NELSON'S ENCYCLO= PÆDIA

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NELSON'S ENCYCLOPÆDIA

VOL. IV.

Blicher—Byzantium

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LIST OF CONTRACTIONS USED IN THIS WORK.

ac., acres.
agric., agricultural.
alt., altitude.
anc., ancient.
ann., annual.
Ar., Arabic.
Aram., Aramaic.
arr., arrondissement.
A.S., Anglo-Saxon.
aver., average.
bor., borough.
bur., burgh.
c. (circa), about.
cap., capital.
cf., compare.
co., county.
Com., Commission.
comm., commune.
cub. ft., cubic feet.
Dan., Danish.
dep., department.
dist., district.
div., division.
Du., Dutch.
E., east.
eccles., ecclesiastical.
ed., edition; edited.
e.g., for example.
Eng., English.
episc., episcopal.
est., estimated.
et seq., and following.
F., Fahrenheit.
fort. tn., fortified town.
Fr., French.
ft., feet.
Ger., German.
gov., government.
Gr., Greek.
Heb., Hebrew.
I., isl., island.
ibid., the same.
i.e., that is.
in., inches.
Ital., Italian.
Lat., Latin.
lat., latitude.
l. bk., left bank.
lit., literally.
long., longitude.
m., miles.
mrkt. tn., market-town.
Mt., mts., mount, mountain, -s.
munic., municipal.
N., north.
N.T., New Testament.
O.T., Old Testament.
par., parish.
parl., parliamentary.
Per., Persian.
pop., population.
Port., Portuguese.
prov., province.
q.v., which see.
R., riv., river.
r. bk., right bank.
R.V., Revised Version.
ry., railway.
ry. jn., railway junction.
S., south.
Sans., Sanskrit.
seapt., seaport.
Sp., Spanish.
sp. gr., specific gravity.
sq. m., square miles.
stn., station.
s.v., under the word.
Syr., Syriac.
temp., temperature.
terr., territory.
trans., translated.
trib., tributary.
U.S.A., United States of America.
vil., village.
vol., volume.
W., west.
wat.-pl., watering-place.
yds., yards.

Railways—C.R., Caledonian Railway; **C.P.R.**, Canadian Pacific Railway; **G.E.R.**, Great Eastern Railway; **G. & S.W.R.**, Glasgow and South-Western Railway; **L. & N.W.R.**, London and North-Western Railway; **N.B.R.**, North British Railway, etc., etc.

Bibliography—Biog. Dict., Biographical Dictionary; **Encyc. Brit.**, Encyclopædia Britannica; **Proc. Royal Geog. Soc.**, Proceedings of the Royal Geographical Society; **Jour.**, Journal; **Hist.**, History; **Mag.**, Magazine, etc., etc.

NELSON'S ENCYCLOPÆDIA.

Vol. IV.

Blicher, STEEN STEENSEN (1782–1848), Danish novelist and poet. From 1819 he led the life of a poor parson, till his growing needs forced him to produce those works which have made him one of the favourite novelists of the Danish nation. Beginning with *En Landsbydegns Dagbog* (1824), he wrote a whole series of masterly tales of Danish, especially Jutish, peasant life, culminating in *E Bindstouw* (1842), written in the Jutland dialect, and incomparably his best work. What Hardy has done for Wessex, Blicher has done for Jutland, but in a spirit of bright and pleasant humour. See his own *Autobiography* prefixed to his *Samlede Noveller* (new ed. by P. Hansen, 1882); Kristensen and Lund, *Blicher's Liv og Gjerning* (1882).

Blickling Homilies. The unique MS. of the Blickling Homilies is at Blickling Hall, near Aylsham, in Norfolk. They belong to the time between Ælfred and Ælfric; they are not homogeneous in character, and may cover a wide period of time. The date 971 occurs in one passage. These homilies, full of legendary, apocryphal, unscriptural matter, form a striking contrast to those of Ælfric, who, as is clear from several passages, intended some of his own homilies as a corrective to them. See J. Earle's *A.S. Literature* (1884) and Wülker's *Grundriss zur Geschichte der A.S. Litteratur* (1885). The homilies have been edited by Rev. R. Morris for the Early English Text Society (1874–80).

Blida, fort. tn., Algeria, 23 m. S.W. of Algiers, at foot of the Atlas Mts. It is famous for its orange groves. There is also some trade in copper, lead, and cotton. Pop. 31,000 (Europeans, 10,000).

Bligh, WILLIAM (1754–1817), English admiral, born in Cornwall; entered the navy, and saw service under Captain Cook in his second voyage (1772–4). As a lieutenant he took part in the action off the Dogger Bank in 1781, and in Howe's relief of Gibraltar (1782). In 1787 he took command of the *Bounty*, and, after his adventures on that voyage, was posted in 1790, and as a captain commanded the *Warrior* (1794) off Ushant, the *Director* at Camperdown in 1797, and the *Glatton* at Copenhagen in 1801. He became captain-general and governor of New South Wales in 1805, but, owing to his tyrannous conduct, was deposed in 1808, and imprisoned until 1310, when he was sent back to England. Undoubtedly a brave man and a first-rate seaman, he was one of the worst of tyrants in days when tyrannical naval commanders were only too numerous. See BOUNTY, MUTINY OF THE.

Blight is a popular term applied to the unhealthy condition of a plant due to a variety of causes, such as attacks of insects, fungi, noxious gases, unsuitable soil, frost, or lightning. See Marshall Ward's *Diseases in Plants* (1901).

Blimbing, a pulpy, yellowish, acid fruit, about the size of a hen's egg, and found on the cucumber tree (*Averrhoa bilimbi*) of the order Oxalidaceæ; the acidity is due to an oxalate of potassium. It is eaten by natives of India and E. Indies, and is also used in the form of pickles.

Blind. In medical terminology the expression 'blindness' means absolute sightlessness; what is popularly termed 'partial blindness' is known medically as amaurosis or amblyopia. Blindness cannot always be accounted for. In general, it may be said to arise from inflammatory or degenerative changes in some part of the path between the cornea without and the visual centre (or that part of the gray matter of the brain especially concerned in sight) within. The eye is so delicate an organ that inflammation of any part may easily spread to the others, and skilled assistance should be called in whenever its safety is concerned. The various forms of eye disease, such as cataract, keratitis, iritis, and retinitis, are briefly touched on under their several headings. One, however—viz. ophthalmia neonatorum (sore eyes of the new-born)—is mentioned here because of its special importance. The disease starts with superficial inflammation of the eyes, caused by contagion during birth. It leads to ulceration and rapid destruction of the eyes, and is very contagious, being readily transmitted from the child to any one associated with it. But the mischief may be prevented by carefully washing the eyes *at birth* with one part of corrosive sublimate to 6,000 parts of water; and then the eyes should be sponged every few hours with the same solution until skilled advice is obtained. Children are sometimes several months old before it is discovered that they are blind. By the third month the healthy child shows signs of recognition on seeing a familiar face; but even after a few weeks it will take pleasure in a bright light, and its perception of it can be tested by moving a candle before the eyes and noting whether they follow it. When over two months, the child with normal sight will blink when an object is suddenly thrust near its eyes.

Training of the Blind.—The first effort to ameliorate the condition of the blind was made in the latter part of the 18th century. Previous to that period they were a helpless pauper class, for whom neither education nor training was provided. The degraded state of the masses of the blind in France is shown by the following incident. In 1771, at an annual fair in Paris, an innkeeper had a group of blind men attired in a ridiculous manner, decorated with peacocks' tails, asses' ears, and pasteboard spectacles without glasses, in which condition they gave a burlesque concert for the profit of their employer. Among those who gazed at this outrage to humanity was the philanthropist Valentine Haüy (1746–1822). After he had gathered all the information possible respecting the blind, he began teaching a blind boy who had earned his living by begging at a church door. Encouraged by the success of his pupil, Haüy collected other blind persons, and in 1784 founded in Paris the first school for the blind (the Institution Nationale des Jeunes Aveugles), and commenced the first printing in raised characters. In 1786 he exhibited

before Louis XVI. and his court at Versailles the attainments of his pupils, and published an account of his methods, entitled *Essai sur l'Education des Aveugles*. As the novelty wore off, contributions almost came to an end, and the blind school must have ceased to exist had it not been taken in 1791 under the protection of the state.

The work of Haüy, the great apostle of the blind, was taken up by Mr. Gall of Edinburgh, Mr. Alston of Glasgow, Dr. Howe of Boston, Mr. Friedlander of Philadelphia, and others. The following were the first schools for the blind in Great Britain and Ireland:—School for the Indigent Blind, Liverpool (1791); Royal Blind Asylum and School, Edinburgh (1793); Bristol School (1793); School for the Indigent Blind, Southwark, London, now moved to Leatherhead (1799); Norwich Asylum and School (1805); Richmond Asylum, Dublin (1810); Glasgow Asylum and School (1827); Belfast School (for deaf and dumb and blind, 1831); Wilberforce School, York (1833); Henshaw's Asylum, Manchester (1839); School for the Blind, Birmingham (1848); Belfast Workshops (1871).

In 1868 Dr. T. R. Armitage founded the British and Foreign Blind Association, for the purpose of promoting the education and employment of the blind. By careful investigation he ascertained that of the blind musicians who had been trained in Great Britain not more than one in 200 became self-sustaining. To provide a higher education and improve the musical training of the blind, the Royal Normal College and Academy of Music was established at Upper Norwood in 1872. Its object was to afford the young blind a thorough general and musical education, to qualify them to earn a living by various intellectual pursuits, especially as organists, pianists, teachers, and pianoforte tuners. Of all who have completed their course of training in the college, 89 per cent. are now self-sustaining men and women.

A practical system of education, which has for its object to make the blind independent and self-sustaining, must be based upon a comprehensive course of physical development. As a rule, the vitality of the blind is much below that of seeing persons, and it is the lack of energy and determination, not the want of sight, that causes so many failures among the blind.

Besides regular gymnastic training, we should endeavour to give young blind children that spontaneous activity and love of play which is the universal impulse of all healthy seeing children. The first requisite is a suitable playground, specially adapted to meet the wants of the blind. Besides a free space where they can run and play, it should have a supply of swings, tilts, jumping-boards, stilts, char-à-bancs, skittle alleys, etc. The pupils should be encouraged to enter various competitions, as walking, running, jumping, leapfrog, sack-racing, *barre-à-pied*, shot-pitching, and tug-of-war. Cycling, rowing, swimming, and roller-skating are also beneficial.

The school curriculum must be varied according to the age and capacity of the pupils, but the teacher's object should be to develop the powers of observation, train the reasoning faculties, strengthen the memory, cultivate the power of clear and concise expression, and stimulate a love of reading and literature. All children of average intelligence should be taught typewriting. From the earliest years manual dexterity should be cultivated by kindergarten work, modelling, sewing, knitting, and *slöjd*. Early

manual training cultivates the perceptive faculties, gives activity to the body, and prepares the hands and fingers for pianoforte playing, pianoforte tuning, and handicrafts.

Music in its various branches, when properly taught, is the best and most lucrative employment for the blind. The musical instruction, in its several branches of harmony, pianoforte, organ, and vocal culture, must be addressed to the *mind*, not merely to the *ear*. If the mental faculties have not been developed and thoroughly disciplined, the blind musician, however well he may play or sing, will be a failure as a teacher. The musical instruction must be more thorough, more analytical, more comprehensive than corresponding instruction given to seeing persons.

Pianoforte tuning is an excellent employment for the blind. Many can be trained to become successful pianoforte tuners when they have reached an age that renders training for the profession of music impossible. The seeing who excel in the business go through a long apprenticeship, and one must give the blind even more careful preparation.

A national scheme of education for the blind which has for its object to make the blind a self-sustaining class, should include properly-planned, well-regulated kindergarten schools for children from five to eight years of age, preparatory schools for children from eight to eleven, intermediate schools for children from eleven to thirteen. At thirteen years of age the future career of the children can usually be determined, and the pupils should be sent, according to ability and future requirements, either to handicraft schools or to colleges where they will be prepared for the university examinations, or receive a good secondary education combined with high-class musical training; in connection with the latter there should be a pianoforte-tuning school.

In every school or class there will be a certain number of young blind children who are feeble in body and defective in intellect; such children are a great burden in any class or school, and require special treatment and instruction. Educational authorities throughout the country should unite and have one or two schools in a healthy locality for mentally defective blind children.

Types and Printing.—The earliest authentic record of reading for the blind describes a plan of engraving the letters upon blocks of wood, the invention of Francesco Lucas, a Spaniard, in the 16th century, who dedicated it to Philip II. of Spain. In 1640, Pierre Moreau, a writing-master in Paris, cast a movable leaden type for the use of the blind; but being without means to carry out his plan, he abandoned it. Pins inserted in cushions were next tried, and large wooden letters. After these came a contrivance of Du Puiseaux, a blind man, who had metal letters cast, and set them in a small frame with a handle. While these experiments were going on in France, attempts had also been made in Germany. Weissenburg of Mannheim, who lost his sight when about seven years of age, made use of letters cut in cardboard, and afterwards pricked maps in the same material. By this method he taught Mdlle. Paradis (1759–1824), the talented blind musician and the friend of Valentine Haüy. To Haüy belongs the honour of being the first to emboss paper (1784) as a means of reading for the blind. His books were embossed in large and small italics, from movable type set by his pupils.

In 1827 Mr. Gall of Edinburgh

embossed some elementary works, and published the Gospel of St. John in 1834. His plan was to use serrated lines and replace curves by angles. In 1832 the Edinburgh Society of Arts offered a gold medal for the best method of printing for the blind, and it was awarded (1837) to Dr. Edmond Fry of London, whose alphabet consisted of ordinary capital letters without their small strokes. In 1836 Rev. W. Taylor of York, and Mr. Alston, in Glasgow, began to print with Fry's type. Almost simultaneously, in 1833, printing for the blind was commenced in Boston, U.S.A., and Philadelphia. Dr. S. G. Howe, in Boston, used small English letters without capitals, angles being employed instead of curves; while Mr. Friedlander, in Philadelphia, used only Roman capitals. About 1838 Mr. Lucas of Bristol, a shorthand writer, and Mr. Frere of Blackheath, each introduced an alphabet of simpler forms, and based their systems on stenography. In 1847 Dr. Moon of Brighton brought out a system which partially retains the outline of Roman letters. This type is easily read by the adult blind, and is still much used by the Home Teaching Societies. The preceding systems are all known as line types, but the one which is now in general use is a point type.

In 1829, Louis Braille, a blind pupil in the Institution des Jeunes Aveugles, Paris, invented an alphabet in which the characters are formed by an arrangement of dots. Its signs are purely arbitrary, and consist of varying combinations of six points (⠿) placed in an oblong, of which the vertical side contains three and the horizontal two points. There are sixty-two possible combinations of these six points. The Braille system for literature and music was brought into general use in England by the late Dr. T. R. Armitage. Unfortunately, the American institutions have adopted two modifications of the point type, and books are being printed for the English-speaking people in three different methods of point type. The original Braille is used by institutions for the blind in the British empire, in European countries, in Mexico, Brazil, and Egypt.

Apparatus.—For writing the point alphabet a simple and ingenious frame has been constructed. Recently Mr. F. Hall, superintendent of the School for the Blind, Jacksonville, Illinois, U.S.A., has perfected a Braille typewriter and also a stereotype-maker by which brass plates can be embossed and any number of copies printed. Mr. Stainsby of Birmingham has brought out a Braille shorthand writer modelled on the Hall machine.

Many ciphering boards have been constructed from time to time to enable the blind to work arithmetical problems. One of the earliest was that invented by Nicholas Saunderson, the blind professor of mathematics at Cambridge. The most recent, and the one now used in the United Kingdom, was introduced by the late Rev. W. Taylor. The board has star-shaped openings, in which a square pin fits in eight different positions. The pin has on one end a plain ridge, on the other a notched ridge, and sixteen characters can be formed with the two ends. This board can be used for algebra. Books are prepared with raised geometrical diagrams. Geography is taught by means of relief maps.

Chiefly owing to the unremitting energy and liberality of the late Dr. T. R. Armitage in connection with the British and Foreign Blind Association, all school appliances for the blind have been greatly improved and cheapened during the last thirty years.

STATISTICS.—Taking the census as a guide, the number of blind in proportion to the population has been steadily on the decrease since the year 1851, when statistics in regard to the blind were first scheduled. For instance, the figures show that in 1851, in England and Wales, there was one blind person to every 979; in 1861, one to every 1,037; in 1871, one to every 1,052; in 1881, one to every 1,138; in 1891, one to every 1,235; and in 1901, one to every 1,285. This result is probably due to improved ophthalmic surgery, and to especial attention being paid to the inflammation of the eyes of new-born babes, a disease which can be prevented and, if taken in time, cured.

There are in England and Wales 25 resident schools, 33 workshops, 46 home-teaching societies; in Scotland, 5 schools and workshops (combined), 9 home-teaching societies; in Ireland, 1 resident school (deaf, dumb, and blind), 5 workshops, 3 asylums (females), 2 home-teaching societies.

The trades usually taught to males are the making of baskets, brushes, mats, sacks, ropes, ship-fenders, brooms, mattress-making, upholstery, wire-making, chair-caning, wood-chopping, etc. Females are taught to make fancy baskets, brushes, chair-caning, knitting, netting, sewing (machine and hand), crocheting, etc.

Large sums have been left for granting pensions to the blind. The principal charities for this purpose are Day's, Hetherington's, the Clothworkers', the Cordwainers', National Blind Relief, and Royal Blind Pension Societies. In 1882 the late Henry Gardner left a bequest of £300,000 to the blind of England and Wales; a portion is given in pensions, but the larger part is devoted to education and training.

Parliament in 1893 passed an act granting elementary education to blind and deaf children, and extended the age limit to sixteen. The education thus provided is inadequate.

In the United States, each state government makes liberal provision for the education and training of the blind. Although it costs much more *per capita* —from £40 to £60 per annum— the blind are as amply provided with the means of education as children that see. The national government appropriates $10,000 per annum for printing embossed books for the blind. France, Germany, Austria, Russia, Norway, Sweden, Denmark, Belgium, Switzerland, Spain, and the English colonies provide by taxation for the education of the blind.

See Levy's *Blindness and the Blind* (1872); Wilson's *Biography of the Blind;* Armitage's *Education and Employment of the Blind* (2nd ed. 1886); Blair's *Education of the Blind* (1876); H. J. Wilson's *Information in Regard to Institutions, Societies, and Classes for the Blind in England and Wales* (1887); Guillié's *Instruction and Amusements of the Blind;* W. Harris's *Guide to Institutions and Charities* (new ed. 1884); Moon's *Light for the Blind* (3rd ed. 1877); Meldrum's *Light on Dark Paths* (1883); *Life of Miss E. Gilbert; Life of Professor H. Fawcett; Life of Dr. Moon;* Roth's *Prevention of Blindness* (1885), and *Physical Education of the Blind* (1885); *Report of Royal Commission (1889);* Reports of Conferences in England, America, and Europe; Reports of leading Institutions for the Blind; De la Sizeranne's *J. Gaudet, his Life and Works, The Blind in Useful Avocations, The Blind in France, True Mission of Smaller Schools* (all in French); Helen Keller's *The Story of my Life* (1903); *Ten Years' Study and Work for the Blind* (1890); *The Blind as seen through Blind Eyes* (trans. by Dr.

Park Lewis, 1893); Mell's *Encyklopädisches Handbuch des Blindenwesens* (1900).

Blind, KARL (1826–1907), German author and revolutionist, was born in Mannheim. Condemned, for taking part in the revolution of 1848, to eight years' imprisonment, he was freed by the people and soldiery. Member of the embassy of Baden and Bavaria to Paris, he was there imprisoned, on the charge of participating in Ledru-Rollin's rising, and then banished from France. He went in 1852 to London, and there formed intimate relations with the leaders of European democracy—Mazzini, Garibaldi, Louis Blanc, etc. He furthered the Schleswig-Holstein movement, and fought in the war of 1870–1. His writings range over Germanic history, literature, and folklore, as well as politics.

Blind Spot IN THE EYE. This is that part of the retina which is insensible to light, and is the point pierced by the optic nerve.

Blindstory, in architecture, the middle story of a large church, over the pier arches and under the clerestory windows. The technical name is 'triforium,' as the gallery or open space between the vaulting of the nave and the roof of the aisles generally opens on the nave by triple apertures. The ornamental arrangement of the triforium varies considerably. In the Norman style it is often formed of a single complete arch, or of an arch subdivided into smaller ones, supported on diminutive shafts. In the Early English style a range of small arches is not uncommon, and sometimes two or more larger arches subdivided are used. In the Decorated and Perpendicular styles the space occupied by the triforium is often much reduced. In ancient times the triforium was appropriated to the use of females. Excellent specimens of the triforium are to be seen at Winchester, Canterbury, Westminster, and Beverley.

Blind-worm, or SLOW-WORM (*Anguis fragilis*), a harmless lizard which differs from its allies in the absence of limbs. Eyes are present, so that both parts of the common name are misnomers. The Latin name refers to the fact that the tail is very brittle, as in the case of so many lizards. The food consists chiefly of earthworms and slugs, and the animal is more or less nocturnal in habit. It is usually yellowish brown in colour, but varies to some extent with the surroundings. It is widely distributed throughout Europe, and is viviparous.

Bliss, FREDERICK JONES (1859), American archæologist and explorer, born at Mount Lebanon, Syria, and educated in America. From 1890 to 1900 he was explorer to the Palestine Exploration Fund, chiefly at Tell-el-Hesy and Jerusalem, and wrote *Excavations at Jerusalem, 1894–7* (1898), *A Mound of Many Cities* (1894), and *The Development of Palestine Exploration* (1906).

Bliss, PHILIP (1787–1857), English antiquary, edited Wood's *Athenæ Oxonienses* (1813–20) and *Autobiography* (1848), and Hearne's *Reliquiæ Hearnianæ* (1857). From 1824–53 Bliss was registrar of Oxford University.

Bliss, PHILIP PAUL (1838–76), born at Clearfield, Pa., U.S.A. He composed numerous hymns (*Hallelujah! 'tis done, Pull for the shore, Hold the fort*, etc.), which became exceedingly popular when utilized by Moody and Sankey in their evangelistic services.

Blister, a vesicle caused by a deposition of serous fluid beneath the skin, in consequence of a burn, the application of a vesicant, or disease, or friction. The same name is given to the therapeutic medium by which the blister is produced. The colour of a blister

shows the nature of its contents, amber colour indicating serum, opalescence pus, and red an admixture of blood. The treatment in general is to puncture, so as to allow the contents of the vesicle to escape slowly, and then to cover with boracic lint. Vesicants, or substances which cause blistering, are cantharides, glacial acetic acid, liquor ammoniæ, liquor epispasticus or blistering fluid, 'Corrigan's button' or 'hammer,' a small flat iron or button heated and applied to the skin.

Blistering is the application of a vesicant near an inflamed part; it should not be directly over it, nor where the skin is loose, nor over any prominence of bone. The cantharidine of a blister may be absorbed and affect the kidneys injuriously, but this should be prevented by sprinkling powdered camphor over the blister before applying it to the skin. A blister left on too long may produce dangerous sloughing; six or eight hours are generally sufficient, when it should be replaced by a warm dressing or poultice. A blister should be opened by pricking the most dependent parts with a disinfected needle. The part should then be dressed with sterilized cotton wool or boracic lint. In the case of children, blisters must be used with special caution, being kept on only for an hour or until the skin is reddened, and then replaced by an aseptic poultice. A blister first acts as a local stimulant; if kept on long enough it causes a large discharge of serum, and so acts as a depletive and depressing agent. A blister over the heart will stimulate its action. Blisters are of service in many brain affections that are attended with congestion, in pleurisy with effusion, in pericarditis, and in effusion in joints. In the acid vomiting of gouty patients a blister over the epigastrium may give relief, and some forms of neuralgia will yield to a vesicant over the seat of pain.

Blister Beetles, a name applied to the members of the family Cantharidæ. See CANTHARIDES.

Blitung. See BILLITON.

Blizzard. A fierce and blinding snowstorm accompanied by high N. winds and a rapid fall of temperature to a point below 0° F. The gale drives before it ice-needles instead of snow, the flakes being virtually ice dust about one-twentieth of an inch in diameter. In severe blizzards the wind will blow at the rate of fifty miles an hour, with the thermometer at 62° below freezing-point; and it has been known to blow for 100 consecutive hours at the rate of over forty miles an hour. No one can live in these winds for any length of time; the painful effect of the blast loaded with ice-needles rouses a kind of frenzy, and many of those who have died from exposure have lost their senses completely before they have perished. Blizzards are most common in the W. and N.W. of the U.S.A., but the name is now in ordinary use elsewhere for severe snowstorms.

Bloch, CARL HENRIK (1834-90), a leading modern representative of Danish national painting; studied at the Copenhagen Academy (of which he was appointed professor in 1871), and painted Zealand and Jutland peasant life —*e.g. The Dinner*, *The Fishermen's Home*—between 1854 and 1859. In Rome (1859–65) this many-sided artist painted the humorous side of monastic life, and became a historical painter. His chief works (*e.g. Christian II. a Prisoner in the Castle of Sonderburg*, and *Samson and the Philistines*) are in the gallery of the royal palace of Christiansborg at Copenhagen; while a fine piece, *The Deliverance of Prometheus*,

went to Athens. He was also a fine etcher. See Muther's *History of Modern Painting* (1895–96).

Bloch, JEAN DE (1836–1902), Polish banker, railway constructer and administrator, was born of Jewish parents, and educated at Warsaw. He wrote, in Russian, *Influence of Railways on the Economic Condition of Russia* (5 vols.), *The Finances of Russia* (4 vols.), and in 1898 *The War of the Future* (6 vols.), of which part has been translated into English under the title *Is War now Impossible?* (1899). The thesis of the last work, which has provoked considerable discussion, is that war between the great powers, such, for example, as between the Dual and Triple Alliance, is no longer possible as the arbiter of international disputes. Bloch points out (1) that the two great alliances are nearly equal in combined numbers, wealth, discipline, and moral qualities; (2) that modern weapons and tactical methods have so developed that the defensive force has gained an immense increment of strength which enables small bodies of men to defend a widely-extended front against superior numbers of the enemy for a protracted period; and (3) that the frontiers are now fortified on a most complete scale, and behind them are vast plains which the spade and magazine rifle can turn into impregnable fortresses. From these considerations he deduces that modern wars will be long wars, and must necessarily result in economic exhaustion, entailing starvation and the dislocation of the social fabric. At best they will result in a 'kind of stalemate,' with no decisive issue. The South African war (to which Bloch's thesis did not specifically apply) justified his theory as to the strength of the defence and the necessity for an overwhelming superiority of force on the part of the attack, and further corroborated a variety of his minor conclusions. These points, however, many military experts hold to be mere commonplaces. His pamphlet, *Lord Roberts's Campaign and its Consequences*, predicted the long guerilla war which followed the fall of Pretoria, and suggested the blockhouse scheme which ultimately brought about the reduction of the country district by district. As for his theories in the case of the Russo-Japanese war, this much may be said—the losses on both sides due to the use of modern weapons were unprecedented, the fighting line was enormously long (100 miles in the case of the Japanese before Mukden), the resisting power of a modern fortress is exceedingly great, close formations entail murderous destruction, and the cost of warfare is so vast that the possibility of economic exhaustion on the part of one or other of the combatants must not be lost sight of. See also Angell's *Great Illusion* (1910).

Block. See PULLEY.

Block, MAURICE (1816–1901), political economist and statistician, was born in Berlin, but became a naturalized Frenchman. In 1862 he was under-secretary to the statistical bureau of the minister of agriculture, and in 1880 was elected member of the Academy of Sciences. Author of *Dictionnaire de l'Administration Française* (1892), *Petit Manuel d'Economie Pratique* (1890), *Progrès de la Science Politique depuis Adam Smith* (1890), *Annuaire de l'Economie Politique et de la Statistique* (1856 *et seq.*), and *Petit Dictionnaire Politique et Social* (1896).

Blockade. The object of a blockade is to prevent an enemy from communicating, or conducting commerce, with the outside world by sea, in order to damage

his resources. A blockade may be in consequence either military or commercial—the former when it affects a fortified town or fleet, the latter when it affects commerce. Commercial blockades are perhaps the more important in their far-reaching effects. The most extensive blockade ever conducted was carried out by the Federals during the civil war in the United States. It extended from the Potomac to the Rio Grande, along the Atlantic coast, and over the Gulf of Mexico, for a distance of 3,000 miles, and lasted four years.

A blockade being an act of war, may be instituted by any recognized belligerent. Differing, as it does, from a siege in the way in which it affects neutrals, certain rules concerning it are adhered to by the leading nations. In a siege or blockade by land, the investing force is in occupation of territory of which it is in possession; whereas a blockading fleet occupies the sea, which is the highway of all nations. The rules which are accepted by Great Britain, the United States, and Germany are that a blockade may be a blockade *de facto*, or a blockade after notification. In the former case a neutral is not expected to be aware of the existing blockade, and, after a warning from the blockading squadron, has to leave the neighbourhood; in the latter case a vessel is subject to capture, ignorance of the blockade being no excuse. The system followed by the French, Italian, Spanish, and Swedish governments is to give a general notification, and a particular one to each ship from one of the vessels of the blockading squadron. It is probable that this system will be superseded, for the reason that the existence of the telegraph almost precludes any possibility of ignorance, and because it would be dangerous, in these days of vessels of high speed, to allow them to approach for inquiry or warning. As Judge Field observed, the greatest facilities would be afforded to elude the blockade.

Various opinions have been held as to what constitutes an effective blockade. In 1742 France and Denmark agreed that at least two vessels were necessary, or a battery on shore. At a later date Holland and Sicily agreed that six vessels just out of gunshot were necessary, or else batteries on shore that were able to prevent ships from entering the port. The Declaration of Paris of 1856, by giving a greater elasticity, has probably brought the matter nearer to practical solution by laying down that blockades to be obligatory are to be effective—that is to say, maintained by a force sufficient to shut out the access of the enemy's ships and other vessels in reality. In 1862, in a note to the United States, the government of Great Britain said that it was of opinion that the fact of a few vessels having managed to run a blockade did not prevent it from being an effective blockade according to international law.

There are various rules in regard to blockade that have been adopted by common consent for convenience. A ship, for instance, is not liable to capture if, on arriving at the scene of blockade, her papers show that she began her voyage in ignorance of it, and was directed to make inquiry, and to proceed, if necessary, to an alternative destination. A vessel, further, for the sake of humanity, is allowed, if in danger or distress, to enter a blockaded port. If a neutral ship be in port when a blockade begins, she is given fifteen days for clearing. Mail steamers, on condition that no contraband of war is carried, are allowed in and out of a blockaded

port. In the United States war with Mexico, British mail boats ran in and out of Vera Cruz. Neutral men-of-war are by consent and custom, but not by right, allowed ingress and egress. See H. Wheaton's *Internat. Law* (4th ed. 1904); W. E. Hall's *Internat. Law* (6th ed. 1909); Freeman Snow's *Lectures at the Naval War Coll.* (1895). See also DECLARATION OF LONDON; DECLARATION OF PARIS.

Block-books, books printed from engraved wocden blocks, one block generally serving for an entire page. A large number of these were produced in Central Europe, chiefly in Germany, also in Holland, during the years that immediately preceded (say 1435 onwards) the invention of typography, or printing from small movable types. Some of them consisted wholly of pictures; others contained explanatory text. It is not known with certainty whether a rude kind of press was used, or whether they were produced by rubbing the back of the paper as it lay on the block. Only one side of the paper was printed on, the two blank sides being afterwards pasted together.

Blockhouse, originally a detached fort blocking or covering the access to a landing, a narrow channel, a mountain pass, a bridge, or other strategical point. It may be constructed of timber, stone, or metal, and is loopholed and embrasured for rifle-firing. The most recent use of the blockhouse was in the war (1899–1902) with the Boers in S. Africa, where the system was employed by Lord Kitchener to protect the railways and lines of communication.

Blocking Course, in masonry, a course of stones laid above a projecting cornice, in order that its weight may prevent the latter from falling, where the centre of gravity of the cornice is rather far forward.

Block Island, an isl., Rhode Island State, U.S.A., 10 m. off shore and 14 m. N.W. of Montauk Point, Long I. It is pear-shaped its longest axis, 8 m., running N. and S. It constitutes Shoreham co., and is a popular summer resort. There is a small light on the N. extremity, and a light on the S.E. visible for twenty miles. It was first visited by Adrian Block in 1614. See Livermore's *Hist. of Block Island from 1614 to 1876* (1877).

Blocksberg. See BROCKEN.

Block System. See RAILWAYS.

Bloemendaal, vil., N. Holland prov., Netherlands, 2 m. N. of Haarlem. Pop. 6,000.

Bloemfontein, cap. of Orange Free State prov., Union of South Africa, 575 m. N.E. of Cape Town and 350 m. N. of Port Elizabeth; healthily situated at an elevation of 4,518 ft., on an extensive plain, which gives it some repute as a health centre. It contains the council chamber of the former republican government, the residence of the former presidents, and a museum. It was occupied by Lord Roberts on March 13, 1900. It is now the official seat of the Supreme Court of the South African Union. Pop. 17,000 whites and 16,000 natives.

Blois, anc. tn. and cap. of dep. Loir-et-Cher, on r. bk. of Loire, 35 m. by rail S.W. of Orleans. The cathedral (Late Gothic) was rebuilt in 1678. The oldest part of the castle (Tour des Oubliettes) dates from the 13th century. Joan of Arc raised her standard here in 1429. The town manufactures vinegar, chocolate, earthenware, shoes, and bricks, and has some trade in wine, corn, and timber. Pop. 24,000. See Le Nail's *Le Château de Blois* (1874).

Blok, PETRUS JOHANNES (1855), Dutch historian, born at Helder; professor of history at Groningen (1884) and Leyden (1894); has written *Geschiedenis van het Ne-*

derlandsche Volk (8 vols. 1891–1907; Eng. trans. by Miss Putnam, 1898, etc.), and books on the history of Dutch towns (1883 and 1884).

Blomefield, Francis (1705–52), topographer of Norfolk, England, born at Fersfield. The work of his life, the *History of Norfolk*, is a mine of information on the county. The third volume he did not live to finish. Continued by C. Parkin, the work appeared in 5 vols. (1739–75), and in 11 vols. (1805–10).

Blomfield, Charles James, (1786–1857), bishop of London, was born at Bury St. Edmunds. He had a brilliant career at Trinity College, Cambridge, of which he was elected a fellow. Between 1810 and 1815 he published editions of several of the plays of Æschylus, an edition of Callimachus, and (in conjunction with Dr. Monk) the *Posthumous Tracts of Porson* (1812) and the *Adversaria Porsoni* (1814). Blomfield became rector of St. Botolph's, Bishopsgate (London), in 1819, bishop of Chester in 1824, and then bishop of London (1828–56). During his London episcopate more than two hundred churches were built, and he was also mainly instrumental in establishing the Colonial Bishoprics' Fund. See *Memoirs of Bishop Blomfield*, by the Rev. A. Blomfield (1863).

Blommaert, Philip (1808–71), Flemish author, born at Ghent. One of the chief revivers of the Flemish idiom, he edited its poetry of the 12th to the 14th century, including *Theophilus* (1836; new ed. 1858), which bears some resemblance to *Faust*, and *Oudvlaemsche Gedichten* (1838–51). He also translated the *Nibelungenlied* into Flemish. *Aloude Geschiedenis der Belgen* (1849) is influenced by anti-French sentiment.

Blommer, Nils Johan Olsson (1811–55), Swedish painter of landscape and prose myths, born at Blommeröd in S. Sweden. His effort was to represent what lies in the poetry of the people, and all the mythical figures which belong neither to definite age nor to definite poets, but constitute rather the expression of national sentiment. Among his works are *The Faithful Sister*, *The Bachelor and the Elves*, *Necken's Sport*.

Blommers, B. J., a living Dutch painter of interiors, landscapes, peasant and fisher life. In choice of subject he resembles Israels, except that he depicts the joy of life and not its tragedy. His *Girl Knitting* and *Shrimpers* are in the Amsterdam National Museum; another good specimen of his skill is *Mother's Joy*. Many of his pictures are in p[illegible]ollections in Glasgow, Edinburgh, and London. See Rooses, *Dutch Painters of the 19th Century* (1898–1901).

Blondel, famous *trouvère* of the 12th century, a native of Nesle in Picardy; was the friend of his fellow-minstrel, Richard Cœur de Lion, king of England. Richard, returning from the Holy Land, was captured by Leopold, Duke of Austria, and thrown into the dungeon of Dürrenstein, where he was discovered by Blondel, whose song was answered by Richard from the tower. Speeding to England, Blondel arranged for the payment of the ransom which set Richard free. The earliest trace of this legend occurs in the *Chronicle of Rheims* (13th century); no mention of it is found in Blondel's (Blondain's) acknowledged poems (vol. xix. of Tarbé's ed. *Collection des Poètes Champenois*, Rheims, 1862).

Blondin, Charles (1824–97), acrobat and tight-rope walker, whose real name was Jean François Gravelet, was born at St. Omer; trained at Lyons; engaged in a tour through the United

States; crossed Niagara on a tight rope in five minutes, June 1859; and settled in England during the last thirty years of his life. In 1862 he took an engagement at the Crystal Palace, and performed at a height of 170 ft. from the ground. He considered his most difficult feat was walking from the main-mast to the mizzen on the P. & O. steamer *Poonah* while on a voyage to Australia. After spending several years in retirement he reappeared in public, and died at Ealing.

Blood, the red fluid which circulates through the heart, arteries, capillaries, and veins, supplying nutrition to all parts of the body, and conveying waste substances from the tissues to those organs by which they are excreted. Human blood is bright red in the arteries, dark in the veins, of an average sp. gr. of 1·055, of a salt taste, faint odour, an alkaline reaction, and a temp. of 100° F. in the interior of the body, but lower in the extremities and on the surface. It holds in suspension large numbers of cells or corpuscles. The fluid itself is called the *plasma* or *liquor sanguinis*. The corpuscles are of two kinds—red and white. In a cubic millimetre of normal human blood there are five million red and ten thousand white corpuscles. The red give the colour to normal blood; they contain a pigment, hæmoglobin, a complex proteid substance containing about 0·4 per cent. of iron. The red corpuscles are round discs $\frac{1}{3200}$ of an inch in diameter and $\frac{1}{12000}$ of an inch thick, and are of a light yellowish tint when seen under the microscope. When freshly-drawn blood is examined under the microscope, the red corpuscles are seen to run together, forming 'rouleaux.' The form of these red cells may be altered by various diseases—*e.g.* pernicious anæmia; and another alteration due to disease is the appearance of nucleated forms of different size. The number of the red cells may also vary: the term 'polycythæmia' is applied to those conditions in which the number of red cells is higher than normal, as contrasted with oligocythæmia, which means a decrease in number. The former condition arises when an animal is taken from a low to a high altitude; the latter is present in all forms of anæmia. The white blood corpuscles, or leucocytes, though much less numerous than the red ones, have important functions. They are derived from lymph corpuscles, the cells of lymphatic glands, spleen, and pancreas; some of them (phagocytes) devour bacteria, dead or degenerate tissue, the products of inflammation, etc., and so have been called 'blood scavengers.' But they not only destroy what is effete; their normal secretions, especially those of the granular forms (for there are several kinds of leucocytes), have been shown to be essential to the economy of the body. Other solid elements in the blood are 'blood plates,' round bodies less than half the diameter of red corpuscles; they do not, as a rule, contain hæmoglobin, but are rich in phosphates and glycogen, and are supposed to aid in coagulation. Granular bodies also are found in blood: they are small, round, and highly refractive; seem to be derived from leucocytes, degenerating red cells, and blood plates; and form precipitates in the blood plasma.

Chemical Composition.—In the red cells the main constituents are hæmoglobin (a globulin which coagulates at 167° F.), lecithin, cholesterin, and salts of potassium, sodium, iron, calcium, and magnesium. The most important salts are the chlorides and phosphates. There is about 70 per cent. of water. The hæmoglobin, which takes up oxygen in the lungs and carries it to all the tissues, is by

far the most important constituent. The leucocytes are rich in a protein, 'nucleo-histin;' and the large proportionate quantity of phosphorus in the cells depends mainly on this substance and on lecithin. The number of leucocytes increases after a meal, and is proportionately larger in the pregnant, the newly-born, and in those suffering from certain diseases. (See LEUCOCYTHÆMIA and LEUCOCYTOSIS.)

Plasma and Serum.—While blood corpuscles and plasma form normal blood, clotted blood consists of clot and serum. The plasma is alkaline, yellowish in tint, of sp. gr. 1·026–1·029; 100 parts of plasma contain water 90·3, and solids 9·7. The characteristic proteins of serum are serum globulin, serum albumin, and fibrin ferment; those of the plasma are fibrinogen, serum globulin, and serum albumin. The gases of plasma and serum are small quantities of oxygen, nitrogen, and carbon dioxide.

The coagulation of blood may be observed in blood which has been drawn into an open vessel. In two or three minutes the surface of the fluid becomes semi-solid or jelly-like, and this change extends in eight or nine minutes throughout the mass. It is supposed that when blood is in the body it contains a globulin 'fibrinogen,' and that when it is shed the fibrinogen molecule is split up into a globulin which remains in solution, and 'fibrin ferment' which does not exist in healthy blood, but is a product of the disintegration of the white corpuscles and blood plates produced when the blood leaves the vessels or comes in contact with foreign matter. Methods have been devised for estimating the total quantity of blood, the volume of the corpuscles and plasma, the specific gravity, and the alkalinity. The quantity of haemoglobin is estimated by colour tests, and the number of red corpuscles within a given volume is counted under the microscope in the hæmocytometer. The bacteriological examination of blood has yielded valuable results, as, for example, in 'Widal's reaction,' which is valuable in the diagnosis of typhoid fever. The recently discovered test of the opsonic index of the blood is an important aid in diagnosis and treatment. See SERUM THERAPY.

Blood, AVENGER OF (Heb. *goël haddam*), a title given to one who pursued a manslayer to avenge the death of his kinsman. Hebrew law stands between primitive custom, which puts the duty of avenging murder on the kindred of the murdered, and modern law, which puts it on the state. Thus it is the kinsman, not the state, who executes justice (Deut. 19: 12); but the manslayer can flee to the altar or the cities of refuge, and there lay his case before the elders (Josh. 20 : 4 *f.*); in Num. 35 : 24*f.* the congregation decides between him and the *goël*. In this way a certain check was given to the blood-feud. It is noteworthy that Hebrew law forbade compensation for murder (Num. 35 : 31 *f.*), which the Koran allows. See W. R. Smith's *Religion of Semites* (1894), p. 33*f.*

Blood, THOMAS (*c.* 1618–80), English adventurer, usually styled Colonel Blood. For his military services on the parliamentary side he was rewarded with Irish estates, which he lost at the restoration, but received again from Charles II. His most notorious exploits were the plot to surprise Dublin Castle and seize the lord-lieutenant, in 1663; the rescue of his friend Captain Mason from a guard of eight troopers near Doncaster; the attempt to kill the Duke of Ormonde, in 1670; and the theft of the crown jewels in 1671, for which he was imprisoned, though

shortly after released by the king.

Blood Flowers are species of *Hæmanthus*, order Amaryllidaceæ, from S. Africa. The flowers vary from white to crimson, and most of them have conspicuous and showy bracts. About forty species are used as greenhouse and sometimes as border plants in Britain. The juice of *H. toxicaria* is used by natives for poisoning their arrows.

Bloodhound, one of the oldest breeds of British dogs, though the present type is very different from the animal used as a dog of war in the 15th and 16th centuries. The art of the breeder has emphasized those features which give dignity and nobility of appearance; and the modern bloodhound, with its peculiarly pointed or dome-shaped skull, its crimson 'haws,' its many wrinkles, its solemn aspect, and its long, pendulous leathers or ears, perhaps carries characteristics to excess. Although popularly associated by name and reputation with fierceness to its human quarry, the bloodhound is a singularly docile, affectionate, and intelligent beast, and an admirable protector and companion to child or adult. A savage bloodhound is rare. Although the old vocation of the dog is gone, modern bloodhound trials have proved that, over ground less frequently trodden than a pavement, the animal retains its acute scent for human blood. It is equally ready to follow any of the chemical preparations used for hunting by 'drag.'

The descent of the English bloodhound is traced to the famous hounds of St. Hubert; but while these were black or white, the modern bloodhound is prejudiced by any admixture of white, except perhaps on the tip of the 'stern' or tail. The Cuban bloodhound, formerly used for hunting runaway slaves, is probably a collateral race from a Spanish stock, but lacks the superb qualities of the English type. There have been many celebrated breeders who have devoted their energies to keeping the strain pure, among whom may be noticed (in past years) Lords Yarborough, Fitzwilliam, and Faversham, the Hon. Grantley Berkeley, Mr. Jennings of Pickering (owner of the celebrated 'Druid'), Mr. Cowen of Blaydon-on-Tyne, and Mr. Holford of Ware (owner of 'Regent,' another magnificent hound). But in fostering 'type,' close breeding has been resorted to, with the usual result of defective constitution, and a large percentage of deaths among whelps.

The following are the points of the bloodhound as laid down by Mr. Edwin Brough, one of the leading breeders:—'Skull long, narrow, and very much peaked; muzzle deep and square; ears set on very low, long, thin, and hanging in graceful folds close to the face; deep-set eyes, with triangular lids, showing the red haw; flews long, thin, and pendulous, the upper lip overhanging the lower one; neck long, with profuse dewlap; skin of face very loose and wrinkled; coat close; skin thin; shoulders deep and sloping; brisket well let down; loins broad and muscular; powerful thighs and second thighs; good legs; round feet; hocks well bent; tapering, lashing stern. Colours, black and tan, red and tawn, tawny.' To this may be added a graceful carriage, and a very grand and sonorous voice, although not often heard when following the trail. The eye should be of a dark hazel colour, and full of aristocratic expression. The average weight of a dog is 90 lbs.; of a bitch, 75 lbs.; and the heights 26 and 24 inches respectively.

Blood-poisoning. See SEPTICÆMIA.

Blood-rain, a red rain which often occurs in Italy and S. Europe. The colour is traced to microscopic dust, of a brick-red colour, borne high into the air by winds from the African desert.

Bloodroot (*Sanguinaria canadensis*), a N. American plant of the poppy order. Its rhizome and roots have a red juice. It is grown as a hardy perennial in Britain, producing glaucous leaves and conspicuous white flowers with masses of yellow stamens. The plant is about six inches high, and makes an effective show. The name is also applied to species of the order Hæmodoraceæ, which is related to the Amaryllids. The plants are found in America, Australia, and S. Africa. Some Australian species have a red juice, and their roots are eaten by the natives. Another bloodroot is *Geum canadense*, order Rosaceæ, of N. America.

Blood-stains. In medico-legal investigations it is often of the utmost importance to determine whether stains are due to blood. The investigation is often carried on under difficulties: the stains may be small, old, or on foul linen, and a simple test should first be tried. Touch the spot with ammonia: if it turns a greenish tint, it is not blood, but probably a vegetable stain; if it does not alter, then various other tests may be tried. (1.) Take a small fragment of the stained fabric, place it on a colour-slab; add to it one or two drops of a freshly-prepared solution of guaiacum in alcohol, mix, then add a drop of ozonic ether. If blood is present, a blue colour results; if not, no colour change takes place. This test is most trustworthy when it yields a negative reaction; for other substances besides blood—such as gluten, raw potato, milk, and bile—give a blue colour with guaiacum. (2.) Cut out a piece of the tained fabric, and saturate it with glacial acetic acid, to which add a crystal of table salt if the stain is old. Press the fluid from the piece, evaporate it, and examine it microscopically when cool. If it is blood, the resulting crystals will be a yellow brown or claret colour, and yield a blue reaction with guaiacum. They are hydrochlorate of hæmatin, and usually occur in the form of rhombic plates. (3.) But by far the best test is the spectroscopic, and for this a small quantity of blood is sufficient. The spectrum of oxyhæmoglobin is characterized by the presence of two absorption bands between the lines D and E. But often the blood will have passed, by exposure to the air, from the condition of oxyhæmoglobin to that of methæmoglobin before the stain is examined; and the spectrum of methæmoglobin is like that of oxyhæmoglobin, with the addition of a thin band in the red nearer the C line than the D. The microscopic examination of the red corpuscles is useful in the case of fresh stains; but all the mammalia, with the exception of the camel, have blood corpuscles like those of man, and the difference in size is so slight that it is impossible to discriminate one from the other. The corpuscles of birds, fishes, and reptiles are more or less oval; those of the camel are large, oval, and nucleated. The results of recent research have placed at the disposal of the medical service very delicate methods of differentiating human blood from that of other animals, and, indeed, of distinguishing between the blood of different animal species. An admirable account of these useful and highly technical tests is given in *Blood Stains: their Detection and the Determination of their Source*, by Major W. D. Sutherland, M.D., I.M.S. (1907).

Bloodstone, a name given to a variety of chalcedony or plasma,

distinguished by the presence on a dark-green ground of blood-red spots, apparently due to red oxide of iron. It has been much used for rings and brooches those varieties being most valued in which the red spots are bright, well defined, not too irregularly scattered, and contrast well with the dark-green colour of the body of the stone. It is found in Iceland, the Hebrides, and in larger quantities in India and Australia. Heliotrope is another name applied to bloodstone. See Streeter's *Precious Stones and Gems* (1898).

Bloodworms are the aquatic larvæ of gnats, belonging to the genus Chironomus. They are long, slender, worm-like creatures, which contain the red blood pigment hæmoglobin, and do not at first possess the ordinary tracheal system of insects. They occur in stagnant water.

Bloomer Costume. This form of dress was introduced into America in 1851 by Mrs. Bloomer of New York. It consists of an ordinary bodice, and a skirt falling just below the knees, over full trousers gathered at the ankles. The fashion was adopted by a few women in the west of London in 1851, but was ridiculed and soon discarded. It led the way, however, to the modern use of knickerbockers and the divided skirt for cycling and climbing.

Bloomfield, tn., Essex co., New Jersey, U.S.A., 12 m. N.W. of New York, on Erie and Lackawanna Railroad and Morris Canal. Its chief educational institution is the German Theological Seminary. It is partly a residential place, but manufactures woollens and rubber goods and boots and shoes. Pop. 12,000. See Shaw's *History of Essex and Hudson Counties, New Jersey* (1884).

Bloomfield, ROBERT (1766–1823), English poet, born in Suffolk, was first an agricultural labourer, and then a shoemaker in London. During a short residence in the country in 1786 he conceived the idea of his poem *The Farmer's Boy*, written under melancholy circumstances in a London garret, and published in 1800. It is an estimable though much overpraised work, and was so successful that close on 26,000 copies were sold in three years. He died in poverty and mental darkness. A collected edition of his works, with Life by Joseph Weston, appeared in 1824.

Bloomington. (1.) City, Illinois, U.S.A., the co. seat of M'Lean co.; situated in the central part of the state, 60 m. N.E. of Springfield. It is the seat of Illinois Wesleyan University (1852); the State Normal University is at Normal, 2 m. distant. The manufactures include machine-shop and foundry products, bricks and tiles. Pork-packing and fruit-canning industries are important. Pop. 26,000. (2.) Town, Indiana, U.S.A., cap. of Monroe co., 50 m. S.S.W. of Indianapolis; is the seat of Indiana University, founded in 1828. It has large limestone quarries, and manufactures furniture and woollen goods. Pop. 9,000.

Bloomsburg, tn., Pennsylvania, U.S.A., co. seat of Columbia co., 35 m. S.W. of Wilkesbarre, on l. bk. of the N. branch of the Susquehanna R. There are foundries and blast furnaces, and furniture, woollen, silk, and flour factories. Pop. 6,200.

Bloomsbury, part of eccles. par. of St. Giles-in-the-Fields and St. George, London, England.

Blore, EDWARD (1787–1879), English architect, son of Thomas Blore (1764–1818), Derby, whose *History of Rutland* (1811), as well as Britton's *English Cathedrals* (1811–15), he illustrated. He did much to revive the study of Gothic architecture. Among the numerous buildings designed by him the chief was Abbotsford. He was the

author of *Monumental Remains of Noble and Eminent Persons* (1824).

Blore with Swinscoe, par. and small vil., on the Dove R., N. Staffordshire, England, 4 m. N.W. of Ashborne. On the heath was fought the second battle of the wars of the Roses in 1459.

Blouet. See MAX O'RELL.

Blount, CHARLES, EARL OF DEVONSHIRE and EIGHTH BARON MOUNTJOY (1563–1606), served in Netherlands, in pursuit of the Armada, and in Brittany (1586–93), and was lieutenant of land forces in Essex's expedition to the Azores (1597). He was implicated in Essex's conspiracy, but escaped punishment. When lord-deputy of Ireland (1601) he put down Tyrone's rebellion. M.P. for Beeralston (1584, 1586, and 1593); K.G. (1597); created Earl of Devonshire (1603).

Blount, CHARLES (1654–93), English deist, was a disciple of Hobbes, and the author of several freethinking works. His *Anima Mundi* (1679) is a history of opinions concerning immortality. Priestcraft is attacked in *Diana of the Ephesians* (1680), and in the better-known translation, with notes, of *The Two First Books of Apollonius Tyaneus* (1680).

Blount, THOMAS (1618–79), English miscellaneous writer, born at Bordesley; was educated for the law, but, being a Roman Catholic, did not practise. He was the author of the *Academie of Eloquence* (1654); *Boscobel*, in two parts (1660 and 1681); *Law Dict.* (1670); *Ancient Tenures and Jocular Customs of some Manors* (1679; new ed. 1815).

Blow, JOHN (1648–1708), English musical composer, became organist of Westminster Abbey in 1669, and was successively master of the children at the Chapel Royal (1674) and St. Paul's Cathedral (1687–98). In organ-playing his contemporaries reckoned him to be unequalled. He was a prolific composer of ecclesiastical music. He wrote incidental music for several occasions, notably the anthems, *I was glad* (for the opening of St. Paul's Cathedral), and *Behold, how good and joyful* (for the union with Scotland). Several of his pieces have been republished in Pauer's *Dict. of Pianists and Composers* (1877).

Blow-fly. See BLUE-BOTTLE.

Blowing Machines, mechanical contrivances for the production of a current of compressed air. Their use is as varied as their form, but they are chiefly employed to produce the blast for metallurgical and forced draught for boiler furnaces, to displace vitiated air in close and foul places and in mines, to supply warmed, cooled, or purified air to public buildings, and to furnish a drying current of air to lumber, grain, fabrics, and other articles, or to remove steam, dust, and refuse from factories. The most elementary blowing machine is the common bellows of domestic use, which was also used from time immemorial for metallurgy, until the blowing cylinder with reciprocating piston was devised. Blowing cylinders worked by direct acting steam-engines and gas-engines are now in general use to produce a blast of from two to five pounds pressure per square inch, according as the fuel is tender or hard; in American anthracite furnaces pressures up to ten pounds are employed. For low pressures and large volumes of air, fans and rotary blowers, often driven directly by steam-turbines, are preferred.

A modern blowing cylinder (Fig. 1) is fitted with a piston usually coupled direct to the reciprocating piston of the steam-engine. Air is drawn into one end of the cylinder through a flap-valve in the cylinder cover while the piston makes its out-stroke, and at the same time the air at

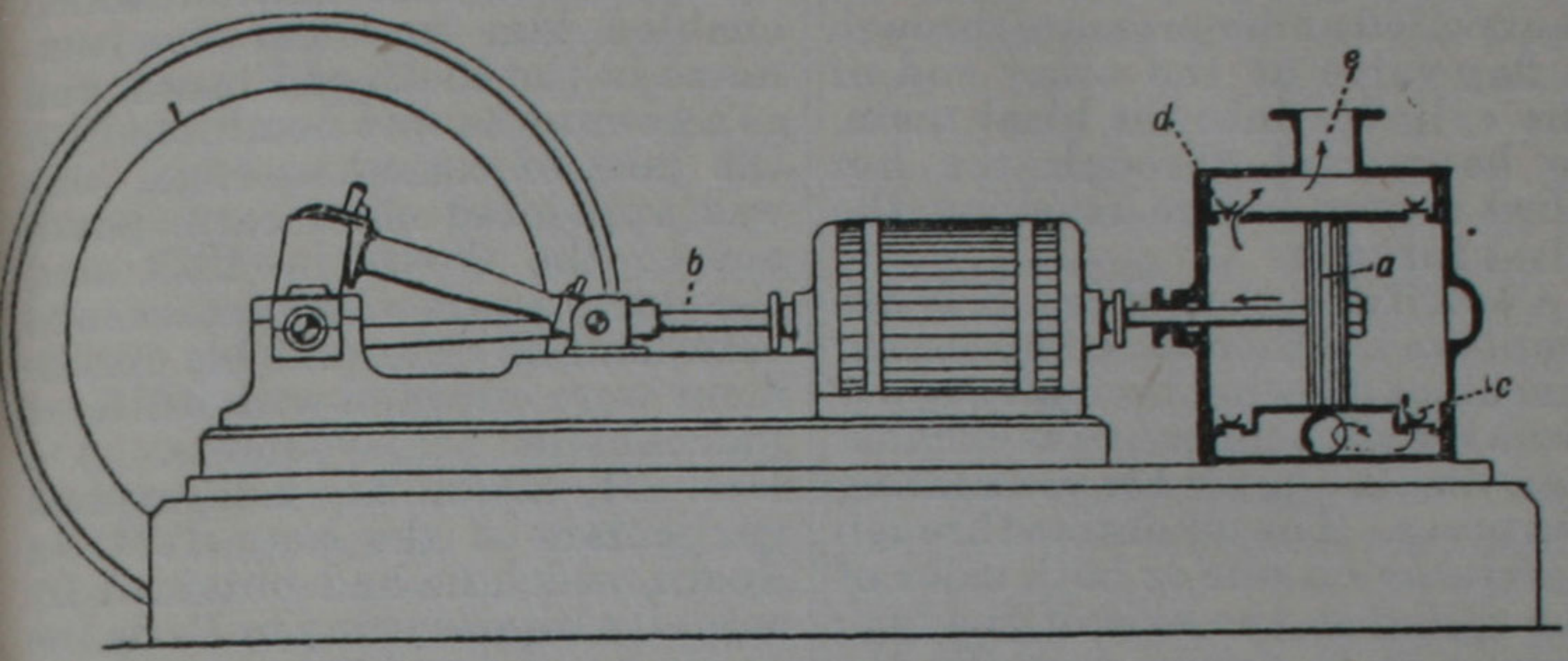


Fig. 1

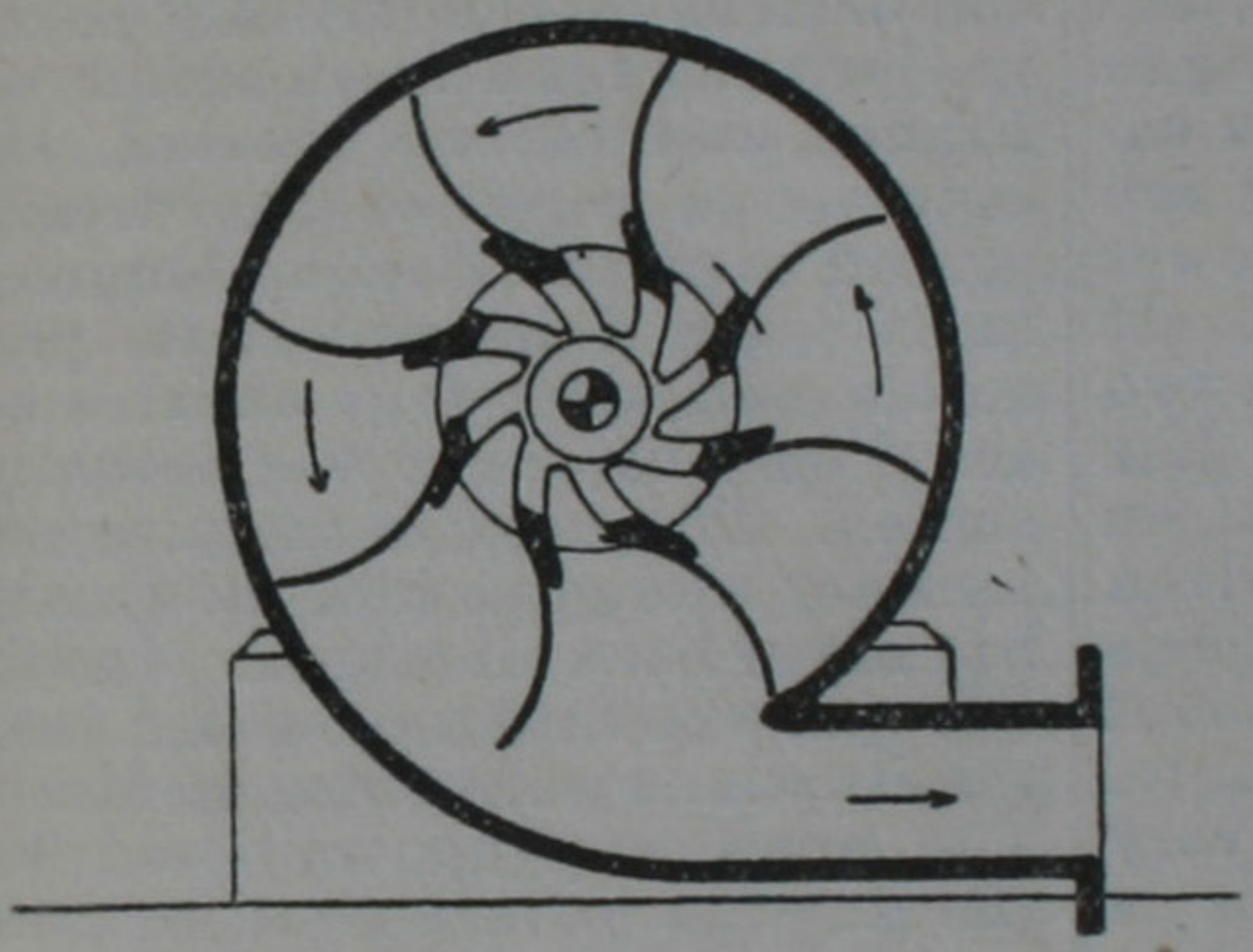


Fig. 2

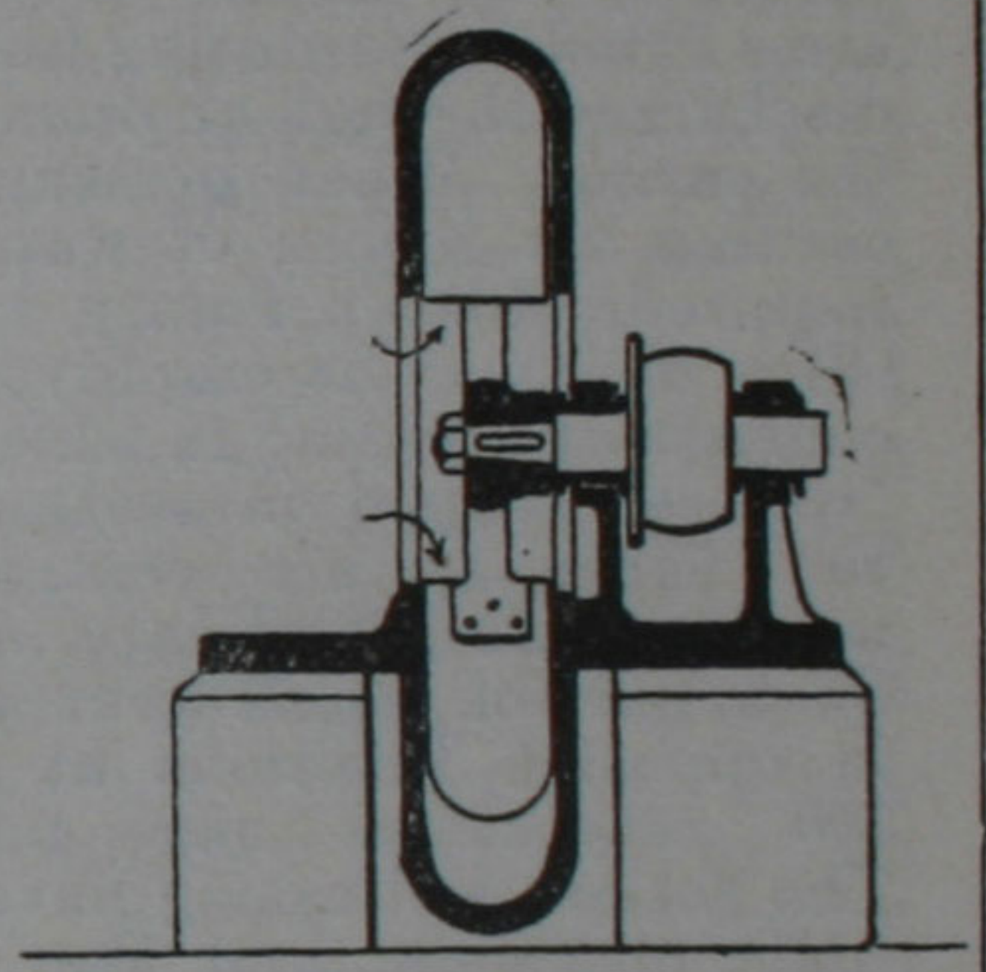


Fig. 3

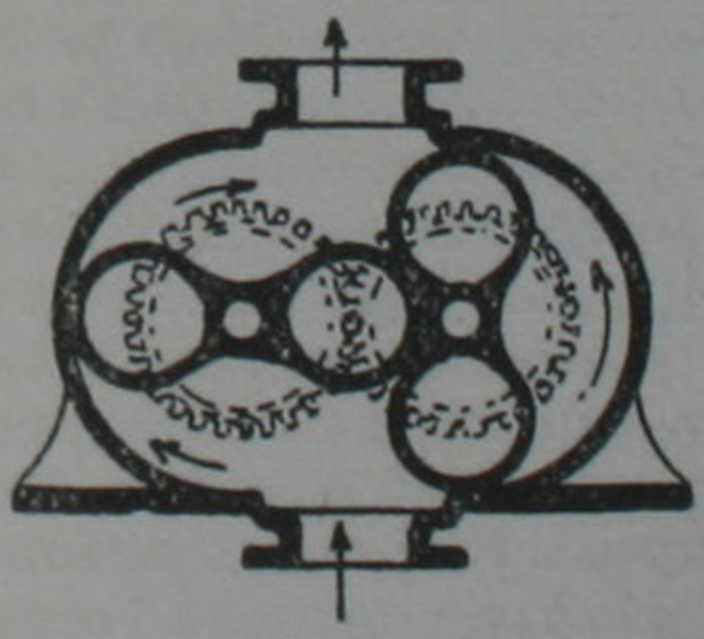


Fig. 4

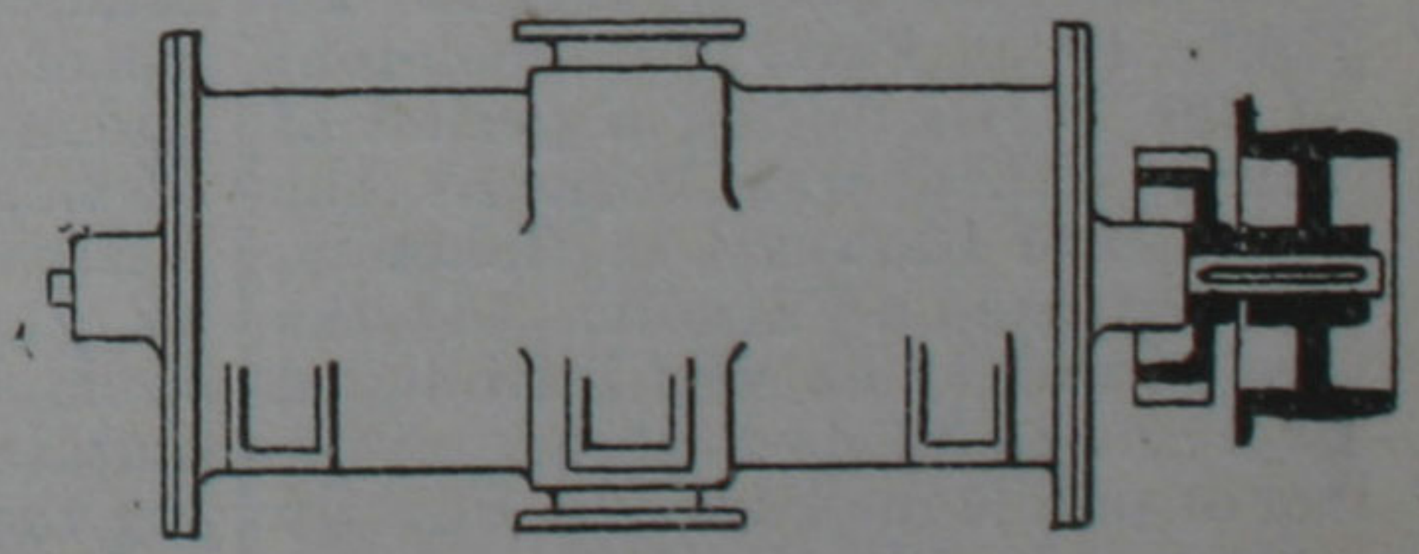


Fig. 5

Blowing Machines.

Fig. 1. Blowing cylinder—*a*, piston; *b*, piston rod of steam-engine; *c*, air inlet valve; *d*, outlet valve; *e*, blast main. Fig. 2. Centrifugal fan, side elevation (section); Fig. 3, end elevation (section). Fig. 4. Roots's rotary blower (section); Fig. 5, elevation.

the other side of the piston, drawn in at the previous in-stroke, is expelled under pressure through a flap-valve at the other end of the cylinder into the blast main, to be passed through the hot blast stoves before reaching the blast furnace.

Centrifugal fans (Figs. 2, 3) are employed either as compressing machines drawing their air supply from the atmosphere, or as exhaust fans displacing air for ventilating purposes. The air enters through apertures on one or both sides of the casing in the axis of the fan; thence it is driven towards the periphery by means of curved arms fitted on a rotating hub, and discharged through an opening in the casing. When pressures exceeding six inches of water are required, Roots's rotary blower (Figs. 4, 5) may be employed. It consists of a casing in which two 'rollers,' shaped in section like the figure 8, are centred on parallel axes, and are driven by a pair of equal spur-wheels in opposite directions at about 300 revolutions per minute. The rollers and casing have very little clearance, and the air is really scraped out of the casing on one side and delivered on the other. See VENTILATION.

Blowitz, HENRI GEORGES STEPHAN ADOLPHE OPPER DE (1825–1903), Paris correspondent of the *Times* during a period of thirty years, was born at the château of Blowsky, in Bohemia, and baptized a Catholic. At the age of twenty he was introduced at Paris to M. de Falloux, minister of public instruction. Shortly afterwards Blowitz received the offer of a professorship of modern languages in Angers. He subsequently occupied a similar post in Marseilles. He shortly afterwards retired from the teaching profession and took to politics. On the establishment of the republic in 1870 he obtained letters of naturalization. He supplied Thiers with information which enabled him to crush the commune in the south of France, and as a reward he was nominated for the post of consul at Riga. He was appointed chief correspondent of the *Times* in 1873, and the thirty years which intervened between this date and his retirement were crowded with brilliant journalistic achievements. On Dec. 31, 1873, he telegraphed particulars of the *coup d'état* in Spain, which he had obtained by actually interviewing in Paris the newly-proclaimed king, Alfonso XII. Two years later he exposed the designs of the military party in Germany for a fresh attack on France, and war was averted. He obtained a copy of the treaty agreed to at the Berlin Congress in 1878, and telegraphed its preamble and sixty-four articles to the *Times* before it was actually signed. The name of the plenipotentiary who gave him the treaty has never been divulged. It was Blowitz who first announced that the Russians were going to Merv. The news was contradicted by the Russian government, but the prophecy was realized within six months. During his connection with the *Times* he interviewed Bismarck, Thiers, Gambetta, King Humbert, Pope Leo XIII., the Sultan of Turkey, the Shah of Persia, and many other notabilities. His *Memoirs* were published in 1903.

Blowpipe, an instrument used by glass-blowers, in analytical chemistry, and in the soldering of metals, for directing and increasing the rapidity of combustion of a flame. In its simplest form it consists of a tapered metal tube fitted with a mouthpiece; from the side projects a narrow tube provided with a nozzle of brass or platinum. By holding the point of the side tube into a candle or gas flame, and blowing a gentle current of air from the mouth,

the flame is deflected, and an intensely hot, pointed jet is obtained. Larger blowpipes are made in various patterns, the air being supplied from a foot-bellows, and the supply of gas and air regulated by taps. See C. F. Plattner's *Blowpipe Analysis* (1875); W. A. Shenstone's *Methods of Glass-blowing* (2nd ed. 1888); and Bolas's *Glass-Blowing and Working* (1898).

Bloxwich, eccles. par. and vil., Staffordshire, England, 2 m. N.W. of Walsall, on L. & N.W.R. In the vicinity are coal and iron-stone mines and blast-furnaces. Pop. of par. 18,000.

Blücher, GEBHARD LEBERECHT VON (1742–1819), Prince of Wahlstatt, field-marshal of Prussia, was born at Rostock, and entered first the Swedish service, then the Prussian (1760). In 1772 he left the army and farmed his own lands until the accession of Frederick-William II. (1787). After being present in many actions (*e.g.* Kaiserslautern) against the French, he commanded the cavalry at Auerstädt in 1806, and was compelled to surrender after the fall of Lübeck (1806), but was soon after exchanged for the French general Victor. In 1813 Blücher received the chief command in Silesia, operating against the French at the battles of Lützen, Bautzen, and Haynau. He defeated Marshal Macdonald at the Katzbach in Aug. 1813, Marmont at Möckern (Oct. 16), and three days later made his victorious entry into Leipzig, and was raised to the rank of field-marshal. In January 1814 he crossed the Rhine, and won the battle of La Rothière, but was soon afterwards defeated by Napoleon. This reverse, however, was quickly wiped out by his victory over Napoleon at Laon on March 9; and after again inflicting a severe defeat on the French at Montmartre, he marched in triumph into Paris. After Napoleon's return from Elba in 1815, Blücher was appointed commander-in-chief of the Prussian army. At Ligny, on June 16, he was defeated after a stubborn action; but he rallied his scattered troops, and moved to the assistance of Wellington at Waterloo. This impending flank attack on the French contributed greatly to the completeness of Wellington's victory, if indeed it was not the chief cause of it, and Blücher was in time to participate in the pursuit. On the second taking of Paris, Wellington had great difficulty in preventing Blücher from sacking the capital, which the latter held to be a justifiable retaliation for the sacking of other capitals by the French. He received the order of the Iron Cross (established 1813) from Frederick-William III. Rauch's noble statue of the veteran was erected (1820) at Breslau. Blücher's intrepidity and warlike fervour gained him the appellation of 'Marshal Vorwärts' (Go ahead), but he was not a great military strategist or tactician. He was characterized by patriotism, loyalty, and integrity, and by uncompromising hatred of Napoleon. Although rough in manner, he was idolized by his troops. See *Lives*, by Förster (1821; new ed. 1887), Scherr (1862), Varnhagen von Ense (in vol. iii. of *Biographische Denkmale*, 1827); also the various histories of the Waterloo campaign.

Bludenz, tn., Vorarlberg, Austria, 18 m. S. by E. of Dornbirn. It is a much frequented tourist resort. Pop. 5,500.

Blue. The blue pigments and dyes in most general use are ultramarine, cobalt blue, indigo, and Prussian blue, in addition to the large number of compounds made from coal-tar products. Laundry blue is made of ultramarine, 60 parts; bicarbonate of

soda, 40 parts; glucose, 12 parts. Grind the two first together, mix in the glucose, and press in moulds. Liquid laundry blue may be made as follows:—Indigo or Prussian blue, 8 lbs.; oxalic acid, 1 lb.; water, 32 gallons.

Bluebeard, hero of the fairy tale, and type of savage husbands. The English version is a rendering of Perrault's *Barbe-Bleue* (in his *Contes*, 1697). Bluebeard is the subject of an *opéra bouffe* by Offenbach (1866). See also Anatole France's *Les Sept Femmes de la Barbe-Bleue* (1909).

Bluebell, a name applied to two plants—the wild hyacinth (*Scilla nutans*), which flowers in woods in spring; and the harebell (*Campanula rotundifolia*), which flowers during summer in pastures and on hills. The latter is the 'bluebell of Scotland.'

Bluebird (*Sialia Wilsoni*), a common N. American bird belonging to the thrush family. In the New England States it is known as the blue robin. The name is also applied to the Indian *Irena puella*, a member of the family Pycnonotidæ. See John Burroughs's *Wake Robin* (1871).

Blue Books, a general term for official reports of the British Parliament and the Privy Council, usually bound in blue paper covers, containing the votes and proceedings of the House, bills at their successive stages, annual estimates for the public service, accounts of the expenditure of the previous year's votes, documents tabled by the ministry voluntarily or on demand of the House, reports of government commissions, annual reports of governors of colonies and consuls, etc. One session's blue books will fill from 80 to 130 folio volumes. The printing of the proceedings of the House dates from 1681, and the selling of its blue books from 1836. Properly speaking, the only blue books are those in blue paper covers. Votes and proceedings of the two Houses, bills, etc., are unbound, and are known as 'Parliamentary Papers.' Estimates, trade returns, etc., are 'white papers.' Certain annual reports, like those of the Labour Department of the Board of Trade, are in buff. Many blue books, such as consular reports, are octavo, not folio. In imitation of the blue book, Germany has established its gray or white book, first communicated (1884) to the Imperial Parliament. In France, the corresponding colour is yellow; in Spain and Austria, red; in Italy, green; and in the United States of America, both blue and red.

Blue-bottle, or BLOW-FLY (*Calliphora vomitoria*), an insect nearly related to the common house fly, but differing in its larger size, its bright blue abdomen, and its deep humming note. The eggs are laid in meat, especially if putrefaction has commenced—the flies being strongly attracted by decomposing matter of any kind—and hatch into maggots, which pass through the usual life-history of flies. In certain parts of England, especially the fens round the Wash, they are a source of constant trouble to the owners of sheep during the warm months, the maggots frequently penetrating the skin.

Blue-coat School. See CHRIST'S HOSPITAL.

Blue-eye, a name given to an Australian bird, *Entomyza cyanotis*, one of the honey-eaters.

Bluefields, or BLEWFIELDS, riv. and tn., on E. ct. of Nicaragua, Central America. The river has a course of about 100 m., and is navigable for 60 m. The harbour of Bluefields is one of the finest in Central America, lat. 12° N. Pop. of tn. about 5,000.

Blue-fish (*Temnodon saltator*), also called 'skip-jack,' is a widely-

distributed fish belonging to the family of the horse-mackerels. It is especially common on the coasts of N. America, where it is much used as food. It may attain a length of three feet, but is usually less, and is a most rapacious fish.

Blue-gowns, or KING'S BEDESMEN, public almsmen in Scotland to whom the kings distributed bounty, in return for which they were expected to pray for the welfare of king and state. The appointment of blue-gowns ceased in 1833, and the last allowance to a blue-gown was made in 1863. See Introduction to Scott's *Antiquary.*

Blue Grass, JUNE GRASS, or SPEAR GRASS (*Poa pratensis*), a valuable permanent pasture grass, known in Britain as smooth meadow grass, and in N. America as the 'blue grass of Kentucky.' The blue grass region is the scene of most of the novels of Mr. James Lane Allen. A similar species, Texas blue grass (*P. arachnifera*) takes its place in the southern states.

Blue Island, tn., Cook co., Illinois, U.S.A., 12 m. s. of Chicago, of which it forms a suburb. Pop. 6,000.

Blue John Mine, chambered cave, N. Derbyshire, England, 1½ m. w. of Castleton, producing the nodular purple fluorspar known as Blue John.

Blue Mountains. (1.) Well-wooded (chiefly with eucalyptus) range of mountains in New South Wales, extending from the Warragong Mts. (or Australian Alps) on the S.W. to the Liverpool Range on the N., approaching to within 40 m. of the coast. In places the spurs run down to the shore. Average alt. 3,000 ft. See Argus's *The Jenolian Caves and the Blue Mountains* (1898). (2.) Mountain group in Oregon, U.S.A., trending nearly N. and S., in the E. part of the state; alt. from 5,000 to 9,000 ft. It is chiefly composed of lava, with granite in the higher portions. (3.) Mountain range in E. of Jamaica, running from E. to W., and culminating at 7,423 ft. (4.) Range, Pennsylvania. See KITTATINNY.

Blue Nile. See NILE.

Blue Peter, in the British navy, the blue flag with white square in the centre, denoting the letter P in the alphabetical signal code; hoisted at the fore to show that a ship is about to put to sea.

Blue Pill, or *Pilula hydrargyri* of the British Pharmacopœia, contains free mercury in the proportion of one part in three, with liquorice and confection of roses. It is a common purgative, acting probably by irritation of the intestinal mucous membrane, and resulting in peristalsis and a watery exudation. It hastens the evacuation of bile, but does not increase the amount secreted by the liver. Its action is commonly aided by the after-use of some saline draught.

Blue Ridge, range of the Appalachian Mts. lying nearest to the Atlantic coast. It is highest in Virginia and N. Carolina, and is traced from the comparatively low headlands of West Point, New York, into Alabama.

Blue Shark (*Carcharias glaucus*), a common shark, which sometimes reaches a length of 25 ft., though from 12 to 15 ft. is the usual size. Most abundant in tropical seas, its range extends northwards to the south coast of England.

Bluestocking, a term applied contemptuously to a female pedant. It originated in connection with certain reunions held in London about 1780 by Johnson's friend, Mrs. Montagu, and other ladies. Hannah More addressed to them her poem of *Bas-Bleu, or Conversation* (2nd ed. 1787).

Blue Suns. After the great eruption of Krakatoa on Aug. 27,

1883, blue, green, silvery, and coppery suns were seen at many places in the tropics, the phenomenon being attributed to a dust haze which proceeded from the neighbourhood of the volcano. Some maintain that the appearances were merely the effect of contrast colours, while others refer them to the transmission or the diffraction of light. Professor Kiessling produced experimentally transmission tints varying from brownish red to gray-blue, obtaining the blue sun both with a cloud of chloride of ammonium and with aqueous vapour mixed with ordinary dust. See Symonds's *Eruption of Krakatoa, and subsequent Phenomena* (1888). See also BISHOP'S RING.

Bluethroat (*Cyanecula suecica*), a beautiful bird allied to the redstart, which is an occasional visitor to Britain. It is also called the 'Swedish nightingale' and the 'bluebreast;' while to epicures it is one of the birds known as beccafico or becfin. It breeds in N. Europe, Siberia, Alaska, etc., and winters in Abyssinia and India.

Blum, HANS (1841), German jurist and historian, born at Leipzig. He was a member of the North German Parliament from 1867–70, and has written several works on jurisprudence and on the contemporary history of Germany, as *Auf dem Wege zur Deutschen Einheit* (2 vols. 1893), *Das Deutsche Reich zur Zeit Bismarcks* (1893), *Fürst Bismarck und seine Zeit* (6 vols. 1894–5), *Persönliche Erinnerungen an den Fürsten Bismarck* (2nd ed. 1900), *Spannende Geschichten* (1902), *Ueberbande* (1904), *Eigene Lebenserinnerungen* (1907), etc.

Blum, ROBERT (1807–48), German politician, born at Cologne. He helped to found (1840) at Leipzig the Schiller Society, and (1847) a publishing house from which he issued his *Staatslexikon*. Democratic leader in the revolution of 1848, he represented Leipzig in the Frankfort Parliament. Sent by the Left with a congratulatory address to the insurgents of Vienna, he led them at the barricades, but was taken prisoner and shot (Nov. 9) for having assumed arms against the imperial troops. The news excited the liveliest indignation throughout Germany, where £6,000 was raised for his widow and children. See his *Life*, by H. Blum (1878).

Blumenau, German colony (founded 1850) and tn. in state of Santa Catharina, Brazil, about 30 m. W. of Itajahy. Corn, tobacco, sugar-cane, coffee, rice, etc., are extensively cultivated. Pop. 30,000.

Blumenbach, JOHANN FRIEDRICH (1752–1840), German naturalist, born at Gotha. Appointed (1776) professor at Göttingen, he there lectured for nearly sixty years on natural history, anatomy, and medicine. In 1785 he discerned, before Cuvier, that the true basis of zoological study is comparative anatomy, a science which he elaborated in *Handbuch d. vergleichenden Anatomie u. Physiologie* (1804; new ed. 1824). Devoting himself particularly to the history of man, he advocated the unity of the race, and made a collection of human skulls, supplying data for his *Collectio Craniorum Diversarum Gentium* (1790–1828). Original observations are also embodied in his *Ueber den Bildungstrieb* (1781), *Institutiones Physiologicæ* (1787; new ed. 1821), *De Generis Humani Varietate Nativa* (1795), etc.

Blumenthal, JACQUES (1828–1908), musical composer, was born at Hamburg, and educated in Vienna and Paris but became a naturalized British subject, having lived in England since 1848. He is best known as a song-writer. his *The Message*, *Requital*, *My Queen*, etc., having had considerable popularity.

Blumenthal, LEONHARD, COUNT VON (1810–1900), Prussian general. Appointed on the general staff in 1849, he distinguished himself in Schleswig-Holstein in the same year; took part as chief of the staff in the campaign against Denmark (1864); served as chief of the staff to the Crown Prince of Prussia in the Austrian campaign of 1866; and in the war with France (1870–1) he again acted as chief of the staff to the Crown Prince Frederick, and took part in the surrender at Sedan and in the siege of Paris. Created a field-marshal by the Emperor Frederick in 1888. See *Journals of Field-Marshal Count von Blumenthal* (Eng. trans. 1902).

Blumenthal, OSKAR (1852), founder and manager of the Lessing Theatre (1888–97) in Berlin, and author of a number of light and popular comedies, such as *Der Probepfeil* (1882), *Die Grosse Glocke* (1887), *Im weissen Rössel* (1898). He has also written light satirical works, as *Allerhand Ungezogenheiten* (1874; 5th ed. 1877), *Gemischte Gesellschaft* (1877), *Aus heiterm Himmel* (1882), *Der Blinde Passagier* (1902), *Wann wir Altern* (1903), *Das Glashaus* (1906), etc.

Blunderbuss, a short gun, unrifled, and with a large bore, widening towards the muzzle, firing many balls or slugs, which scattered when fired, and were effective within a limited range without exact aim being taken. It has long been obsolete.

Blunt, JOHN HENRY (1823–84), English writer of theological and ecclesiastical books. Taking orders in 1852, he was presented with the crown living of Beverstone, in Gloucestershire, in 1873. He published *Annotated Book of Common Prayer* (1866), *Hist. of the Reformation* (1868), *Dict. of Theology* (1870), *Dict. of Sects and Heresies* (1874), and *Cyclopædia of Religion* (1884).

Blunt, JOHN JAMES (1794–1855), professor of divinity in Cambridge from 1839, is best known by his *Sermons*, and by his apologetic works, reissued as *Undesigned Coincidences in the Writings both of the Old and the New Testament* (1847). His *Hist. of the Christian Church during the First Three Centuries* (1856), and his lectures *On the Right Use of the Early Fathers*, were published after his death.

Blunt, WILFRID SCAWEN (1840), English poet, born at Petworth House, Sussex; served in the British diplomatic service from 1858 to 1870. His wife, Lady Anne Blunt, is a granddaughter of Lord Byron. Blunt upheld the cause of Arabi Pasha in Egypt in 1882, and in 1887–8 took part in the anti-coercion movement in Ireland, for which he suffered imprisonment. He resides for part of each year in Egypt. He is a poet of a high order. His works include *Love Sonnets of Proteus* (1880); *The Future of Islam* (1882); *The Wind and the Whirlwind* (1883); *Ideas about India* (1885); *In Vinculis* (1889); *A New Pilgrimage* (1889); *Esther* (1892); *Griselda* (1893); *Satan Absolved* (1899); *Seven Golden Odes of Pagan Arabia* (1903); *Secret History of the English Occupation of Egypt* (1907); and *India under Ripon* (1909). A useful selection of his *Poems* was made by W. E. Henley and G. Wyndham in 1898.

Bluntschli, JOHANN KASPAR (1808–81), Swiss jurist, born at Zürich. Professor at Zürich (1833), he published (1838–9) *Staats- und Rechts- geschichte der Stadt u. Landschaft Zürich*, the tenor of which conforms with the principles of the historic school. In 1848 he was called to a law chair at Munich. His *Allgemeines Staatsrecht* (1852; 5th ed. 1875–6), translated into English (1885; 2nd ed. 1892) and French (1877),

established his authority as a jurist. From 1861 professor at Heidelberg, and at the front of liberal movements, he co-operated in the foundation of the German House of Representatives (1862), and induced (1865) the upper house to submit voluntarily to reform. No less zealous for religious freedom, he was one of the most active members of the German Protestant Union. Bluntschli wrote several other books on German and Swiss law, politics, and history (*e.g. Geschichte der Republik Zürich*, 1847–56). His *Selbstbiographie* (3 vols.) appeared in 1884.

Blushing is a reflex dilatation of the blood-vessels of the face and neck, due to vasomotor paralysis through the cervical sympathetic nerve, acted upon by the higher cerebral nerve centres, their action being initiated by the emotions of shame, bashfulness, timidity, and the like. The phenomenon is not fully understood.

Blyth, seapt., mrkt. tn., and eccles. par., 9 m. S.E. of Morpeth, Northumberland, England; engaged in coal export trade. Pop. 30,000.

Boa, a genus of very large snakes, confined to tropical America, and without poison fangs. Their great size (10 to 11 ft.) and strength enable them to crush their prey to death by coiling the pliant body round the victim. The habit has long been rendered familiar by descriptions of the boa constrictor. The process of digestion is long and laborious, and is aided by a copious discharge of saliva. Together with the anacondas (*Eunectes*) and the pythons, the boas are included in the family Pythonidæ. The anaconda is an aquatic boa, said to reach 30 ft. in length. See PYTHON.

Boabdil, more correctly ABU ABDALLAH, last Moorish king of Granada. Rebelling against his father (1481), and then warring against his uncle, he so reduce the strength of the Moors tha he had to surrender Granad to Ferdinand of Aragon (1492 Crossing (1493) to Africa, he fe fighting in the service of the kin of Fez.

Boac, tn., on W. coast of th small isl. of Marinduque, Philip pines. Pop. 15,000.

Boadicea, queen of the Icen in Britain, who inhabited Suffol and Norfolk. The outrages o the Romans (60 A.D.)—two of he own daughters had been rav ished—caused her to head an in surrection during the absence o Suetonius Paulinus, the Roma governor, in Anglesey. She suc ceeded so far as to capture th towns of Camulodunum (Col chester) and Londinium, killin 70,000 Romans and their allies But Suetonius, on his return defeated the Britons with grea slaughter, and the queen put a end to her life (62 A.D.). Thi victory secured the Roman do minion in Britain. See Tenny son's *Boadicea*, Cowper's od with the same title, and Tacitus' *Annals*, xiv. 31–37.

Boanerges, a name given b Jesus, in Mark 3:17, to the dis ciples James and John, the son of Zebedee, and interpreted b the sacred writer as 'sons o thunder;' hence sometimes ap plied to a man of strong an vehement character.

Boar, or WILD BOAR (*Su scrofa*), a mammal once commo in the British Isles, and stil found in many parts of Europe Asia Minor, India, and N. Africa It is believed to be the origina of the domestic pig, from whic it differs in certain minor points The body is covered with long stiff bristles, beneath which there is a softer curling undercoat which is uniform in tint in the adult, while the young are striped In the swamps which it usually haunts the boar is prevented

from sinking in the mire by its broad spreading feet; on dry land it uses only the two median toes in walking, the lateral ones being too short to reach the ground. As is indicated by the generalized character of the teeth, the boar is practically omnivorous, though it depends largely upon roots, bulbs, and tubers, which are dug up by the sensitive snout with the help of the tusks. In the male the canines or dog-teeth are greatly developed, and make the animal a dangerous adversary when at bay. Zoologically the boar is of great interest, as being one of the most generalized of living even-toed ungulates, and as retaining the marshy habitat of the ancestral ungulates. Its unspecialized nature is shown especially in the number and structure of the teeth, of which it has forty-four, in the number (4) of the complete toes and the structure of the limbs, and in the simple nature of the stomach (contrast sheep and cow). See also PIG.

Board of Trade Unit, or B.T.U., is the commercial unit of electrical supply, and equals 1,000 watt-hours. It is equal to 1·34 h.p. working for one hour, as 746 watts = 1 h.p. The number of B.T.U.'s received in an hour is the product of the volts and ampères divided by 1,000.

Boards of Agriculture, Education, Trade, Works, etc. See AGRICULTURE, EDUCATION, TRADE, WORKS, etc.

Boar-fish, a name applied to two distinct fish—(1) to an Australian food-fish (*Histiopterus recurvirostris*) belonging to the perch family, and (2) to the Mediterranean *Capros aper*, one of the horse-mackerels, which occasionally appears off the British coast.

Boat, a term now indiscriminately used for sea and river vessels of all kinds, but more properly applied to a vessel that can be hauled up on or launched from a beach. It may be propelled by oars, sails, steam, or other motive power. From the earliest ages men have used buoyant contrivances to float them across streams and lakes. The primitive log or number of logs lashed together to form a raft, or bundles of brushwood or reeds used for the same purpose, early developed into the parent of modern boats, the dug-out, which has been found in association with Stone Age remains and in Swiss lake dwellings. Bark canoes and wickerwork frames covered with skins, such as the coracle of the ancient Britons, are a further development. The catamaran clearly exhibits its connection with the raft, so modified as to afford less resistance to the water. The art of boat-building began when men first lashed together pieces of wood with thongs, sinews, or fibres into a serviceable shape. For modern methods of boat-building see SHIP-BUILDING. Every kind of primitive boat may still be seen in use somewhere or other in the world. The coracle, for example, is still found on certain Welsh streams. Modern boats are of many kinds, according to the purposes for which they are intended and the character of the waters on which they are to sail. They are usually classed for racing purposes as open, half-decked, and decked boats. The canoe, punt, skiff, gondola, dingy, and outrigger are used on smooth water for pleasure and racing. The boats used by watermen vary greatly, according to the locality. On the Thames the wherry or skiff is used; on the north-east coast of England the coble, which is furnished with a dipping lug-sail. Larger and more powerfully built boats are used by fishermen. The ordinary canal boat, the Thames

barge, and the Norfolk wherry are used for freight; the former is usually towed, the two latter have sails. Whale boats are sharp at both ends, and are steered with an oar. Lifeboats are provided with air chambers, which render them self-righting or self-bailing, or both combined. The following boats are used in the royal navy for rowing and sailing: barge, pinnace, cutter, lifeboat cutter, galley, gig, jolly-boat, and dingy. Steam launches, pinnaces, and cutters are also employed. The Board of Trade requires every sea-going ship to carry a specified number of boats, according to the tonnage. Sea-going ships carrying passengers must carry a lifeboat, and have sufficient boat accommodation for all the passengers and crew carried. Among collapsible boats the Berthon is at once the most efficient and the most popular. The high-speed motor boat is chiefly a development of the past four or five years. See also YACHT, SUBMARINE NAVIGATION, MOTOR BOAT, and separate articles on the types mentioned above.

Boatbill, or BOATBILLED HERON (*Cancroma cochlearia*), is a S. American night-heron, remarkable for its broad head ending in the peculiar flattened bill to which it owes its name. The birds occur especially in the woods bordering the rivers of Brazil, and feed upon worms and aquatic organisms. See HERON.

Boat-fly, or WATER-BOATMAN (*Notonecta*), an insect belonging to the same group as the bug (Hemiptera-Heteroptera), but living entirely in the water. It is peculiar in that it always swims back downwards, and is exceedingly common in ponds, where it may be seen rising to the surface to breathe.

Boat Race. See ROWING.

Boatswain, a warrant-officer in the Royal Navy. The term is derived from 'boat's swain,' or hus band. According to Sir Harri Nicolas's account of the 'bus carles,' every ship was ancientl in charge of a 'batsuen,' wh commanded her crew in actio and acted at all times as maste pilot or steersman. The office o boatswain, although long in us received recognition for the fir time when the navy was increase in the 16th century. The dutie attached to the office were t take charge of the boats, sail rigging, colours, anchors, cable and cordage, and also to summo the crew to their duty, and t assist in the necessary busines of the ship. He has always use for this purpose a whistle, whic is to some extent his token o office. Boatswains were ancientl appointed by warrant from th Navy Board. At the present da the qualification necessary for boatswain is that he must hav been seven years at sea, and hav served one complete year as petty officer, either as seaman gunner, or seaman torpedo man and be between the ages o twenty-one and thirty-five Chief boatswains are promote from boatswains as the Admi ralty may see fit. For exemplar conduct, or for distinction by act of gallantry, these selected boat swains receive, after examina tion, a commission, on obtainin which they are given a gratuit of £100 for outfit. See *Th King's Regulations and Admi ralty Instructions.*

Boavista, or BUENAVISTA, th second largest of the Cape Verd Islands, with three ports—Port Sal Rey on the W., Porto do Nort on the N.E., and Porto Curralinh on the S.E. Pop. 5,000.

Boa Vista, the name of severa towns and villages in Brazil, th principal of which are: in th state of Maranhao, on the Ri Tocantins; in the state of Ama zonas, on the Rio Branco, als

on the Rio Purus; in the state of Pernambuco, on the Rio San Francisco; and in the state of Santa Catharina, 230 m. S.W. of Curityha.

Boaz, the name of one of the two brazen pillars at the porch of Solomon's temple, Jerusalem (1 Kings 7:21); the other was called Jachin.

Boaz, a man of Bethlehem, married Ruth, a Moabitess, and their son Obed was the grandfather of David. See Ruth; 1 Chron. 2:12–15; Matt. 1:5.

Bobbili, tn. in the Bobbili Estate (area, 1 sq. m.), Vizagapatam dist., Madras, India. The town is one of the most ancient in the presidency. Pop. 17,000.

Bobbins, wooden rollers with axial perforation by which to place them on a spindle, and flanged at each end. It is on bobbins that yarn is wound. In throstle-spinning the bobbins receive the threads of wool, cotton, etc., from the drawing rollers. The largest bobbins are used for the slubbing frames, where, from the lap shape in which it comes from the carder, the cotton passes into a loose strand. The most familiar form of bobbin is the pirn or spool of sewing-thread. Metal bobbins are used for lace-making. Paper tubes are now largely taking the place of bobbins.

Bobbio, tn. and episc. see, prov. Pavia, Italy, on the Trebbia, 26 m. S.W. of Piacenza. Near it, in 612, St. Columbanus founded an abbey, which possessed a famous collection of historical MSS., now in the Vatican and the Ambrosian Library, Milan. There is an old cathedral. Pop. 5,000.

Bober, riv., Silesia, Germany, rises on the Bohemian frontier in the Riesengebirge, and flows in a N.W. direction past Bunzlau and Sagan, joining the Oder at Krossen after a course of 150 m.

Böblingen, tn., Würtemberg, Germany, in the Neckar circle, 16 m. by rail S.W. of Stuttgart; manufactures sugar and chemicals, and cultivates hops. Here, in 1525, Truchsess von Waldburg defeated the insurgent peasants with heavy loss. Pop. 5,700.

Bobolink, or RICE-BUNTING (*Dolichonyx oryzivorus*), a N. American bird, famous for its song, powers of flight, and especially for the flavour of its flesh. It is related both to the buntings and to the family Icteridæ.

Bobrek, tn., Prussian prov. of Silesia, 3 m. W. by S. of Beuthen; with coal mines and zinc and iron works. Pop. 6,000.

Bobrinets, tn., Russia, gov. of and 120 m. N. of Kherson city, on an affluent of the Bûg. Tobacco manufacture. Pop. 15,000.

Bobruisk, tn., Minsk gov., Russia, till 1897 a strong fortress (besieged by the French in 1812), on Berezina, 103 m. by rail S.E. of Minsk. Pop. 35,000.

Bocage, MANOEL MARIA BARBOSA DU (1765–1805), Portuguese poet, born at Setubal; entered first the navy, where he remained until 1790, and after that devoted himself to literature. Bocage is, after Camoens, the most popular Portuguese poet. He wrote in every *genre* of poetry, but excelled in the sonnet, some of his being among the best in the Portuguese language. His liberal ideas brought him several times into trouble with the Inquisition. His works appeared under the title *Rimas* (1806–14); later, under the title *Obras Poeticas* (1875, 1876). See Braga's *Bocage, sua Vida e Epoca Litteraria* (1877).

Bocas del Toro, prov. of Panama, in the extreme N.W., the principal banana-producing prov. Pop. 22,000. The cap., Bocas del Toro, is situated on an island in Almirante Bay. Imports are valued at £1,750,000, and exports (mainly bananas and nuts) at £300,000 per annum. Pop. 6,000.

Bocaue, tn., Bulacan prov., Luzon, Philippine Is., 15 m. N.W. of Manila. Sugar and rice are cultivated. Pop. 10,000.

Boccaccio, GIOVANNI (1313–75), great Italian writer and humanist, was born at Paris, the natural son of a Florentine merchant. In 1334 (or 1338) he fell in love with Maria d'Aquino, a natural daughter of King Robert of Naples. This passion directly or indirectly inspired the poet to the composition of a number of works—the *Rime*, *Filocolo*, *Filostrato*, *Teseide*, *Amorosa Visione*, and *Fiammetta*. In 1340 he was recalled to Florence by his father. From 1345 to 1347 he dwelt in the Romagna, till, in 1349, his father's death compelled him again to return to Florence. In 1350 he entertained as his guest Petrarch, with whom he formed a close friendship. In 1359 Petrarch endeavoured to influence Boccaccio's religious feelings, and three years later a priest, Gioacchino Ciani, effected a complete change in his moral views and conduct. In 1363 he withdrew to Certaldo (near Florence), where he passed the remainder of his life, except for embassies to Avignon (1365) and to Rome (1367), a visit to Petrarch (1368), and the Dante lectures which he delivered at Florence.

The list of his works in verse is headed by the *Rime*, mostly composed between 1334 and 1348 (a good ed. by Baldelli, Leghorn, 1802). The *Amorosa Visione* (*c.* 1342; 1st ed. Milan, 1521) is outwardly, in metre and framework, imitated from the *Commedia*. In *Filostrato* (*c.* 1338; 1st ed. Venice, 1480), in the *Teseide* (*c.* 1341; 1st ed. Ferrara, 1475), and in the *Ninfale Fiesolano* (date uncertain; 1st ed. Venice, 1477; a good reprint in Torraca's *Poemetti Mitologici dei Sec. XIV., XV., XVI.*, Leghorn, 1888), Boccaccio employed, for the first time in narrative poetry, the octave stanza, which was afterwards so prominent in Italian literature.

The series of prose works opens with the prolix *Filocolo* (1338–40; 1st ed. Florence, 1472; Eng. trans. by H. G., London, 1567). This was succeeded by the *Ameto* (1341–2; 1st ed. Rome, 1478); *Fiammetta* (before 1343; 1st ed. Padua, 1472), the heroine of which stands for Maria d'Aquino, and the hero, Pamfilo, for Boccaccio himself; the *Corbaccio*, or *Laberinto d'Amore* (1354; 1st ed. Florence, 1487); and the *Vita di Dante* (*c.* 1364; best ed. that of Macrì-Leone, Florence, 1888; Eng. versions by Wicksteed, Hull, 1888, and Carpenter, New York, 1900: the former is restricted to the purely biographical sections), a sequel to which was his *Commento sopra la Commedia* (1373–5; ed. by Ciccarelli, Naples, 1723; better by Milanesi, Florence, 1863). The best collective edition of the minor works is still Moutier's *Opere Volgari di G. B. Corrette su i Testi a Penna* (Florence, 1827–34, vols. v.–xvii.).

The *Decamerone*, the book on which rests Boccaccio's chief claim to immortality, was composed for the most part between the years 1348 and 1353. The framework of the tales describes how, while the plague is raging at Florence in 1348, seven maidens and three youths of noble birth repair to a villa near the city, and, to while away the time, tell each a tale on ten successive days, making one hundred stories in all. The tales go back to the most various sources—Eastern, classical, and French stories, contemporary events, anecdotes, and scandals. (See Landau, *Die Quellen des Dekameron*, 2nd ed. Stuttgart, 1884.) Many great writers have borrowed from him—Chaucer, Shakespeare, Dryden, Lope de Vega, Molière, La Fontaine, Musset, Hans Sachs, and Les-

sing, to name but a few. The first edition is that of Venice (1470), and specially important among the early ones is that of Giunti (Florence, 1573). Good modern editions are those of P. Dal Rio (Florence, 1841–4) and P. Fanfani (*ib.* 1857). Hitherto the MS. Mannetti (1384) of the Laurenziana (diplomatic reprint, Lucca, 1761) has been considered the best; now the claims of the Berlin Hamilton MS. are being advanced. (See the treatise by Tobler, 1887, and by Hecker, 1892.) English versions: Anonymous, 1620 (vol. i. only); anonymous, 1702; Dryden's *Fables* (a small selection in verse), 1713; Balguy, 1741; Dubois, 1804; Kelly, 1855; Wright, 1874; Payne, 1886; unexpurgated trans. (1874).

His Latin works consist of:—(*a*) *De Genealogiis Deorum Gentilium* (1350–60; 1st ed. Venice, 1472; Ital. trans. Venice, 1547). (*b*) *De Claris Mulieribus* (1352–62; 1st ed. Ulm, 1473; by Albanzani, 3rd ed. Bologna, 1875). (*c*) *De Casibus Virorum* (*c.* 1363; Italian version, Venice, 1545; English paraphrase by Lydgate, *Falls of Princes*, 1st ed. 1494). (*d*) *De Montibus, Silvis, Fontibus, Lacubus, Fluminibus, Stagnis et Paludibus, et de Nominibus Maris* (1st ed. Venice, 1472; Italian version, Venice, 1520). The few Latin letters are distinguished in neither form nor matter (edited, with some Italian ones, by Corrazzini, Florence, 1877). More interesting, as throwing light on contemporary events, are the eclogues of the *Bucolicon* (Florence, 1504).

For a full account of all the editions, see *Serie delle Edizioni delle Opere di G. B.* (Bologna, 1875). Biographers, Manni (1742) and Baldelli (1806). Landau (Stuttgart, 1877; Italian version by Traversi, much enlarged, Naples, 1881) and Veselovsky (St. Petersburg, 1893–4) deserve careful study. See, too, J. A. Symonds, *Boccaccio as Man and Author* (London, 1895); W. P. Ker, *Boccaccio* (Oxford, 1900); Edward Hutton, *Giovanni Boccaccio* (1909); and Lee's *Decameron and its Sources* (1909).

Boccage, MARIE ANNE FIQUET DU (1710–1802), French poetess, born at Rouen. Emulating Milton, she wrote *Paradis Terrestre* (1748); the poem *Columbiade* (1756), which brought her into notice; and *Lettres sur l'Angleterre, la Hollande et l'Italie* (1770). She was highly praised by Voltaire.

Boccalini, TRAJANO (1556–1613), Italian satirist, born at Loreto; became governor of several cities under the papal see (1608–1611). In 1612–13 appeared his *Ragguagli di Parnaso*, a work full of brilliant satire against contemporary politics and literature. An unfinished sequel, *La Pietra del Paragone Politico*, was completed by Girolamo Briani (1615). An English version of these works, *Advertisements from Parnassus, together with the Politick Touchstone*, by Henry, Earl of Monmouth (London, 1656), reached the 3rd edition in 1674. Boccalini's *Commentarii sopra Cornelio Tacito* (Geneva, 1669) is couched in the same vein as the *Ragguagli*. See G. Mestica, *T. B. e la Letteratura Critica e Politica del Seicento* (Florence, 1878); G. Silingardi, *La Vita, i Tempi e le Opere di T. B.* (Modena, 1883).

Bocca Tigris, or BOGUE FORTS, at mouth of Canton R., China; taken by British in 1841, and again in 1856.

Boccherini, LUIGI (1743–1805), Italian musical composer and 'cellist, born at Lucca; studied at Rome, and spent the greater part of his life (from 1768) at Madrid as court composer. His instrumental works—mostly quintets, quartets, and trios—number 366; but of these 74 are unpublished. Of his vocal works, only the *Stabat Mater* is published. His

best works are still much appreciated for their originality, dignity of style, and melodiousness. See *Life*, in German, by Schletterer, and in French by Picquot.

Bocchus, king of Mauretania in Africa, father-in-law of Jugurtha, with whom he fought for a time against the Romans, but, changing sides, betrayed him to Sulla in 106 B.C. See Mommsen's *Hist. of Rome*, and Sallust's *Jugurtha*.

Bochart, SAMUEL (1599–1667), born at Rouen. As pastor in Caen, he publicly defended (1629) Protestantism in a public discussion with Véron, a Jesuit. His immense learning was exhibited in his *Geographia Sacra* (1646; later editions in 1651, 1674, 1681), on early Scripture history. After a brief visit (1652) to Stockholm, he published his greatest work, *Hierozoicon* (1675, 1793–6), mainly on the natural history of Scripture, but also on fabulous animals in other literatures. See Haag's *La France Protestante*, vol. ii. (1846–59); *History of Rationalism*, by Hurst (9th ed. 1882); and *German Rationalism* (trans. 1865), by Hagenbach.

Bochmann, GREGOR VON (1850), Russian painter; born at Nehat in Esthonia, Russia, and settled since 1868 at Düsseldorf, though he has made repeated journeys to Esthonia, Holland, Belgium, etc., for the subjects of his paintings. Among his best-known works are *A Church in Esthonia* (1874); *Potato Harvest in Esthonia* (1876); *Dockyards in Holland* (1878), now in the National Gallery at Berlin; *The Fish Market at Reval;* and *On a Country Road*.

Bochnia, tn., Galicia, Austria, 25 m. E. by S. of Cracow; has salt mines. Pop. 10,000.

Bocholt, tn., prov. Westphalia, Prussia, 44 m. W. by S. of Münster; has woollen and cotton industries, iron foundries, etc. Pop. 24,000.

Bochum, tn., prov. Westphalia, Prussia, 10 m. E. of Essen by rail; a chief centre of the Westphalian iron, steel, and coal industries, with coal mines, tin-smelting, brickworks, etc. Pop. 120,000. See Darpe's *Geschichte der Stadt Bochum* (1888–94).

Bockenheim, an industrial suburb of Frankfort-on-the-Main.

Böcking, EDUARD (1802–70), German lawyer, born at Trarbach, on the Mosel; in 1835 became professor of jurisprudence at Bonn. He published valuable editions of classic works of law, as *Notitia Dignitatum* (5 vols. 1839–50); *Institutionen, or Pandekten des Römischen Privatrechts* (2 vols., 2nd ed., 1853 and 1855). He also edited the complete works of Ulrich von Hutten (5 vols. 1859–62).

Böckingen, tn., Würtemberg, Germany, near Heilbronn. Pop. 9,000.

Böcklin, ARNOLD (1827–1901), Swiss painter, a native of Basel. After studying (1845–50) in Düsseldorf, Antwerp, Brussels, and Paris, he settled in Rome, but in 1856 moved to Munich. Here he found a generous patron in Baron von Schack. Then he acted as art teacher at Weimar (1860–63), painted in Basel (1866–71), in Munich again (1871–4), and lived at Florence (1874–85), Zürich (1885–92), and Fiesole (1892–1901). One of the most notable painters of modern Teutonic art, he makes the figures and the backgrounds of the old (classic) myths live again before our eyes. He has, besides, a decided leaning towards the weird and the grotesque. Among his more remarkable works are *Pan amongst the Reeds*, *Pirates Plundering a Castle*, *Island of the Dead* (1883), *Panic Terror*, *The Sport of the Waves*, *The Stillness of the Sea*, *Tritons and Nereids*, *The Island of the Blessed*, *Battle of the Centaurs*, *Petrarch*, and *The Plague* (these three at Basel),

and *Sea Surges* and *A Recluse Playing the Violin* (at Berlin). See *Life* by Schmid in the portfolio of Böcklin's works (4 vols. 1892–1901); also monographs, in German, by Meissner (1898), Schick (1902), Mendelssohn (1901), and Floerke (1902).

Bocland ('book-land'), an Anglo-Saxon tenure (called also CHARTER-LAND, or 'deed-land'), was land granted by deed or 'book' from the king to the church or to nobles. It corresponded more or less to the later feudal tenure in fee simple, though the precise terms on which it was held depended on the actual words of grant. Land held by tenants of the lord of book-land was called 'laen-land.' Book-land was distinguished from 'folk-land,' which was probably land held by customary tenure as opposed to written grant. The conjecture of some writers, that land held by customary tenure was called *ethel*, and that folk-land was the public land from which book-land was severed and granted to private proprietors, is probably wrong; but the whole subject of land tenure in Anglo-Saxon days is obscure. See Pollock and Maitland's *History of English Law* (2nd ed. 1898).

Bocskay, STEPHEN (1556–1606), prince of Transylvania from 1604 to 1606. In 1604 the brutal conduct of Basta in Transylvania, and the attempts of Rudolf II. of Austria to destroy religious liberty in Hungary, led to an insurrection in Transylvania and in Hungary, the leader of which was Bocskay, who was proclaimed prince of Transylvania.

Bod, the most westerly of the feudatory states of Orissa, India. Area, 2,060 sq. m.

Boddam, fishing vil., E. Aberdeenshire, Scotland, 3 m. S. of Peterhead. Pop. 1,500.

Bode, JOHANN ELERT (1747–1826), German astronomer, born at Hamburg. Director of the observatory in Berlin (1786–1825), he founded the *Astronomische Jahrbücher* (1776). His *Uranographia* (1801; new ed. 1819) comprises some 12,000 stars more than the earlier maps. His *Représentation des Astres* (1782), in 34 sheets, contains all the stars visible to the naked eye above the horizon at Berlin, as also the most important telescopic stars. An empirical formula denoting the relative distances of the planets is called 'Bode's Law.' Place a row of fours under the names of the planets ranged in a line in order of their distances. Then under this row 0, 3, 6, 12, and so on. Add the two columns: the result shows approximately the relative distances of the planets. The real relative distances, the earth's distance being reckoned as 10, are:—

3·9	7·2	10	15	27·5	52	95	192	300

Bode also wrote *Anleitung zur Kenntniss des gestirnten Himmels* (1768; 11th ed. 1858) and other books.

Bodegas, or BABAHOYO, cap. of prov. Rios, Ecuador; trading centre between Quito and Guayaquil, and about 40 m. N.E. of the latter; accessible to large steamers by the river Guayas. Pop. 8,000.

Bodenbach, tn., Bohemia, Austria, on the Elbe, 81 m. by rail N. by W. of Prague. It has a chalybeate spring. The industries are brewing, cotton-spinning, and the manufacture of sweetmeats. Pop. 11,000.

Bodensee. See CONSTANCE, L.

Bodenstedt, FRIEDRICH MARTIN VON (1819–92), German poet and dramatist; taught in Russia (1841–7), and became (1854) professor of Slavonic languages and (1858) of Old English literature at Munich. From 1867–73 he was connected with the famous Court Theatre at Meiningen, and from 1879–82 he was in the United

States. He was a prolific original writer, and also translated from Shakespeare, Hafiz, Omar Khayyam, Pushkin, Lermontov, Turgeniev. With Paul Heyse, Wilbrandt, Herwegh, Gildemeister, and others, he issued a German translation of Shakespeare's plays (9 vols. 1866-72) and sonnets (1862), and wrote useful books on Shakespeare's contemporaries (1862), female characters (1875), etc. He also wrote on Russian subjects; published original plays, such as *Kaiser Paul* (1876); various volumes of verse, including *Epische Dichtungen* (1863), and tales. See his *Ausgewählte Dichtungen* (1864) and *Gesammelten Schriften* (12 vols. 1865-69). From a certain easy philosophy, exemplified in his popular *Lieder des Mirza Schaffy* (1851; 145th ed. 1893; Eng. trans. 1880), Bodenstedt has been called *Der Horaz der deutschen Bourgeoisie.* The man and his works are best seen in his egoistic *Erinnerungen aus meinem Leben* (1888-90), and in an interesting series of letters edited by G. Schenck (1893).

Bodichon, MADAME (1827-90), an eager advocate of women's rights; was the eldest daughter (Barbara Leigh) of Benjamin Smith, for many years M.P. for Norwich. In 1857 she married Eugène Bodichon, M.D., and lived for some time in Algeria. She began in 1855 the agitation which resulted in the passing of the Married Women's Property Act, and contributed to the foundation of Girton College, Cambridge.

Bodin, JEAN (1530-96), French political philosopher; born in Angers, and studied at Toulouse. In 1561 he went to Paris as an advocate, and in 1566 he published a treatise on the method of studying history, which evoked the wrath of the great jurist Cujas. In spite of his Protestantism, Bodin began to rise in the official world. Though he had opposed Charles IX., and narrowly escaped the massacre of St. Bartholomew (1572), he was made *avocat du roi* at Laon. In 158[illegible] he published his treatise on political philosophy, *La Républiqu[illegible]* (Latin trans. 1586; English, 1606) in which he builds upon the family as the basis of settled government, the supreme embodiment of which is the sovereign. The Catholic League, however, became so strong that in 1589 Bodin felt compelled to join its ranks. By this time he was *procureur général*, and a marked man. In 1593, after the victories of Henry IV., Bodin once more ventured to break openly with the League. His *Heptaplomeres* (first published 1857) is a plea for religious toleration; though in his chief work, and in *Démonomanie* (1580), he shows himself a believer in the superstitions of his age. See Boudrillart's *Bodin et son Temps* (1853), and Sir F. Pollock's *Science of Politics* (new ed. 1902).

Bodle, a Scottish copper coin worth two pennies Scots, or one-sixth of an English penny, issued in the reign of Charles II., and said to have been named from Bothwell, an old Scottish mint-master.

Bodleian Library, Oxford, named from Sir Thomas Bodley, who, after the complete destruction (before 1557) of the ancient university library of Oxford, restored it (1598) by a large gift of books collected by himself. The library was opened (1602) with upwards of 2,000 vols. Later contributors include the Earl of Pembroke, with 242 vols. of Greek MSS.; Sir Walter Raleigh; Archbishop Laud, nearly 1,300 MSS. in eighteen languages; Sir Kenelm Digby, 238 MSS.; and Robert Burton. Of John Selden's library the Bodleian received about 8,000 vols. The great Lord Fairfax enriched it with many MSS., including Dodsworth's 161

vols. in English genealogy. Bishop Rawlinson's bequest (1755) included some 1,900 printed books and over 4,800 MSS. Nineteenth-century donations include Richard Gough's collection (1809), numbering over 3,700 MS. and printed vols., mainly in British topography; Edward Malone's collection of English drama and early poetry; Francis Douce's collection (1834); and Robert Mason's bequest (1841) of £36,000. The library now has over 700,000 volumes as bound up (probably more than twice as many separate title-pages) and 33,000 MSS. It is entitled to a copy of every book published in the United Kingdom, not being an unaltered reprint. The first catalogue of its printed books was published in 1605, by its first librarian; the last in 1843–51, in 4 vols., by its eleventh librarian. See 'The Foundation of Libraries,' chap. xix. of *Cambridge Hist. of English Lit.*, vol. iv. (1909).

Bodley, JOHN EDWARD COURTENAY (1853), a student of European politics, was called to the English bar in 1874. He was private secretary to Sir Charles Dilke, when president of the Local Government Board in 1882–5. Since 1890 he has lived in France. See his *France* (vol. i., *The Revolution and Modern France;* vol. ii., *The Parliamentary System*, 1898; 7th ed. 1907); *L'Anglomanie et les Traditions Françaises* (1899); a French version of his own *France* (1901); *The Coronation of Edward VII.*, by command of the King (1903); *The Church in France* (1906); and three articles in *Encyclopædia Britannica* on 'The History of the Third Republic.'

Bodley, SIR THOMAS (1545–1613), English diplomatist and scholar. In 1585 he began his diplomatic career with a mission to Denmark. In 1589 he became the queen's representative in the United Provinces, where he acted as a member of the council of state until 1596. The rest of his life was devoted to the foundation and development of the Bodleian Library at Oxford. See his own autobiographical *Reliquiæ Bodleianæ* (1703); Wood's *Athenæ Oxon.* (1813–20); Macray's *Annals of the Bodleian Library* (1868).

Bodmer, JOHANN JAKOB (1698–1783), one of the chief pioneers in the regeneration of German literature in the 18th century; was a native of Zürich, where (1725–75) he was professor of Swiss history. With Breitinger and others he founded a weekly critical periodical (1721–3), *Die Diskurse der Maler*, the object of which was to emancipate literature from the trammels of pedantic rule. The new 'Swiss' school won its way slowly, until its principles were adopted by Lessing and others. Bodmer also drew attention to the old German epics, particularly the *Nibelungenlied*, of which he edited part in 1757. For Life and bibliography, see J. Baechtold's *Geschichte der Deutschen Literatur in der Schweiz* (1887–92).

Bodmin, par., munic. bor., and co. tn. of Cornwall, England, 30 m. N.W. of Plymouth. The chief manufactures are boots and serges. Pop. 5,400.

Bodo, seapt., Nordland, Norway, on the Saltenfjord, about 460 m. N. by E. of Christiania. Pop. 4,800.

Bodobriga. See BOPPARD.

Bodoni, GIAMBATTISTA (1740–1813), Italian printer. During his early manhood he worked (from 1758) in the printing-house of the Propaganda in Rome, and afterwards (1768) became superintendent of the Duke of Parma's press. In 1788 he published, under the title of *Manuale Tipografico*, a collection of 178 different types, increased in the 2nd ed. (1818) to 250. Between 1791 and 1813 he issued many beautiful editions of the classics, notably a

Homer in 1808; but they are more distinguished for typographic beauty than for accuracy.

Bodtcher, LUDVIG (1793–1874), Danish poet; spent most of his earlier life in Italy with the Danish artists, including Thorwaldsen. It was largely through his efforts that the works of the great sculptor were acquired for Denmark. He returned to Copenhagen in 1835. He produced two small collections of poems, which are among the best in Danish literature. See *Digte*, with Life, by Arentzen (4th ed. 1878); and G. Brandes's *Danske Digtere* (1896).

Body-cavity, or CŒLOM, the space which in many animals lies between the body-wall and the alimentary canal. It is seen perhaps in its simplest form in annelid worms, such as the earthworm, or the fishermen's lobworm, and there satisfies the following conditions: it is lined throughout by the cells of the middle layer (mesoblast) of embryology, communicates with the exterior by kidney tubules or nephridia, and gives rise to the genital products on its walls. Such a cavity is present, in theory at least, at some period of life in all animals except Cœlentera and Protozoa; higher animals are therefore sometimes called Cœlomata, in opposition to these two groups. But in many cœlomate animals — *e.g.* crustaceans and insects—the cœlom is obliterated at a very early stage, and in others—*e.g.* round worms —the space present between gut and body-wall fails to satisfy the conditions given above, and is therefore not a true cœlom.

Body's Island, long sandy isl. off coast of N. Carolina, U.S.A. A lighthouse (150 ft. high) stands 2 m. from its S. extremity.

Boece, or BOETHIUS, HECTOR (*c.* 1465–1536), Scottish historian, was probably the son of Alexander Boyis, a burgess of Dundee. He studied in Paris, became a professor in the college of Montaigu in 1492, and made the acquaintance of Erasmus. He returned to Scotland about 1498, and became principal in 1505 of the University of Aberdeen. In 1522 he published the *Lives* of the bishops of Mortlach and Aberdeen (new ed. Bannatyne Club, 1875), at the press of Jodocus Badius in Paris; and in 1527 the *Historia Gentis Scotorum*, which was translated (1533) into Scottish prose at the request of James V., and into English for Holinshed's *Chronicles* in 1577.

Boeckh, PHILIPP AUGUST (1785–1867), classical philologist, born at Karlsruhe. Having since 1803 studied under Wolf, he became professor of philology in 1807 in Heidelberg, and in 1811 in Berlin, where he acted also from 1812 as director of the philological, and from 1820 of the pedagogical, seminary. His *Public Economy of Athens* (1817; enlarged 1840), of which there is an excellent translation by A. Lamb (1857), presents a complete and minute picture of classic Athens from every point of view. His edition of Pindar (1811–21) established the present basis of metre. His great work, *Corpus Inscriptionum Græcarum*, was continued by Franz, Curtius, Kirchhoff, and Röhl (1828–77). His minor writings appeared in 7 vols. (1858–74).

Boehm, SIR JOSEPH EDGAR (1834–90), British sculptor, born in Vienna, and studied in Italy, France, and in England, where he settled in 1862, and was elected A.R.A. (1878) and R.A. (1882). His chief works are: Statue of Queen Victoria (1869) in Windsor Castle, of Carlyle at Chelsea, and of Wellington at Hyde Park Corner; the Duke of Kent Monument in St. George's Chapel, and the Stanley Sarcophagus in Westminster Abbey. Boehm was appointed sculptor-in-ordinary to

Queen Victoria (1881), and created baronet (1889).

Boehme, or BOEHM (called also in England BEHMEN), JAKOB (1575–1624), German philosopher and mystic, was born in a peasant home at Altseidenberg, near the town of Görlitz, where he spent his industrious, contemplative life. As a boy, when herding cattle, he conceived a profound mystic sense of God in nature, which seemed an intimate revelation; and through the time of his very rudimentary education in the village school, of his apprenticeship to a shoemaker at the neighbouring town, and of his journeyman wanderings, until he settled down as a master workman at the age of nineteen, this emotional temperament grew into a consuming passion for truth. Boehme's books were limited to the Bible, in which he was deeply versed, and to a few theosophical and alchemistic writings, such as those of Paracelsus; and the task before his illiterate genius was to shadow forth, in those obscure symbols, natural images, and poetic suggestions which were his only instruments, philosophical conceptions which were new to his age, and which later were not easily expressed by Hegel. 'There reigns in his writings a twilight, as in a Gothic dome.' For Boehme, God is the One from whom all creation proceeds by His self-differentiation into a negation of Himself. Spirit cannot be, except it distinguish that which is not itself from itself; and this inner difference, beginning in God, and reproducing itself in all consciousness, is the principle by which the whole world is evolved. This negation of self, by which self arises, is variously identified with evil; and, again, the doctrine of the Trinity is never far from Boehme's meaning when he writes of the divine self-distinction. His earliest work, *Aurora* (1612), was denounced from the pulpit, and he was forbidden by the magistrates of Görlitz to write any more. This injunction Boehme obeyed for some years, but finally broke through it. He was much harassed by pedant and official, but his quiet, humble spirit was undisturbed. Boehme has exercised a more powerful influence on minds concerned with experimental religion, and imaginations capable of spiritual desire, than on the direct development of academic philosophy. 'His best contributions,' says Dr. Stirling of Schelling, 'are those in analogy with Boehme.' But it is in writers such as William Law that we find the true line of descent; every page of Law's *Spirit of Love* shows his acknowledged debt to the German mystic. Boehme's collected works were published in Amsterdam in 1675, and again in 1730, and in Leipzig in 1831–46. They were translated into English shortly after his death.

Bœhmeria, a genus of plants of the order Urticaceæ, noted for the production of strong fibres, which are made into ropes and sailcloth. *Bœhmeria nivea* fibres produce Chinese grass-cloth, which resembles linen. The plant is also cultivated in India, S. United States, and Jamaica. The rhea fibre of Assam is derived from the same plant. Puyha fibre of Nepaul is got from *Bœhmeria puya*, and is used for making ropes and sailcloth.

Bœle, vil., Westphalia, Prussia, near Arnsberg. Pop. 6,500.

Bœotia, a district of ancient Greece, bounded on the E. by the Eubœan Sea; S. by Attica, Megaris, and the Corinthian Gulf. Its inhabitants were said to be slow and heavy-witted. In the earliest times Bœotia was occupied by a race called the Minyæ, whose chief city was Orchomenus. The Bœotian cities were united in a league,

and the history of Bœotia turns chiefly on the attempts made by Thebes to dominate this league. It was only after the battle of Leuctra, in 371 B.C., that the Thebans gained their aim; in 364 they destroyed Orchomenus. The Bœotians bore the brunt of the Greek resistance to Philip at Chæronea in 338 B.C.; and in 335 Thebes revolted against Alexander, and was destroyed, and Orchomenus was rebuilt. Henceforward Bœotian history is unimportant. Bœotia now forms one of the Grecian nomarchies (provs.). Pop. 66,000. See W. Rhys Roberts's *The Ancient Bœotians* (1895).

Boerhaave, HERMANN (1668–1738), a Dutch physician, born at Voorhout, near Leyden. Lecturer (1701), he became (1709) professor of medicine and botany, and (1714–36) rector of the University of Leyden, filling also, from 1718, the chair of chemistry. He was a pioneer in clinical medical instruction. His *Institutiones Medicæ* (1708) had great influence. Of equal merit are his *Elementa Chemiæ* (1724). Boerhaave was the first to lecture in Holland on diseases of the eye. See Burton's *Account of Boerhaave's Life and Writings* (1743), and Johnson's *Life* (1834).

Boers (Du. *boer*, a 'peasant or husbandman;' connected with Ger. *bauer*, 'peasant'), the farmers in S. Africa of Dutch descent who founded Cape Town in 1650.

Boer Wars. See SOUTH AFRICA.

Boethius, HECTOR. See BOECE.

Boëtius, or BOËTHIUS (*c.* 470–524), 'the last of the Romans whom Cato or Tully could have acknowledged for their countrymen' (Gibbon). His full name was ANICIUS MANLIUS SEVERINUS BOËTIUS. He became famous for his learning and knowledge of Greek philosophy, and was consul in 510, also chief of the senate. Theodoric, king of the Ostrogoths, made him one of his most powerful ministers. But his protests against the excesses committed by the Gothic officers, and especially his defence of Albinus, who with Symmachus was accused of seeking to liberate Rome, brought him into disfavour with Theodoric. He was accused of treason, sentenced to death untried, and imprisoned in the tower of Pavia, where he produced his great work, the *Consolation of Philosophy*. He was executed in 525. He wrote many works on arithmetic, geometry, logic, and music which are extant, and translated the principal works of Aristotle. These were the chief sources for the knowledge which the middle ages had of Aristotle. A defence of the Christian faith is incorrectly assigned to him. His *Consolation of Philosophy* was translated by Alfred the Great (ed. Fox, 1864) and Chaucer (pub. 1480), and more recently by James (1897). It is a dialogue between the author and Philosophy, in prose and verse. Complete works, eds. of Basel (1570), Paris (1860); Peiper, *Consolatio* (1871); Friedlein, *De Institutione Arithmetica et Musica* (1867); Meister, *Commentaria in Aristotelem* (1877–80). See Gibbon's *Decline and Fall;* Bury's *Later Roman Empire* (1889); H. F. Stewart's *Boëthius* (1891).

Bog. Bogs are most abundant in flat-lying countries, high latitudes, and near the sea, as high rainfall, cold climate, and insufficient evaporation favour their formation. Vegetation of a peculiar type is usually abundant—rushes, sedges, grasses, mosses, algæ, and other plants adapted for aquatic conditions. There are many different ways in which they have originated. Some are old lakes which have become almost filled up; others lie in hollows in the surface of the boulder clay, left after the melt-

ing of the ice sheets of the great Ice Age; others are found in the deserted loops of river channels, or in the half-obliterated courses frequent in river deltas. A few are due to subsidence of the surface, owing to removal of underground materials (coal, salt, etc.). Mangrove swamps are characteristic of the sluggish waters which wind through the innumerable channels of many great tropical deltas—*e.g.* that of the Niger. On the east coast of the United States are many flat lands partly overflowed by the sea, and forming salt marshes. The economic importance of marshes and bogs is not great; peat, bog iron ore, and bog oak are their most valuable products. When reclaimed they may yield most fertile soils. See Bog Mosses; Bog Plants; Allen, Bog of; Peat.

Bogardus, James (1800–74), American watchmaker and inventor, born at Catskill, New York. Of his various devices the best known are the dry gas meter (1833), a medal-engraving machine (1836), and instruments used in rubber manufacture and deep-sea sounding. In 1839 he gained the prize offered by the British government for the best machine for the manufacture of postage stamps.

Bog Asphodel. See Asphodel, Bog.

Bog Bean, Buck Bean, or Marsh Trefoil (*Menyanthes trifoliata*) belongs to the gentian order. It is found in Britain in marshy places, and perennates by means of rhizomes. In summer it sends up trefoil leaves, the leaflets being not unlike those of the cultivated bean. Its inflorescence grows directly from the rhizome, 6 to 10 in. high, and consists of a raceme of beautiful pink and white flowers which suggest the cultivated hyacinth.

Bog Butter, a kind of lard or tallow found in the peat bogs of Ireland and Scotland, usually at a depth of from two to twelve feet below the surface, and encased in wooden kegs or dishes; sometimes in wicker-work baskets, bark or cloth wrappings, and even in rushes. Samples analyzed (1885) by W. Ivison Macadam (*Proc. Soc. Antiq. Scot.*, xvi. 206–208) all contained cow hairs; but the 'rue tallow' similarly treated by the Faroe Islanders in 1670 (see L. Debes's *Fœroæ, et Fœroa Reserata*, trans. 1676) was principally obtained from sheep. Bog butter, being unsalted, was purposely sunk in peat to preserve it from becoming rancid. It appears to have been used in Ireland and the Hebrides down to the 18th century. It has sometimes been confused with adipocere.

Bögh, Erik (1822–99), Danish author, born at Copenhagen; from 1855–60 artistic director of the Casino Theatre at Copenhagen; from 1860–77 editor of *Folkets Avis*, which he made the most popular paper in Denmark; and from 1881 censor of the Royal Theatre. He was regarded as one of the wittiest feuilletonist writers in Denmark.

Boghaz-Keui, or Boghaz-Koi, vil., prov. Angora, Asia Minor, 90 m. E. of Angora; has remains of an extensive ruined city which is now proved to have been one of the great centres of 'Hittite' civilization. In 1905–7 the ruins were scientifically explored by Winckler and Puchstein, and yielded numerous tablets of great historic interest (see Smithsonian Report, 1908, p. 677). See also Van Lennep's *Travels in Asia Minor* (1870), and Chantre's *Mission en Cappadocie* (1898).

Bogie, the small truck forming the front part of a locomotive engine. The front end of the boiler is pivoted to it, and thus the wheels of the bogie readily adapt themselves to the curves of the line, thereby lessening

wear and tear and the danger of derailment. Similarly, bogies are placed under each end of a railway carriage. See STEAM-ENGINE; RAILWAYS—*Rolling Stock*.

Bog Iron Ore, a spongy and porous form of limonite, known under this name from its being frequently found in meadows and bogs. In such situations the water absorbs much carbon dioxide from decomposing vegetation, and is thus able to dissolve out oxide of iron from the rocks through which it passes. On emerging to the surface the iron is precipitated in a brown pulverulent mass which may collect in such quantities as to be used as an iron ore, as is done in Norway and Sweden. The 'iron-pan,' a hard dark brown layer beneath the soil, a source of trouble to farmers, is a deposit of this nature. The beds of clay ironstone in the Carboniferous formation may be ascribed chiefly to these agencies.

Bog Mosses, or PEAT MOSSES, are species of *Sphagnum*, abundant in the marshes and peat bogs of temperate and cold regions; about a third of their number are tropical. They differ from most other mosses in being very spongy and full of water; they grow in dense masses and tufts, often of considerable depth, and are of various colours, from pale green or yellow to deep red. Peat is formed by the decay of their lower portions. See Braithwaite's *Sphagnaceæ, or Peat Mosses of Europe and N. America* (1880).

Bog Myrtle, or SWEET GALE (*Myrica gale*), of the order Myricaceæ; looks like a dwarf willow, and forms low slender bushes on boggy ground and moorland in the British Isles, as well as throughout Middle and N. Europe, N. Asia, and N. America. It produces a fragrant resin, and on this account is used by country people for placing among clothes, to perfume them and to keep off insects.

Bognor, wat.-pl. and eccles. par., 9 m. by rail S.E. of Chichester, Sussex, England; pier and esplanade. Pop. 6,200.

Bogo, seapt. on N.E. coast of Cebu I., Philippines, 50 m. N. of Cebu, with good harbour. Pop. 15,000.

Bog Oak. Portions of trees are often found in peat bogs, showing that a forest formerly grew where mosses and other marshy plants which form peat have supervened. Oak, birch, hazel, and beech are the commonest trees; their wood, though preserving its original structure and grain, is usually black, dense, and difficult to work. It is valued for ornamental purposes; furniture and ornaments are made from it. Much so-called bog oak owes its dark colour to artificial treatment. See J. Geikie's *Prehistoric Europe* (1881); Avebury's *The Origin of Civilization* (new ed. 1902).

Bogodukhov, or BOHODUKHOV, tn., Kharkov gov., Russia, 34 m. by rail W.N.W. of Kharkov; has tanneries. Pop. 20,000.

Bog of Allen. See ALLEN, BOG OF.

Bogomili (from Slavonic words meaning 'friends of God'), a religious sect whose chief seats were in Thrace, Macedonia, and Bulgaria, spreading over Servia, Bosnia, Dalmatia, and Croatia, where the sect was called Patarenes. The founder was probably a bishop named Bogomil, who lived in the 10th century, and one of their leaders was a monk, named Basil, in the 12th century, whose tenets were akin to those of the Manichæans and Gnostics. Basil was burned at the stake by the Emperor Alexius Comnenus in 1118. In spite of much persecution, the sect survived until the Turkish conquest in the 16th century, holding as its doctrines the origin of evil in declension from God, that Christ saved men by His teaching, the rejection of the sac-

raments, the use of images in worship, and the rejection of the books of the Old Testament except the Psalms and the Prophets. The sect practised severe asceticism. See Zegnbanus's *Panoplia*, edited by Gieseler (1852); Razki's *Bogomili i Paterani* (1869).

Bogong, MOUNT, Bogong co., Victoria, Australia, 160 m. N.E. of Melbourne; the highest summit in the colony. Alt. 6,508 ft.

Bogoroditsk, or BOHORODITSK, tn., Tula gov., Russia, 40 m. S.E. of Tula; has important tanneries. Pop. 5,000.

Bogorodsk, or BOHORODSK, tn., Moscow gov., Russia, on an affluent of Volga, 50 m. by rail E. by N. of Moscow. Pop. 12,000.

Bogos, a pastoral tribe of Abyssinia. They are a well-built race, with expressive features and brown skin, patriarchal in their habits, and of Hamitic descent. They are mostly Christians. Chief tn. Keren. Pop. about 18,000.

Bogoslovsk, tnship., Perm gov., 170 m. N.E. of Perm city, Russia; has a meteorological observatory, and important copper mines and gold workings in the vicinity. Pop. 8,500.

Bogotá, cap. of Colombia, in the dep. of Bogotá, in 4° 35′ N., 74° 13′ W., is one of the foremost cities of South America. It is situated on an elevated plateau at the base of the E. range of the Cordilleras. The chief buildings are the capitol, the library, and the cathedral erected in 1563; the San Carlos palace, in which the president of the republic resides; and the meteorological observatory. Besides these, there are the university, museum, public library, mint, and theatres. Bogotá is the seat of an archbishop. There are railways to several neighbouring towns, the longest of which is to Girardot (52 m.), on the Magdalena. The manufactures include pottery, glass, cordage, and cloth. Iron, coal, salt, limestone, fire clay, and precious stones occur in the district. Founded in 1538 by Quesada, the town was called Santa Fé (after the camp of Ferdinand and Isabella before Granada), then Santa Fé de Bogotá, and since 1819 simply Bogotá. Alt. 8,670 ft. Pop. 125,000; the dep. has an area of 4,000 sq. m. and a pop. of 300,000.

Bog Plants include pitcher-plants and lady's-slippers, bird's-eye primroses, marsh orchises, sundews, Pinguiculas, Trilliums, and marsh marigolds, rushes, sedges, meadow-sweets, and ferns. For a bog garden an open situation should be selected, preferably on a slight slope, and should be excavated about two feet deep. The pit thus formed should be lined over its base and a foot up its sides with concrete, so as to be watertight. About eight inches from the base should be an escape pipe for surplus water. Or the base and the lower part of the sides may be lined with a thick layer of clay. Up to the level of this escape pipe a layer of broken stone should occupy the whole base. Over this should be placed a mixture of leaf-mould, peat, and fibrous loam, together with great blocks of stone, the whole being so arranged as to present an irregular surface and varying degrees of dryness. Water should be allowed to flow through daily. Care is needed to prevent the more vigorous plants from encroaching on and destroying their more dainty and less sturdy neighbours. In addition to the plants named, the following are all excellent: *Lilium canadense*, *L. pardalinum*, *L. superbum*, *Iris Kæmpferi*, *Spiræa aruncus*, *S. venusta*, *Onoclea sensibilis*, *Gentiana verna*, *G. asclepiadea*, *Habenaria ciliaris*, *H. nivea*, *Orchis foliosa*, *Calla palustris*, *Epigæa repens*, *Lobelia cardinalis*, *Corydalis lutea*, *Aponogeton distachyon*, *Myosotis palustris*, *Mimulus*

luteus, *Arundo donax*, *Phormium tenax*, *Osmunda regalis*, *Bambusa Metake*, *B. glaucescius*, *Bocconia cordata*, and *Meconopsis Wallichiana*.

Bogra, dist. and chief tn. in Rajshahi div., Eastern Bengal and Assam, India. Area, 1,359 sq. m. Pop. of dist. 850,000; of tn. 7,000.

Bog Spavin, a fluctuating swelling on the inner and front part of the hock of a horse, arising from a distension of the joint capsule with synovial fluid. See HORSE—*Diseases*.

Bogue, DAVID (1750–1825), Scottish Congregational minister, was born in Coldingham, Berwickshire; became pastor of a Congregationalist church at Gosport in 1777, and subsequently (1789) theological tutor at the theological seminary there. He was a founder of the London Missionary Society (1795), the British and Foreign Bible Society, and the Religious Tract Society. He wrote a *History of Dissenters* (3 vols. 1809), in conjunction with James Bennett and *Essay on the Divine Authority of the New Testament* (1801).

Boguslav, anc. tn., Kiev gov., Russia, 70 m. S.S.E. of Kiev; cloth manufacture and trade in wool, leather, and sheep-skins. Pop. 9,000.

Bogutschütz, tn., prov. Silesia, Prussia, immediately N.E. of Kattowitz, with coal mines and zinc furnaces. Pop. 20,000.

Bohain, tn., dep. Aisne, France, 13 m. N.N.E. of St. Quentin; fortified, and said to have been besieged and taken thirteen times between 1181 and 1815; has brewing, tanning, wool-spinning, and dyeing industries. Pop. 6,800.

Bohemia (Boh. *Chekhy*; Ger. *Böhmen*), a kingdom of the Austrian empire, with the kingdom of Saxony on the N., Bavaria on the W., Prussian Silesia on the N.E., and Moravia on the E. The kingdom is fenced in by lofty mountain ranges—the Bohemian Forest on the S.W., the Fichtelgebirge and Erzgebirge on the N.W., and the Isargebirge, Riesengebirge, Adlergebirge, and other chains of the Sudetic system on the N.E. A broad but relatively low hilly region, constituting the watershed between the Elbe and the March, marks it off from Moravia; and the determining feature of the interior is the river Elbe. From the Bohemian Forest the surface slopes towards the Elbe in a series of terraces and hilly plateaus trenched by the Moldau and its tributaries. The only level tracts are the small expansions of the river valleys—*e.g.* at Prague, Pilsen, and Budweis. The climate resembles that of the interior of Germany, but is more severe in the mountainous parts on the borders than in the low-lying Elbe valley. The climate of Bohemia is continental in its character. The annual mean temperature at Prague is 46½° F.

With a fertile soil, an industrious population, and abundant mineral deposits, Bohemia is one of the richest divisions of the Austrian empire. Forests cover 29 per cent. of the surface; the remainder is under cultivation or under grass. Cereals thrive in the lower N. districts, potatoes and oats in the higher grounds. Beetroot is extensively grown for sugar. The most important minerals are coal and lignite, silver, iron, and graphite, with lead, tin, antimony, and gold. In point of value Bohemia produces one-half the mineral wealth of the entire empire. The lignite mines stretch along the foot of the Erzgebirge from Aussig to Eger, and produce annually some 18,000,000 tons; while the bituminous coal mines, most of them around Kladno (W. of Prague) and Pilsen, yield over 7,000,000 tons. Iron ore is mined near

Prague, Pilsen, and Falkenau, to the extent of 700,000 tons per annum; of this some 300,000 tons of pig iron are smelted at Prague and Pilsen. The mining of gold was revived in 1903, the principal mines being at Mount Roudny and at Krasna Hora. The most important industry is sugar-manufacturing; over 500,000 tons of raw sugar being produced yearly. Cloth and other woollen goods are manufactured at Reichenberg, Aussig, Friedland, and Asch; cotton goods at Prague, and generally from Reichenberg westwards to Brüx; carpets at Reichenberg and Eger; linens at Trautenau, Schönberg, and Hohenelbe; beer at Pilsen and Eger; glass at Prague, Eger, Pilsen, Gablonz, and Karlsbad. Nearly 200,000,000 gallons of beer are brewed annually; and the glass trade has been in a flourishing condition since its introduction from Venice in the 13th century. Of less importance are distilling, engineering, and printing. Along the N.W. border are the well-known mineral springs of Karlsbad, Marienbad, Franzensbad, Teplitz, Bilin, Johannisbad, and Sedlitz. Bohemia is the centre of an active trade, and the Elbe is of the greatest importance as a means of communication. Prague *viâ* the Moldau and the Elbe is 490 m. from Hamburg.

The Bohemians, who style themselves Czechs (Chekhs), are mostly of Slav stock, and have been settled in the land since the 5th century. About 37 per cent. of the population is of German descent, mostly town dwellers, and between them and the Czechs—mainly the peasants and aristocracy—there exists a bitter race enmity, which has been deepened in recent years by the attempt of the Czechs to wrest the political supremacy from the Germans. About 96 per cent. of the entire population is Roman Catholic; 1½ per cent. is Jewish. At the end of the Thirty Years' war (1648) Bohemia had barely 800,000 inhabitants; in 1772 she had 2,314,795; in 1857, 4,705,527; and now the population is nearly 7,000,000, giving 348 to each sq. m. over the total area of 20,052 sq. m. The capital is Prague. Education over the kingdom is tolerably satisfactory. Prague includes the oldest of the German universities, founded in 1348. In 1882 it was divided into two separate universities, one German (1,700 students), one Czech (4,300). The Prague technical high school is similarly divided. There are two commercial academies (both at Prague), a mining academy (Pribram), two agricultural colleges (Tabor and Böhmisch-Leipa), a forestry academy (Weisswasser), and other technical institutions. Elementary education is compulsory from seven to fourteen. Secondary schools are organized on the German plan. Bohemia is governed by a provincial assembly of 242 members, and sends 110 members to the Austrian Reichsrath.

History.—When Bohemia (with which we here include Moravia) is first mentioned in history we find it occupied by the Boii, a Celtic tribe; hence the name Böhmen (Ger. *heim*, or home, of the Boii). The Boii were overcome (1st century B.C.) by the Marcomanni; and when the latter had been crushed by other tribes, the Slavonic Czechs made their appearance (about 450 A.D.), and have since occupied the country.

For a long time after this the history of the country is a blank. It is impossible to accept the stories of Kosmas about Krok, Premysl, and Libusa. The Bohemians are supposed to have been tributary to Charlemagne. In the 9th century Christianity was introduced among them by Cyril and Methodius. We hear of the great monarch Svatopluk of

Moravia; but the history of these countries till the time of Wenceslaus I. (Vaclaw), who was crowned king in 1230, is devoid of interest. His son was Premysl Ottokar II. (1253–78), who has been accused of introducing German colonists into his kingdom. He went on an expedition against the heathen Prussians: many of them were converted, and the city of Königsberg was founded. In 1260 he defeated the Hungarians with great slaughter. In 1273 Rudolph of Hapsburg was elected German emperor, and proved one of the most bitter enemies of the Bohemian king. A great battle took place (1278) near Marchfeld, and Ottokar was defeated and slain. He was succeeded by his son Wenceslaus (1278–1305), during whose reign the country was very prosperous. This king, when preparing to invade Austria, died suddenly in 1305, at the age of thirty-four. He was succeeded by his son Wenceslaus III., who only reigned one year, and was assassinated at Olmütz; thus the male line of the dynasty of Premysl came to an end.

After the very short and fruitless reigns of another Rudolph of Hapsburg and Henry of Carinthia, the choice of the Bohemians fell on John of Luxemburg, only son of the German emperor Henry VII. The rule of King John (1310–46) was bad for the country, the revenues of which he squandered. He was a kind of knight-errant of the period. In 1336, while on a crusade against the heathen Lithuanians, he lost one of his eyes; this calamity was soon followed by total blindness. He went to assist his brother-in-law, the king of France, and was killed at the battle of Crécy in 1346. He was succeeded by his son Charles IV. (1346–78), who was a great lover of the Bohemian language, and founded (1348) the University of Prague. In 1356, at the Diet of Metz, he issued the celebrated Golden Bull, which, among other things, is noteworthy for its recommending that the German princes should learn the Bohemian language. This sovereign died in 1378, aged sixty-two. His daughter Anne became the wife of Richard II. of England. Charles was succeeded by his son Wenceslaus IV. (1378-1419), a drunkard, who caused St. John Nepomuk, now the patron saint of Bohemia, to be thrown into the Moldau.

At this time the country was moved by the doctrines of Wycliffe, which had been carried thither by Peter Payne. The great preacher of the new teaching was John Huss or Hus, although the movement was strongly leavened with nationalist aspirations. Huss was burnt at the Council of Constance in 1415. Bohemia was now agitated by religious wars, and the chief general on the side of the reformers was John Ziska. Wenceslaus died in 1419, and was succeeded by his brother Sigismund, the German emperor, who died in 1437. He was succeeded by Albert, Duke of Austria; but he only held rule for two years, dying in 1439. His sympathies lay entirely with the Germans. After his death his queen, Elizabeth, only daughter of Sigismund, gave birth to a son named Ladislaus Posthumus. During the minority of the king, George Podebrad was entrusted with the administration of Bohemia. The young king died prematurely in 1457. On his death Podebrad, who had proved himself an excellent ruler, was unanimously chosen (1458) king by the Bohemian Estates. Pope Paul II., however, regarded the new Utraquist king with the greatest abhorrence. Podebrad was engaged in continuous fighting with Matthias Corvinus, the vigorous king of Hungary, and

succeeded in driving him completely out of Moravia. He died, however, of dropsy in 1471, and was succeeded by Ladislaus II., son of Casimir IV. of Poland. In his reign the contending religious parties were reconciled by the peace of Kuttenberg (1485); but in 1487 the bondage of the peasants was finally established in Bohemia. Ladislaus was a weak man, and governed both Bohemia and Hungary, which were now temporarily united, in an inefficient manner. He died at Buda, the capital of Hungary, in 1516. His son Louis succeeded him. Previous to his death Ladislaus had negotiated two family marriages, which were destined to be of great historical importance. The Archduchess Mary, grand-daughter of the Emperor Maximilian, was to marry Louis, and Louis's sister Anne was to marry the Archduke Ferdinand, grandson of the emperor. Louis was a young man of feeble constitution, and reigned only ten years, dying at the age of twenty. The great event of his reign was the invasion of Hungary by the Sultan Solyman. The Hungarians were outnumbered, and suffered a disastrous defeat (Aug. 29, 1526). The king was drowned in the marshes while trying to escape. After considerable discussion, the Bohemian Diet elected the Archduke Ferdinand to be their king, according to the Family Compact.

From this time forward the two smaller kingdoms were constrained to follow the fortunes of their Hapsburg masters. Ferdinand was not often in Bohemia, and his presence was generally for mischief. He procured (1547) that he should be nominated hereditary instead of elective ruler. In the same year certain of the leading men in Prague endeavoured to get back some of those ecclesiastical and political liberties which the king had stolen; but he was able to crush the movement, and the ringleaders were executed. In 1556, during one of his visits to Bohemia, Ferdinand introduced the Jesuits, who had a great reactionary influence upon the country. He died in 1564, and was succeeded by his son Maximilian (Emperor Maximilian II.), who had a short but troubled reign. In spite of his tolerant views, he failed to make himself popular with the Bohemians. He died in 1576, and was succeeded by his son Rudolph, who also became German emperor (Rudolph II.) and king of Hungary. He fixed his residence at Prague, and thus practically made it the capital of the Austrian dominions. Rudolph was ultimately compelled by his subjects to grant (1609) the celebrated Letter of Majesty, which ensured religious toleration. The emperor was gradually driven from his dominions by his younger brother Matthias, and compelled to abdicate in 1612. Matthias confirmed the Letter of Majesty, but the quarrels between the Catholics and Protestants still continued. The emperor procured the election of his cousin Ferdinand (afterwards Emperor Ferdinand II.) as king of Bohemia, and the latter confirmed and even enlarged the Letter of Majesty. At a Diet in 1615 Bohemian was proclaimed the official language of the country.

In spite of his pretended toleration of Protestantism, Ferdinand had really taken an oath to extirpate heresy. On May 23, 1618, occurred the well-known Defenestration, as it is called, whereby Slawata and Martinitz, two creatures of Ferdinand, were flung by the patriotic Protestant party out of the windows of the Hradschin. This was the beginning of the Thirty Years' war (1618–48). Matthias died in 1619, and Ferdinand II. succeeded. The events of the Thirty Years' war belong

to Austrian and German history. The Estates of Bohemia deposed Ferdinand II., and chose (1619) Frederick, the Protestant Elector Palatine, who, however, fled after the battle of the White Mountain in 1620, leaving his partisans to their fate. Many of the leading Protestants were executed, others driven into exile. The Emperor Ferdinand II. died in 1637, and was succeeded by his son Ferdinand III. The political and religious liberties of Bohemia were now annihilated, and the national language began to decay. But religious freedom was restored by the Edict of Toleration in the reign of Joseph II. (1780–90), in consequence of which many concealed Protestants declared themselves in Bohemia. In 1848 the country was agitated by revolutionary movements. The most important events since that date have been the quarrels between the Germans and the Czechs, and the political agitation for autonomy carried on by the vigorous Young Czech party. See F. Palacky's *Geschichte von Böhmen* (5 vols. 1844–67); Bachmann's *Geschichte Böhmens* (vols. i. and ii. 1899–1905); Lützow's *Bohemia* (1896); Maurice's *Bohemia* (1896); Baker's *Pictures from Bohemia* (1894); Coles's *The Gipsy Road* (1894); Hodgson's *On Plain and Peak* (1898); and Monroe's *Bohemia of the Czechs* (1910).

Language and Literature.—The Bohemian language belongs to the western branch of the Slavonic languages, and is closely connected with Slovakish, which is spoken in the northern parts of Hungary. Bohemian literature may be divided into three leading periods—(1) from the beginning till the Hussite wars (1410); (2) from the time of Huss to the latter part of the 18th century; (3) from the renaissance of the literature till our own days. The earliest productions are religious hymns. We will pass over the *Libusin Soud* and the *Kralodvorsky Rukopis*, the authenticity of which has long been, and still is, disputed. Between 1240 and 1253 appeared an interesting version of a Latin *Alexandrëis*, and we have also versified lives of saints. To the 14th century belongs the chronicle called after Dalimil, although the real name of the author is unknown. It is in verse. Some clever satires were written by Smil of Pardubitz, surnamed Flaska, who was killed in 1403. To this period belongs *The Book of the Old Lord of Rosenberg* (*Kniha Stareho Pana Rozenberka*), one of the earliest specimens of Bohemian prose; and also the *Exposition of the Law*, by Andrew of Duba. By the beginning of the 15th century the translation of the Bible into Czech had been accomplished.

The second period begins with the name of Huss, who did a great deal to settle Bohemian orthography. Some of his writings are in Latin, but he left a fair number in Bohemian. Peter Chelcicky (1390–1460) wrote a celebrated work, the *Net of Faith* (*Sit Viry*). In 1487 the first regular printing press was set up at Prague, and the Bible was printed there in the following year. Some interesting volumes of travels were published. Gelenius and Veleslavin (1546–99) worked as humanists, and did much to spread the renaissance in Bohemia. Hajek (1495–1553) wrote a curious chronicle, with which he incorporated all the early Bohemian legends, so that his history is more amusing than reliable. Harant published his travels in the Holy Land, and we have the narrative by Wenceslaus Vratislav of Mitrovitz and his captivity at Constantinople. But the efforts of the Bohemians, both in their Diet and in their literature, to preserve the national language were rendered fruitless by the battle of

the White Mountain in 1620, and for nearly two hundred years Bohemia was lost to the European nations. John Amos Komensky (more familiar to Englishmen in the Latin form of his name, Comenius) composed his valuable works on education, in exile. He died in Holland in 1670 (born in 1592). It was not until nearly the close of the 18th century that a revival of Bohemian literature took place. It began with Joseph Dobrovsky (1753–1829), who wrote a grammar of Czech and an epoch-making work on Old Slavonic (Vienna, 1822). Jungmann (1773–1847) compiled a valuable dictionary, and Kollar (1793–1852) and Celakovsky (1799–1852) gained reputation as poets. In our own days Bohemian literature has been greatly developed. Palacky (1798–1876) was the author of the great national history, and by his monumental work taught the Bohemians to remember their historic past. His literary labours have been carried on by Tomek. A valuable worker in the field of history is Joseph Kalousek. A history of Bulgaria was written by Constantine Joseph Jiricek (1854). Among the most celebrated poets are Jan Vrchlicky, born in 1853, a voluminous writer; Sladek (1845), Halek (1835–74), Zeyer (1841), and Henrietta Pech, who writes under the name of Eliska Krasnohorska. The first to collect the folk-tales of the country was Bozena Nemcova (1820–62). Schafarik (1795–1861) was the first to treat scientifically the ethnology of the Slavonic races. His book is familiar to most students in the German translation, *Slavische Alterthümer* (1837). See the exhaustive *History of Bohemian Literature*, in Czech, by Jiricek (1874); also others by Sabina (1863–6), Sembera (4th ed. 1874), and Tieftrunk (3rd ed. 1885); Pypin and Spasovic's *Geschichte der Slavischen Literaturen* (Ger. ed. 1880–4); the *Czech Encyclopædia* (11 vols. 1859–74), and its Supplement (17 vols. 1888–1901); and Lützow's *History of Bohemian Literature* (1899).

Bohemian Brethren. See MORAVIANS.

Bohemian Forest (Ger. *Böhmerwald*), a mt. range separating Bavaria from Bohemia; stretches from the Fichtelgebirge S. to the Danube, some 150 m. It reaches its maximum elevation in Arber (4,785 ft.) and Rachel (4,770 ft.), though the average altitudes lie between 2,500 ft. and 4,500 ft. With the exception of the highest summits, the range is covered with dense forest, and is crossed, at altitudes varying from 1,600 to 3,400 ft., by three railways and four roads, the best known being the 'golden ladder' from Passau to Strakonitz. Near the southern extremity of the range, and between it and the Danube, the Bohemian Forest is accompanied by its parallel outlier the Bavarian Forest, which culminates in the Dreitannenriegel (3,990 ft.).

Bohemond I. (1056–1111), prince of Antioch, the eldest son of Robert Guiscard, won renown (1081–5) against Alexius Comnenus, emperor of Byzantium, and in the first crusade (1096), capturing Antioch (1098), of which he became prince, but was himself captured (1100) by the Turks and imprisoned for three years. He renewed unsuccessfully the war (1107–8) against Alexius. He died at Canosa, in Apulia. In the sovereignty of Antioch he was succeeded by six princes of his name, the principality being destroyed by the Mamelukes in 1268. See Gibbon's *Decline and Fall*, ch. lviii. and lx.; and Hagenmeyer's *Gesta Francorum* (1890).

Bohlen, PETER VON (1796–1840), German Orientalist, born in Oldenburg. In 1822–4 he attended A. W. von Schlegel's lectures on Sanskrit at Bonn, and

in 1828 became professor of Oriental languages at the University of Königsberg. Among his principal works are *Das alte Indien* (2 vols. 1830), once a popular book, though now antiquated; *Ueber den Ursprung der Zendsprache* (1831); and translations of two Sanskrit poems in the original metre—*viz. Bhartriharis 'Sententiæ'* (1833), and *Ritusanhara, sive Tempestatum Cyclus, Carmen Kalidasi* (1840). See his *Autobiography* (1841).

Böhme. See BOEHME, JAKOB.

Böhmen. See BOHEMIA.

Böhmer, EDUARD (1827–1907), German philologist and theologian; born at Stettin. He became professor of Romance philology at Halle in 1868, and in 1872 at Strassburg. He published an edition of Spinoza's *Tractatus de Deo et Homine* (1852); *Ueber die Apokalypse* (1855); *Das erste Buch der Thora* (1862); *Ueber die Provençalische Poesie der Gegenwart* (1870); an edition of the poem of Roland under the title *Rencesval* (1872); *Pindars Sizilische Oden mit Prosaübersetzung* (1892). He edited also the review *Romanische Studien* (5 vols. 1871–80).

Böhmerwald. See BOHEMIAN FOREST.

Böhmisch-Leipa, tn., Bohemia, Austria, 40 m. N. by E. of Prague, with railway workshops, calico printing, and other industries. Pop. 11,000.

Böhmisch-Trubau, tn., E. Bohemia, Austria, 32 m. E.S.E. of Pardubitz. Has textile industries. Pop. 6,000.

Bohn, HENRY GEORGE (1796–1884), English publisher, was the son of a Westphalian bookbinder, who settled in London in 1795. In 1846 he began the cheap issue of notable books with which his name is associated. Besides the *Origin and Progress of Printing* (1857), and the *Biography and Bibliography of Shakespeare* (1863), which he wrote for the Philobiblon Society, Bohn compiled several works for his 'Libraries,' edited Lowndes's *Bibliographer's Manual* (1857–64), and published his own translations of Goethe, Schiller, Humboldt, and Petrarch.

Bohol, or BOJOL. (1.) Island lying between Leyte I. and Zebu or Cebu I., Philippine Is.; 70 m. N.W. of Mindanao; produces hemp, cacao, cotton, timber, sugar, tobacco, and millet. Cap. Tagbilaram. Area about 1,400 sq. m. Pop. 245,000. (2.) Prov., Philippine Is., including Bohol I. and dependent islands. Area, 1,614 sq. m. Pop. 270,000.

Bohrdt, HANS (1857), German marine painter, self-taught, born at Berlin; has produced numerous pictures depicting the sea and the movements of ships, as *Reception of the Emperor William II. at Spithead on Aug. 2, 1889* (1890), *The Meteor* (1891), *Brandenburg's First Sea-fight* (1893)—all three in possession of the Emperor William II.—*Opening of the North Sea-Baltic Canal* (1896), in the Berlin National Gallery; *Sea-fight off Gothland in 1564* (1901); *The Viking's Last Voyage* (1896). In 1898 he was appointed professor at the Academy of Painting in Berlin.

Boiardo, MATTEO MARIA, Count of Scandiano (*c.* 1434–94), Italian poet, born near Reggio, in Emilia; appointed governor of Reggio (1478), of Modena (1481), and again of Reggio (1487–94). His fame as a poet rests chiefly upon the romantic lyric *Orlando Innamorato;* but he also showed himself a worthy follower of Petrarch in his *Amorum Libri Tres* (1499; new ed. by Panizzi, 1835), and in five allegorical eclogues written in 1471–2. He further translated from Herodotus, Xenophon, Apuleius, and Cornelius Nepos, and dramatized Lucian's *Timon.* The two first parts of the *Orlando* appeared at Venice in 1486; the three parts complete at Scandi-

ano in 1495. See Stiavelli's ed. of the *Orlando* (1894), and Panizzi's ed. (1830), vol. ii. of which contains Boiardo's biography; also Ferrari and Campanini's *Studi su M. M. B.* Ariosto continued the theme of Boiardo's masterpiece in his *Orlando Furioso*.

Boie, CHRISTIAN HEINRICH (1744–1806), German critic and editor, was, from 1769 onwards, the leader of the Göttingen poets, of whom he was at once the oldest and the most mature and moderate. He is important mainly as the editor of the *Göttinger Musenalmanach* (1770–5), the first German imitation of the French *Almanach des Muses* (1765). The volumes for the years 1773 and 1774 are the chief manifestoes of the revival in German lyric poetry; they contain Bürger's *Lenore*, poems by Goethe and Schiller, and some of the best work of Hölty, Miller, and Fritz Stolberg. Boie subsequently edited an excellent monthly, *Das Deutsche Museum* (1776–88), later *Das Neue Deutsche Museum* (1789–91). See Weinhold's *Life* (1868).

Boieldieu, FRANÇOIS ADRIEN (1775–1834), master of the French school of comic opera, was born at Rouen; studied under Cherubini at Paris, where he was appointed to a professorship in the Conservatoire. He lived in St. Petersburg (1803–10), but spent most of his life in Paris. Of his numerous works the most popular are *Le Calife de Bagdad* (1799), *Jean de Paris* (1812), and *La Dame Blanche* (1825), his *chef-d'œuvre*. He possessed a charming gift of melody, and his instrumentation, though light, is always full of grace and refinement. See *Life* by Pougin, in French (1875).

Boii, a Gallic tribe which at an early date crossed the Alps, and settled partly in Italy between the Po and the Apennines, and partly in Germany, in Bohemia (which derives its name from them), and between the Danube and the Tyrol. After many wars the Romans subdued the Italian Boii in 191 B.C.; the German Boii were expelled, at the end of the 1st century B.C., by the Marcomanni.

Boil, a circumscribed gangrenous inflammation of the skin, or of subcutaneous connective tissue, or of a gland, with the formation of a core of dead tissue. Boils occur in persons who are run down, or whose blood is impoverished or poisoned by unsuitable diet, and are formed especially in those parts where the skin is irritated by rubbing or pressure. The micro-organism *Staphylococcus pyogenes* is always present in a boil. The most efficient treatment is to improve the general health. When large boils have become soft, they should be lanced freely and dressed antiseptically. In their early stages they may often be stopped by rubbing in corrosive sublimate (1 part) mixed with white vaseline (2,000 parts). But it is more important to take very little meat or alcohol, increase the farinaceous and fatty elements of diet, stimulate the hepatic and digestive functions (*e.g.* by calomel), and take sufficient physical exercise and rest. Boils are liable to occur in recurrent crops, a condition termed furunculosis. Obstinate cases are now successfully treated by VACCINE THERAPY.

Boileau-Despréaux, NICOLAS (1636–1711), French poet and critic, born in Paris, studied successively for the church and the bar, but in 1657 determined to devote himself to poetry. About 1660 he came into notice by certain satires in the manner of Horace and Juvenal. Seven of them, along with a *Discours au Roi*, were published in 1666, under the title *Satires du Sieur D** (*i.e.* Despréaux: he published his poems anonymously till 1701), two others being added in 1668 in the third

edition. From 1669 to 1674 he was engaged on the *Art Poétique* (new ed. 1888), a work of extreme importance, not merely as the 'declaration of the literary faith of a great age'—for Boileau had reasoned out much of it with Molière, La Fontaine, and Racine—but also as the most complete modern expression of the doctrines of classicism in literature. In the same volume as the *Art Poétique* appeared a translation of Longinus, the first four cantos of the *Lutrin* (a serio-comic epic, and perhaps his most popular work), and the first four *Epistles*. In 1677 he was appointed, with Racine, historiographer-royal. He published the two concluding cantos of the *Lutrin*, with five new *Epistles*, in 1683; but his later poetic work consists only of the unfortunate *Ode sur le Prise de Namur* (1693), three satires (1693–1705), three epistles (1695), and a few epigrams. He was the chief defender of the ancients in the quarrel of the ancients and the moderns, and replied to Charles Perrault in his *Réflexions Critiques sur Longin* (1693–1710). The chief characteristic of Boileau's verse is its impeccable form; but he is lacking in delicacy and imagination. His influence in England may be traced in Roscommon's *Essay on Translated Verse* (1681), Sheffield's *Essay on Poetry* (1682), and Pope's *Essay on Criticism* (1711). A complete translation of his works, 'made English by several hands,' appeared in 1712 (3 vols.). His other works include the *Dissertation Critique sur Joconde* (1662–5), *Dialogue sur les Héros de Roman* (1664 or 1665), *Discours sur la Satire* (1668), *Discours sur l'Ode* (1693); and more than a hundred of his letters have been published. See complete works, ed. Brossette, 2 vols. (1716), and Saint-Marc, 5 vols. (1747); *Boileau, L'Art Poétique*, ed. D. N. Smith (1898); *La Vie de M. Despréaux*, by Desmaizeaux (1712); *Boileau*, by Morillot, in the *Classiques Populaires* (1891); *Boileau*, by Lanson, in the *Grands Ecrivains Français* (new ed. 1900).

Boiler. A boiler is a vessel in which steam is generated. The gases produced by the more or less complete combustion of the fuel—solid, liquid, or gaseous—in the furnace of the boiler act as a carrier of the heat to the various parts of the heating surface through which the heat is transmitted to the water by conduction. It is essential that the furnace should have sufficient dimensions to allow of enough air being present to consume the fuel properly, and that the area of the surface designed to absorb the heat should be such that the products of combustion may be rejected at as low a temperature as practically possible, which of course must be higher than the temperature of the water in the boiler. With careful stoking, in a well-designed boiler it is estimated that each pound of coal of good average quality will evaporate about 9½ lbs. of water from and at 212° F. (each pound of water thus evaporated being equivalent to 966 heat units). The quantity of coal consumed per hour on each square foot of fire-grate surface depends partly on the draught, and partly on the volume of the combustion space above the grate. The ratio of heating surface to fire-grate area varies greatly, as the table below indicates. The heating surface comprises the walls of the furnace or combustion chamber, together with those portions of the boiler in the furnace tubes or flues which are in contact with the furnace gases whilst on their way to the chimney.

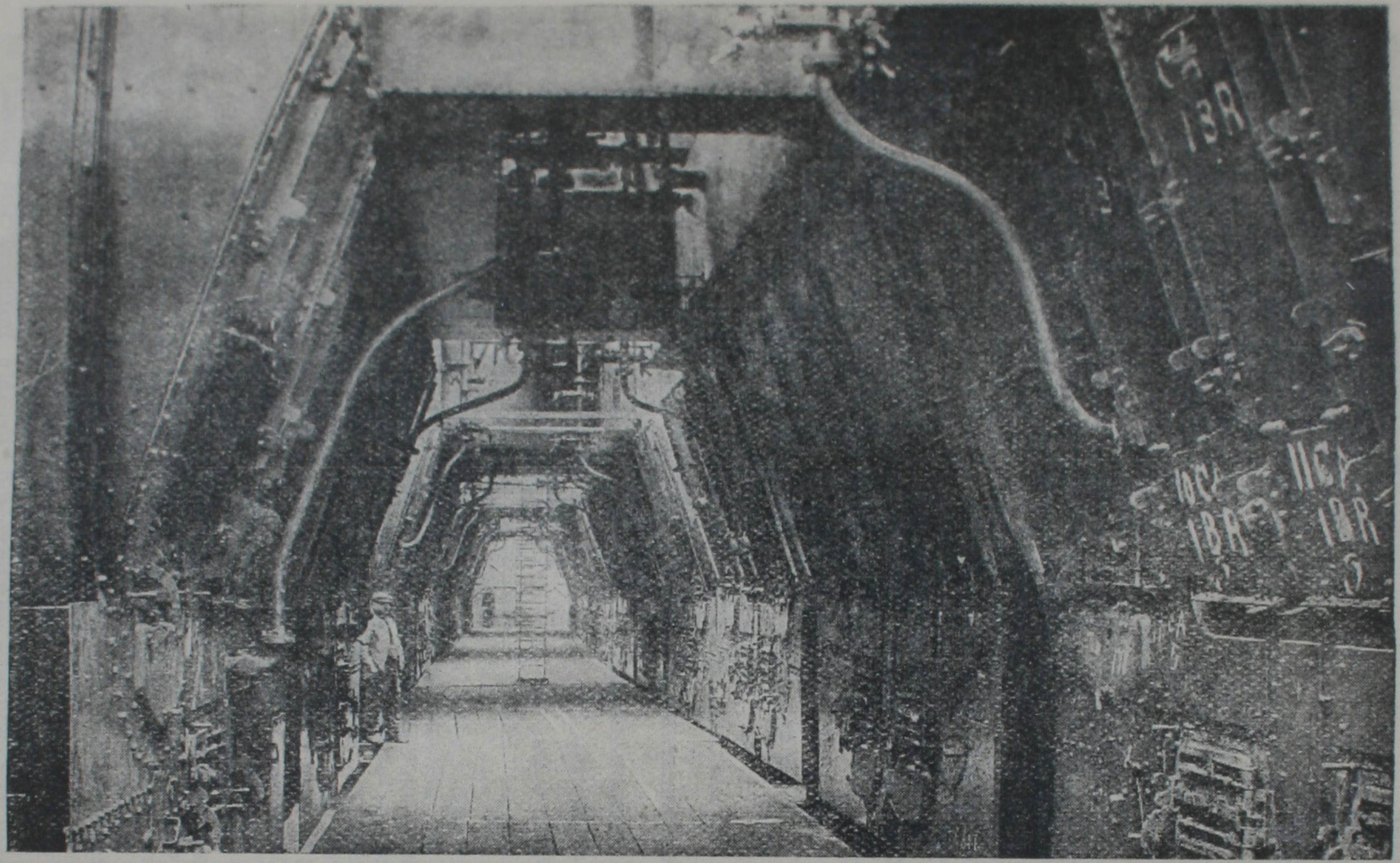
Natural or *chimney draught* is caused by the difference in weight between the products of combustion in the chimney and an equal

volume of cooler air outside; on this account it is necessary that the waste gases should leave the boiler at a comparatively high temperature (about 600° F.). With *forced draught* the air is not *drawn* through the furnace as with natural draught, but is made to enter under a small pressure. It is therefore possible to use more heating surface for a given grate area, and the products of combustion can be discharged at a lower temperature, thus increasing the efficiency of the boiler. With a properly arranged system of forced draught, an increase in economy of 15 per cent., as compared with natural draught, may result. In land practice it is usual to add to the heating surface by introducing an *economizer*, which acts as a feed-water heater by utilizing some of the otherwise wasted heat in the flue gases.

Theoretically, 1 lb. of average British coal requires about 11 lbs. of air for its complete combustion; but practical tests of boilers show that at least twice as much is actually used in an ordinary boiler, and from 15 to 20 per cent. of the total heat of combustion escapes in the flue gases. A well-arranged boiler will utilize about 70 per cent. of the available heat in the fuel; with an economizer added, the efficiency may be raised to 79 per cent. A good supply of air is, of course, absolutely necessary; but too much must be avoided, otherwise the flue-gas loss is increased; also, to bring about perfect combustion, the air must enter above as well as below the fire. Careful attention must be given to the stoking: it is not conducive to economy to introduce large quantities of fuel at a time, because the rich volatile hydrocarbons in the fuel are then distilled off without being consumed. A much thicker fire (10 to 14 in.) may be used with forced than with natural draught (about 8 in.).

The rate at which heat is conducted through the walls of a boiler depends mainly upon the difference in temperature between the hot furnace gases and the water, and the rapidity with which the steam, when formed, can escape from the surface at which it was generated. The iron or steel of which a boiler is usually made is a good conductor. Steam, on the other hand, opposes the passage of heat; and in order that the maximum transference of heat may be brought about, it is necessary that there should be a vigorous circulation of the hot gases and the water on the opposite sides of the boiler plates. The presence of even a very thin layer of scale on the boiler plates greatly impedes the passage of heat through them; in fact, want

Type of Boiler.	Draught.	Coal consumed per Square Foot of Grate Area per Hour (lbs.).	Square Feet of Heating Surface for each Square Foot of Grate Area.
Lancashire and Cornish.	Natural.	10 to 18.	15 to 25.
	Forced.	15 to 26.	
Multitubular marine .	Natural.	15.	25 to 50.
	Forced.	30.	
Locomotive	Induced.	30 to 120.	50 to 75.
Water tube	Natural.	12 to 22.	25 to 50.
	Forced.	45 to 60.	



The Boilers of S.S. 'Mauretania' when ready to be put on board.

of proper circulation, and scale on the plates, have a far greater effect in hindering the conduction of heat, and thus reducing the evaporative power of a boiler, than the thickness of the plates themselves. Active circulation, by producing an equable temperature throughout the boiler, tends to prolong its life, because it prevents the production of deteriorating strains caused by unequal expansion and contraction.

It is very important that the temperature of the flames in the furnace should be kept as high as possible; complete combustion of the gases coming off from the fuel can only be effected when the flames do not come in contact with the heat-absorbing surfaces, which should be arranged so as not to interfere with the combustion of the fuel gases. It is also important that the gases be compelled to circulate equally over all parts of the heating surfaces. If boiler settings are not properly arranged the gases are apt to 'short circuit' and reach the chimney without parting with much of their heat.

To prevent considerable variations in the steam pressure, it is essential that the steam space in a boiler above the water should be capacious. Too small a steam space causes violent outbursts of steam and priming (water coming over with the steam, forming *wet steam*). A boiler with excessive heating surface and deficient water space generally primes heavily when pressed. The steam should be taken off from a boiler at a point as far as possible from the water.

The chief sources of waste in a boiler are—unsuitable proportions of furnace, combustion chamber, fire-grate, and heating surface; deficiency or excess of air supply; incomplete combustion; radiation; priming; leaky joints, valves, cocks, etc.; scale and soot on heating surface; flue-gas waste; and leakage of air into flues through defective brickwork. All radiating surfaces in boiler and steam-pipes should be properly covered with some efficient non-conducting composition.

Mild Siemens steel is now almost universally used for boiler construction. It not only possesses greater strength and ductility than iron, but it is more homogeneous in character, and can be made in larger sheets. The Board of Trade requires for shell plates a tenacity of not more than 32 tons, and not less than 27 tons per sq. in., with an elongation of not less than 20 per cent. on a length of 10 in. For plates exposed to heat and flame, a steel of slightly less tenacity and greater ductility is selected.

Boilers for Stationary Engines: Lancashire and Cornish Types.—For supplying steam to stationary engines, the boilers known as the Cornish and Lancashire types are most common in Britain. The Lancashire boiler consists of a long horizontal cylinder with flat ends, and is provided with two large parallel tubes stretching from end to end within the water space; each tube contains a furnace at one end, and communicates at the other with the external flues of the boiler. As a steam generator, the Lancashire boiler stands pre-eminent where the space at command will permit of its introduction. It has a large water volume, and once steam is raised, it is converted into a huge reservoir of heat energy. It is capable of supplying large quantities of steam with very little effort, and when fitted with an economizer it is most efficient and economical. All the heating surfaces, external and internal, are completely accessible, and can be kept clean and free from deposits with the least possible difficulty. A very common size for factory work is 8 ft. diameter by 30 ft. long, with

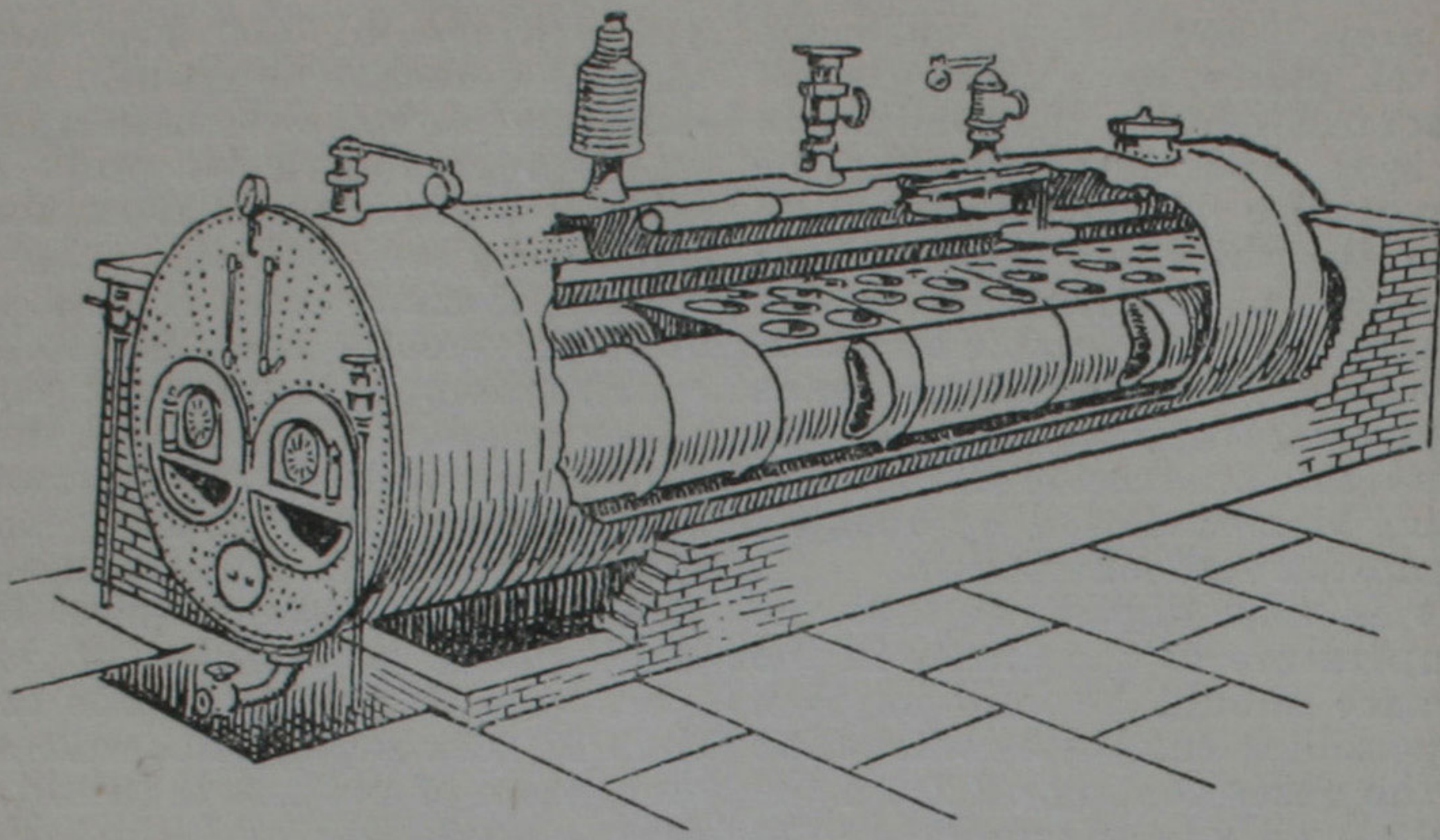


FIG. 1.—*Galloway Boiler* (*longitudinal section*).

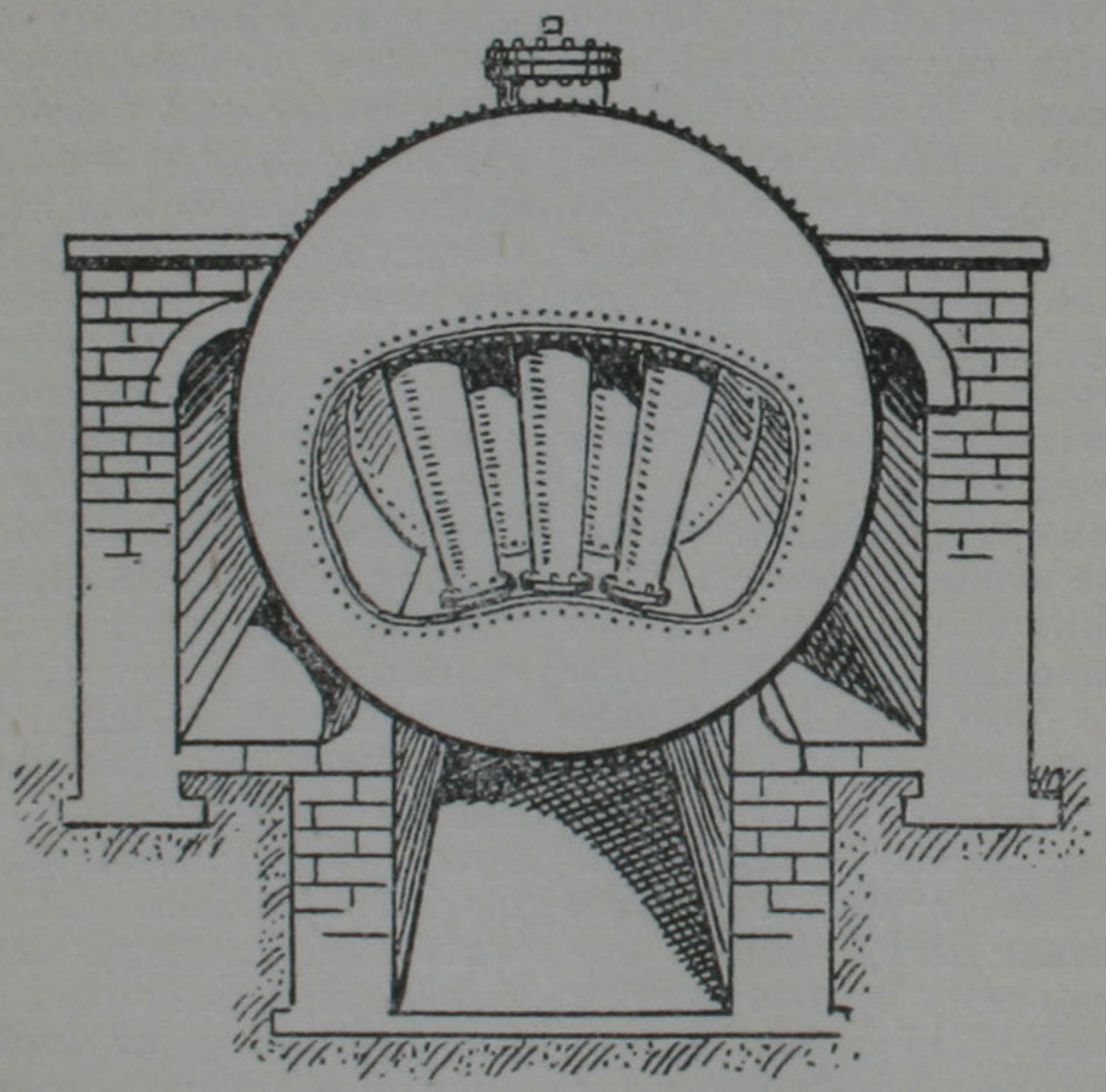


FIG. 2.—*Galloway Boiler* (*cross section*).

two furnace tubes about 3 ft. in diameter. Such a boiler would contain about 20 tons of water, and should be capable, when combined with an economizer, of evaporating about 6,700 lbs. of water per hour. As regards strength, the Lancashire type of boiler can be, and is, constructed for pressures up to 250 lbs. per sq. in. Cross tubes are fitted in the furnace tubes to intercept and divide the hot gases, and to increase the circulation of the water. The Galloway boiler (Figs. 1 and 2), an improvement on the ordinary Lanca-

shire boiler, is distinguished by the wide, segmental, kidney-shaped flue tube, into which the furnace tubes are merged immediately behind the furnaces. The flue tube extends from the point of junction of the furnace tubes to the far end of the boiler, and is traversed by closely-set conical water tubes or pipes. Fig. 2, a rear view of the boiler, shows the setting of the cross tubes, the arrangement of the flues, and the way in which the boiler is supported. The evaporative power of a boiler of this type is considerably greater than that of the ordinary Lancashire boiler. The Cornish is exactly similar to the Lancashire boiler, except that it has only one internal furnace tube; it is used in cases where only a moderate quantity of steam is required.

The above boilers are fired internally—*i.e.* the fuel is consumed inside the external shell. Before the introduction of the above types, externally-fired or egg-ended boilers (not water-tube) were used. They consisted of a long horizontal cylinder with hemispherical ends, the furnace being placed under the boiler. They are distinctly less efficient than internally-fired boilers. Externally-fired boilers are still used in localities where fuel is very cheap, or for raising steam by utilizing the heat in the waste gases from blast-furnaces.

The 'Economic' boiler is much shorter in proportion to its diameter than the Lancashire and Cornish types, a boiler 8 ft. diameter being only 14 ft. in length. It consists of a cylindrical shell with one or two internal furnace tubes, above which are a number of small tubes running from end to end of the boiler. A combustion chamber of brick or iron, lined with firebrick, receives the products of combustion at the back; they then return through the small tubes to a smoke-box in front of the boiler, and thence through suitable flues to the chimney. The brick combustion chamber at the back becomes red hot when the boiler is at work, and greatly promotes the combustion of the fuel gases. The boiler is simple and inexpensive in construction; it has a large proportion of heating surface, and is consequently economical in fuel consumption. It occupies much less space in proportion to its evaporative capacity than the ordinary Cornish or Lancashire boiler.

Vertical Boilers are all internally fired, and are very useful for generating steam for small engines and steam-cranes. The free surface of the water from which the steam rises is comparatively small, and consequently the steam rises with considerable velocity, which increases the liability to prime and produce wet steam. These boilers are very handy, and require no brickwork setting, but they are not economical. The simplest form is the cross-tube boiler. It consists of a vertical cylindrical shell having a conical fire-box and single flue tube or uptake between the crown of the fire-box and that of the boiler shell, and is fitted with several cross tubes in the fire-box. The grate forms the floor of the fire-box, to which access is given by a door in the side of the cylindrical shell. There are a great many forms of vertical boilers, mainly differing in the arrangement of the tubes and fire-box. Fig. 3 shows two vertical sections of a standard Cochran boiler, 6 ft. in diameter and 13 ft. 6 in. in height, designed for a working pressure of 100 lbs. per sq. in.; the ratio of heating surface to grate surface is 17 to 1. The dome-shaped fire-box communicates with a vertical combustion chamber, lined at the back with firebrick, connected by rows of straight horizontal tubes to a smoke-box at the front of the boiler. The top of the boiler shell is

also dome-shaped, to gain strength and increase the steam space.

Locomotive Multitubular Type.—This (Fig. 4) consists of a rectangular fire-box attached to a cylindrical shell called the barrel, which extends horizontally from the fire-box to the front part or smoke-box end of the boiler; the fire-box is connected to the smoke-box by a number of tubes, through which the products of combustion pass on their way to the chimney. The fire-box is enclosed completely within the body of the boiler, and consequently the four sides, and also the top or crown, are available as heating surface, which is further augmented by the tubes traversing the water space in the barrel. The sides and top of the fire-box being flat, would quickly collapse under the pressure of the steam, unless special provision, in the shape of stays, was made to stiffen and support them. The tubes, in addition to acting as flues and heating surface, fulfil also the function of stays to the flat end of the barrel of the boiler, and to the portion of the fire-box opposite to it. This type of boiler is self-contained, easy of erection, very economical in fuel, and being supported on a strong cast-iron ashpan at the fire-box end and a substantial pedestal under the smoke-box, only very little brickwork is necessary. The grate areas and heating surfaces of these boilers are both large. The exhaust steam from the engine is sometimes turned into the chimney in order to increase the draught. Fig. 4 shows a longitudinal section and end view (partly in section) of a locomotive type boiler.

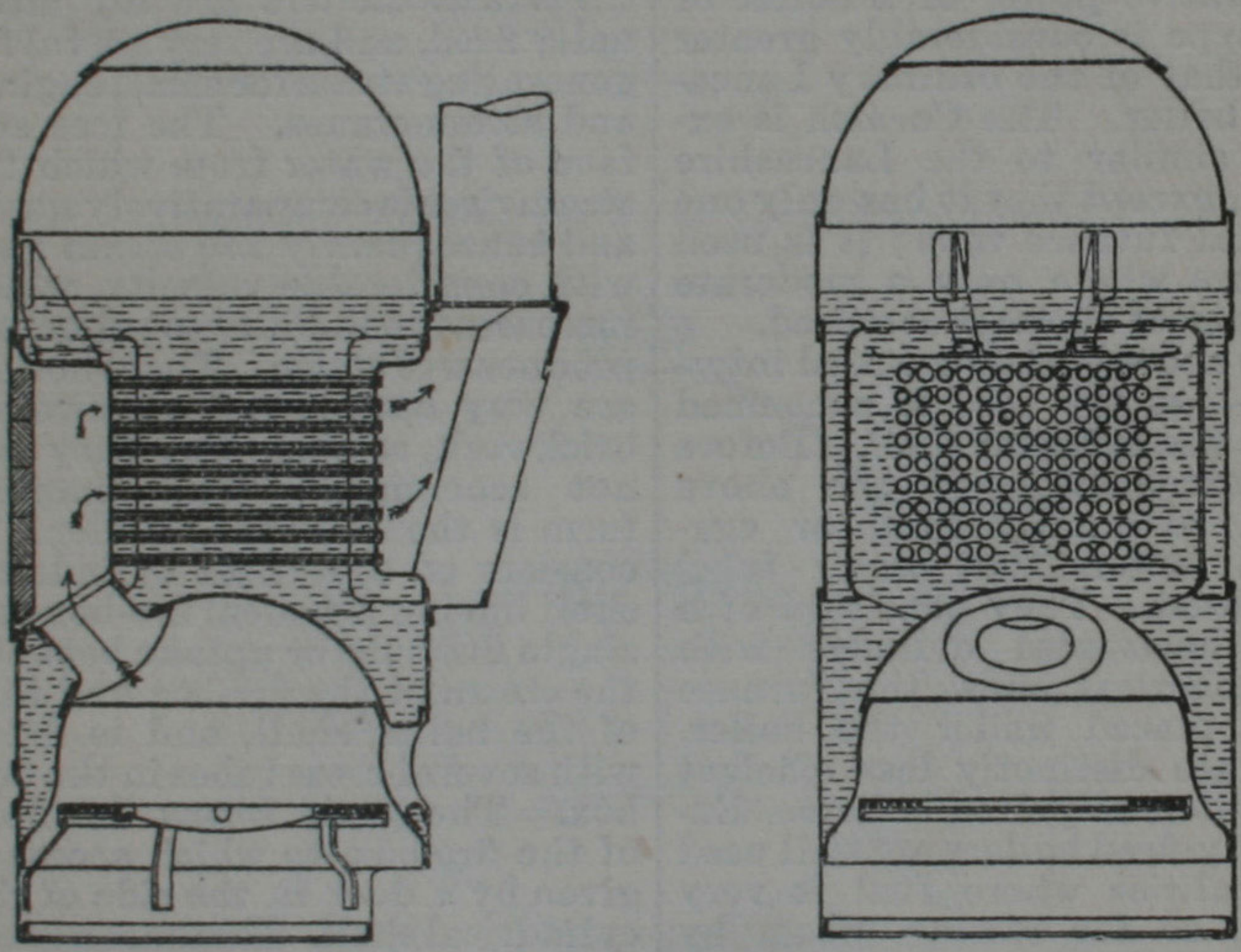


FIG. 3.—*Cochran Boiler.*

Marine Boilers.—The most usual type, generally known as the Scotch boiler, consists of a short horizontal cylindrical steel shell with flat end plates, and is provided with several internal furnaces in cylindrical flues communicating with internal combustion chambers, which are fitted with a large number of return tubes above the