, and in 1857 succeeded Lewis Cass in the United States Senate, serving until 1875, and at once taking his stand with the most radical opponents of slavery extension. When the Civil War became inevitable he endeavoured to impress upon the North the necessity of taking extraordinary measures for the preservation of the Union. After the fall of Fort Sumter he advocated the enlistment of 500,000 instead of 75,000 men for a long instead of a short term, and the vigorous enforcement of confiscation measures. In July 1862 he made a bitter attack in the Senate on General George B. McClellan, charging him with incompetency and lack of "nerve." Throughout the war he allied himself with the most radical of the Republican faction in opposition to President Lincoln's policy, and subsequently became one of the bitterest opponents of President Johnson's plan of reconstruction. From October 1875 to March 1877 he was secretary of the interior in the cabinet of President Grant, succeeding Columbus Delano (1809-1896). In 1876, as chairman of the national republican committee, he managed the campaign of Hayes against Tilden. In February 1879 he was re-elected to the Senate to succeed Isaac P. Christiancy (1812-1890), and soon afterwards, in a speech concerning Mexican War pensions, bitterly denounced Jefferson Davis. He died at Chicago, Illinois, on the 1st of November 1879. By his extraordinary force of character he exercised a wide personal influence during his lifetime, but failed to stamp his personality upon any measure or policy of lasting importance.

CHANDOS, BARONS AND DUKES OF. The English title of Chandos began as a barony in 1554, and was continued in the family of Brydges (becoming a dukedom in 1719) till 1789. In 1822 the dukedom was revived in connexion with that of Buckingham.

JOHN BRYDGES, 1st Baron Chandos (c. 1490-1557), a son of Sir Giles Brydges, or Bruges (d. 1511), was a prominent figure at the English court during the reigns of Henry VIII., Edward VI. and Mary. He took part in suppressing the rebellion of Sir Thomas Wyat in 1554, and as lieutenant of the Tower of London during the earlier part of Mary's reign, had the custody, not only of Lady Jane Grey and of Wyat, but for a short time of the princess Elizabeth. He was created Baron Chandos of Sudeley in 1554, one of his ancestors, Alice, being a grand-daughter of Sir Thomas Chandos (d. 1375), and he died in March 1557. The three succeeding barons, direct descendants of the 1st baron, were all members of parliament and persons of some importance. Grey, 5th Baron Chandos (c. 1580-1621), lord-lieutenant of Gloucestershire, was called the "king of the Cotswolds," owing to his generosity and his magnificent style of living at his residence, Sudeley Castle. He has been regarded by Horace Walpole and others as the author of some essays, *Horae Subsecivae*. His elder son George, 6th Baron Chandos (1620-1655), was a supporter of Charles I. during his struggle with Parliament, and distinguished himself at the first battle of Newbury in 1643. He had six daughters but no sons, and after the death of his brother William in 1676 the barony came to a kinsman, Sir James Brydges, Bart. (1642-1714), who was English ambassador to Constantinople from 1680 to 1685.

JAMES BRYDGES, 1st duke of Chandos (1673-1744), son and heir of the last-named, had been member of parliament for Hereford from 1698 to 1714, and, three days after his father's death, was created Viscount Wilton and earl of Carnarvon. For eight years, from 1705 to 1713, during the War of the Spanish Succession, he was paymaster-general of the forces abroad,

and in this capacity he amassed great wealth. In 1719 he was created marquess of Carnarvon and duke of Chandos. The duke is chiefly remembered on account of his connexion with Handel and with Pope. He built a magnificent house at Canons near Edgware in Middlesex, and is said to have contemplated the construction of a private road between this place and his unfinished house in Cavendish Square, London. For over two years Handel, employed by Chandos, lived at Canons, where he composed his oratorio *Esther*. Pope, who in his *Moral Essays* (*Epistle to the Earl of Burlington*) doubtless described Canons under the guise of "Timon's Villa," referred to the duke in the line, "Thus gracious Chandos is belov'd at sight"; but Swift, less complimentary, called him "a great complier with every court." The poet was caricatured by Hogarth for his supposed servility to the duke. Chandos, who was lord-lieutenant of the counties of Hereford and Radnor, and chancellor of the university of St Andrews, became involved in financial difficulties, and after his death on the 9th of August 1744 Canons was pulled down. He was succeeded by his son Henry, 2nd duke (1708-1771), and grandson James, 3rd duke (1731-1789). On the death of the latter without sons in September 1789 all his titles, except that of Baron Kinloss, became extinct, although a claimant arose for the barony of Chandos of Sudeley. The 3rd duke's only daughter, Anna Elizabeth, who became Baroness Kinloss on her father's death, was married in 1796 to Richard Grenville, afterwards marquess of Buckingham; and in 1822 this nobleman was created duke of Buckingham and Chandos (see BUCKINGHAM, DUKES OF).

See G.E. C(okayne), *Complete Peerage* (1887-1898); and J.R. Robinson, *The Princely Chandos*, *i.e.* the 1st duke (1893).

CHANDOS, SIR JOHN (?-1370), one of the most celebrated English commanders of the 14th century. He is found at the siege of Cambrai in 1337, and at the battle of Crécy in 1346. At the battle of Poitiers, in 1356, it was he who decided the day and saved the life of the Black Prince. For these services Edward III. made him a knight of the Garter, gave him the lands of the viscount of Saint Sauveur in Cotentin, and appointed him his lieutenant in France and vice-chamberlain of the royal household. In 1362 he was made constable of Aquitaine, and won the victories of Auray (1364) and Navaret in Spain (1367) over Duguesclin. He was seneschal of Poitou in 1369, and was mortally wounded at the bridge of Lussac near Poitiers on the 31st of December. He died on the following day, the 1st of January 1370.

See Benjamin Fillon, "John Chandos, Connétable d'Aquitaine et Sénéchal de Poitou," in the *Revue des provinces de l'ouest* (1855).

CHANDRAGUPTA MAURYA (reigned 321-296 B.C.), known to the Greeks as Sandracottus, founder of the Maurya empire and first paramount ruler of India, was the son of a king of Magadha by a woman of humble origin, whose caste he took, and whose name, Mura, is said to have been the origin of that of Maurya assumed by his dynasty. As a youth he was driven into exile by his kinsman, the reigning king of Magadha. In the course of his wanderings he met Alexander the Great, and, according to Plutarch (*Alexander*, cap. 62), encouraged him to invade the Ganges kingdom by enlarging on the extreme unpopularity of the reigning monarch. During his exile he collected a large force of the warlike clans of the north-

west frontier, and on the death of Alexander attacked the Macedonian garrisons and conquered the Punjab. He next attacked Magadha, dethroned and slew the king, his enemy, with every member of his family, and established himself on the throne (321). The great army acquired from his predecessor he increased until it reached the total of 30,000 cavalry, 9000 elephants, and 600,000 infantry; and with this huge force he overran all northern India, establishing his empire from the Arabian Sea to the Bay of Bengal. In 305 Seleucus Nicator crossed the Indus, but was defeated by Chandragupta and forced to a humiliating peace (303), by which the empire of the latter was still farther extended in the north. About six years later Chandragupta died, leaving his empire to his son Bindusura.

An excellent account of the court and administrative system of Chandragupta has been preserved in the fragments of Megasthenes, who came to Pataliputra as the envoy of Seleucus shortly after 303. The government was, of course, autocratic and even tyrannous, but it was organized on an elaborate system, army and civil service being administered by a series of boards, while the cities were governed by municipal commissioners responsible for public order and the upkeep of public works. Chandragupta himself is described as living in barbaric splendour, appearing in public only to hear causes, offer sacrifice, or to go on military and hunting expeditions, and withal so fearful of assassination that he never slept two nights running in the same room.

See J.W. MacCrindle, *Ancient India as described by Megasthenes and Arrian* (Calcutta, 1877); V.A. Smith, *Early Hist. of India* (Oxford, 1908); also the articles INDIA: *History*, and INSCRIPTIONS: *Indian*.

CHANGARNIER, NICOLAS ANNE THÉODULE (1793-1877), French general, was born at Autun on the 26th of April 1793. Educated at St Cyr, he served for a short time in the bodyguard of Louis XVIII., and entered the line as a lieutenant in January 1815. He achieved distinction in the Spanish campaign of 1823, and became captain in 1825. In 1830 he entered the Royal Guard and was sent to Africa, where he took part in the Mascara expedition. Promoted commandant in 1835, he distinguished himself under Marshal Clausel in the campaign against Ahmed Pasha, bey of Constantine, and became lieutenant-colonel in 1837. The part he took in the expedition of Portes-de-Fer gained him a colonelcy, and his success against the Hajutas and Kabyles, the cross of the Legion of Honour. Three more years of brilliant service in Africa won for him the rank of *maréchal de camp* in 1840, and of lieutenant-general in 1843. In 1847 he held the Algiers divisional command. He visited France early in 1848, assisted the provisional government to establish order, and returned to Africa in May to succeed General Cavaignac in the government of Algeria. He was speedily recalled on his election to the general assembly for the department of the Seine, and received the command of the National Guard of Paris, to which was added soon afterwards that of the troops in Paris, altogether nearly 100,000 men. He held a high place and exercised great influence in the complicated politics of the next two years. In 1849 he received the grand cross of the Legion of Honour. An avowed enemy of republican institutions, he held a unique position in upholding the power of the president; but in January 1851 he opposed Louis Napoleon's policy, was in consequence deprived of his double command, and at the *coup d'état* in December was arrested and sent to Mazas, until his banishment from France by the decree of the 9th of January 1852. He returned to France after the general amnesty, and resided in his estate in the department of Saône-et-Loire. In 1870 he held no command, but was present with the headquarters, and afterwards with Bazaine in Metz. He was employed on an unsuccessful mission to

Prince Frederick Charles, commanding the German army which besieged Metz, and on the capitulation became a prisoner of war. At the armistice he returned to Paris, and in 1871 was elected to the National Assembly by four departments, and sat for the Somme. He took an active part in politics, defended the conduct of Marshal Bazaine, and served on the committee which elaborated the monarchical constitution. When the comte de Chambord refused the compromise, he moved the resolution to extend the executive power for ten years to Marshal MacMahon. He was elected a life senator in 1875. He died in Paris on the 14th of February 1877.

CHANG-CHOW, a town of China, in the province of Fu-kien, on a branch of the Lung Kiang, 35 m. W. of Amoy. It is surrounded by a wall 4½ m. in circumference, which, however, includes a good deal of open ground. The streets are paved with granite, but are very dirty. The river is crossed by a curious bridge, 800 ft. long, constructed of wooden planks supported on twenty-five piles of stones about 30 ft. apart. The city is a centre of the silk-trade, and carries on an extensive commerce in different directions. Brick-works and sugar-factories are among its chief industrial establishments. Its population is estimated at about 1,000,000.

CHANG CHUN, KIU (1148-1227), Chinese Taoist sage and traveller, was born in 1148. In 1219 he was invited by Jenghiz Khan, founder of the Mongol empire and greatest of Asiatic conquerors, to visit him. Jenghiz' letter of invitation, dated the 15th of May 1219 (by present reckoning), has been preserved, and is among the curiosities of history; here the terrible warrior appears as a meek disciple of wisdom, modest and simple, almost Socratic in his self-examination, alive to many of the deepest truths of life and government. Chang Chun obeyed this summons; and leaving his home in Shantung (February 1220) journeyed first to Peking. Learning that Jenghiz had gone far west upon fresh conquests, the sage stayed the winter in Peking. In February 1221 he started again and crossed eastern Mongolia to the camp of Jenghiz' brother Ujughen, near Lake Bör or Buyur in the upper basin of the Kerulun-Amur. Thence he travelled south-westward up the Kerulun, crossed the Karakorum region in north-central Mongolia, and so came to the Chinese Altai, probably passing near the present Uliassutai. After traversing the Altai he visited Bishbalig, answering to the modern Urumtsi, and moved along the north side of the Tian Shan range to lake Sairam, Almalig (or Kulja), and the rich valley of the Ili. We then trace him to the Chu, over this river to Talas and the Tashkent region, and over the Jaxartes (or Syr Daria) to Samarkand, where he halted for some months. Finally, through the "Iron Gates" of Termit, over the Oxus, and by way of Balkh and northern Afghanistan, Chang Chun reached Jenghiz' camp near the Hindu Kush. Returning home he followed much the same course as on his outward route: certain deviations, however, occur, such as a visit to Kuku-khoto. He was back in Peking by the end of January 1224. From the narrative of his expedition (the *Si yu ki*, written by his pupil and companion Li Chi Chang) we derive some of the most faithful and vivid pictures ever drawn of nature and man between the Great Wall of China and Kabul, between the Aral and the Yellow Sea: we may particularly notice the sketches of the Mongols, and of the people of Samarkand and its

neighbourhood; the account of the fertility and products of the latter region, as of the Ili valley, at or near Almalig-Kulja; and the description of various great mountain ranges, peaks and defiles, such as the Chinese Altai, the Tian Shan, Mt Bogdo-ola (?), and the Iron Gates of Termit. There is, moreover, a noteworthy reference to a land apparently identical with the uppermost valley of the Yenisei. After his return Chang Chun lived at Peking till his death on the 23rd of July 1227. By order of Jenghiz some of the former imperial garden grounds were made over to him, for the foundation of a Taoist monastery.

See E. Bretschneider, *Mediaeval Researches from Eastern Asiatic Sources*, vol. i. pp. 35-108, where a complete translation of the narrative is given, with a valuable commentary; C.R. Beazley *Dawn of Modern Geography*, iii. 539.

(C. R. B.)

CHANGE (derived through the Fr. from the Late Lat. *cambium, cambiare*, to barter; the ultimate derivation is probably from the root which appears in the Gr. κάμπτειν, to bend), properly the substitution of one thing for another, hence any alteration or variation, so applied to the moon's passing from one phase to another. The use of the word for a place of commercial business has usually been taken to be a shortened form of Exchange (*q.v.*) and so is often written 'Change. The *New English Dictionary* points out that "change" appears earlier than "exchange" in this sense. "Change" is particularly used of coins of lower denomination given in substitution for those of larger denomination or for a note, cheque, &c.,

and also for the balance of a sum paid larger than that which is due. A further application is that in bell-ringing, of the variations in order in which a peal of bells may be rung. The term usually excludes the ringing of the bells according to the diatonic scale in which they are hung (see BELL). It is from a combination of these two meanings that the thieves' slang phrase "ringing the changes" arises; it denotes the various methods by which wrong change may be given or extracted, or counterfeit coin passed.

CHANGELING, the term used of a child substituted or changed for another, especially in the case of substitutions popularly supposed to be through fairy agency. There was formerly a widespread superstition that infants were sometimes stolen from their cradles by the fairies. Any specially peevish or weakly baby was regarded as a changeling, the word coming at last to be almost synonymous with imbecility. It was thought that the elves could only effect the exchange before christening, and in the highlands of Scotland babies were strictly watched till then. Strype states that in his time midwives had to take an oath binding themselves to be no party to the theft or exchange of babies. The belief is referred to by Shakespeare, Spenser and other authors. Pennant, writing in 1796, says: "In this very century a poor cottager, who lived near the spot, had a child who grew uncommonly peevish; the parents attributed this to the fairies and imagined it was a changeling. They took the child, put it in a cradle, and left it all night beneath the "Fairy Oak" in hopes that the *tylwydd têg* or fairy family would restore their own before morning. When morning came they

found the child perfectly quiet, so went away with it, quite confirmed in their belief" (*Tour in Scotland*, 1796, p. 257).

See W. Wirt Sikes, *British Goblins* (1880).

CHANGOS, a tribe of South American Indians who appear to have originally inhabited the Peruvian coast. A few of them still live on the coast of Atacama, northern Chile. They are a dwarfish race, never exceeding 5 ft. in height. Their sole occupation is fishing, and in former times they used boats of inflated sealskins, lived in sealskin huts, and slept on heaps of dried seaweed. They are a hospitable and friendly people, and never resisted the whites.

CHANGRA, or KANGHARI (anc. *Gangra*; called also till the time of Caracalla, *Germanicopolis*, after the emperor Claudius), the chief town of a sanjak of the same name in the Kastamuni vilayet, Asia Minor, situated in a rich, well-watered valley; altitude 2500 ft. The ground is impregnated with salt, and the town is unhealthy. Pop. (1894) 15,632, of whom 1086 are Christians (Cuinet). Gangra, the capital of the Paphlagonian kingdom of Deiotarus Philadelphus, son of Castor, was taken into the Roman province of Galatia on his death in 6-5 B.C. The earlier town, the name of which

signified “she-goat,” was built on the hill behind the modern city, on which are the ruins of a late fortress; while the Roman city occupied the site of the modern. In Christian times Gangra was the metropolitan see of Paphlagonia. In the 4th century the town was the scene of an important ecclesiastical synod.

Synod of Gangra.—Conjectures as to the date of this synod vary from 341 to 376. All that can be affirmed with certainty is that it was held about the middle of the 4th century. The synodal letter states that twenty-one bishops assembled to take action concerning Eustathius (of Sebaste?) and his followers, who contemned marriage, disparaged the offices of the church, held conventicles of their own, wore a peculiar dress, denounced riches, and affected especial sanctity. The synod condemned the Eustathian practices, declaring however, with remarkable moderation, that it was not virginity that was condemned, but the dishonouring of marriage; not poverty, but the disparagement of honest and benevolent wealth; not asceticism, but spiritual pride; not individual piety, but dishonouring the house of God. The twenty canons of Gangra were declared ecumenical by the council of Chalcedon, 451.

See Mansi ii. pp. 1095-1122; Hardouin i. pp. 530-540; Hefele 2nd ed., i. pp. 777 sqq. (English trans. ii. pp. 325 sqq.).

CHANNEL ISLANDS (French *Îles Normandes*), a group of islands in the English Channel, belonging (except the Îles Chausey) to Great Britain. (For map, see ENGLAND, Section VI.) They lie between 48° 50′ and 49° 45′

N., and 1° 50′ and 2° 45′ W., along the French coast of Cotentin (department of Manche), at a distance of 4 to 40 m. from it, within the great rectangular bay of which the northward horn is Cape La Hague. The greater part of this bay is shallow, and the currents among the numerous groups of islands and rocks are often dangerous to navigation. The nearest point of the English coast to the Channel Islands is Portland Bill, a little over 50 m. north of the northernmost outlier of the islands. The total land area of the islands is about 75 sq. m. (48,083 acres), and the population in 1901 was 95,618. The principal individual islands are four:—JERSEY (area 45 sq. m., pop. 52,576), GUERNSEY (area 24.5 sq. m., pop. 40,446), ALDERNEY (area 3.06 sq. m., pop. 2062), and SARK (area nearly 2 sq. m., pop. 504). Each of these islands is treated in a separate article. The chief town and port of Jersey is St Helier, and of Guernsey St Peter Port; a small town on Alderney is called St Anne. Regular communication by steamer with Guernsey and Jersey is provided on alternate days from Southampton and Weymouth, by steamers of the London & South-Western and Great Western railway companies of England. Railway communications within the islands are confined to Jersey. Regular steamship communications are kept up from certain French ports, and locally between the larger islands. In summer the islands, especially Jersey, Guernsey and Sark, are visited by numerous tourists, both from England and from France.

The islands fall physically into four divisions. The northernmost, lying due west of Cape La Hague, and separated therefrom by the narrow Race of Alderney, includes that island, Burhou and Ortach, and numerous other islets west of it, and west again the notorious Casquets, an angry group of jagged rocks, on the largest of which is a powerful lighthouse. Doubtful tradition places here the wreck of the “White Ship,” in which William, son of Henry I., perished in 1120; in 1744 the “Victory,” a British man-of-war, struck on one of the rocks, and among calamities of modern times the wreck of the “Stella,” a passenger vessel, in 1899, may be recalled. The

second division of islands is also the most westerly; it includes Guernsey with a few islets to the west, and to the east, Sark, Herm, Jethou (inhabited islands) and others. The strait between Guernsey and Herm is called Little Russel, and that between Herm and Sark Great Russel. Sark is famous for its splendid cliffs and caves, while Herm possesses the remarkable phenomenon of a shell-beach, or shore, half-a-mile in length, formed wholly of small shells, which accumulate in a tidal eddy formed at the north of the island. To the south-east of these, across the channel called La Déroute, lies Jersey, forming, with a few attendant islets, of which the Ecréhou to the north-east are the chief, the third division. The fourth and southernmost division falls into two main subdivisions. The Minquiers, the more western, are a collection of abrupt rocks, the largest of which, Maîtresse Ile, affords a landing and shelter for fishermen. Then eastern subdivision, the Îles Chausey, lies about 9 m. west by north of Granville (to which commune they belong) on the French coast, and belongs to France. These rocks are close set, low and curiously regular in form. On Grande Ile, the only permanently inhabited island (pop. 100), some farming is carried on, and several of the islets are temporarily inhabited by fishermen. There is also a little granite-quarrying, and seaweed-burning employs many.

None of the islands is mountainous, and the fine scenery for which they are famous is almost wholly coastal. In this respect each main island has certain distinctive characteristics. Bold cliffs are found on the south of Alderney; in Guernsey they alternate with lovely bays; Sark is specially noted for its magnificent sea-caves, while the coast scenery of Jersey is on the whole more gentle than the rest.

Geology.—Geologically, the Channel Islands are closely related to the neighbouring mainland of Normandy. With a few exceptions, to be noted later, all the rocks are of pre-Cambrian, perhaps in part of Archean age. They consist of massive granites, gneisses, diorites, porphyrites, schists and

phyllites, all of which are traversed by dykes and veins. In Jersey we find in the north-west corner a granitic tract extending from Grosnez to St Mary and St John, beyond which it passes into a small granulitic patch. South of the granites is a schistose area, by St Ouen and St Lawrence, and reaching to St Aubin's Bay. Granitic masses again appear round St Brelade's Bay. The eastern half of the island is largely occupied by porphyrites and similar rocks (hornstone porphyry) with rhyolites and denitrified obsidians; some of the latter contain large spherulites with a diameter of as much as 24 in.; these are well exposed in Bouley Bay; a complex igneous and intrusive series of rocks lies around St Helier. In the north-east corner of the island a conglomerate, possibly of Cambrian age, occurs between Bouley Bay and St Catherine's Bay. Tracts of blown-sand cover the ground for some distance north of St Clement's Bay and again east of St Ouen's Bay. In the sea off the latter bay a submerged forest occurs. The northern half of Guernsey is mainly dioritic, the southern half, below St Peter, is occupied by gneisses. Several patches of granite and granulite fringe the western coast, the largest of these is a hornblende granite round Rocquaine Bay. Hornblende gneiss from St Sampson and quartz diorite from Capelles, Corvée and elsewhere are transported to England for road metal. Sark is composed almost wholly of hornblende-schists and gneisses with hornblendic granite at the north end of the island, in Little Sark and in the middle of Bréchou. Dykes of diabase and diorite are abundant. Alderney consists mainly of hornblende granite and granulite, which are covered on the east by two areas of sandstone which may be of Cambrian age. An enstatite-augite-diorite is sent from Alderney for road-making. Besides the submerged forest on the coast of Jersey already mentioned, there are similar occurrences near St Peter Port and St Sampson's harbour, and in Vazon Bay in Guernsey. Raised beaches are to be seen at several points in the islands.

Climate.—The climate is mild and very pleasant. In Jersey the mean temperature for twenty years is found to be—in January (the coldest month)

42.1° F., in August (the hottest) 63°, mean annual 51.7°. In Guernsey the figures are, for January 42.5°, for August 59.7°, mean annual 49.5°. The mean annual rainfall for twenty-five years in Jersey is 34.21 in., and in Guernsey 38.64 in. The average amount of sunshine in Jersey is considerably greater than in the most favoured spots on the south coast of England; and in Guernsey it is only a little less than in Jersey. Snow and frost are rare, and the seasons of spring and autumn are protracted. Thick sea-fogs are not uncommon, especially in May and June.

Flora and Fauna.—The flora of the islands is remarkably rich, considering their extent, nearly 2000 different species of plants having been counted throughout the group. Of timber properly speaking there is little, but the evergreen oak, the elm and the beech are abundant. Wheat is the principal grain in cultivation; but far more ground is taken up with turnips and potatoes, mangold, parsnip and carrot. The tomato ripens as in France, and the Chinese yam has been successfully grown. There is a curious cabbage, chiefly cultivated in Jersey, which shoots up into a long woody stalk from 10 to 15 ft. in height, fit for walking-sticks or palisades. Grapes and peaches come to perfection in greenhouses without artificial heat; and not only apples and pears but oranges and figs can be reared in the open air. The arbutus ripens its fruit, and the camellia clothes itself with blossom, as in more southern climates; the fuchsia reaches a height of 15 or 20 ft., and the magnolia attains the dimensions of a tree. Of the flowers, both indigenous and exotic, that abound throughout the islands, it is sufficient to mention the Guernsey lily with its rich red petals, which is supposed to have been brought from Japan.

The number of the species of the mammalia is little over twenty, and several of these have been introduced by man. There is a special breed of horned cattle, and each island has its own variety, which is carefully kept from all intermixture. The animals are small and delicate, and marked by a

peculiar yellow colour round the eyes and within the ears. The red deer was once indigenous, and the black rat is still common in Alderney, Sark and Herm. The list of birds includes nearly 200 species, nearly 100 of which are permanent inhabitants of the islands. There are few localities in the northern seas which are visited by a greater variety of fish, and the coasts abound in crustacea, shell-fish and zoophytes.

Government.—For the purposes of government the Channel Islands (excluding the French Chauseys) are divided into two divisions:—(1) Jersey, and (2) the bailiwick of Guernsey, which includes Alderney, Sark, Herm and Jethou with the island of Guernsey. The constitutions of each division are peculiar and broadly similar, but differing in certain important details; they may therefore be considered together for the sake of comparison. Until 1854 governors were appointed by the crown; now a separate military lieutenant-governor is appointed for each division on the recommendation of the war office after consultation with the home office. The other crown officials are the bailiff (*bailli*) or chief magistrate, the *procureur du roi*, representing the attorney-general, and the *avocat du roi*, or in Guernsey the *contrôle*, representing the solicitor-general. In Jersey the *vicomte* is also appointed by the crown, in the position of a high sheriff (and coroner); but his counterpart in Guernsey, the *prévôt*, is not so appointed. The bailiff in each island is president of the royal court, which is composed of twelve jurats, elected for life, in Jersey by the ratepayers of each parish, in Guernsey by the Elective States, a body which also elects the *prévôt*, who, with the jurats, serves upon it. The rest of the body is made up of the rectors of the parishes, the *douzaines*, or elected parish councils ("dozens," from the original number of their members) of the town parish of St Peter Port, the four cantons, and the county parishes, and certain other officials. The royal court administers justice (but in Jersey there is a trial by jury for criminal cases), and in Guernsey can pass temporary ordinances subject to no higher body. It also puts forward *projets de loi* for the approval of the

Deliberative States. Alderney and Sark have a separate legal existence with courts dependent on the royal court of Guernsey. In both Jersey and Guernsey the chief administrative body is the Deliberative States. The Jersey States is composed of the lieutenant-governor (who has a veto on the deliberation of any question, but no vote), the bailiff, jurats, parish rectors, parish constables and deputies, the *procureur* and *avocat*, with right to speak but no vote, and the *vicomte*, with right of attendance only. Besides the veto of the lieutenant-governor, the bailiff has the power to dissent from any measure, in which case it is referred to the privy council. In Guernsey the States consists of the bailiff, jurats, eight out of ten rectors, the *procureur* and deputies; while the lieutenant-governor is always invited and may speak if he attends. By both States local administration is carried on (largely through committees); and relations with the British parliament are maintained through the privy council. Acts of parliament are transmitted to the islands by an order in council to be registered in the rolls of the royal court, and are not considered to be binding until this is done; moreover, registration may be held over pending discussion by the States if any act is considered to menace the privileges of the islands. The right of the crown to legislate by order in council is held to be similarly limited. In cases of encroachment on property, a remarkable form of appeal of very ancient origin called *Clameur de Haro* survives (see HARO, CLAMEUR DE). The islands are in the diocese of Winchester, and there is a dean in both Jersey and Guernsey, who is also rector of a parish.

These peculiar constitutions are of local development, the history of which is obscure. The bailiff was originally assisted in his judicial work by itinerant justices; their place was later taken by the elected jurats; later still the practice of summoning the States to assist in the passing of Ordinances was established by the bailiff and jurats, and at last the States claimed the absolute right of being consulted. This was confirmed to them in 1771.

It is characteristic of these islands that there should be compulsory service in the militia. In Jersey and Alderney every man between the ages of sixteen and forty-five is liable, but in Jersey after ten years' service militiamen are transferred to the reserve. In Guernsey the age limit is from sixteen to thirty-three, and the obligation is extended to all who are British subjects, and draw income from a profession practised in the island. Garrisons of regular troops are maintained in all three islands. Taxation is light in the islands, and pauperism is practically unknown.

In 1904 the revenue of Jersey was £70,191, and its expenditure £69,658; the revenue of Guernsey was £79,334, and the expenditure £43,385. The public debt in the respective islands was £322,070 and £195,794. In Jersey the annual revenues from crown rights (principally seigneurial dues, houses and lands and tithes) amount to about £2700, and about £360 is remitted to the paymaster-general. In Guernsey these revenues, in which the principal item is fines on transference of property (*treizièmes* or fees), amount to about £4500, and about £1000 is remitted. In Alderney the revenues (chiefly from harbour dues) amount to about £1400.

In Jersey the English gold and silver coinage are current, but there is a local copper coinage and local one-pound notes are issued. Guernsey has also such notes, and its copper coinage consists of pence, halfpence, two-double and one-double (one-eighth of a penny) pieces. A Guernsey pound is taken as equal to 24 francs, and English and French currency pass equally throughout the islands.

Industry.—The old Norman system of land-tenure has survived, and the land is parcelled out among a great number of small proprietors; holdings ranging from 5 to 25 acres as a rule. The results of this arrangement seem to be favourable in the extreme. Every corner of the ground is carefully and intelligently cultivated, and a considerable proportion is allotted to market-gardening. The cottages are neat and comfortable, the hedges well-trimmed,

and the roads kept in excellent repair. There is a considerable export trade in agricultural produce and stock, including vegetables and fruit, in fish (the fisheries forming an important industry) and in stone. There is no manufacture of importance. The inhabitants share in common the right of collecting and burning seaweed (called *vraic*) for manure. The cutting of the weed (vraicking) became a ceremonial occasion, taking place at times fixed by the government, and connected with popular festivities.

Language.—The language spoken in ordinary life by the inhabitants of the islands is in great measure the same as the old Norman French. The use of the *patois* has decreased naturally in modern times. Modern French is the official language, used in the courts and states, and English is taught in the parochial schools, and is familiar practically to all. The several islands have each its own dialect, differing from that of the others in vocabulary and idiom; differences are also observable in different localities within the same island, as between the north and the south of Guernsey. None of the dialects has received much literary cultivation, though Jersey is proud of being the birthplace of one of the principal Norman poets, Wace, who flourished in the 12th century.

History.—The original ethnology and pre-Christian history of the Channel Islands are largely matters of conjecture and debate. Of early inhabitants abundant proof is afforded by the numerous megalithic monuments—cromlechs, kistvaens and maenhirs—still extant. But little trace has been left of Roman occupation, and such remains as have been discovered are mainly of the portable description that affords little proof of actual settlement, though there may have been an unimportant garrison here. The constant recurrence of the names of saints in the place-names of the islands, and the fact that pre-Christian names do not occur, leads to the inference that before Christianity was introduced the population was very scanty. It may be considered to have consisted originally of Bretons (Celts),

and to have received successively a slight admixture of Romans and Legionaries, Saxons and perhaps Jutes and Vandals. Christianity may have been introduced in the 5th century. Guernsey is said to have been visited in the 6th century by St Sampson of Dol (whose name is given to a small town and harbour in the island), St Marcou or Marculfus and St Magloire, a friend and fellow-evangelist of St Sampson, who founded monasteries at Sark and at Jersey, and died in Jersey in 575. Another evangelist of this period was St Helerius, whose name is borne by the chief town of Jersey, St Helier. In his life it is stated that the population of the island when he reached it was only 30. In 933 the islands were made over to William, duke of Normandy (d. 943), and after the Norman conquest of England their allegiance shifted between the English crown and the Norman coronet according to the vicissitudes of war and policy. During the purely Norman period they had been enriched with numerous ecclesiastical buildings, some of which are still extant, as the chapel of Rozel in Jersey.

In the reign of John of England the future of the islands was decided by their attachment to the English crown, in spite of the separation of the duchy of Normandy. To John it has been usual to ascribe a document, at one time regarded by the islanders as their Magna Carta; but modern criticism leaves little doubt that it is not genuine. An unauthenticated “copy” of uncertain origin alone has been discovered, and there is little proof of there ever having been an original. The reign of Edward I. was full of disturbance; and in 1279 Jersey and Guernsey received from the king, by letters patent, a public seal as a remedy for the dangers and losses which they had incurred by lack of such a certificate. Edward II. found it necessary to instruct his collectors not to treat the islanders as foreigners: his successor, Edward III., fully confirmed their privileges, immunities and customs in 1341; and his charter was recognized by Richard II. in 1378. In 1343 there was a descent of the French on Guernsey; the governor was defeated, and Castle Cornet besieged. In 1372 there was another attack on

Guernsey, and in 1374 and 1404 the French descended on Jersey. None of these attempts, however, resulted in permanent settlement. Henry V. confiscated the alien priories which had kept up the same connexion with Normandy as before the conquest, and conferred them along with the regalities of the islands on his brother, the duke of Bedford. During the Wars of the Roses, Queen Margaret, the consort of Henry VI., made an agreement with Pierre de Brézé, comte de Maulevrier, the seneschal of Normandy, that if he afforded assistance to the king he should hold the islands independently of the crown. A force was accordingly sent to take possession of Mont Orgueil. It was captured and a small part of the island subjugated, and here Maulevrier remained as governor from 1460 to 1465; but the rest held out under Sir Philip de Carteret, seigneur of St Ouen, and in 1467 the vice-admiral of England, Sir Richard Harliston, recaptured the castle and brought the foreign occupation to an end. In 1482-1483 Pope Sixtus IV., at the instance of King Edward IV., issued a bull of anathema against all who molested the islands; it was formally registered in Brittany in 1484, and in France in 1486; and in this way the islands acquired the right of neutrality, which they retained till 1689. In the same reign (Edward IV.) Sark was taken by the French, and only recovered in the reign of Mary, by the strategy (according to tradition) of landing from a vessel a coffin nominally containing a body for burial, but in reality filled with arms. By a charter of 1494, the duties of the governors of Jersey were defined and their power restricted; and the educational interests of the island were furthered at the same time by the foundation of two grammar schools. The religious establishments in the islands were dissolved, as in England, in the reign of Henry VIII. The Reformation was heartily welcomed in the islands. The English liturgy was translated into French for their use. In the reign of Mary there was much religious persecution; and in that of Elizabeth Roman Catholics were maltreated in their turn. In 1568 the islands were attached to the see of Winchester, being finally separated from that of Coutances, with

which they had long been connected, with short intervals in the reign of John, when they had belonged to the see of Exeter, and that of Henry VI., when they had belonged to Salisbury.

The Presbyterian form of church government was adopted under the influence of refugees from the persecution of Protestantism on the continent. It was formally sanctioned in St Helier and St Peter Port by Queen Elizabeth; and in 1603 King James enacted that the whole of the islands "should quietly enjoy their said liberty." During his reign, however, disputes arose. An Episcopal party had been formed in Jersey, and in 1619 David Bandinel was declared dean of the island. A body of canons which he drew up agreeable to the discipline of the Church of England was accepted after considerable modification by the people of his charge; but the inhabitants of Guernsey maintained their Presbyterian practices. Of the hold which this form of Protestantism had got on the minds of the people even in Jersey abundant proof is afforded by the general character of the worship at the present day.

In the great struggle between king and parliament, Presbyterian Guernsey supported the parliament; in Jersey, however, there were at first parliamentarian and royalist factions. Sir Philip de Carteret, lieutenant-governor, declared for the king, but Dean Bandinel and Michael Lemprière, a leader of the people, headed the parliamentary party. They received a commission for the apprehension of Carteret, who established himself in Elizabeth Castle; but after some fighting had taken place he died in the castle in August 1643. Meanwhile in Guernsey Sir Peter Osborne, the governor, was defying the whole island and maintaining himself in Castle Cornet. A parliamentarian governor, Leonard Lydcott, arrived in Jersey immediately after Sir Philip de Carteret's death. But the dowager Lady Carteret was holding Mont Orgueil; George Carteret, Sir Philip's nephew, arrived from St Malo to support the royalist cause, and Lydcott and

Lemprière presently fled to England. George Carteret established himself as lieutenant-governor and bailiff. Bandinel was imprisoned in Mont Orgueil, and killed himself in trying to escape. Jersey was now completely royalist. In 1646 the prince of Wales, afterwards Charles II., arrived secretly at Jersey, and remained over two months at Elizabeth Castle. He went on to France, but returned in 1649, having been proclaimed king by George Carteret, and at Elizabeth Castle he signed the declaration of his claims to the throne on the 29th of October. In 1651, when Charles had fled to France again after the battle of Worcester, parliamentarian vessels of war appeared at Jersey. The islanders, weary of the tyrannical methods of their governor, now Sir George Carteret, offered little resistance. On the 15th of December the royalist remnant yielded up Elizabeth Castle; and at the same time Castle Cornet, Guernsey, which had been steadily held by Osborne, capitulated. In each case honourable terms of surrender were granted. Both islands had suffered severely from the struggle, and the people of Guernsey, appealing to Cromwell on the ground of their support of his cause, complained that two-thirds of the land was out of cultivation, and that they had lost "their ships, their traffic and their trading." After the Restoration there was considerable improvement, and in the reign of James II. the islanders got a grant of wool for the manufacture of stockings—4000 tods[1] of wool being annually allowed to Jersey, 2000 to Guernsey, 400 to Alderney and 200 to Sark. Alderney, which had been parliamentarian, was granted after the Restoration to the Carteret family; and it continued to be governed independently till 1825.

By William of Orange the neutrality of the islands was abolished in 1689, and during the war between England and France (1778-1783) there were two unsuccessful attacks on Jersey, in 1779 and 1781, the second, under Baron de Rullecourt, being famous for the victory over the invaders due to the bravery of the young Major Peirson, who fell when the French were on the point of surrender. During the revolutionary period in France the islands

were the home of many refugees. In the 18th century various attempts were made to introduce the English custom-house system; but proved practically a failure, and the islands throve on smuggling and privateering down to 1800.

AUTHORITIES.—Heylin, *Relation of two Journeys* (1656); P. Falle, *Account of the Island of Jersey* (1694; notes, &c., by E. Durell, Jersey, 1837); J. Duncan, *History of Guernsey* (London, 1841); P. le Geyt, *Sur les constitutions, les lois et les usages de cette île* [Jersey], ed. R.P. Marett (Jersey, 1846-1847); F.B. Tupper, *Chronicles of Castle Cornet, Guernsey* (2nd ed. London, 1851), and *History of Guernsey and its Bailiwick* (Guernsey, 1854); S.E. Hoskins, *Charles II. in the Channel Islands* (London, 1854), and other works; Delacroix, *Jersey, ses antiquités, &c.* (Jersey, 1859); T. le Cerf, *L'archipel des Îles Normandes* (Paris, 1863); G. Dupont, *Le Cotentin et ses îles* (Caen, 1870-1885); J.P.E. Havet, *Les Cours royales des Îles Normandes* (Paris, 1878); E. Pégot-Ogier, *Histoire des Îles de la Manche* (Paris, 1881); C. Noury, *Géologie de Jersey* (Paris and Jersey, 1886); D.T. Ansted and R.G. Latham, *Channel Islands* (1865; 3rd ed., rev. by E.T. Nicolle, London, 1893), the principal general work of reference; Sir E. MacCulloch, *Guernsey Folklore*, ed. Edith F. Carey (London, 1903); E.F. Carey, *Channel Islands* (London, 1904).

1 A tod generally equalled 28 lb

CHANNING, WILLIAM ELLERY (1780-1842), American divine and philanthropist, was born in Newport, Rhode Island, on the 7th of April

1780. His maternal grandfather was William Ellery, a signer of the Declaration of Independence; his mother, Lucy Ellery, was a remarkable woman; and his father, William Channing, was a prominent lawyer in Newport. Channing had as a child a refined delicacy of feature and temperament, and seemed to have inherited from his father simple and elegant tastes, sweetness of temper, and warmth of affection, and from his mother that strong moral discernment and straightforward rectitude of purpose and action which formed so striking a feature of his character. From his earliest years he delighted in the beauty of the scenery of Newport, and always highly estimated its influence upon his spiritual character. His father was a strict Calvinist, and Dr Samuel Hopkins, one of the leaders of the old school Calvinists, was a frequent guest in his father's house. He was, even as a child, he himself says, "quite a theologian, and would chop logic with his elders according to the fashion of that controversial time." He prepared for college in New London under the care of his uncle, the Rev. Henry Channing, and in 1794, about a year after the death of his father, entered Harvard College. Before leaving New London he came under religious influences to which he traced the beginning of his spiritual life. In his college vacations he taught at Lancaster, Massachusetts, and in term time he stinted himself in food that he might need less exercise and so save time for study,—an experiment which undermined his health, producing acute dyspepsia. From his college course he thought that he got little good, and said "when I was in college, only three books that I read were of any moment to me: ... Ferguson on *Civil Society*, ... Hutcheson's *Moral Philosophy*, and Price's *Dissertations*. Price saved me from Locke's philosophy."

After graduating in 1798, he lived at Richmond, Virginia, as tutor in the family of David Meade Randolph, United States marshal for Virginia. Here he renewed his ascetic habits and spent much time in theological study, his mind being greatly disturbed in regard to Trinitarian teachings in general

and especially prayer to Jesus. He returned to Newport in 1800 “a thin and pallid invalid,” spent a year and a half there, and in 1802 went to Cambridge as regent (or general proctor) in Harvard; in the autumn of 1802 he began to preach, having been approved by the Cambridge Association. On the 1st of June 1803, having refused the more advantageous pastorate of Brattle Street church, he was ordained pastor of the Federal Street Congregational church in Boston. At this time it seems certain that his theological views were not fixed, and in 1808, when he preached a sermon at the ordination of the Rev. John Codman (1782-1847), he still applied the title “Divine Master” to Jesus Christ, and used such expressions as “shed for souls” of the blood of Jesus, and “the Son of God himself left the abodes of glory and expired a victim of the cross.” But his sermon preached in 1819 at Baltimore at the ordination of the Rev. Jared Sparks was in effect a powerful attack on Trinitarianism, and was followed in 1819 by an article in *The Christian Disciple*, “Objections to Unitarian Christianity Considered,” and in 1820 by another, “The Moral Argument against Calvinism”—an excellent evidence of the moral (rather than the intellectual) character of Unitarian protest. In 1814 he had married a rich cousin, Ruth Gibbs, but refused to make use of the income from her property on the ground that clergymen were so commonly accused of marrying for money.

He was now entering on his public career. Even in 1810, in a Fast Day sermon, he warned his congregation of Bonaparte’s ambition; two years later he deplored “this country taking part with the oppressor against that nation which has alone arrested his proud career of victory”; in 1814 he preached a thanksgiving sermon for the overthrow of Napoleon; and in 1816 he preached a sermon on war which led to the organization of the Massachusetts Peace Society. His sermon on “Religion, a Social Principle,” helped to procure the omission from the state constitution of the third article of Part I., which made compulsory a tax for the support of religious worship. In 1821 he delivered the Dudleian lecture on the “Evidences of

Revealed Religion" at Harvard, of whose corporation he had been a member since 1813; he had received its degree of S.T.D. in 1820. In August 1821 he undertook a journey to Europe, in the course of which he met in England many distinguished men of letters, especially Wordsworth and Coleridge. Both of these poets greatly influenced him personally and by their writings, and he prophesied that the Lake poets would be one of the greatest forces in a forming spiritual reform. Coleridge wrote of him, "He has the love of wisdom and the wisdom of love."

On his return to America in August 1823, Dr Channing resumed his duties as pastor, but with a more decided attention than before to literature and public affairs, especially after receiving as colleague, in 1824, the Rev. Ezra Stiles Gannett. In 1830, because of his wife's bad health, Channing went to the West Indies. Negro slavery, as he saw it there, and as he had seen it in Richmond, more than thirty years before, so strongly impressed him that he began to write his book *Slavery* (1835). In this he insists that "not what is profitable, but what is right" is "the first question to be proposed by a rational being"; that slavery ought to be discussed "with a deep feeling of responsibility, and so done as not to put in jeopardy the peace of the slave-holding states"; that "man cannot be justly held and used as property"; that the tendency of slavery is morally, intellectually, and domestically, bad; that emancipation, however, should not be forced on slave-holders by governmental interference, but by an enlightened public conscience in the South (and in the North), if for no other reason, because "slavery should be succeeded by a friendly relation between master and slave; and to produce this the latter must see in the former his benefactor and deliverer." He declined to identify himself with the Abolitionists, whose motto was "Immediate Emancipation" and whose passionate agitation he thought unsuited to the work they were attempting. The moderation and temperance of his presentation of the anti-slavery cause naturally resulted in some misunderstanding and misstatement of his position, such as is to be

found in Mrs Chapman's *Appendix* to the *Autobiography of Harriet Martineau*, where Channing is represented as actually using his influence on behalf of slavery. In 1837 he published *Thoughts on the Evils of a Spirit of Conquest, and on Slavery: A Letter on the Annexation of Texas to the United States*, addressed to Henry Clay, and arguing that the Texan revolt from Mexican rule was largely the work of land-speculators, and of those who resolved "to throw Texas open to slave-holders and slaves"; that the results of annexation must be war with Mexico, embroiling the United States with England and other European powers, and at home the extension and perpetuation of slavery, not alone in Texas but in other territories which the United States, once started at conquest, would force into the Union. But he still objected to political agitation by the Abolitionists, preferring "unremitting appeals to the reason and conscience," and, even after the prominent part he took in the meeting in Faneuil Hall, called to protest against the murder of Elijah P. Lovejoy, he wrote to *The Liberator*, counselling the Abolitionists to "disavow this resort to force by Mr Lovejoy." Channing's pamphlet *Emancipation* (1840) dealt with the success of emancipation in the West Indies, as related in Joseph John Gurney's *Familiar Letters to Henry Clay of Kentucky, describing a Winter in the West Indies* (1840), and added his own advice "that we should each of us bear our conscientious testimony against slavery," and that the Free States "abstain as rigidly from the use of political power against Slavery in the States where it is established, as from exercising it against Slavery in foreign communities," and should free themselves "from any obligation to use the powers of the national or state governments in any manner whatever for the support of slavery." In 1842 he published *The Duty of the Free States*, or *Remarks Suggested by the Case of the Creole*, a careful analysis of the letter of complaint from the American to the British government, and a defence of the position taken by the British government. On the 1st of August 1842 he delivered at Lenox, Massachusetts, an address celebrating

the anniversary of emancipation in the British West Indies. Two months later, on the 2nd of October 1842, he died at Bennington, Vermont.

Physically Channing was short and slight; his eyes were unnaturally large; his voice wonderfully clear, and like his face, filled with devotional spirit. He was not a great pastor, and lacked social tact, so that there were not many people who became his near friends; but by the few who knew him well, he was almost worshipped. As a preacher Channing was often criticised for his failure to deal with the practical everyday duties of life. But his sermons are remarkable for their rare simplicity and gracefulness of style as well as for the thought that they express. The first open defence of Unitarians was not based on doctrinal differences but on the peculiar nature of the attack on them made in June 1815 by the conservatives in the columns of *The Panoplist*, where it was stated that Unitarians were "operating only in secret, ... guilty of hypocritical concealment of their sentiments." His chief objection to the doctrine of the Trinity (as stated in his sermon at the ordination of the Rev. Jared Sparks) was that it was no longer used philosophically, as showing God's relation to the triple nature of man, but that it had lapsed into mere Tritheism. To the name "Unitarian" Channing objected strongly, thinking "unity" as abstract a word as "trinity" and as little expressing the close fatherly relation of God to man. It is to be noted that he strongly objected to the growth of "Unitarian orthodoxy" and its increasing narrowness. His views as to the divinity of Jesus were based on phrases in the Gospels which to his mind established Christ's admission of inferiority to God the Father,—for example, "Knoweth no man, neither the Son, but the Father"; at the same time he regarded Christ as "the sinless and spotless son of God, distinguished from all men by that infinite peculiarity—freedom from moral evil." He believed in the pre-existence of Jesus, and that it differed from the pre-existence of other souls in that Jesus was actually conscious of such pre-existence, and he reckoned him one with God the Father in the sense of spiritual union (and not metaphysical

mystery) in the same way that Jesus bade his disciples “Be ye one, even as I am one.” Bunsen called him “the prophet in the United States for the presence of God in mankind.” Channing believed in historic Christianity and in the story of the resurrection, “a fact which comes to me with a certainty I find in few ancient histories.” He also believed in the miracles of the Gospels, but held that the Scriptures were not inspired, but merely records of inspiration, and so saw the possibility of error in the construction put upon miracles by the ignorant disciples. But in only a few instances did he refuse full credence of the plain gospel narrative of miracles. He held, however, that the miracles were facts and not “evidences” of Christianity, and he considered that belief in them followed and did not lead up to belief in Christianity. His character was absolutely averse from controversy of any sort, and in controversies into which he was forced he was free from any theological odium and continually displayed the greatest breadth and catholicity of view. The differences in New England churches he considered were largely verbal, and he said that “would Trinitarians tell us what they mean, their system would generally be found little else than a mystical form of the Unitarian doctrine.”

His opposition to Calvinism was so great that even in 1812 he declared “existence a curse” if Calvinism be true. Possibly his boldest and most elaborate defence of Unitarianism was his sermon on *Unitarianism most favourable to Piety*, preached in 1826, criticizing as it did the doctrine of atonement by the sacrifice of an “infinite substitute”; and the Election Sermon of 1830 was his greatest plea for spiritual and intellectual freedom.

Channing’s reputation as an author was probably based largely on his publication in *The Christian Examiner* of *Remarks on the Character and Writings of John Milton* (1826), *Remarks on the Life and Character of Napoleon Bonaparte* (1827-1828), and an *Essay on the Character and Writings of Fénelon* (1829). An *Essay on Self-Culture* (1838) was an

address introducing the Franklin Lectures delivered in Boston September 1838. Channing was an intimate friend of Horace Mann, and his views on the education of children are stated, by no less an authority than Elizabeth Palmer Peabody, to have anticipated those of Froebel. His *Complete Works* have appeared in various editions (5 vols., Boston, 1841; 2 vols., London, 1865; 1 vol., New York, 1875).

Among members of his family may be mentioned his two nephews William Henry (1810-1884), son of his brother Francis Dana, and William Ellery, commonly known as Ellery (1818-1901), son of his brother Walter, a Boston physician (1786-1876). The former, whose daughter married Sir Edwin Arnold, the English poet, became a Unitarian pastor, for some time in America, and also in England, where he died; he was deeply interested in Christian Socialism, and was a constant writer, translating Jouffroy's *Ethics* (1840), and assisting in editing the *Memoirs of Margaret Fuller* (1852); and he wrote the biography of his uncle (see O.B. Frothingham's *Memoir*, 1886). Ellery Channing married Margaret Fuller's sister (1842), and besides critical essays and poems published an intimate sketch of Thoreau in 1873.

See the *Memoir* by William Henry Channing (3 vols., London, 1848; republished in one volume, New York, 1880); Elizabeth Palmer Peabody, *Reminiscences of the Rev. William Ellery Channing, D.D*. (Boston, 1880), intimate but inexact; John White Chadwick, *William Ellery Channing, Minister of Religion* (Boston, 1903); and William M. Salter, "Channing as a Social Reformer" (*Unitarian Review*, March 1888).

(R. We.)

CHANSONS DE GESTE, the name given to the epic chronicles which take so prominent a place in the literature of France from the 11th to the 15th century. Gaston Paris defined a chanson de geste as a song the subject of which is a series of historical facts or *gesta*. These facts form the centre around which are grouped sets of poems, called cycles, and hence the two terms have in modern criticism become synonymous for the epic family to which the hero of the particular group or cycle belongs. The earliest chansons de geste were founded on the fusion of the Teutonic spirit, under a Roman form, into the new Christian and French civilization. It seems probable that as early as the 9th century epic poems began to be chanted by the itinerant minstrels who are known as jongleurs. It is conjectured that in a base Latin fragment of the 10th century we possess a translation of a poem on the siege of Girona. Gaston Paris dates from this lost epic the open expression of what he calls "the epic fermentation" of France. But the earliest existing chanson de geste is also by far the noblest and most famous, the *Chanson de Roland*; the conjectural date of the composition of this poem has been placed between the years 1066 and 1095. That the author, as has been supposed, was one of the conquerors of England, it is perhaps rash to assert, but undoubtedly the poem was composed before the First Crusade, and the writer lived at or near the sanctuary of Mont Saint-Michel. The *Chanson de Roland* stands at the head of modern French literature, and its solidity and grandeur give a dignity to the whole class of poetry of which it is the earliest and by far the noblest example. But it is in the crowd of looser and later poems, less fully characterized, less steeped in the individuality of their authors, that we can best study the form of the typical chanson de geste. These epics sprang from the soil of France; they were national and historical; their anonymous writers composed them spontaneously, to a common model, with little regard to the artificial niceties of style. The earlier examples, which succeed the *Roland*, are unlike that great work in having no plan, no system of composition. They

are improvisations which wander on at their own pace, whither accident may carry them. This mass of medieval literature is monotonous, primitive and superficial. As Léon Gautier has said, in the rudimentary psychology of the chansons de geste, man is either entirely good or entirely bad. There are no fine shades, no observation of character. The language in which these poems are composed is extremely simple, without elaboration, without ornament. Everything is sacrificed to the telling of a story by a narrator of little skill, who helps himself along by means of a picturesque, but almost childish fancy, and a primitive sentiment of rhythm. Two great merits, however, all the best of these poems possess, force and lucidity; and they celebrate, what they did much to create, that unselfish elevation of temper which we call the spirit of chivalry.

Perhaps the most important cycle of chansons de geste was that which was collected around the name of Charlemagne, and was known as the *Geste du roi*. A group of this cycle dealt with the history of the mother of the emperor, and with Charlemagne himself down to the coming of Roland. To this group belong *Bertha Greatfoot* and *Aspremont*, both of the 12th century, and a variety of chansons dealing with the childhood of Charlemagne and of Ogier the Dane. A second group deals with the struggle of Charlemagne with his rebellious vassals. This is what has been defined as the Feudal Epic; it includes *Girars de Viane* and *Ogier the Dane*, both of the 13th century, or the end of the 12th. A third group follows Charlemagne and his peers to the East. It is in the principal of these poems, *The Pilgrimage to Jerusalem*, that Alexandrine verse first makes its appearance in French literature. This must belong to the beginning of the 12th century. A fourth group, antecedent to the Spanish war, is of the end of the 12th century and the beginning of the 13th; it includes *Aiquin*, *Fierabras* and *Otinel*. The fifth class discusses the war in Spain, and it is to this that *Roland* belongs; there are different minor epics dealing with the events of Roncevaux, and independent chansons of *Gui de Bourgogne*, *Gaidon* and

Anseïs de Carthage. The *Geste du Roi* comprises a sixth and last group, proceeding with events up to the death of Charlemagne; this contains *Huon de Bordeaux* and a vast number of poems of minor originality and importance.

Another cycle is that of Duke William Shortnose, *La Geste de Guillaume*. This includes the very early and interesting *Departure of the Aimeri Children*, *Aliscans* and *Rainoart*. It is thought that this cycle, which used to be called the *Geste de Garin de Monglane*, is less artificial than the others; it deals with the heroes of the South who remained faithful in their vassalage to the throne. The poems belonging to this cycle are extremely numerous, and some of them are among the earliest which survive. These chansons find their direct opposites in those which form the great cycle of *La Geste de Doon de Mayence*, sometimes called "la faulse geste," because it deals with the feats of the traitors, of the rebellious family of Ganelon. This is the geste of the Northmen, always hostile to the Carlovingian dynasty. It comprises some of the most famous of the chansons, in particular *Parise la duchesse* and *The Four Sons of Aymon*. Several of its sections are the production of a known poet, Raimbert of Paris. From this triple division of the main body of the chansons de geste into *La Geste du Roi*, *La Geste de Guillaume* and *La Geste de Doon*, are excluded certain poems of minor importance,—some provincial, such as *Amis and Amiles* and *Garin*, some dealing with the Crusades, such as *Antioche*, and some which are not connected with any existing cycle, such as *Ciperis de Vignevaux*; most of this last category, however, are works of the decadence.

The analysis which is here sketched is founded on the latest theories of Léon Gautier, who has given the labour of a lifetime to the investigation of this subject. The wealth of material is baffling to the ordinary student; of the medieval chansons de geste many hundreds of thousands of lines have been preserved. The habit of composing became in the 14th century, as has been

said, no longer an art but a monomania. Needless to add that a very large proportion of the surviving poems have never yet been published. All the best of the early chansons de geste are written in ten-syllable verse, divided into stanzas or *laisses* of different length, united by a single assonance. Rhyme came in with the 13th century, and had the effect in languid bards of weakening the narrative; the sing-song of it led at last to the abandonment of verse in favour of plain historical prose. The general character of the chansons de geste, especially of those of the 12th century, is hard, coarse, inflexible, like the march of rough men stiffened by coats of mail. There is no art and little grace, but a magnificent display of force. These poems enshrine the self-sufficiency of a young and powerful people; they are full of Gallic pride, they breathe the spirit of an indomitable warlike energy. All their figures belong to the same social order of things, and all illustrate the same fighting aristocracy. The moving principle is that of chivalry, and what is presented is, invariably, the spectacle of the processional life of a medieval soldier. The age described is a disturbed one; the feudal anarchy of Europe is united, for a moment, in defending western civilization against the inroads of Asia, against "the yellow peril." But it is a time of transition in Europe also, and Charlemagne, the immortal but enfeebled emperor, whose beard is whiter than lilies, represents an old order of things against which the rude barons of the North are perpetually in successful revolt. The loud cry of the dying Ronald, as E. Quinet said, rings through the whole poetical literature of medieval France; it is the voice of the individuality of the great vassal, who, in the decay of the empire, stands alone with himself and with his sword.

AUTHORITIES,—Léon Gautier, *Les Épopées françaises* (4 vols., 1878-1894); Gaston Paris, *La Littérature française au moyen âge* (1890); Paul Meyer, *Recherches sur l'épopée française* (1867); G. Paris, *Histoire poétique de Charlemagne* (1865); A. Longnon, *Les Quatre Fits Aimon*, &c. (1879).

(E. G.)

CHANT (derived through the Fr. from the Lat. *cantare*, to sing; an old form is "chaunt"), a song or melody, particularly one sung according to the rules of church service-books. For an account of the chant or *cantus firmus* of the Roman Church see PLAIN-SONG. In the English church "chants" are the tunes set to the unmetrical verses of the psalms and canticles. The chant consisted of an "intonation" followed by a reciting note of indefinite length; a "mediation" closed the first part of the verse, leading to a second reciting note; a "termination" closed the second part of the verse. In the English chant the "intonation" disappeared. Chants are "single," if written for one verse only, "double," if for two. "Quadruple" chants for four verses have also been written.

CHANTABUN, or CHANTABURI, the principal town of the Siamese province of the same name, on the E. side of the Gulf of Siam, in 102° 6′ E., 12° 38′ N. Pop. about 5000. The town lies about 12 m. from the sea on a river which is navigable for boats and inside the bar of which there is good anchorage for light-draft vessels. The trade is chiefly in rubies and sapphires from the mines of the Krat and Pailin districts, and in pepper, of which about 500 tons are exported annually. Cardamoms and rosewood are

also exported. In 1905 Chantabun was made the headquarters of a high commissioner with jurisdiction extending over the coast districts from the Nam Wen on the East to Cape Liant on the West, which were thus united to form a provincial division (*Monton*). In 1893 Chantabun was occupied by a French force of four hundred men, a step taken by France as a guarantee for the execution by Siam of undertakings entered into by the treaty of that year. The occupation, which was merely military and did not affect the civil government, lasted until January 1905, when, in accordance with the provisions of the Franco-Siamese treaty of 1904, the garrison of occupation was withdrawn. Chantabun has been since the 17th century, and still is, a stronghold of the Roman Catholic missionaries, and the Christian element amongst the population is greater here than anywhere else in Siam.

CHANTADA, a town of north-western Spain, in the province of Lugo, on the left bank of the Río de Chantada, a small right-hand tributary of the river Miño, and on the main road from Orerse, 18 m. S. by W., to Lugo, 28 m. N. by E. Pop. (1900) 15,003. Chantada is the chief town of the fertile region between the Miño and the heights of El Faro, which mark the western border of the province. Despite the lack of railway communication, it has a thriving trade in grain, flax, hemp, and dairy produce.

CHANTAGE (a Fr. word from *chanter*, to sing, slang for a criminal making an avowal under examination), a demand for money backed by the threat of scandalous revelations, the French equivalent of "blackmail."

CHANTARELLE, an edible fungus, known botanically as *Cantharellus cibarius*, found in woods in summer. It is golden yellow, somewhat inversely conical in shape and about 2 in. broad and high. The cap is flattened above with a central depression and a thick lobed irregular margin. Running down into the stem from the cap are a number of shallow thick gills. The substance of the fungus is dry and opaque with a peculiar smell suggesting ripe apricots or plums. The flesh is whitish tinged with yellow. The chantarelle is sold in the markets on the continent of Europe, where it forms a regular article of food, but seems little known in Britain though often plentiful in the New Forest and elsewhere. Before being cooked they should be allowed to dry, and then thrown into boiling water. They may then be stewed in butter or oil, or cut up small and stewed with meat. No fungus requires more careful preparation.

See M.C. Cooke, *British Edible Fungi*, (1891), pp. 104-105.

CHANTAVOINE, HENRI (1850-), French man of letters, was born at Montpellier on the 6th of August 1850, and was educated at the École Normale Supérieure. After teaching in the provinces he moved, in 1876, to the Lycée Charlemagne in Paris, and subsequently became professor of rhetoric at the Lycée Henri IV. and *maître de conferences* at the École Normale at Sèvres. He was associated with the *Nouvelle Revue* from its foundation in 1879, and he joined the *Journal des débats* in 1884. His poems include *Poèmes sincères* (1877), *Satires contemporaines* (1881), *Ad memoriam* (1884), *Au fil des jours* (1889).

CHANTILLY, a town of northern France, in the department of Oise, 25 m. N. of Paris on the Northern railway to St Quentin. Pop. (1906) 4632. It is finely situated to the north of the forest of Chantilly and on the left bank of the river Nonette, and is one of the favourite Parisian resorts. Its name was long associated with the manufacture, which has now to a great extent decayed, of lace and blonde; it is still more celebrated for its château and its park (laid out originally by A. Le Nôtre in the second half of the 17th century), and as the scene of the great annual races of the French Jockey Club. The château consists of the palace built from 1876 to 1885 and of an older portion adjoining it known as the châtelet. The old castle must have been in existence in the 13th century, and in the reign of Charles VI. the lordship belonged to Pierre d'Orgemont, chancellor of France. In 1484 it passed to the house of Montmorency, and in 1632 from that family to the house of Condé. Louis II., prince de Condé, surnamed the Great, was specially attached to the place, and did a great deal to enhance its beauty

and splendour. Here he enjoyed the society of La Bruyère, Racine, Molière, La Fontaine, Boileau, and other great men of his time; and here his steward Vatel killed himself in despair, because of a hitch in the preparations for the reception of Louis XIV. The stables close to the racecourse were built from 1719 to 1735 by Louis-Henri, duke of Bourbon. Of the two splendid mansions existing at that period known as the grand château and the châtelet, the former was destroyed about the time of the Revolution, but the latter, built for Anne de Montmorency by Jean Bullant, still remains as one of the finest specimens of Renaissance architecture in France. The château d'Enghien, facing the entrance to the grand château, was built in 1770 as a guest-house. On the death in 1830 of the duke of Bourbon, the last representative of the house of Condé, the estate passed into the hands of Henri, duc d'Aumale, fourth son of Louis Philippe. In 1852 the house of Orleans was declared incapable of possessing property in France, and Chantilly was accordingly sold by auction. Purchased by the English bankers, Coutts & Co., it passed back into the hands of the duc d'Aumale, in 1872. By him a magnificent palace, including a fine chapel in the Renaissance style, was erected on the foundations of the ancient grand château and in the style of the châtelet. It is quadrilateral in shape, consisting of four unequal sides flanked by towers and built round a courtyard. The whole group of buildings as well as the pleasure-ground behind them, known as the Parterre de la Volière, is surrounded by fosses supplied with water from the Nonette. On the terrace in front of the château there is a bronze statue of the constable Anne de Montmorency. The duc d'Aumale installed in the châtelet a valuable library, specially rich in incunabula and 16th century editions of classic authors, and a collection of the paintings of the great masters, besides many other objects of art. By a public act in 1886 he gave the park and château with its superb collections to the Institute of France in trust for the nation, reserving to himself only a life interest; and when he died in 1897 the Institute acquired full possession.

CHANTREY, SIR FRANCIS LEGATT (1782-1841), English sculptor, was born on the 7th of April 1782 at Norton near Sheffield, where his father, a carpenter, cultivated a small farm. His father died when he was eight years of age; and his mother having married again, his profession was left to be chosen by his friends. In his sixteenth year he was on the point of being apprenticed to a grocer in Sheffield, when, having seen some wood-carving in a shop-window, he requested to be made a carver instead, and was accordingly placed with a Mr Ramsey, wood-carver in Sheffield. In this situation he became acquainted with Raphael Smith, a distinguished draftsman in crayon, who gave him lessons in painting; and Chantrey, eager to commence his course as an artist, procured the cancelling of his indentures, and went to try his fortune in Dublin and Edinburgh, and finally (1802) in London. Here he first obtained employment as an assistant wood-carver, but at the same time devoted himself to portrait-painting, bust-sculpture, and modelling in clay. He exhibited pictures at the Academy for some years from 1804, but from 1807 onwards devoted himself mainly to sculpture. The sculptor Nollekens showed particular zeal in recognizing his merits. In 1807 he married his cousin, Miss Wale, who had some property of her own. His first imaginative work in sculpture was the model of the head of Satan, which was exhibited at the Royal Academy in 1808. He afterwards executed for Greenwich hospital four colossal busts of the admirals Duncan, Howe, Vincent and Nelson; and so rapidly did his reputation spread that the next bust which he executed, that of Horne Tooke, procured him commissions to the extent of £12,000. From this period he was almost uninterruptedly engaged in professional labour. In 1819 he visited Italy, and became acquainted with the most distinguished sculptors

of Florence and Rome. He was chosen an associate (1815) and afterwards a member (1818) of the Royal Academy, received the degree of M.A. from Cambridge, and that of D.C.L. from Oxford, and in 1835 was knighted. He died after an illness of only two hours' duration on the 25th of November 1841, having for some years suffered from disease of the heart, and was buried in a tomb constructed by himself in the church of his native village.

The works of Chantrey are extremely numerous. The principal are the statues of Washington in the State-house at Boston, U.S.A.; of George III. in the Guildhall, London; of George IV. at Brighton; of Pitt in Hanover Square, London; of James Watt in Westminster Abbey and in Glasgow; of Roscoe and Canning in Liverpool; of Dalton in Manchester; of Lord President Blair and Lord Melville in Edinburgh, &c. Of his equestrian statues the most famous are those of Sir Thomas Munro in Calcutta, and the duke of Wellington in front of the London Exchange. But the finest of Chantrey's works are his busts, and his delineations of children. The figures of two children asleep in each other's arms, which form a monumental design in Lichfield cathedral, have always been lauded for beauty, simplicity and grace. So is also the statue of the girlish Lady Louisa Russell, represented as standing on tiptoe and fondling a dove in her bosom. Both these works appear, in design, to have owed something to Stothard; for Chantrey knew his own scantiness of ideal invention or composition, and on system sought aid from others for such attempts. In busts, his leading excellence is facility—a ready unconstrained air of life, a prompt vivacity of ordinary expression. Allan Cunningham and Weekes were his chief assistants, and were indeed the active executants of many works that pass under Chantrey's name. Chantrey was a man of warm and genial temperament, and is said to have borne noticeable though commonplace resemblance to the usual portraits of Shakespeare.

Chantrey Bequest.—By the will dated the 31st of December 1840, Chantrey (who had no children) left his whole residuary personal estate after the decease or on the second marriage of his widow (less certain specified annuities and bequests) in trust for the president and trustees of the Royal Academy (or in the event of the dissolution of the Royal Academy, to such society as might take its place), the income to be devoted to the encouragement of British fine art in painting and sculpture only, by "the purchase of works of fine art of the highest merit ... that can be obtained." The funds might be allowed to accumulate for not more than five years; works by British or foreign artists, dead or living, might be acquired, so long as such works were entirely executed within the shores of Great Britain, the artists having been in residence there during such execution and completion. The prices to be paid were to be "liberal," and no sympathy for an artist or his family was to influence the selection or the purchase of works, which were to be acquired solely on the ground of intrinsic merit. No commission or orders might be given: the works must be finished before purchase. Conditions were made as to the exhibition of the works, in the confident expectation that as the intention of the testator was to form and establish a "public collection of British Fine Art in Painting and Sculpture," the government or the country would provide a suitable gallery for their display; and an annual sum of £300 and £50 was to be paid to the president of the Royal Academy and the secretary respectively, for the discharge of their duties in carrying out the provisions of the will.

Lady Chantrey died in 1875, and two years later the fund became available for the purchase of paintings and sculptures. The capital sum available amounted to £105,000 in 3% Consols, which (since reduced to 2½%) produces an available annual income varying from £2500 to £2100. Galleries in the Victoria and Albert Museum at South Kensington were at first adopted as the depository of the works acquired, until in 1898 the Royal Academy arranged with the treasury, on behalf of the government,

for the transference of the collection to the National Gallery of British Art, which had been erected by Sir Henry Tate at Millbank. It was agreed that the "Tate Gallery" should be its future home, and that "no power of selection or elimination is claimed on behalf of the trustees and director of the National Gallery" (Treasury Letter, 18054-98, 7th December 1898) in respect of the pictures and sculptures which were then to be handed over and which should, from time to time, be sent to augment the collection. Inasmuch as it was felt that the provision that all works must be complete to be eligible for purchase militated against the most advantageous disposition of the fund in respect of sculpture, in the case of wax models or plaster casts before being converted into marble or bronze, it was sought in the action of *Sir F. Leighton* v. *Hughes* (tried by Mr Justice North, judgment May 7th, 1888, and in the court of appeal, before the master of the rolls, Lord Justice Cotton, and Lord Justice Fry, judgment June 4th, 1889—the master of the rolls dissenting) to allow of sculptors being commissioned to complete in bronze or marble a work executed in wax or plaster, such "completion" being more or less a mechanical process. The attempt, however, was abortive.

A growing discontent with the interpretation put by the Royal Academy upon the terms of the will as shown in the works acquired began to find expression more than usually forcible and lively in the press during the year 1903, and a debate raised in the House of Lords by the earl of Lytton led to the appointment of a select committee of the House of Lords, which sat from June to August 1904. The committee consisted of the earls of Carlisle, Lytton, and Crewe, and Lords Windsor, Ribblesdale, Newton, and Killanin, and the witnesses represented the Royal Academy and representative art institutions and art critics. The report (ordered to be printed on the 8th of August 1904) made certain recommendations with a view to the prevention of certain former errors of administration held to have been sustained, but dismissed other charges against the Academy. In reply thereto a

memorandum was issued by the Royal Academy (February 1905, ordered to be printed on the 7th of August 1905—Paper 166) disagreeing with certain recommendations, but allowing others, either intact or in a modified form.

Up to 1905 inclusive 203 works had been bought—all except two from living painters—at a cost of nearly £68,000. Of these, 175 were in oil-colours, 12 in water-colours, and 16 sculptures (10 in bronze and 6 marble).

See *The Administration of the Chantrey Bequest*, by D.S. MacColl (l6mo, London, 1904), a highly controversial publication by the leading assailant of the Royal Academy: *Chantrey and His Bequest*, by Arthur Fish, a complete illustrated record of the purchases, &c. (London, 1904); *The Royal Academy, its Uses and Abuses*, by H.J. Laidlay (London, 1898), controversial; *Report from the Select Committee of the House of Lords on the Chantrey Trust; together with the Proceedings of the Committee, Minutes of Evidence and Appendix* (Wyman & Sons, 1904), and *Index* (separate publication, 1904).

CHANT ROYAL, one of the fixed forms of verse invented by the ingenuity of the poets of medieval France. It is composed of five strophes, identical in arrangement, of eleven verses each, and of an envoi of five verses. All the strophes are written on the five rhymes exhibited in the first strophe, the entire poem, therefore, consisting of sixty lines in the course of which five rhymes are repeated. It has been conjectured that the chant royal is an extended ballade, or rather a ballade conceived upon a larger scale; but which form preceded the other appears to be uncertain. On this point Henri

de Croï, who wrote about these forms of verse in his *Art et science de rhétorique* (1493), throws no light. He dwells, however, on the great dignity of what he calls the "Champt Royal," and says that those who defy with success the ardour of its rules deserve crowns and garlands for their pains. Étienne Pasquier (1529-1615) points out the fact that the Chant Royal, by its length and the rigidity of its structure, is better fitted than the ballade for solemn and pompous themes. In Old French, the most admired chants royal are those of Clement Marot; his *Chant royal chrestien*, with its refrain

"Santé au corps, et Paradis à l'âme,"

was celebrated. Théodore de Banville defines the chant royal as essentially belonging to ages of faith, when its subjects could be either the exploits of a hero of royal race or the processional splendours of religion. La Fontaine was the latest of the French poets to attempt the chant royal, until it was resuscitated in modern times.

This species of poem was unknown in English medieval literature and was only introduced into Great Britain in the last quarter of the 19th century. The earliest chant royal in English was that published by Edmund Gosse in 1877; it is here given to exemplify the structure and rhyme-arrangement of the form:—

The Praise of Dionysus

"Behold, above the mountains there is light,
A streak of gold, a line of gathering fire,
And the dim East hath suddenly grown bright
With pale aerial flame, that drives up higher
The lurid mists which all the night long were
Breasting the dark ravines and coverts bare;

Behold, behold! the granite gates unclose,
And down the vales a lyric people flows,
Who dance to music, and in dancing fling
Their frantic robes to every wind that blows,
And deathless praises to the Vine-God sing.

Nearer they press, and nearer still in sight,
Still dancing blithely in a seemly choir;
Tossing on high the symbol of their rite,
The cone-tipp'd thyrsus of a god's desire;
Nearer they come, tall damsels flushed and fair,
With ivy circling their abundant hair,
Onward, with even pace, in stately rows,
With eye that flashes, and with cheek that glows,
And all the while their tribute-songs they bring,
And newer glories of the past disclose
And deathless praises to the Vine-God sing.

The pure luxuriance of their limbs is white,
And flashes clearer as they draw the nigher,
Bathed in an air of infinite delight,
Smooth without wound of thorn, or fleck of mire,
Borne up by song as by a trumpet's blare,
Leading the van to conquest, on they fare,
Fearless and bold, whoever comes or goes,
These shining cohorts of Bacchantes close,
Shouting and shouting till the mountains ring,
And forests grim forget their ancient woes,
And deathless praises to the Vine-God sing.

And youths there are for whom full many a night
Brought dreams of bliss, vague dreams that haunt and tire
Who rose in their own ecstasy bedight,
And wandered forth through many a scourging briar,
And waited shivering in the icy air,
And wrapped the leopard-skin about them there,
Knowing for all the bitter air that froze,
The time must come, that every poet knows,
When he shall rise and feel himself a king,
And follow, follow where the ivy grows,
And deathless praises to the Vine-God sing.

But oh! within the heart of this great flight,
Whose ivory arms hold up the golden lyre?
What form is this of more than mortal height?
What matchless beauty, what inspiréd ire?
The brindled panthers know the prize they bear,
And harmonize their steps with tender care;
Bent to the morning, like a living rose,
The immortal splendour of his face he shows;
And, where he glances, leaf and flower and wing
Tremble with rapture, stirred in their repose,
And deathless praises to the Vine-God sing.

Envoi.

PRINCE of the flute and ivy, all thy foes
Record the bounty that thy grace bestows,
But we, thy servants, to thy glory cling,
And with no frigid lips our songs compose,
And deathless praises to the Vine-God sing."

In the middle ages the chant royal was largely used for the praise of the Virgin Mary. Eustache Deschamps (1340-1410) distinguishes these Marian chants royaux, which were called “serventois,” by the absence of an envoi. These poems are first mentioned by Rutebeuf, a *trouvère* of the 13th century. The chant royal is practically unknown outside French and English literature.

(E. G.)

CHANTRY (Fr. *chanterie*, from *chanter*, to sing; Med. Lat. *cantuaria*), a small chapel built out from a church, endowed in pre-Reformation times for the express purpose of maintaining priests for the chanting of masses for the soul of the founder or of some one named by him. It generally contained the tomb of the founder, and, as the officiator or mass-priest was often unconnected with the parochial clergy, had an entrance from the outside. The word passed through graduations of meaning. Its first sense was singing or chanting. Then it meant the endowment funds, next the priests, and then the church or chapel itself.

CHANUTE, a city of Neosho county, Kansas, U.S.A., 1 m. from the Neosho river, and about 120 m. S.S.W. of Kansas city. Pop. (1890) 2826; (1900) 4208, of whom 210 were foreign-born and 171 were negroes; (1910

census) 9272. Chanute is served by the Atchison, Topeka & Santa Fe and the Missouri, Kansas & Texas railways, the former having large repair shops. The city is in the Kansas-Oklahoma oil and gas field, and is surrounded by a fine farming and dairying region, in which special attention is given to the raising of small fruit; oil, gas, cement rock and brick shale are found in the vicinity. Among the city's manufactures are refined oil, Portland cement, vitrified brick and tile, glass, asphalt, ice, cigars, drilling machinery, and flour. The municipality owns and operates the waterworks, a natural gas plant, and an electric lighting plant. Four towns— New Chicago, Tioga, Chicago Junction and Alliance—were started here about the same time (1870). In 1872 they were consolidated, and the present name was adopted in honour of Octave Chanute (b. 1832), the civil engineer and aeronautist (see FLIGHT AND FLYING), then the engineer of the Lawrence, Leavenworth & Galveston railway (now part of the Atchison system). Chanute was incorporated as a city of the third class in 1873, and its charter was revised in 1888. Natural gas and oil were found here in 1899, and Chanute became one of the leaders of the Kansas independent refineries in their contest with the Standard Oil Company.

CHANZY, ANTOINE EUGÈNE ALFRED (1823-1883), French general, was born at Nouart (Ardennes) on the 18th of March 1823. The son of a cavalry officer, he was educated at the naval school at Brest, but enlisted in the artillery, and, subsequently passing through St Cyr, was commissioned in the Zouaves in 1843. He saw a good deal of fighting in Algeria, and was promoted lieutenant in 1848, and captain in 1851. He

became *chef de bataillon* in 1856, and served in the Lombardy campaign of 1859, being present at Magenta and Solferino. He took part in the Syrian campaign of 1860-61 as a lieutenant-colonel; and as colonel commanded the 48th regiment at Rome in 1864. He returned to Algeria as general of brigade, assisted to quell the Arab insurrection, and commanded the subdivisions of Bel Abbes and Tlemçen in 1868. Although he had acquired a good professional reputation, he was in bad odour at the war office on account of suspected contributions to the press, and at the outbreak of the Franco-German War he was curtly refused a brigade command. After the revolution, however, the government of national defence called him from Algeria, made him a general of division, and gave him command of the XVI. corps of the army of the Loire. (For the operations of the Orleans campaign which followed, see FRANCO-GERMAN WAR.) The Loire army won the greatest success of the French during the whole war at Coulmiers, and followed this up with another victorious action at Patay; in both engagements General Chanzy's corps took the most brilliant part. After the second battle of Orleans and the separation of the two wings of the French army, Chanzy was appointed to command that in the west, designated the second army of the Loire. His enemies, the grand duke of Mecklenburg, Prince Frederick Charles, and General von der Tann, all regarded Chanzy as their most formidable opponent. He displayed conspicuous moral courage and constancy, not less than technical skill, in the fighting from Beaugency to the Loire, in his retreat to Le Mans, and in retiring to Laval behind the Mayenne. As Gambetta was the soul, Chanzy was the strong right arm of French resistance to the invader. He was made a grand officer of the Legion of Honour, and was elected to the National Assembly. At the outbreak of the Commune, Chanzy, then at Paris, fell into the hands of the insurgents, by whom he was forced to give his parole not to serve against them. It was said that he would otherwise have been appointed instead of MacMahon to command the army of Versailles. A ransom of £40,000 was also paid by the

government for him. In 1872 he became a member of the committee of defence and commander of the VII. army corps, and in 1873 was appointed governor of Algeria, where he remained for six years. In 1875 he was elected a life senator, in 1878 received the grand cross of the Legion of Honour, and in 1879, without his consent, was nominated for the presidency of the republic, receiving a third of the total votes. For two years he was ambassador at St Petersburg, during which time he received many tokens of respect, not only from the Russians, but also from the German emperor, William I., and Prince Bismarck. He died suddenly, while commanding the VI. army corps (stationed nearest to the German frontier), at Châlons-sur-Marne, on the 4th of January 1883, only a few days after Gambetta, and his remains received a state funeral. He was the author of *La Deuxième Armée de la Loire* (1872). Statues of General Chanzy have been erected at Nouart and Le Mans.

CHAOS, in the Hesiodic theogony, the infinite empty space, which existed before all things (*Theog.* 116, 123). It is not, however, a mere abstraction, being filled with clouds and darkness; from it proceed Erebus and Nyx (Night), whose children are Aether (upper air) and Hemera (Day). In the Orphic cosmogony the origin of all goes back to Chronos, the personification of time, who produces Aether and Chaos. In the Aristophanic parody (*Birds*, 691) the winged Eros in conjunction with gloomy Chaos brings forth the race of birds. The later Roman conception (Ovid, *Metam.* i. 7) makes Chaos the original undigested, amorphous mass, into which the architect of the world introduces order and harmony, and

from which individual forms are created. In the created world (cosmos, order of the universe) the word has various meanings:—the universe; the space between heaven and earth; the under-world and its ruler. Metaphorically it is used for the immeasurable darkness, eternity, and the infinite generally. In modern usage “chaos” denotes a state of disorder and confusion.

CHAPBOOK (from the O. Eng. *chap*, to buy and sell), the comparatively modern name applied by booksellers and bibliophiles to the little stitched tracts written for the common people and formerly circulated in England, Scotland and the American colonies by itinerant dealers or chapmen, consisting chiefly of vulgarized versions of popular stories, such as *Tom Thumb*, *Jack the Giant Killer*, *Mother Shipton*, and *Reynard the Fox* —travels, biographies and religious treatises. Few of the older chapbooks exist. Samuel Pepys collected some of the best and had them bound into small quarto volumes, which he called Vulgaria; also four volumes of a smaller size, which he lettered *Penny Witticisms, Penny Merriments, Penny Compliments* and *Penny Godlinesses*. The early chapbooks were the direct descendants of the black-letter tracts of Wynkyn de Worde. It was in France that the printing-press first began to supply reading for the common people. At the end of the 15th century there was a large popular literature of farces, tales in verse and prose, satires, almanacs, &c., stitched together so as to contain a few leaves, and circulated by itinerant booksellers, known as colporteurs. Most early English chapbooks are adaptations or translations of these French originals, and were introduced into England early in the 16th

century. The chapbooks of the 17th century present us with valuable illustrations of the manners of the time; one of the best known is that containing the story of Dick Whittington. Others which had a great vogue are *Jack the Giant Killer, Little Red Riding Hood*, and *Mother Shipton*. Those of the 18th century are far inferior in every way, both as regards the literature and the printing; and unfortunately it is these which form the bulk of what is now known to us in collections as chapbooks. They have never exercised any great influence in England nor received much attention, owing no doubt to their poor literary character. In France, on the other hand, their French equivalents have been the object of close and systematic study, and *L'Histoire des livres populaires ou de la littérature du colportage* by Charles Nisard (1854) goes deeply into the subject. Amongst English books may be mentioned *Notices of Fugitive Tracts and Chapbooks*, by J.O. Halliwell-Phillipps (1849); *Chapbooks of the 18th Century*, by John Ashton (1882), and some reprints by the Villon Society in 1885. The word "chapbook" has not been noticed earlier than 1824, when Dibdin, the celebrated bibliographer, described a work as being "a chapbook, printed in rather a neat black-letter."

CHAPE (from the Fr. *chape*, a hood, cope or sheath), a cover or metal plate, such as the cap upon the needle in the compass, also the transverse guard of a sword which protects the hand. From the original meaning comes the use of the word as a support or catch to attach one thing to another, as the hook on a belt to which the sword is fastened. The word is also used for the tip of a fox's brush.

CHAPEL, a place of religious worship,[1] a name properly applied to that of a Christian religious body, but sometimes to any small temple of pagan worship (Lat. *sacellum*). The word is derived through the O. Fr. *chapele*, modern *chapelle*, from the Late Lat. *capelle* or *cappella*, diminutive of *cappa*, a cape, particularly that of a monk. This word was transferred to any sanctuary containing relics, in the early history of the Frankish Church, because the cloak of St Martin, *cappa brevior Sancti Martini*, one of the most sacred relics of the Frankish kings, was carried in a sanctuary or shrine wherever the king went; and oaths were taken on it (see Ducange, *Glossarium*, *s.v. Capella*). Such a sanctuary was served by a priest, who was hence called *capellanus*, from which is derived the English "chaplain" (*q.v.*). The strict application of the word to a sanctuary containing relics was extended to embrace any place of worship other than a church, and it was synonymous, therefore, with "oratory" (*oratorium*), especially one attached to a palace or to a private dwelling-house. The celebrated Sainte Chapelle in Paris, attached to what is now the Palais de Justice, well illustrates the early and proper meaning of the word. It was built (consecration, 1248) by St Louis of France to contain the relic of the Crown of Thorns, ransomed by the king from the Venetians, who held it in pawn from the Latin emperor of the East, John of Brienne, lately dead. The chapel served as the sanctuary of the relic lodged in the upper chapel, and the whole building was attached as the place of worship to the king's palace. This, the primary meaning, survives in the chapels usually placed in the aisles of cathedrals and large churches. They were originally built either to contain relics of a particular saint to whom they were dedicated, or the tomb of a particular family.

In the Church of England the word is applied to a private place of worship, attached either to the palaces of the sovereign, “chapels royal,” or to the residence of a private person, to a college, school, prison, workhouse, &c. Further, the word has particular legal applications, though in each case the building might be and often is styled a church. These are places of worship supplementary to a parish church, and may be either “chapels of ease,” to ease or relieve the mother-church and serve those parishioners who may live far away, “parochial chapels,” the “churches” of ancient divisions of a very large and widely scattered parish, or “district chapels,” those of a district of a parish divided under the various church building acts. A “free chapel” is one founded by the king and by his authority, and visited by him and not by the bishop. A “proprietary chapel” is one that belongs to a private person. They are anomalies to the English ecclesiastical law, have no parish rights, and can be converted to other than religious purposes, but a clergyman may be licensed to perform duty in such a place of worship. In the early and middle part of the 19th century such proprietary chapels were common, but they have practically ceased to exist. “Chapel” was early and still is in England the general name of places of worship other than those of the established Church, but the application of “church” to all places of worship without distinction of sect is becoming more and more common. The word “chapel” was in this restricted sense first applied to places of worship belonging to the Roman Church in England, and was thus restricted to those attached to foreign embassies, or to those of the consorts of Charles I. and II. and James II., who were members of that church. The word is still frequently the general term for Roman Catholic churches in Great Britain and always so in Ireland. The use of “chapel” as a common term for all Nonconformist places of worship was general through most of the 19th century, so that “church and chapel” was the usual phrase to mark the distinction between members of the established Church and those of Nonconformist bodies. Here the widened use of “church” noticed above has

been especially marked. Most of the recent buildings for worship erected by Nonconformist bodies will be found to be styled Wesleyan, Congregational, &c., churches. It would appear that while the word “chapel” was not infrequent in the early history of Nonconformity, “meeting-house” was the more usual term.

From the architectural point of view the addition of chapels to a cathedral or large church assumes some historical importance in consequence of the changes it involved in the plan. It was the introduction of the apsidal chapels in the churches of France which eventually led to the *chevet* or cluster of eastern chapels in many of the great cathedrals, and also sometimes to the extension of the transept so as to include additional apsidal chapels on the east side. In France, and to a certain extent in Italy, the multiplication of chapels led to their being placed on the north and south side of the aisles, and in some cases, as at Albi in France, to the suppression of the aisles and the instalment of the chapels in their place. The chapels of the colleges at Oxford and Cambridge are sometimes of large dimensions and architecturally of great importance, that of Christ Church being actually the cathedral of Oxford; among others may be mentioned the chapel of Merton College, and the new chapel of Exeter College, both in Oxford, and the chapel of King’s College, Cambridge, which is roofed over with perhaps the finest fan-vault in England. (See VAULT, Plate II., fig. 19.)

---

1 The only other English sense is that of a printer’s workshop, or the body of compositors in it, who are presided over by a “father of the chapel.”

CHAPELAIN, JEAN (1595-1674), French poet and man of letters, the son of a notary, was born in Paris on the 4th of December 1595. His father destined him for his own profession; but his mother, who had known Ronsard, had determined otherwise. At an early age Chapelain began to qualify himself for literature, learning, under Nicolas Bourbon, Greek and Latin, and teaching himself Italian and Spanish. Having finished his studies, he was engaged for a while in teaching Spanish to a young nobleman. He was then appointed tutor to the two sons of a M. de la Trousse, grand provost of France. Attached for the next seventeen years to the family of this gentleman, the administration of whose fortune was wholly in his hands, he seems to have published nothing during this period, yet to have acquired a great reputation as a probability. His first work given to the public was a preface for the *Adone* of Marini, who printed and published that notorious poem at Paris. This was followed by an excellent translation of Mateo Aleman's novel, *Guzmán de Alfarache*, and by four extremely indifferent odes, one of them addressed to Richelieu. The credit of introducing the law of the dramatic unities into French literature has been claimed for many writers, and especially for the Abbé d'Aubignac, whose *Pratique du théâtre* appeared in 1657. The theory had of course been enunciated in the *Art poétique* of J.C. Scaliger in 1561, and subsequently by other writers, but there is no doubt that it was the action of Chapelain that transferred it from the region of theory to that of actual practice. In a conversation with Richelieu in about 1632, reported by the abbé d'Olivet, Chapelain maintained that it was indispensable to maintain the unities of time, place and action, and it is explicitly stated that the doctrine was new to the cardinal and to the poets who were in his pay. French classical drama thus owes the riveting of its fetters to Chapelain. Rewarded with a pension of a thousand crowns, and from the first an active member of the newly-constituted Academy, Chapelain drew up the plan of the grammar and dictionary the compilation of which was to be a principal function of the

young institution, and at Richelieu's command drew up the *Sentiments de l'Académie sur le Cid*. In 1656 he published, in a magnificent form, the first twelve cantos of his celebrated epic *La Pucelle*,[1] on which he had been engaged during twenty years. Six editions of the poem were disposed of in eighteen months. But this was the end of the poetic reputation of Chapelain, "the legist of Parnassus". Later the slashing satire of Boileau (in this case fairly master of his subject) did its work, and Chapelain ("*Le plus grand poète Français qu' ait jamais été et du plus solide jugement*," as he is called in Colbert's list) took his place among the failures of modern art.

Chapelain's reputation as a critic survived this catastrophe, and in 1663 he was employed by Colbert to draw up an account of contemporary men of letters, destined to guide the king in his distribution of pensions. In this pamphlet, as in his letters, he shows to far greater advantage than in his unfortunate epic. His prose is incomparably better than his verse; his criticisms are remarkable for their justice and generosity; his erudition and kindliness of heart are everywhere apparent; the royal attention is directed alike towards the author's firmest friends and bitterest enemies. To him young Racine was indebted not only for kindly and seasonable counsel, but also for that pension of six hundred livres which was so useful to him. The catholicity of his taste is shown by his *De la lecture des vieux romans* (pr. 1870), in which he praises the *chansons de geste*, forgotten by his generation. Chapelain refused many honours, and his disinterestedness in this and other cases makes it necessary to receive with caution the stories of Ménage and Tallemant des Réaux, who assert that he was in his old age a miser, and that a considerable fortune was found hoarded in his apartments when he died on the 22nd of February 1674.

There is a very favourable estimate of Chapelain's merits as a critic in George Saintsbury's *History of Criticism*, ii. 256-261. An analysis of *La Pucelle* is given in pp. 23-79 of Robert Southey's *Joan of Arc*. See also *Les*

Lettres de Jean Chapelain (ed. P. Tanuzey de Larroque, 1880-1882); *Lettres inédites ... à P.D. Huet* (1658-1673, ed. by L.G. Pellissier, 1894); Julien Duchesne, *Les Poèmes épiques du XVIIe siècle* (1870); the abbé A. Fabre, *Les Ennemis de Chapelain* (1888), *Chapelain et nos deux premières Académies* (1890); and A. Muehlan, *Jean Chapelain* (1893).

---

1 The last twelve cantos of *La Pucelle* were edited (1882) from the MS. with corrections and a preface in the author's autograph, in the *Bibliothèque Nationale*, by H. Herluison. Another edition, by E. de Molènes (2 vols.), was published in 1892.

CHAPEL-EN-LE-FRITH, a market town in the High Peak parliamentary division of Derbyshire, England, 20 m. S.E. of Manchester, on the London & North-Western and Midland railways. Pop. (1901) 4626. It lies in an upland valley of the Peak district, the hills of which rise above 1200 ft. in its immediate vicinity. There are paper-works and ironworks, and brewing is carried on. The foundation of the church of St Thomas of Canterbury is attributed to the foresters of the royal forest or frith of the Peak early in the 13th century; and from this the town took name. After the defeat of the Scottish forces at Preston by Cromwell in 1648, it is said that 1500 prisoners were confined in the church at Chapel-en-le-Frith.

CHAPEL HILL, a town of Orange county, North Carolina, U.S.A., about 28 m. N.W. of Raleigh. Pop. (1900) 1099; (1910) 1149. It is served by a branch of the Southern railway, connecting at University, 10 m. distant, with the Greensboro & Goldsboro division. The town is best known as the seat of the University of North Carolina (see NORTH CAROLINA), whose campus contains 48 acres. There are cotton and knitting mills and lumber interests of some importance. Chapel Hill was settled late in the 18th century, and was first incorporated in 1851.

CHAPELLE ARDENTE (Fr. "burning chapel"), the chapel or room in which the corpse of a sovereign or other exalted personage lies in state pending the funeral service. The name is in allusion to the many candles which arc lighted round the catafalque. This custom is first chronicled as occurring at the obsequies of Dagobert I. (602-638).

CHAPERON, originally a cap or hood (Fr. *chape*) worn by nobles and knights of the Garter in full dress, and after the 16th century by middle-aged ladies. The modern use of the word is of a married or elderly lady (cf. "duenna") escorting or protecting a young and unmarried girl in public places and in society.

CHAPLAIN, strictly one who conducts service in a chapel (*q.v.*), *i.e.* a priest or minister without parochial charge who is attached for special duties to a sovereign or his representatives (ambassadors, judges, &c.), to bishops, to the establishments of nobles, &c., to institutions (*e.g.* parliament, congress, colleges, schools, workhouses, cemeteries), or to the army and the navy. In some cases a parish priest is also appointed to a chaplaincy, but in so far as he is a chaplain he has no parochial duties. Thus a bishop of the English Church appoints examining chaplains who conduct the examination of candidates for holy orders; such officials generally hold ordinary benefices also. The British sovereign has 36 "Chaplains in Ordinary," who perform service at St James's in rotation, as well as "Honorary Chaplains" and "Chaplains of the Household." There are also royal chaplains in Scotland and Ireland. The Scottish chaplains in ordinary are on the same basis as those in England, but the Irish chaplains are attached to the household of the lord-lieutenant. The Indian civil service appoints a number of clergymen of the Church of England and the Church of Scotland. These clergymen are known as Chaplains, and are subject to the same conditions as other civil servants, being eligible for a retiring pension after 23 years of service. Chaplains are also appointed under the foreign office to embassies, legations, consulates, &c.

Workhouse chaplains are appointed by overseers and guardians on the direction of the Local Government Board, to which alone such chaplains are responsible. Prison chaplains are appointed by the home secretary.

In the British army there are two kinds of chaplains, permanent and occasional. The former, described as Chaplains to the Forces, hold

commissions, serving throughout the empire except in India: they include a Chaplain-General who ranks as a major-general, and four classes of subordinate chaplains who rank respectively as colonels, lieutenant-colonels, majors and captains. There are about 100 in all. Special chaplains (Acting Chaplains for Temporary Service) may be appointed by a secretary of state under the Army Chaplains Act of 1868 to perform religious service for the army in particular districts. The permanent chaplains may be Church of England, Roman Catholic, or Presbyterian; Wesleyans (if they prefer not to accept commissions) may be appointed Acting Chaplains. The Church of England chaplains report to the chaplain-general, while other chaplains report to the War Office direct. In the navy, chaplains are likewise appointed but do not hold official rank. They must have a special ecclesiastical licence from the archbishop of Canterbury. In 1900 a Chaplains' Department of the Territorial Force was formed; there is no denominational restriction.

In the armies and navies of all Christian countries chaplains are officially appointed, with the single exception of France, where the office was abolished on the separation of Church and State. In the army of the United States of America chaplains are originally appointed by the president, and subsequently are under the authority of the secretary of war, who receives recommendations as regards transfer from department commanders. By act of Congress, approved in April 1904, the establishment of chaplains was fixed at 57 (15 with the rank of major), 12 for the artillery corps and 1 each for the cavalry and infantry regiments. There is no distinction of sect. In the U.S. navy the chaplains are 24 in number, of whom 13 rank as lieutenants, 7 as commanders, 4 as captains.

In the armies of Roman Catholic countries there are elaborate regulations. Where the chaplains are numerous a chaplain-major is generally appointed, but in the absence of special sanction from the pope such officer has no spiritual jurisdiction. Moreover, chaplains must be

approved by the ordinary of the locality. In Austria there are Roman Catholic, Greek Church, Jewish and Mahommedan chaplains. The Roman Catholic chaplains are classed as parish priests, curates and assistants, and are subject to an army Vicar Apostolic. In war, at an army headquarters there are a "field-rabbi," a "military imam," an evangelical minister, as well as the Roman Catholic hierarchy. By a decree of the Sacred Congregation of Propaganda (May 15, 1906), the archbishop of Westminster is the ecclesiastical superior of all commissioned Roman Catholic chaplains in the British army and navy, and he is empowered to negotiate with the civil authorities concerning appointments.

In Germany, owing to the fact that there are different religions in the different states, there is no uniform system. In Prussia there are two *Feldprobste* (who are directly under the war minister), one Lutheran, one Roman Catholic. The latter is a titular bishop, and has sole spiritual authority over soldiers. There are also army corps and divisional chaplains of both faiths. Bavaria and Saxony, both Roman Catholic states, have no special spiritual hierarchy; in Bavaria, the archbishop of Munich and Freysing is *ex officio* bishop of the army.

The origin of the office of *capellanus* or *cappellanus* in the medieval church is generally traced (see Du Cange, *Gloss, med. et infim. Latin*.) to the appointment of persons to watch over the sacred cloak (*cappa* or *capella*) of St Martin of Tours, which was preserved as a relic by the French monarchs. In time of war this cloak was carried with the army in the field, and was kept in a tent which itself came to be known as a *cappella* or *capella*. It is also suggested that the *capella* was simply the tent or canopy which the French kings erected over the altar in the field for the worship of the soldiers. However this may be, the name *capellanus* was generally applied to those who were in charge of sacred relics: such officials were also known as *custodes, martyrarii, cubicularii*. Thus we hear of a *custos*

palatinae capellae who was in charge of the palace chapel relics, and guarded them in the field; the chief of these *custodes* was sometimes called the *archicapellanus*. From the care of sacred relics preserved in royal chapels, &c. (*sacella* or *capellae*), the office of *capellanus* naturally extended its scope until it covered practically that of the modern court chaplain, and was officially recognized by the Church. These clerics became the confessors in royal and noble houses, and were generally chosen from among bishops and other high dignitaries. The arch-chaplain not only received jurisdiction within the royal household, but represented the authority of the monarch in religious matters, and also acquired more general powers. In France the arch-chaplain was grand-almoner, and both in France and in the Holy Roman Empire was also high chancellor of the realm. The office was abolished in France at the Revolution in 1789, revived by Pius IX. in 1857, and again abolished on the fall of the Second Empire.

The Roman Catholic Church also recognizes a class of beneficed chaplains, supported out of "pious foundations" for the specific duty of saying, or arranging for, certain masses, or taking part in certain services. These chaplains are classified as follows:— *Ecclesiastical*, if the foundation has been recognized officially as a benefice; *Lay*, if this recognition has not been obtained; *Mercenary*, if the person who has been entrusted with the duty of performing or procuring the desired celebration is a layman (such persons also are sometimes called "Lay Chaplains"); *Collative*, if it is provided that a bishop shall collate or confer the right to act upon the accepted candidate, who otherwise could not be recognized as an ecclesiastical chaplain. There are elaborate regulations governing the appointment and conduct of these chaplains.

Other classes of chaplains are:—(1) *Parochial* or *Auxiliary Chaplains*, appointed either by a parish priest (under a provision authorized by the

Council of Trent) or by a bishop to take over certain specified duties which he is unable to perform; (2) *Chaplains of Convents*, appointed by a bishop: these must be men of mature age, should not be regulars unless secular priests cannot be obtained, and are not generally to be appointed for life; (3) *Pontifical Chaplains*, some of whom (known as Private Chaplains) assist the pontiff in the celebration of Mass; others attached directly to the pope are honorary private chaplains who occasionally assist the private chaplains, private clerics of the chapel, common chaplains and supernumerary chaplains. The common chaplains were instituted by Alexander VII., and in 1907 were definitely allowed the title "Monsignore" by Pius X.

CHAPLIN, HENRY (1841-), English statesman, second son of the Rev. Henry Chaplin, of Blankney, Lincolnshire, was educated at Harrow and Christ Church, Oxford, and first entered parliament in 1868 as Conservative member for Mid-Lincolnshire. He represented this constituency (which under the Redistribution Act of 1885 became the Sleaford division) till 1906, when he was defeated, but in 1907 returned to the House of Commons as member for Wimbledon at a by-election. In 1876 he married a daughter of the 3rd duke of Sutherland, but lost his wife in 1881. Outside the House of Commons he was a familiar figure on the Turf, winning the Derby with Hermit in 1867; and in politics from the first the "Squire of Blankney" took an active interest in agricultural questions, as a popular and typical representative of the English "country gentleman" class. Having filled the office of chancellor of the duchy of Lancaster in Lord

Salisbury's short ministry of 1885-1886, he became president of the new Board of Agriculture in 1889, with a seat in the cabinet, and retained this post till 1892. In the Conservative cabinet of 1895-1900 he was president of the Local Government Board, and was responsible for the Agricultural Rates Act of 1896; but he was not included in the ministry after its reconstruction in 1900. Mr Chaplin had always been an advocate of protectionism, being in this respect the most prominent inheritor of the views of Lord George Bentinck; and when in 1903 the Tariff Reform movement began under Mr Chamberlain's leadership, he gave it his enthusiastic support, becoming a member of the Tariff Commission and one of the most strenuous advocates in the country of the new doctrines in opposition to free trade.

CHAPMAN, GEORGE (? 1559-1634), English poet and dramatist, was born near Hitchin. The inscription on the portrait which forms the frontispiece of *The Whole Works of Homer* states that he was then (1616) fifty-seven years of age. Anthony à Wood (*Athen. Oxon.* ii. 575) says that about 1574 he was sent to the university, "but whether first to this of Oxon, or that of Cambridge, is to me unknown; sure I am that he spent some time in Oxon, where he was observed to be most excellent in the Latin and Greek tongues, but not in logic or philosophy." Chapman's first extant play, *The Blind Beggar of Alexandria*, was produced in 1596, and two years later Francis Meres mentions him in *Palladis Tamia* among the "best for tragedie" and the "best for comedie." Of his life between leaving the university and settling in London there is no account. It has been suggested,

from the detailed knowledge displayed in *The Shadow of Night* of an incident in Sir Francis Vere's campaign, that he saw service in the Netherlands. There are frequent entries with regard to Chapman in Henslowe's diary for the years 1598-1599, but his dramatic activity slackened during the following years, when his attention was chiefly occupied by his *Homer*. In 1604 he was imprisoned with John Marston for his share in *Eastward Ho*, in which offence was given to the Scottish party at court. Ben Jonson voluntarily joined the two, who were soon released. Chapman seems to have enjoyed favour at court, where he had a patron in Prince Henry, but in 1605 Jonson and he were for a short time in prison again for "a play." Beaumont, the French ambassador in London, in a despatch of the 5th of April 1608, writes that he had obtained the prohibition of a performance of *Biron* in which the queen of France was represented as giving Mademoiselle de Verneuil a box on the ears. He adds that three of the actors were imprisoned, but that the chief culprit, the author, had escaped (Raumer, *Briefe aus Paris*, 1831, ii. 276). Among Chapman's patrons was Robert Carr, earl of Somerset, to whom he remained faithful after his disgrace. Chapman enjoyed the friendship and admiration of his great contemporaries. John Webster in the preface to *The White Devil* praised "his full and heightened style," and Ben Jonson told Drummond of Hawthornden that Fletcher and Chapman "were loved of him." These friendly relations appear to have been interrupted later, for there is extant in the Ashmole MSS. an "Invective written by Mr George Chapman against Mr Ben Jonson." Chapman died in the parish of St Giles in the Fields, and was buried on the 12th of May 1634 in the churchyard. A monument to his memory was erected by Inigo Jones.

Chapman, his first biographer is careful to let us know, “was a person of most reverend aspect, religious and temperate, qualities rarely meeting in a poet”; he had also certain other merits at least as necessary to the exercise of that profession. He had a singular force and solidity of thought, an admirable ardour of ambitious devotion to the service of poetry, a deep and burning sense at once of the duty implied and of the dignity inherent in his office; a vigour, opulence, and loftiness of phrase, remarkable even in that age of spiritual strength, wealth and exaltation of thought and style; a robust eloquence, touched not unfrequently with flashes of fancy, and kindled at times into heat of imagination. The main fault of his style is one more commonly found in the prose than in the verse of his time,— a quaint and florid obscurity, rigid with elaborate rhetoric and tortuous with labyrinthine illustration; not dark only to the rapid reader through closeness and subtlety of thought, like Donne, whose miscalled obscurity is so often “all glorious within,” but thick and slab as a witch’s gruel with forced and barbarous eccentricities of articulation. As his language in the higher forms of comedy is always pure and clear, and sometimes exquisite in the simplicity of its earnest and natural grace, the stiffness and density of his more ambitious style may perhaps be attributed to some pernicious theory or conceit of the dignity proper to a moral and philosophic poet. Nevertheless, many of the gnomic passages in his tragedies and allegoric poems are of singular weight and beauty; the best of these, indeed, would not discredit the fame of the very greatest poets for sublimity of equal thought and expression: witness the lines chosen by Shelley as the motto for a poem, and fit to have been chosen as the motto for his life.

The romantic and sometimes barbaric grandeur of Chapman’s *Homer* remains attested by the praise of Keats, of Coleridge and of Lamb; it is written at a pitch of strenuous and laborious exaltation, which never flags or breaks down, but never flies with the ease and smoothness of an eagle

native to Homeric air. From his occasional poems an expert and careful hand might easily gather a noble anthology of excerpts, chiefly gnomic or meditative, allegoric or descriptive. The most notable examples of his tragic work are comprised in the series of plays taken, and adapted sometimes with singular licence, from the records of such part of French history as lies between the reign of Francis I. and the reign of Henry IV., ranging in date of subject from the trial and death of Admiral Chabot to the treason and execution of Marshal Biron. The two plays bearing as epigraph the name of that famous soldier and conspirator are a storehouse of lofty thought and splendid verse, with scarcely a flash or sparkle of dramatic action. The one play of Chapman's whose popularity on the stage survived the Restoration is *Bussy d'Ambois* (d'Amboise),—a tragedy not lacking in violence of action or emotion, and abounding even more in sweet and sublime interludes than in crabbed and bombastic passages. His rarest jewels of thought and verse detachable from the context lie embedded in the tragedy of *Caesar and Pompey*, whence the finest of them were first extracted by the unerring and unequalled critical genius of Charles Lamb. In most of his tragedies the lofty and labouring spirit of Chapman may be said rather to shine fitfully through parts than steadily to pervade the whole; they show nobly altogether as they stand, but even better by help of excerpts and selections. But the excellence of his best comedies can only be appreciated by a student who reads them fairly and fearlessly through, and, having made some small deductions on the score of occasional pedantry and occasional indecency, finds in *All Fools*, *Monsieur d'Olive*, *The Gentleman Usher*, and *The Widow's Tears* a wealth and vigour of humorous invention, a tender and earnest grace of romantic poetry, which may atone alike for these passing blemishes and for the lack of such clear-cut perfection of character and such dramatic progression of interest as we find only in the yet higher poets of the English heroic age.

So much it may suffice to say of Chapman as an original poet, one who held of no man and acknowledged no master, but from the birth of Marlowe well-nigh to the death of Jonson held on his own hard and haughty way of austere and sublime ambition, not without kindly and graceful inclination of his high grey head to salute such younger and still nobler compeers as Jonson and Fletcher. With Shakespeare we should never have guessed that he had come at all in contact, had not the keen intelligence of William Minto divined or rather discerned him to be the rival poet referred to in Shakespeare's sonnets with a grave note of passionate satire, hitherto as enigmatic as almost all questions connected with those divine and dangerous poems. This conjecture Professor Minto fortified by such apt collocation and confrontation of passages that we may now reasonably accept it as an ascertained and memorable fact.

The objections which a just and adequate judgment may bring against Chapman's master-work, his translation of Homer, may be summed up in three epithets: it is romantic, laborious, Elizabethan. The qualities implied by these epithets are the reverse of those which should distinguish a translator of Homer; but setting this apart, and considering the poems as in the main original works, the superstructure of a romantic poet on the submerged foundations of Greek verse, no praise can be too warm or high for the power, the freshness, the indefatigable strength and inextinguishable fire which animate this exalted work, and secure for all time that shall take cognizance of English poetry an honoured place in its highest annals for the memory of Chapman.

(A. C. S.)

Chapman's works include:—Σκιά νυκτός: *The Shadow of Night: Containing two Poeticall Hymnes* ... (1594), the second of which deals with Sir Francis Vere's campaign in the Netherlands; *Ovid's Banquet of Sence. A Coronet for his Mistresse Philosophie; and His Amorous Zodiacke with a translation of a Latine coppie, written by a Fryer, Anno Dom. 1400* (1595,

2nd ed. 1639), a collection of poems frequently quoted from in *England's Parnassus* (1600); "De Guiana, carmen epicum," a poem prefixed to Lawrence Keymis's *A Relation of the second voyage to Guiana* (1596); *Hero and Leander. Begun by Christopher Marloe; and finished by George Chapman* (1598); *The Blinde begger of Alexandria, most pleasantly discoursing his variable humours ...* (acted 1596, printed 1598), a popular comedy; *A Pleasant Comedy entituled An Humerous dayes Myrth* (identified by Mr Fleay with the "Comodey of Umero" noted by Henslowe on the 11th of May 1597; printed 1599); *Al Fooles, A Comedy* (paid for by Henslowe on the 2nd of July 1599, its original name being "The World runs on wheels"; printed 1605); *The Gentleman Usher* (c. 1601, pr. 1606), a comedy; *Monsieur d'Olive* (1604, pr. 1606), one of his most amusing and successful comedies; *Eastward Hoe* (1605), written in conjunction with Ben Jonson and John Marston, an excellent comedy of city life; *Bussy d'Ambois,*[1] *A Tragedie* (1604, pr. 1607, 1608, 1616, 1641, &c.), the scene of which is laid in the court of Henry III.; *The Revenge of Bussy d'Ambois. A Tragedie* (pr. 1613, but probably written much earlier); *The Conspiracie, And Tragedie of Charles Duke of Byron. Marshall of France, ... in two plays* (1607 and 1608; pr. 1608 and 1625); *May-Day, A witty Comedie* (pr. 1611; but probably acted as early as 1601); *The widdowes Teares. A Comedie* (pr. 1612; produced perhaps as early as 1605); *Caesar and Pompey: A Roman Tragedy, declaring their warres. Out of whose events is evicted this Proposition. Only a just man is a freeman* (pr. 1631), written, says Chapman in the dedication, "long since," but never staged.

The Tragedy of Alphonsus Emperour of Germany (see the edition by Dr Karl Elye; Leipzig, 1867) and *Revenge for Honour* (1654)[2] both bear Chapman's name on the title-page, but his authorship has been disputed. In *The Ball* (lic. 1632; pr. 1639), a comedy, and *The Tragedie of Chabot Admirall of France* (lic. 1635; pr. 1639) he collaborated with James Shirley. *The memorable Masque of the two Honourable Houses or Inns of Court;*

the Middle Temple and Lyncoln's Inne, was performed at court in 1613 in honour of the marriage of the Princess Elizabeth.

The Whole Works of Homer: Prince of Poets. In his Iliads and Odysseys ... appeared in 1616, and about 1624 he added *The Crowne of all Homers works Batrachomyomachia or the Battaile of Frogs and Mise. His Hymns and Epigrams.* But the whole works had been already published by instalments. *Seaven Bookes of the Iliades of Homer* had appeared in 1598, *Achilles Shield* in the same year, books i.-xii. about 1609; in 1611 *The Iliads of Homer, Prince of Poets* ...; and in 1614 *Twenty-four Bookes of Homer's Odisses* were entered at Stationers' Hall. In 1609 he addressed to Prince Henry *Enthymiae Raptus; or the Teares of Peace*, and on the death of his patron he contributed *An Epicede, or Funerall Song* (1612). A paraphrase of *Petrarchs Seven Penitentiall Psalms* (1612), a poem in honour of the marriage of Robert Carr, earl of Somerset, and Frances, the divorced countess of Essex, indiscreetly entitled *Andromeda Liberata* ... (1614), a translation of *The Georgicks of Hesiod* (1618), *Pro Vere Autumni Lachrymae* (1622), in honour of Sir Horatio Vere, *A justification of a Strange Action of Nero ... also ... the fifth Satyre of Juvenall* (1629), and *Eugenia* ... (1614), an elegy on Sir William Russell, complete the list of his separately published works.

Chapman's *Homer* was edited in 1857 by the Rev. Richard Hooper; and a reprint of his dramatic works appeared in 1873. The standard edition of Chapman is the *Works*, edited by R.H. Shepherd (1874-1875), the third volume of which contains an "Essay on the Poetical and Dramatic works of George Chapman," by Mr Swinburne, printed separately in 1875. The selection of his plays (1895) for the Mermaid Series is edited by Mr W.L. Phelps. For the sources of the plays see Emil Koeppel, "Anellen Studien zu den Dramen George Chapman's, Philip Massinger's und John Ford's" in *Quellen und Forschungen zur Sprach und Kulturgeschichte* (vol. 82,

Strassburg, 1897). The suggestion of W. Minto (see *Characteristics of the English Poets*, 1885) that Chapman was the "rival poet" of Shakespeare's sonnets is amplified in Mr A. Acheson's *Shakespeare and the Rival Poet* (1903). Much satire in Chapman's introduction is there applied to Shakespeare. For other criticisms of his translation of Homer see Matthew Arnold, *Lectures on translating Homer* (1861), and Dr A. Lohff, *George Chapman's Ilias-Übersetzung* (Berlin, 1903). (M. Br.)

---

1 Chapman's source in this piece remains undetermined. It cannot be the *Historia sui temporis* of Jacques de Thorn, for the 4th volume of his work, which relates the story, was not published until 1609 (see Koeppel, p. 14).

2 This play appears to have been issued in 1653 with the title *The Parracide, or Revenge for Honour* as the work of Henry Glathorne.

CHAPMAN (from O. Eng. *céap*, and Mid. Eng. *cheap*, to barter, cf. "Cheapside" in London, and Ger. *Kaufmann*), one who buys or sells, a trader or dealer, especially an itinerant pedlar. The word "chap," now a slang term, meant originally a customer.

CHAPONE, HESTER (1727-1801), English essayist, daughter of Thomas Mulso, a country gentleman, was born at Twywell,

Northamptonshire, on the 27th of October 1727. She was a precocious child, and at the age of nine wrote a romance entitled *The Loves of Amoret and Melissa*. Hecky Mulso, as she was familiarly called, developed a beautiful voice, which earned her the name of "the linnet." While on a visit to Canterbury she made the acquaintance of the learned Mrs Elizabeth Carter, and soon became one of the admirers of the novelist Samuel Richardson. She was one of the little court of women who gathered at North End, Fulham; and in Miss Susannah Highmore's sketch of the novelist reading *Sir Charles Grandison* to his friends Miss Mulso is the central figure. She corresponded with Richardson on "filial obedience" in letters as long as his own, signing herself his "ever obliged and affectionate child." She admired, however, with discrimination, and in the words of her biographer (*Posthumous Works*, 1807, p. 9) "her letters show with what dignity, tempered with proper humility, she could maintain her own well-grounded opinion." In 1760 Miss Mulso, with her father's reluctant consent, married the attorney, John Chapone, who had been befriended by Richardson. Her husband died within a year of her marriage. Mrs Chapone remained in London visiting various friends. She had already made small contributions to various periodicals when she published, in 1772, her best known work, *Letters on the Improvement of the Mind.* This book brought her numerous requests from distinguished persons to undertake the education of their children. She died on the 25th of December 1801.

See *The Posthumous Works of Mrs Chapone, containing her correspondence with Mr Richardson; a series of letters to Mrs Elizabeth Carter ... together with an account of her life and character drawn up by her own family* (1807).

CHAPPE, CLAUDE (1763-1805), French engineer, was born at Brûlon (Sarthe) in 1763. He was the inventor of an optical telegraph which was widely used in France until it was superseded by the electric telegraph. His device consisted of an upright post, on the top of which was fastened a transverse bar, while at the ends of the latter two smaller arms moved on pivots. The position of these bars represented words or letters; and by means of machines placed at intervals such that each was distinctly visible from the next, messages could be conveyed through 50 leagues in a quarter of an hour. The machine was adopted by the Legislative Assembly in 1792, and in the following year Chappe was appointed *ingénieur-télégraphe*; but the originality of his invention was so much questioned that he was seized with melancholia and (it is said) committed suicide at Paris in 1805.

His elder brother, Ignace Urbain Jean Chappe (1760-1829), took part in the invention of the telegraph, and with a younger brother, Pierre François, from 1805 to 1823 was administrator of the telegraphs, a post which was also held by two other brothers, René and Abraham, from 1823 to 1830. Ignace was the author of a *Histoire de la télégraphie* (1824). An uncle, Jean Chappe d'Auteroche (1728-1769), was an astronomer who observed two transits of Venus, one in Siberia in 1761, and the other in 1769 in California, where he died.

CHAPPELL, WILLIAM (1809-1888), English writer on music, a member of the London musical firm of Chappell & Co., was born on the 20th of November 1809, eldest son of Samuel Chappell (d. 1834), who founded the business. William Chappell is particularly noteworthy for his

starting the Musical Antiquarian Society in 1840, and his publication of the standard work *Popular Music of the Olden Time* (1855-1859)—an expansion of a collection of "national English airs" made by him in 1838-1840. The modern revival of interest in English folk-songs owes much to this work, which has since been re-edited by Professor H.E. Wooldridge (1893). W. Chappell died on the 20th of August 1888. His brother, Thomas Patey Chappell (d. 1902), meanwhile had largely extended the publishing business, and had started (1859) the Monday and Saturday Popular Concerts at St James's Hall, which were successfully managed by a younger brother, S. Arthur Chappell, till they came to an end towards the close of the century.

CHAPRA, or CHUPRA, a town of British India, the administrative headquarters of Saran district in Bengal, near the left bank of the river Gogra, just above its confluence with the Ganges; with a railway station on the Bengal & North-Western line towards Oudh. Pop. (1901) 45,901, showing a decrease of 21% in the decade. There are a government high school, a German Lutheran mission, and a public library endowed by a former maharaja of Hatwa. Chapra is the centre of trade in indigo and saltpetre, and conducts a large business by water as well as by rail.

CHAPTAL, JEAN ANTOINE CLAUDE, COMTE DE CHANTE-LOUP (1756-1832), French chemist and statesman, was born at Nogaret, Lozère, on the 4th of June 1756. The son of an apothecary, he studied chemistry at Montpellier, obtaining his doctor's diploma in 1777, when he repaired to Paris. In 1781 the States of Languedoc founded a chair of chemistry for him at the school of medicine in Montpellier, where he taught the doctrines of Lavoisier. The capital he acquired by the death of a wealthy uncle he employed in the establishment of chemical works for the manufacture of the mineral acids, alum, white-lead, soda and other substances. His labours in the cause of applied science were at length recognized by the French government, which presented him with letters of nobility, and the cordon of the order of Saint Michel. During the Revolution a publication by Chaptal, entitled *Dialogue entre un Montagnard et un Girondin*, caused him to be arrested; but being speedily set at liberty through the intermission of his friends, he undertook, in 1793, the management of the saltpetre works at Grenelle. In the following year he went to Montpellier, where he remained till 1797, when he returned to Paris. After the *coup d'état* of the 18th of Brumaire (November 9, 1799) he was made a councillor of state by the First Consul, and succeeded Lucien Bonaparte as minister of the interior, in which capacity he established a chemical manufactory near Paris, a school of arts, and a society of industries; he also reorganized the hospitals, introduced the metrical system of weights and measures, and otherwise greatly encouraged the arts and sciences. A misunderstanding between him and Napoleon (who conferred upon him the title of comte de Chanteloup) occasioned Chaptal's retirement from office in 1804; but before the end of that year he was again received into favour by the emperor, who bestowed on him the grand cross of the Legion of Honour, and made him treasurer to the conservative senate. On Napoleon's return from Elba, Chaptal was made director-general of commerce and manufactures and a minister of state. He was obliged after the downfall of the emperor to withdraw into

private life; and his name was removed from the list of the peers of France until 1819. In 1816, however, he was nominated a member of the Academy of Sciences by Louis XVIII. Chaptal was especially a popularizer of science, attempting to apply to industry and agriculture the discoveries of chemistry. In this way he contributed largely to the development of modern industry. He died at Paris on the 30th of July 1832.

His literary works exhibit both vigour and perspicuity of style; he wrote, in addition to various articles, especially in the *Annales de chimie, Élémens de chimie* (3 vols., 1790; new ed., 1796-1803); *Traité du salpètre et des goudrons* (1796); *Tableau des principaux sels terreux* (1798); *Essai sur le perfectionnement des arts chimiques en France* (1800); *Art de faire, de gouverner, et de perfectionner les vins* (1 vol., 1801; new ed., 1819); *Traité théorique et pratique sur la culture de la vigne, &c.*, (2 vols., 1801; new ed., 1811); *Essai sur le blanchiment* (1801); *La Chimie appliquée aux arts* (4 vols., 1806); *Art de la teinture du coton en rouge* (1807); *Art du teinturier et du dégraisseur* (1800); *De l'industrie française* (2 vols., 1819); *Chimie appliquée a l'agriculture* (2 vols., 1823; new ed., 1829).

CHAPTER (a shortened form of *chapiter*, a word still used in architecture for a capital; derived from O. Fr. *chapitre*, Lat. *capitellum*, diminutive of *caput*, head), a principal division or section of a book, and so applied to acts of parliament, as forming "chapters" or divisions of the legislation of a session of parliament. The name "chapter" is given to the permanent body of the canons of a cathedral or collegiate church, presided over, in the English Church, by the dean, and in the Roman communion by

the provost or the dean, and also to the body of the members of a religious order. This may be a "conventual" chapter of the monks of a particular monastery, "provincial" of the members of the order in a province, or "general" of the whole order. This ecclesiastical use of the word arose from the custom of reading a chapter of Scripture, or a head (*capitulum*) of the *regula*, to the assembled canons or monks. The transference from the reading to the assembly itself, and to the members constituting it, was easy, through such phrases as *convenire ad capitulum*. The title "chapter" is similarly used of the assembled body of knights of a military or other order. (See also CANON; CATHEDRAL; DEAN).

CHAPTER-HOUSE (Lat. *capitolium*, Ital. *capitolo*, Fr. *chapitre*, Ger. *Kapitelhaus*), the chamber in which the chapter or heads of the monastic bodies (see ABBEY and CATHEDRAL) assembled to transact business. They are of various forms; some are oblong apartments, as Canterbury, Exeter, Chester, Gloucester, &c.; some octagonal, as Salisbury, Westminster, Wells, Lincoln, York, &c. That at Lincoln has ten sides, and that at Worcester is circular; most are vaulted internally and polygonal externally, and some, as Salisbury, Wells, Lincoln, Worcester, &c., depend on a single slight vaulting shaft for the support of the massive vaulting. They are often provided with a vestibule, as at Westminster, Lincoln, Salisbury and are almost exclusively English.

CHAPU, formerly an important maritime town of China, in the province of Cheh-kiang, 50 m. N.W. of Chên-hai, situated in one of the richest and best cultivated districts in the country. It is the port of Hang-chow, with which it has good canal communication, and it was formerly the only Chinese port trading with Japan. The town has a circuit of about 5 m. exclusive of the suburbs that lie along the beach; and the Tatar quarter is separated from the rest by a wall. It was captured and much injured by the British force in 1842, but was abandoned immediately after the engagement. The sea around it has now silted up, though in the middle of the 19th century it was accessible to the light-draught ships of the British fleet.

CHAR (*Salvelinus*), a fish of the family Salmonidae, represented in Europe, Asia and North America. The best known and most widely distributed species, the one represented in British and Irish lakes, is *S. alpinus*, a graceful and delicious fish, covered with very minute scales and usually dark olive, bluish or purplish black above, with or without round orange or red spots, pinkish white or yellowish pink to scarlet or claret red below. When the char go to sea, they assume a more silvery coloration, similar to that of the salmon and sea trout; the red spots become very indistinct and the lower parts are almost white. The very young are also silvery on the sides and white below, and bear 11 to 15 bars, or parr-marks, on the side. This fish varies much according to localities; and the difference in colour, together with a few points of doubtful constancy, have given rise to the establishment of a great number of untenable so-called species, as

many as seven having been ascribed to the British and Irish fauna, viz. *S. alpinus, nivalis, killinensis, willoughbyi, perisii, colii* and *grayi*, the last from Lough Melvin, Ireland, being the most distinct. *S. alpinus* varies much in size according to the waters it inhabits, remaining dwarfed in some English lakes, and growing to 2 ft. or more in other localities. In other parts of Europe, also, various local forms have been distinguished, such as the "omble chevalier" of the lakes of Switzerland and Savoy (*S. umbla*), the "Säbling" of the lakes of South Germany and Austria (*S. salvelinus*), the "kullmund" of Norway (*S. carbonarius*), &c., while the North American *S. parkei, alipes, stagnalis, arcturus, areolus, oquassa* and *marstoni* may also be regarded as varieties. Taken in this wide sense, *S. alpinus* has a very extensive distribution. In central Europe, in the British islands and in the greater part of Scandinavia it is confined to mountain lakes, but farther to the north, in both the Old World and the New, it lives in the sea and ascends rivers to spawn. In Lapland, Iceland, Greenland and other parts of the arctic regions, it ranks among the commonest fishes. The extreme northern point at which char have been obtained is 82° 34′ N. (Victoria lake and Floeberg Beach, Arctic America). It reaches an altitude of 2600 ft. in the Alps and 6000 ft. in the Carpathians.

The American brook char, *S. fontinalis*, is a close ally of *S. alpinus*, differing from it in having fewer and shorter gill-rakers, a rather stouter body, the back more or less barred or marbled with dark olive or black, and the dorsal and caudal fins mottled or barred with black. Many local varieties of colour have been distinguished. Sea-run individuals are often nearly plain bright silvery. It is a small species, growing to about 18 in. abundant in all clear, cold streams of North America, east of the Mississippi, northward to Labrador. The fish has been introduced into other parts of the United States, and also into Europe.

Another member of the same section of Salmonidae is the Great Lake char of North America, *S. namaycush*, one of the largest salmonids, said to attain a weight of 100 lb The body is very elongate and covered with extremely small scales. The colour varies from grey to black, with numerous round pale spots, which may be tinged with reddish; the dorsal and caudal fins reticulate with darker. This fish inhabits the Great Lakes regions and neighbouring parts of North America.

CHAR-À-BANC (Fr. for "benched carriage"), a large form of wagonette-like vehicle for passengers, but with benched seats arranged in rows, looking forward, commonly used for large parties, whether as public conveyances or for excursions.

CHARACTER (Gr. χαρακτήρ from χαράττειν, to scratch), a distinctive mark (spelt "caracter" up to the 16th century, with other variants); so applied to symbols of notation or letters of the alphabet; more figuratively, the distinguishing traits of anything, and particularly the moral and mental qualities of an individual human being, the sum of those qualities which distinguish him as a personality. From the latter usage "a character" becomes almost identical with "reputation"; and in the sense of "giving a servant a character," the word involves a written testimonial. For

the law relating to servants' characters see MASTER AND SERVANT. A further development is the use of "character" to mean an "odd or eccentric person"; or of a "character actor," to mean an actor who plays a highly-coloured strange part. The word is also used as the name of a form of literature, consisting of short descriptions of types of character. Well-known examples of such "characters" are those of Theophrastus and La Bruyère, and in English, of Joseph Hall (1574-1656) and Sir Thomas Overbury.

CHARADE, a kind of riddle, probably invented in France during the 18th century, in which a word of two or more syllables is divined by guessing and combining into one word (the answer) the different syllables, each of which is described, as an independent word, by the giver of the charade. Charades may be either in prose or verse. Of poetic charades those by W. Mackworth Praed are well known and excellent examples, while the following specimens in prose may suffice as illustrations. "My *first*, with the most rooted antipathy to a Frenchman, prides himself, whenever they meet, upon sticking close to his jacket; my *second* has many virtues, nor is its least that it gives its name to my first; my *whole* may I never catch!" "My *first* is company; my *second* shuns company; my *third* collects company; and my *whole* amuses company." The solutions are *Tar-tar* and *Co-nun-drum*. The most popular form of this amusement is the acted charade, in which the meaning of the different syllables is acted out on the stage, the audience being left to guess each syllable and thus, combining the meaning of all the syllables, the whole word. A brilliant example of the acted charade is described in Thackeray's *Vanity Fair*.

CHARCOAL, the blackish residue consisting of impure carbon obtained by removing the volatile constituents of animal and vegetable substances; wood gives origin to wood-charcoal; sugar to sugar-charcoal; bone to bone-charcoal (which, however, mainly consists of calcium phosphate); while coal gives "coke" and "gas-carbon." The first part of the word charcoal is of obscure origin. The independent use of "char," meaning to scorch, to reduce to carbon, is comparatively recent, and must have been taken from "charcoal," which is quite early. The *New English Dictionary* gives as the earliest instance of "char" a quotation dated 1679. Similarly the word "chark" or "chak," meaning the same as "char," is also late, and is probably due to a wrong division of the word "charcoal," or, as it was often spelled in the 16th and 17th centuries, "charkole" and "charke-coal." No suggestions for an origin of "char" are satisfactory. It may be a use of the word "chare," which appears in "char-woman," the American "chore"; in all these words it means "turn," a turn of work, a job, and "charcoal" would have to mean "turned coal," *i.e.* wood changed or turned to coal, a somewhat forced derivation, for which there is no authority. Another suggestion is that it is connected with "chirk" or "chark," an old word meaning "to make a grating noise."

Wood-charcoal.—In districts where there is an abundance of wood, as in the forests of France, Austria and Sweden, the operation of charcoal-burning is of the crudest description. The method, which dates back to a very remote period, generally consists in piling billets of wood on their ends so as to form a conical pile, openings being left at the bottom to admit air, with a central shaft to serve as a flue. The whole is covered with turf of

moistened soil. The firing is begun at the bottom of the flue, and gradually spreads outwards and upwards. The success of the operation—both as to the intrinsic value of the product and its amount—depends upon the rate of the combustion. Under average conditions, 100 parts of wood yield about 60 parts by volume, or 25 parts by weight, of charcoal. The modern process of carbonizing wood—either in small pieces or as sawdust—in cast iron retorts is extensively practised where wood is scarce, and also by reason of the recovery of valuable by-products (wood spirit, pyroligneous acid, wood-tar), which the process permits. The question of the temperature of the carbonization is important; according to J. Percy, wood becomes brown at 220° C., a deep brown-black after some time at 280°, and an easily powdered mass at 310°. Charcoal made at 300° is brown, soft and friable, and readily inflames at 380°; made at higher temperatures it is hard and brittle, and does not fire until heated to about 700°. One of the most important applications of wood-charcoal is as a constituent of gunpowder (*q.v.*). It is also used in metallurgical operations as a reducing agent, but its application has been diminished by the introduction of coke, anthracite smalls, &c. A limited quantity is made up into the form of drawing crayons; but the greatest amount is used as a fuel.

The porosity of wood-charcoal explains why it floats on the surface of water, although it is actually denser, its specific gravity being about 1.5. The porosity also explains the property of absorbing gases and vapours; at ordinary temperatures ammonia and cyanogen are most readily taken up; and Sir James Dewar has utilized this property for the preparation of high vacua at low temperatures. This character is commercially applied in the use of wood-charcoal as a disinfectant. The fetid gases produced by the putrefaction and waste of organic matter enter into the pores of the charcoal, and there meet with the oxygen previously absorbed from the atmosphere; oxidation ensues, and the noxious effluvia are decomposed. Generally, however, the action is a purely mechanical one, the gases being

only absorbed. Its pharmacological action depends on the same property; it absorbs the gases of the stomach and intestines (hence its use in cases of flatulence), and also liquids and solids. Wood-charcoal has also the power of removing colouring matters from solutions, but this property is possessed in a much higher degree by animal-charcoal.

Animal-charcoal or *bone black* is the carbonaceous residue obtained by the dry distillation of bones; it contains only about 10% of carbon, the remainder being calcium and magnesium phosphates (80%) and other inorganic material originally present in the bones. It is generally manufactured from the residues obtained in the glue (*q.v.*) and gelatin (*q.v.*) industries. Its decolorizing power was applied in 1812 by Derosne to the clarification of the syrups obtained in sugar-refining; but its use in this direction has now greatly diminished, owing to the introduction of more active and easily managed reagents. It is still used to some extent in laboratory practice. The decolorizing power is not permanent, becoming lost after using for some time; it may be revived, however, by washing and reheating.

Lampblack or *soot* is the familiar product of the incomplete combustion of oils, pitch, resins, tallow, &c. It is generally prepared by burning pitch residues (see COAL-TAR) and condensing the product. Thus obtained it is always oily, and, before using as a pigment, it must be purified by ignition in closed crucibles (see CARBON).

CHARCOT, JEAN MARTIN (1825-1893), French physician, was born in Paris on the 29th of November 1825. In 1853 he graduated as M.D. of Paris University, and three years later was appointed physician of the Central Hospital Bureau. In 1860 he became professor of pathological anatomy in the medical faculty of Paris, and in 1862 began that famous connexion with the Salpêtrière which lasted to the end of his life. He was elected to the Academy of Medicine in 1873, and ten years afterwards became a member of the Institute. His death occurred suddenly on the 16th of August 1893 at Morvan, where he had gone for a holiday. Charcot, who was a good linguist and well acquainted with the literature of his own as well as of other countries, excelled as a clinical observer and a pathologist. His work at the Salpêtrière exerted a great influence on the development of the science of neurology, and his classical *Leçons sur les maladies du système nerveux*, the first series of which was published in 1873, represents an enormous advance in the knowledge and discrimination of nervous diseases. He also devoted much attention to the study of obscure morbid conditions like hysteria, especially in relation to hypnotism (*q.v.*); indeed, it is in connexion with his investigation into the phenomena and results of the latter that his name is popularly known. In addition to his labours on neurological and even physiological problems he made many contributions to other branches of medicine, his published works dealing, among other topics, with liver and kidney diseases, gout and pulmonary phthisis. As a teacher he was remarkably successful, and always commanded an enthusiastic band of followers.

CHARD, JOHN ROUSE MERRIOTT (1847-1897), British soldier, was born at Boxhill, near Plymouth, on the 21st of December 1847, and in 1868 entered the Royal Engineers. In 1878 Lieutenant Chard was ordered to South Africa to take part in the Zulu War, and was stationed at the small post of Rorke's Drift to protect the bridges across the Buffalo river, and some sick men and stores. Here, with Lieutenant Gonville Bromhead (1856-1891) and eighty men of the 2nd 24th Foot, he heard, on the 22nd of January 1879, of the disaster of Isandhlwana from some fugitives who had escaped the slaughter. Believing that the victorious Zulus would attempt to cross into Natal, they prepared, hastily, to hold the Drift until help should come. They barricaded and loopholed the old church and hospital, and improvised defences from wagons, mealie sacks and bags of Indian corn. Early in the afternoon they were attacked by more than 3000 Zulus, who, after hours of desperate hand-to-hand fighting, carried the outer defences, an inner low wall of biscuit boxes, and the hospital, room by room. The garrison then retired to the stone kraal, and repulsed attack after attack through the night. The next morning relieving forces appeared, and the enemy retired. The spirited defence of Rorke's Drift saved Natal from a Zulu invasion, and Chard's and Bromhead's gallantry was rewarded with the V.C. and immediate promotion to the rank of captain and brevet-major. On Chard's return to England he became a popular hero. From 1893-1896 he commanded the Royal Engineers at Singapore, and was made a colonel in 1897. He died the same year at Hatch-Beauchamp, near Taunton, on the 1st of November.

CHARD, a market town and municipal borough in the Southern parliamentary division of Somersetshire, England, 142½ m. W. by S. of London by the London & South Western railway. Pop. (1901) 4437. It stands on high ground within 1 m. of the Devonshire border. Its cruciform parish church of St Mary the Virgin is Perpendicular of the 15th century. A fine east window is preserved. The manufactures include linen, lace, woollens, brassware and ironware. Chard is governed by a mayor, 4 aldermen and 12 councillors. Area, 444 acres.

Chard (*Cerdre*, *Cherdre*, *Cherde*) was commercial in origin, being a trade centre near the Roman road to the west. There are two Roman villas in the parish. There was a British camp at Neroche in the neighbourhood. The bishop of Bath held Chard in 1086, and his successor granted in 1234 the first charter which made Chard a free borough, each burgage paying a rent of 12d. Trade in hides was forbidden to non-burgesses. This charter was confirmed in 1253, 1280 and 1285. Chard is said to have been incorporated by Elizabeth, as the corporation seal dates from 1570, but no Elizabethan charter can be found. It was incorporated by grant of Charles I. in 1642, and Charles II. gave a charter in 1683. Chard was a mesne borough, the first overlord being Bishop Joceline, whose successors held it (with a brief interval from 1545 to 1552) until 1801, when it was sold to Earl Poulett. Parliamentary representation began in 1312, and was lost in 1328. A market on Monday and fair on the 25th of July were granted in 1253, and confirmed in 1642 and 1683, when two more fair days were added (November 2 and May 3), the market being changed to Tuesday. The market day is now Monday, fairs being held on the first Wednesday in May, August and November, for corn and cattle only, their medieval importance as centres of the cloth trade having departed.

CHARDIN, JEAN SIMÉON (1699-1779), French *genre* painter, was born in Paris, and studied under Pierre Jacques Cazes (1676-1754), the historical painter, and Noël Nicolas Coypel. He became famous for his still-life pictures and domestic interiors, which are well represented at the Louvre, and for figure-painting, as in his *Le Bénédicité* (1740).

CHARDIN, SIR JOHN (1643-1713), French traveller, was born at Paris in 1643. His father, a wealthy jeweller, gave him an excellent education, and trained him in his own art; but instead of settling down in the ordinary routine of the craft, he set out in company with a Lyons merchant named Raisin in 1665 for Persia and India, partly on business and partly to gratify his own inclination. After a highly successful journey, during which he had received the patronage of Shah Abbas II. of Persia, he returned to France in 1670, and there published in the following year *Récit du Couronnement du roi de Perse Soliman III*. Finding, however, that his Protestant profession cut him off from all hope of honours or advancement in his native country, he set out again for Persia in August 1671. This second journey was much more adventurous than the first, as instead of going directly to his destination, he passed by Smyrna, Constantinople, the Crimea, Caucasia, Mingrelia and Georgia, and did not reach Ispahan till June 1673. After four years spent in researches throughout Persia, he again visited India, and returned to Europe by the Cape of Good Hope in 1677. The persecution of Protestants in France led him, in 1681, to settle in London, where he was appointed jeweller to the court, and received from Charles II. the honour of knighthood. In 1683 he was sent to Holland as representative of the English

East India Company; and in 1686 he published the first part of his great narrative—*The Travels of Sir John Chardin into Persia and the East Indies, &c.* (London). Sir John died in London in 1713, and was buried in Westminster Abbey, where his monument bears the inscription *Nomen sibi fecit eundo*.

It was not till 1711 that the complete account of Chardin's travels appeared, under the title of *Journal du voyage du chevalier Chardin*, at Amsterdam. The Persian portion is to be found in vol. ii. of Harris's *Collection*, and extracts are reprinted by Pinkerton in vol. ix. The best complete reprint is by Langlès (Paris, 1811). Sir John Chardin's narrative has received the highest praise from the most competent authorities for its fulness, comprehensiveness and fidelity; and it furnished Montesquieu, Rousseau, Gibbon and Helvétius with most important material.

CHARENTE, an inland department of south-western France, comprehending the ancient province of Angoumois, and inconsiderable portions of Saintonge, Poitou, Marche, Limousin and Périgord. It is bounded N. by the departments of Deux-Sèvres and Vienne, E. by those of Vienne and Dordogne, S. by Dordogne and W. by Charente-Inférieure. Area 2305 sq. m. Pop. (1906) 351,733. The department, though it contains no high altitudes, is for the most part of a hilly nature. The highest points, many of which exceed 1000 ft., are found in the Confolentais, the granite region of the extreme north-east, known also as the Terres Froides. In the Terres Chaudes, under which name the remainder of the department is included, the levels vary in general between 300 and 650 ft., except in the

western plains—the Pays-Bas and Champagne—where they range from 40 to 300 ft. A large part of Charente is thickly wooded, the principal forests lying in its northern districts. The department, as its name indicates, belongs mainly to the basin of the river Charente (area of basin 3860 sq. m.; length of river 225 m.), the chief affluents of which, within its borders, are the Tardoire, the Touvre and the Né. The Confolentais is watered by the Vienne, a tributary of the Loire, while the arrondissement of Barbexieux in the south-west belongs almost wholly to the basin of the Gironde.

The climate is temperate but moist, the rainfall being highest in the north-east. Agriculturally, Charente is prosperous. More than half its surface is arable land, on the greater part of which cereals are grown. The potato is an important crop. The vine is predominant in the region of Champagne, the wine produced being chiefly distilled into the famous brandy to which the town of Cognac gives its name. The best pasture is found in the Confolentais, where horned cattle are largely reared. The chief fruits are chestnuts, walnuts and cider-apples. The poultry raised in the neighbourhood of Barbezieux is highly esteemed. Charente has numerous stone quarries, and there are peat workings and beds of clay which supply brick and tile-works and earthenware manufactories. Among the other industries, paper-making, which has its chief centre at Angoulême, is foremost. The most important metallurgical establishment is the large foundry of naval guns at Ruelle. Flour-mills and leather-works are numerous. There are also many minor industries subsidiary to paper-making and brandy-distilling, and Angoulême manufactures gunpowder and confectionery. Coal, salt and timber are prominent imports. Exports include paper, brandy, stone and agricultural products. The department is served chiefly by the Orlêans and Ouest-État railways, and the Charente is navigable below Angoulême. Charente is divided into the five arrondissements of Angoulême, Cognac, Ruffec, Barbezieux and Confolens (29 cantons, 426 communes). It belongs to the region of the XII. army

corps, to the province of the archbishop of Bordeaux, and to the académie (educational division) of Poitiers. Its court of appeal is at Bordeaux.

Angoulême (the capital), Cognac, Confolens, Jarnac and La Rochefoucauld (*q.v.*) are the more noteworthy places in the department. Barbezieux and Ruffec, capitals of arrondissements and agricultural centres, are otherwise of little importance. The department abounds in churches of Romanesque architecture, of which those of Bassac, St Amant-de-Boixe (portions of which are Gothic in style), Plassac and Gensac-la-Pallue may be mentioned. There are remains of a Gothic abbey church at La Couronne, and Roman remains at St Cybardeaux, Brossac and Chassenon (where there are ruins of the Gallo-Roman town of Cassinomagus).

CHARENTE-INFÉRIEURE, a maritime department of south-western France, comprehending the old provinces of Saintonge and Aunis, and a small portion of Poitou, and including the islands of Ré, Oléron, Aix and Madame. Area, 2791 sq.m. Pop. (1906) 453,793. It is bounded N. by Vendée, N.E. by Deux-Sèvres, E. by Charente, S.E. by Dordogne, S.W. by Gironde and the estuary of the Gironde, and W. by the Bay of Biscay. Plains and low hills occupy the interior; the coast is flat and marshy, as are the islands (Ré, Aix, Oléron) which lie opposite to it. The department takes its name from the river Charente, which traverses it during the last 61 m. of its course and drains the central region. Its chief tributaries are on the right the Boutonne, on the left the Seugne. The climate is temperate and, except along the coast, healthy. There are several sheltered bays on the coast, and several good harbours, the chief of which are La Rochelle, Rochefort and

Tonnay-Charente, the two latter some distance up the Charente. Royan on the north shore of the Gironde is an important watering-place much frequented for its bathing.

The majority of the inhabitants of Charente-Inférieure live by agriculture. The chief products of the arable land are wheat, oats, maize, barley and the potato. Horse and cattle-raising is carried on and dairying is prosperous. A considerable quantity of wine, most of which is distilled into brandy, is produced. The department has a few peat-workings, and produces freestone, lime and cement; the salt-marshes of the coast are important sources of mineral wealth. Glass, pottery, bricks and earthenware are prominent industrial products. Ship-building, brandy-distilling, iron-founding and machine construction are also carried on. Oysters and mussels are bred in the neighbourhood of La Rochelle and Marennes, and there are numerous fishing ports along the coast.

The railways traversing the department belong to the Ouest-État system, except one section of the Paris-Bordeaux line belonging to the Orléans Company. The facilities of the department for internal communication are greatly increased by the number of navigable streams which water it. The Charente, the Sèvre Niortaise, the Boutonne, the Seudre and the Gironde furnish 142 m. of navigable waterway, to which must be added the 56 m. covered by the canals of the coast. There are 6 arrondissements (40 cantons, 481 communes), cognominal with the towns of La Rochelle, Rochefort, Marennes, Saintes, Jonzac and St Jean d'Angély—La Rochelle being the chief town of the department. The department forms the diocese of La Rochelle, and is attached to the 18th military region, and in educational matters to the académie of Poitiers. Its court of appeal is at Poitiers.

La Rochelle, St Jean d'Angély, Rochefort and Saintes (*q.v.*) are the principal towns. Surgères and Aulnay possess fine specimens of the

numerous Romanesque churches. Pons has a graceful château of the 15th and 16th centuries, beside which there rises a fine keep of the 12th century.

CHARENTON-LE-PONT, a town of northern France in the department of Seine, situated on the right bank of the Marne, at its confluence with the Seine, 1 m. S.E. of the fortifications of Paris, of which it is a suburb. Pop. (1906) 18,034. It derives the distinctive part of its name from the stone bridge of ten arches which crosses the Marne and unites the town with Alfortville, well known for its veterinary school founded in 1766. It has always been regarded as a point of great importance for the defence of the capital, and has frequently been the scene of sanguinary conflicts. The fort of Charenton on the left bank of the Marne is one of the older forts of the Paris defence. In the 16th and 17th centuries Charenton was the scene of the ecclesiastical councils of the Protestant party, which had its principal church in the town. At St Maurice adjoining Charenton is the famous Hospice de Charenton, a lunatic asylum, the foundation of which dates from 1641. Till the time of the Revolution it was used as a general hospital, and even as a prison, but from 1802 onwards it was specially appropriated to the treatment of lunacy. St Maurice has two other national establishments, one for the victims of accidents in Paris (*asile national Vacassy*), the other for convalescent working-men (*asile national de Vincennes*). Charenton has a port on the Canal de St Maurice, beside the Marne, and carries on boat-building and the manufacture of tiles and porcelain.

CHARES, Athenian general, is first heard of in 366 B.C. as assisting the Phliasians, who had been attacked by Argos and Sicyon. In 361 he visited Corcyra, where he helped the oligarchs to expel the democrats, a policy which led to the subsequent defection of the island from Athens. In 357, Chares was appointed to the command in the Social War, together with Chabrias, after whose death before Chios he was associated with Iphicrates and Timotheus (for the naval battle in the Hellespont, see TIMOTHEUS). Chares, having successfully thrown the blame for the defeat on his colleagues, was left sole commander, but receiving no supplies from Athens, took upon himself to join the revolted satrap Artabazus. A complaint from the Persian king, who threatened to send three hundred ships to the assistance of the confederates, led to the conclusion of peace (355) between Athens and her revolted allies, and the recall of Chares. In 349, he was sent to the assistance of Olynthus (*q.v.*) against Philip II. of Macedon, but returned without having effected anything; in the following year, when he reached Olynthus, he found it already in the hands of Philip. In 340 he was appointed to the command of a force sent to aid Byzantium against Philip, but the inhabitants, remembering his former plunderings and extortions, refused to receive him. In 338 he was defeated by Philip at Amphissa, and was one of the commanders at the disastrous battle of Chaeroneia. Lysicles, one of his colleagues, was condemned to death, while Chares does not seem to have been even accused. After the conquest of Thebes by Alexander (335), Chares is said to have been one of the Athenian orators and generals whose surrender was demanded. Two years later he was living at Sigeum, for Arrian (*Anabasis* i. 12) states that he went from there to pay his respects to Alexander. In 332 he entered the service of Darius and took over the command of a Persian force in Mytilene, but capitulated on the approach of a Macedonian fleet on condition of being allowed to retire unmolested. He is last heard of at Taenarum, and is supposed to have died at Sigeum. Although boastful and vain-glorious,

Chares was not lacking in personal courage, and was among the best Athenian generals of his time. At the best, however, he was “hardly more than an ordinary leader of mercenaries” (A. Holm). He openly boasted of his profligacy, was exceedingly avaricious, and his bad faith became proverbial.

Diod. Sic. xv. 75, 95, xvi. 7, 21, 22, 85-88; Plutarch, *Phocion*, 14; Theopompus, *ap.* Athenaeum, xii. p. 532; A. Schäfer, *Demosthenes und seine Zeit* (1885); A. Holm, *History of Greece* (Eng. trans., 1896), vol. iii.

CHARES, of Lindus in Rhodes, a noted sculptor, who fashioned for the Rhodians a colossal bronze statue of the sun-god, the cost of which was defrayed by selling the warlike engines left behind by Demetrius Poliorcetes, when he abandoned the siege of the city in 303 B.C. (Pliny, *Nat. Hist.* xxxiv. 41). The colossus was seventy cubits (105 ft.) in height; and its fingers were larger than many statues. The notion that the legs were planted apart, so that ships could sail between them, is absurd. The statue was thrown down by an earthquake after 56 years; but the remains lay for ages on the spot.

CHARES, of Mytilene, a Greek belonging to the suite of Alexander the Great. He was appointed court-marshal or introducer of strangers to the king, an office borrowed from the Persian court. He wrote a history of Alexander in ten books, dealing mainly with the private life of the king. The fragments are chiefly preserved in Athenaeus.

See *Scriptores Rerum Alexandri* (pp. 114-120) in the Didot edition of Arrian.

CHARGE (through the Fr. from the Late Lat. *carricare*, to load in a *carrus* or wagon; cf. "cargo"), a load; from this, its primary meaning, also seen in the word "charger," a large dish, come the uses of the word for the powder and shot to load a firearm, the accumulation of electricity in a battery, the necessary quantity of dynamite or other explosive in blasting, and a device borne on an escutcheon in heraldry. "Charge" can thus mean a burden, and so a care or duty laid upon one, as in "to be in charge" of another. With a transference to that which lays such a duty on another, "charge" is used of the instructions given by a judge to a jury, or by a bishop to the clergy of his diocese. In the special sense of a pecuniary burden the word is used of the price of goods, of an encumbrance on property, and of the expenses of running a business. Further uses of the word are of the violent, rushing attack of cavalry, or of a bull or elephant, or football player; hence "charger" is a horse ridden in a charge, or more loosely a horse ridden by an officer, whether of infantry or cavalry.

CHARGÉ D'AFFAIRES (Fr. for "in charge of business"), the title of two classes of diplomatic agents, (1) *Chargés d'affaires* (*ministres chargés d'affaires*), who were placed by the *règlement* of the congress of Vienna in the 4th class of diplomatic agents, are heads of permanent missions accredited to countries to which, for some reason, it is not possible or not desirable to send agents of a higher rank. They are distinguished from these latter by the fact that their credentials are addressed by the minister for foreign affairs of the state which they are to represent to the minister for foreign affairs of the receiving state. Though still occasionally accredited, ministers of this class are now rare. They have precedence over the other class of *chargés d'affaires*. (2) *Chargés d'affaires per interim*, or *chargés des affaires*, are those who are presented as such, either verbally or in writing, by heads of missions of the first, second or third rank to the minister for foreign affairs of the state to which they are accredited, when they leave their post temporarily, or pending the arrival of their successor. It is usual to appoint a counsellor or secretary of legation *chargé d'affaires*. Some governments are accustomed to give the title of minister to such *chargés d'affaires*, which ranks them with the other heads of legation. Essentially *chargés d'affaires* do not differ from ambassadors, envoys or ministers resident. They represent their nation, and enjoy the same privileges and immunities as other diplomatic agents (see DIPLOMACY).

CHARGING ORDER, in English law, an order obtained from a court or judge by a judgment creditor under the Judgment Acts 1838 and 1840, by which the property of the judgment debtor in any stocks or funds stands

charged with the payment of the amount for which judgment shall have been recovered, with interest. A charging order can only be obtained in respect of an ascertained sum, but this would include a sum ordered to be paid at a future date. An order can be made on stock standing in the name of a trustee in trust for the judgment debtor, or on cash in court to the credit of the judgment debtor, but not on stock held by a debtor as a trustee. The application for a charging order is usually made by motion to a divisional court, though it may be made to a judge. The effect of the order is not that of a contract to pay the debt, but merely of an instrument of charge on the shares, signed by the debtor. An interval of six months must elapse before any proceedings are taken to enforce the charge, but, it necessary, a stop order on the fund and the dividends payable by the debtor can be obtained by the creditor to protect his interest A solicitor employed to prosecute any suit, matter or proceeding in any court, is entitled, on declaration of the court, to a charge for his costs upon the property recovered or preserved in such suit or proceeding. (See *Rules of the Supreme Court*, o. XLIX.)

CHARIBERT (d. 567), king of the Franks, was the son of Clotaire I. On Clotaire's death in 561 his estates were divided between his sons, Charibert receiving Paris as his capital, together with Rouen, Tours, Poitiers, Limoges, Bordeaux and Toulouse. Besides his wife, Ingoberga, he had unions with Merofleda, a wool-carder's daughter, and Theodogilda, the daughter of a neatherd. He was one of the most dissolute of the Merovingian kings, his early death in 567 being brought on by his excesses.

(C. Pf.)

CHARIDEMUS, of Oreus in Euboea, Greek mercenary leader. About 367 B.C. he fought under the Athenian general Iphicrates against Amphipolis. Being ordered by Iphicrates to take the Amphipolitan hostages to Athens, he allowed them to return to their own people, and joined Cotys, king of Thrace, against Athens. Soon afterwards he fell into the hands of the Athenians and accepted the offer of Timotheus to re-enter their service. Having been dismissed by Timotheus (362) he joined the revolted satraps Memnon and Mentor in Asia, but soon lost their confidence, and was obliged to seek the protection of the Athenians. Finding, however, that he had nothing to fear from the Persians, he again joined Cotys, on whose murder he was appointed guardian to his youthful son Cersobleptes. In 357, on the arrival of Chares with considerable forces, the Chersonese was restored to Athens. The supporters of Charidemus represented this as due to his efforts, and, in spite of the opposition of Demosthenes, he was honoured with a golden crown and the franchise of the city. It was further resolved that his person should be inviolable. In 351 he commanded the Athenian forces in the Chersonese against Philip II. of Macedon, and in 349 he superseded Chares as commander in the Olynthian War. He achieved little success, but made himself detested by his insolence and profligacy, and was in turn replaced by Chares. After Chaeroneia the war party would have entrusted Charidemus[1] with the command against Philip, but the peace party secured the appointment of Phocion. He was one of those whose surrender was demanded by Alexander after the destruction of Thebes, but escaped with banishment. He fled to Darius III., who received him with distinction. But, having expressed his dissatisfaction with the preparations made by the king just before the battle of Issus (333), he was put to death.

See Diod. Sic. xvii. 30; Plutarch, *Phocion*, 16, 17; Arrian, *Anabasis*, i. 10; Quintus Curtius iii. 2; Demosthenes, *Contra Aristocratem*; A. Schäfer, *Demosthenes und seine Zeit* (1885).

---

1 According to some authorities, this is a second Charidemus, the first disappearing from history after being superseded by Chares in the Olynthian war.

CHARING CROSS, the locality about the west end of the Strand and the north end of Whitehall, on the south-east side of Trafalgar Square, London, England. It falls within the bounds of the city of Westminster. Here Edward I. erected the last of the series of crosses to the memory of his queen, Eleanor (d. 1290). It stood near the present entrance to Charing Cross station of the South-Eastern & Chatham railway, in the courtyard of which a fine modern cross has been erected within a few feet of the exact site. A popular derivation of the name connected it with Edward's "dear queen" (*chère reine*), and a village of Cherringe or Charing grew up here later, but the true origin of the name is not known. There is a village of Charing in Kent, and the name is connected by some with that of a Saxon family, Cerring.

*** END OF THE PROJECT GUTENBERG EBOOK ENCYCLOPAEDIA BRITANNICA, 11TH EDITION, "CERARGYRITE" TO "CHARING CROSS" ***

Updated editions will replace the previous one—the old editions will be renamed.

Creating the works from print editions not protected by U.S. copyright law means that no one owns a United States copyright in these works, so the Foundation (and you!) can copy and distribute it in the United States without permission and without paying copyright royalties. Special rules, set forth in the General Terms of Use part of this license, apply to copying and distributing Project Gutenberg™ electronic works to protect the PROJECT GUTENBERG™ concept and trademark. Project Gutenberg is a registered trademark, and may not be used if you charge for an eBook, except by following the terms of the trademark license, including paying royalties for use of the Project Gutenberg trademark. If you do not charge anything for copies of this eBook, complying with the trademark license is very easy. You may use this eBook for nearly any purpose such as creation of derivative works, reports, performances and research. Project Gutenberg eBooks may be modified and printed and given away—you may do practically ANYTHING in the United States with eBooks not protected by U.S. copyright law. Redistribution is subject to the trademark license, especially commercial redistribution.

START: FULL LICENSE

THE FULL PROJECT GUTENBERG™ LICENSE

PLEASE READ THIS BEFORE YOU DISTRIBUTE OR USE THIS WORK

To protect the Project Gutenberg™ mission of promoting the free distribution of electronic works, by using or distributing this work (or any other work associated in any way with the phrase “Project Gutenberg”), you agree to comply with all the terms of the Full Project Gutenberg License available with this file or online at www.gutenberg.org/license.

Section 1. General Terms of Use and Redistributing Project Gutenberg electronic works

1.A. By reading or using any part of this Project Gutenberg electronic work, you indicate that you have read, understand, agree to and accept all the terms of this license and intellectual property (trademark/copyright) agreement. If you do not agree to abide by all the terms of this agreement, you must cease using and return or destroy all copies of Project Gutenberg electronic works in your possession. If you paid a fee for obtaining a copy of or access to a Project Gutenberg electronic work and you do not agree to be bound by the terms of this agreement, you may obtain a refund from the person or entity to whom you paid the fee as set forth in paragraph 1.E.8.

1.B. “Project Gutenberg” is a registered trademark. It may only be used on or associated in any way with an electronic work by people who agree to be bound by the terms of this agreement. There are a few things that you can do with most Project Gutenberg electronic works even without complying with the full terms of this agreement. See paragraph 1.C below. There are a lot of things you can do with Project Gutenberg electronic works if you follow the terms of this agreement and help preserve free future access to Project Gutenberg electronic works. See paragraph 1.E below.

1.C. The Project Gutenberg Literary Archive Foundation (“the Foundation” or PGLAF), owns a compilation copyright in the collection of Project Gutenberg electronic works. Nearly all the individual works in the collection are in the public domain in the United States. If an individual work is unprotected by copyright law in the United States and you are located in the United States, we do not claim a right to prevent you from copying, distributing, performing, displaying or creating derivative works

based on the work as long as all references to Project Gutenberg are removed. Of course, we hope that you will support the Project Gutenberg mission of promoting free access to electronic works by freely sharing Project Gutenberg works in compliance with the terms of this agreement for keeping the Project Gutenberg name associated with the work. You can easily comply with the terms of this agreement by keeping this work in the same format with its attached full Project Gutenberg License when you share it without charge with others.

1.D. The copyright laws of the place where you are located also govern what you can do with this work. Copyright laws in most countries are in a constant state of change. If you are outside the United States, check the laws of your country in addition to the terms of this agreement before downloading, copying, displaying, performing, distributing or creating derivative works based on this work or any other Project Gutenberg work. The Foundation makes no representations concerning the copyright status of any work in any country other than the United States.

1.E. Unless you have removed all references to Project Gutenberg:

1.E.1. The following sentence, with active links to, or other immediate access to, the full Project Gutenberg License must appear prominently whenever any copy of a Project Gutenberg work (any work on which the phrase “Project Gutenberg” appears, or with which the phrase “Project Gutenberg” is associated) is accessed, displayed, performed, viewed, copied or distributed:

> This eBook is for the use of anyone anywhere in the United States and most other parts of the world at no cost and with almost no restrictions whatsoever. You may copy it, give it away or re-use it under the terms of the Project Gutenberg™ License included with this eBook or online at www.gutenberg.org. If you are not located in the United States, you will have to check the laws of the country where you are located before using this eBook.

1.E.2. If an individual Project Gutenberg electronic work is derived from texts not protected by U.S. copyright law (does not contain a notice indicating that it is posted with permission of the copyright holder), the

work can be copied and distributed to anyone in the United States without paying any fees or charges. If you are redistributing or providing access to a work with the phrase “Project Gutenberg” associated with or appearing on the work, you must comply either with the requirements of paragraphs 1.E.1 through 1.E.7 or obtain permission for the use of the work and the Project Gutenberg trademark as set forth in paragraphs 1.E.8 or 1.E.9.

1.E.3. If an individual Project Gutenberg electronic work is posted with the permission of the copyright holder, your use and distribution must comply with both paragraphs 1.E.1 through 1.E.7 and any additional terms imposed by the copyright holder. Additional terms will be linked to the Project Gutenberg License for all works posted with the permission of the copyright holder found at the beginning of this work.

1.E.4. Do not unlink or detach or remove the full Project Gutenberg License terms from this work, or any files containing a part of this work or any other work associated with Project Gutenberg.

1.E.5. Do not copy, display, perform, distribute or redistribute this electronic work, or any part of this electronic work, without prominently displaying the sentence set forth in paragraph 1.E.1 with active links or immediate access to the full terms of the Project Gutenberg License.

1.E.6. You may convert to and distribute this work in any binary, compressed, marked up, nonproprietary or proprietary form, including any word processing or hypertext form. However, if you provide access to or distribute copies of a Project Gutenberg work in a format other than “Plain Vanilla ASCII” or other format used in the official version posted on the official Project Gutenberg website (www.gutenberg.org), you must, at no additional cost, fee or expense to the user, provide a copy, a means of exporting a copy, or a means of obtaining a copy upon request, of the work in its original “Plain Vanilla ASCII” or other form. Any alternate format must include the full Project Gutenberg License as specified in paragraph 1.E.1.

1.E.7. Do not charge a fee for access to, viewing, displaying, performing, copying or distributing any Project Gutenberg works unless you comply with paragraph 1.E.8 or 1.E.9.

1.E.8. You may charge a reasonable fee for copies of or providing access to or distributing Project Gutenberg electronic works provided that:

- You pay a royalty fee of 20% of the gross profits you derive from the use of Project Gutenberg works calculated using the method you already use to calculate your applicable taxes. The fee is owed to the owner of the Project Gutenberg trademark, but he has agreed to donate royalties under this paragraph to the Project Gutenberg Literary Archive Foundation. Royalty payments must be paid within 60 days following each date on which you prepare (or are legally required to prepare) your periodic tax returns. Royalty payments should be clearly marked as such and sent to the Project Gutenberg Literary Archive Foundation at the address specified in Section 4, “Information about donations to the Project Gutenberg Literary Archive Foundation.”

- You provide a full refund of any money paid by a user who notifies you in writing (or by e-mail) within 30 days of receipt that s/he does not agree to the terms of the full Project Gutenberg™ License. You must require such a user to return or destroy all copies of the works possessed in a physical medium and discontinue all use of and all access to other copies of Project Gutenberg™ works.

- You provide, in accordance with paragraph 1.F.3, a full refund of any money paid for a work or a replacement copy, if a defect in the electronic work is discovered and reported to you within 90 days of receipt of the work.

- You comply with all other terms of this agreement for free distribution of Project Gutenberg™ works.

1.E.9. If you wish to charge a fee or distribute a Project Gutenberg™ electronic work or group of works on different terms than are set forth in this agreement, you must obtain permission in writing from the Project Gutenberg Literary Archive Foundation, the manager of the Project Gutenberg™ trademark. Contact the Foundation as set forth in Section 3 below.

1.F.

1.F.1. Project Gutenberg volunteers and employees expend considerable effort to identify, do copyright research on, transcribe and proofread works not protected by U.S. copyright law in creating the Project Gutenberg™ collection. Despite these efforts, Project Gutenberg™ electronic works, and the medium on which they may be stored, may contain "Defects," such as, but not limited to, incomplete, inaccurate or corrupt data, transcription errors, a copyright or other intellectual property infringement, a defective or damaged disk or other medium, a computer virus, or computer codes that damage or cannot be read by your equipment.

1.F.2. LIMITED WARRANTY, DISCLAIMER OF DAMAGES - Except for the "Right of Replacement or Refund" described in paragraph 1.F.3, the Project Gutenberg Literary Archive Foundation, the owner of the Project Gutenberg™ trademark, and any other party distributing a Project Gutenberg™ electronic work under this agreement, disclaim all liability to you for damages, costs and expenses, including legal fees. YOU AGREE THAT YOU HAVE NO REMEDIES FOR NEGLIGENCE, STRICT LIABILITY, BREACH OF WARRANTY OR BREACH OF CONTRACT EXCEPT THOSE PROVIDED IN PARAGRAPH 1.F.3. YOU AGREE THAT THE FOUNDATION, THE TRADEMARK OWNER, AND ANY DISTRIBUTOR UNDER THIS AGREEMENT WILL NOT BE LIABLE TO YOU FOR ACTUAL, DIRECT, INDIRECT, CONSEQUENTIAL, PUNITIVE OR INCIDENTAL DAMAGES EVEN IF YOU GIVE NOTICE OF THE POSSIBILITY OF SUCH DAMAGE.

1.F.3. LIMITED RIGHT OF REPLACEMENT OR REFUND - If you discover a defect in this electronic work within 90 days of receiving it, you can receive a refund of the money (if any) you paid for it by sending a written explanation to the person you received the work from. If you received the work on a physical medium, you must return the medium with your written explanation. The person or entity that provided you with the defective work may elect to provide a replacement copy in lieu of a refund. If you received the work electronically, the person or entity providing it to you may choose to give you a second opportunity to receive the work electronically in lieu of a refund. If the second copy is also defective, you may demand a refund in writing without further opportunities to fix the problem.

1.F.4. Except for the limited right of replacement or refund set forth in paragraph 1.F.3, this work is provided to you ‘AS-IS’, WITH NO OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PURPOSE.

1.F.5. Some states do not allow disclaimers of certain implied warranties or the exclusion or limitation of certain types of damages. If any disclaimer or limitation set forth in this agreement violates the law of the state applicable to this agreement, the agreement shall be interpreted to make the maximum disclaimer or limitation permitted by the applicable state law. The invalidity or unenforceability of any provision of this agreement shall not void the remaining provisions.

1.F.6. INDEMNITY - You agree to indemnify and hold the Foundation, the trademark owner, any agent or employee of the Foundation, anyone providing copies of Project Gutenberg™ electronic works in accordance with this agreement, and any volunteers associated with the production, promotion and distribution of Project Gutenberg™ electronic works, harmless from all liability, costs and expenses, including legal fees, that arise directly or indirectly from any of the following which you do or cause to occur: (a) distribution of this or any Project Gutenberg work, (b) alteration, modification, or additions or deletions to any Project Gutenberg work, and (c) any Defect you cause.

Section 2. Information about the Mission of Project Gutenberg

Project Gutenberg is synonymous with the free distribution of electronic works in formats readable by the widest variety of computers including obsolete, old, middle-aged and new computers. It exists because of the efforts of hundreds of volunteers and donations from people in all walks of life.

Volunteers and financial support to provide volunteers with the assistance they need are critical to reaching Project Gutenberg’s goals and ensuring that the Project Gutenberg collection will remain freely available for

generations to come. In 2001, the Project Gutenberg Literary Archive Foundation was created to provide a secure and permanent future for Project Gutenberg and future generations. To learn more about the Project Gutenberg Literary Archive Foundation and how your efforts and donations can help, see Sections 3 and 4 and the Foundation information page at www.gutenberg.org.

Section 3. Information about the Project Gutenberg Literary Archive Foundation

The Project Gutenberg Literary Archive Foundation is a non-profit 501(c)(3) educational corporation organized under the laws of the state of Mississippi and granted tax exempt status by the Internal Revenue Service. The Foundation's EIN or federal tax identification number is 64-6221541. Contributions to the Project Gutenberg Literary Archive Foundation are tax deductible to the full extent permitted by U.S. federal laws and your state's laws.

The Foundation's business office is located at 41 Watchung Plaza #516, Montclair NJ 07042, USA, +1 (862) 621-9288. Email contact links and up to date contact information can be found at the Foundation's website and official page at www.gutenberg.org/contact

Section 4. Information about Donations to the Project Gutenberg Literary Archive Foundation

Project Gutenberg™ depends upon and cannot survive without widespread public support and donations to carry out its mission of increasing the number of public domain and licensed works that can be freely distributed in machine-readable form accessible by the widest array of equipment including outdated equipment. Many small donations ($1 to $5,000) are particularly important to maintaining tax exempt status with the IRS.

The Foundation is committed to complying with the laws regulating charities and charitable donations in all 50 states of the United States. Compliance requirements are not uniform and it takes a considerable effort, much paperwork and many fees to meet and keep up with these

requirements. We do not solicit donations in locations where we have not received written confirmation of compliance. To SEND DONATIONS or determine the status of compliance for any particular state visit www.gutenberg.org/donate.

While we cannot and do not solicit contributions from states where we have not met the solicitation requirements, we know of no prohibition against accepting unsolicited donations from donors in such states who approach us with offers to donate.

International donations are gratefully accepted, but we cannot make any statements concerning tax treatment of donations received from outside the United States. U.S. laws alone swamp our small staff.

Please check the Project Gutenberg web pages for current donation methods and addresses. Donations are accepted in a number of other ways including checks, online payments and credit card donations. To donate, please visit: www.gutenberg.org/donate.

Section 5. General Information About Project Gutenberg electronic works

Professor Michael S. Hart was the originator of the Project Gutenberg concept of a library of electronic works that could be freely shared with anyone. For forty years, he produced and distributed Project Gutenberg eBooks with only a loose network of volunteer support.

Project Gutenberg eBooks are often created from several printed editions, all of which are confirmed as not protected by copyright in the U.S. unless a copyright notice is included. Thus, we do not necessarily keep eBooks in compliance with any particular paper edition.

Most people start at our website which has the main PG search facility: www.gutenberg.org.

This website includes information about Project Gutenberg, including how to make donations to the Project Gutenberg Literary Archive Foundation,

how to help produce our new eBooks, and how to subscribe to our email newsletter to hear about new eBooks.