

Cleavers, or goose-grass (*G. aparine*), is the rough trailing herb found in hedges, where it climbs by means of minute hooked hairs. Its spherical fruits, roasted and ground, are said (doubtfully) to be an excellent substitute for coffee.

Bedwelty, par. and vil., Monmouthshire, England, 6 m. S. of Tredegar; has extensive coal mines and ironworks. Pop. (par.) 10,000.

Bedworth, par. and tn., Warwickshire, England, 5 m. N.E. of Coventry, on L. & N.W.R. The Coventry Canal runs through the parish, which contains coal and ironstone mines. Pop. (par.) 7,000.

Bee. Bees constitute the division Anthophila of the sting-bearing Hymenoptera, the Hymenoptera being insects which have two pairs of membranous wings, and are distinguished from wasps and ants by the possession of more profuse branched and plumose hairs on the body. The common hive-bee (*Apis mellifica*) is the most highly specialized member of the Anthophila, probably modified by prolonged domestication. In early summer the bee-keeper recognizes the premonitory symptoms of swarming—first, an unusual restlessness among the bees; and second, a large decrease of the workers entering and leaving the hive on the ordinary business of pollen and honey gathering. Within the hive the signs of the coming change are even more obvious—many of the workers being occupied in gorging themselves with honey from the store, or loading their legs with propolis, the resinous substance which bees collect from plants. Suddenly more than half of the workers, with the queen of the hive, leave their old home, and fly to some previously fixed place, where they 'swarm.' Sometimes a second and third swarm will be

given off from the same hive (this depending upon the strength of the hive), each with a queen, without whom the swarm will not settle. The first or top swarm is always the most important, and the honey of the greatest value. Immediately the swarm is hived the workers climb to the roof, forming a pendent curtain of suspending bees, widening towards the base. Here they remain from eighteen to twenty-four hours, the temperature of the hive rising to a considerable height, till the old home wax, secreted by the eight pockets on the surface of the abdomen, appears on each bee as eight whitish plates. These are then removed by the bees from their pockets, and, after mastication and kneading, are fastened to the roof of the hive. When the foundations of the comb are thus laid, other bees form hexagonal cells, until the honeycomb is made. Meantime the queen has been impatiently waiting to lay her innumerable eggs as soon as provision is made for them. As this period of comb-building is exhausting to the workers and delays their honey-making, it is the object of the bee-keeper to diminish the bees' labour by the supply of comb foundations and other mechanical appliances. When completed, the comb consists of a number of so-called worker cells, about one-fifth of an inch in diameter, serving for ordinary storehouses and for cradles for developing workers; and the larger (a quarter-inch) drone cells, in which the drones or males develop, but which are used for superabundant food; and the formation of the 'royal cells,' in which queens develop.

This is the ordinary comb of the colony, and as fast as the workers are able to build worker cells the queen lays in them her eggs. As these will speedily develop into maggot-like larvæ, re-

quiring to be fed, foraging parties become necessary.

The working duties of the hive may be divided into external and internal—the former mainly performed by the older, the latter by the younger bees.

The external duties consist in collecting pollen, or bee-bread, from flowers, and conveying it to the hive; in sucking up nectar from flowers, carrying it to the hive in the so-called honey-bag, and transforming it into honey; and finally, in collecting the sticky substance known as propolis, which the bees use for varnishing purposes. As in the case of ants, the workers are sterile females. The mouth is furnished with strong jaws or mandibles, used for constructive purposes, and also with an elongated tubular apparatus for nectar-gathering. This consists chiefly of the lower lip of the bee, but is often called the tongue, hence the classification of bees into short and long tongued forms a distinction of great importance; for the evolution of tubular flowers has apparently taken place simultaneously with the evolution of the latter type of bees, which alone can reach the honey of such flowers or fertilize them. Another important feature in the structure of the working bee is the presence on the last pair of legs of the 'pollen basket,' the beautiful arrangement of hairs by means of which the bee carries pollen to the hive.

The workers have arduous internal duties. They feed and rear the larvæ; they build the comb and arrange the entire internal economy; they keep the interior clean and sweet; they ventilate the hive by movements of the wings. The life of the worker does not exceed six weeks in the summer months.

The life-history of the worker may be given as follows:—From

the egg laid by the queen in a worker cell an eyeless larva is hatched, and is fed by the workers at first by a secretion from certain glands—the so-called pap—and later apparently on honey and pollen. After several moults develops into a pupa, the cell being sealed by the workers. After some twelve days the perfect worker emerges, and in about twenty-four hours enters on its duty as a nurse.

The development of the larger-sized drone, or stingless male, is similar, though the cell in which it occurs is naturally larger. With regard to the determination of sex, it is usually believed that the drone is produced from an unfertilized egg; but others hold that though this may be the case, proof of the assertion is still to be furnished, and that the question of worker or drone is solved by the respective treatment of egg and larva.

In regard to the queen, it appears certain that the sex is determined by the 'royal jelly'—different from worker pap—furnished to the developing larva.

The position of the queen in the hive may be best appreciated by returning to the queenless hive from which the primary swarm escaped, and which contains perhaps one-third of the original workers, but has the stores of the original colony, and in its brood comb probably several queen cells containing pupæ and larvæ. One of these cells speedily liberates a virgin queen, who endeavours to destroy her rivals within their cells. She is prevented or permitted by the workers according as they do or do not contemplate another swarm. In the latter case, the execution is postponed until after the nuptial flight. The virgin queen quits the hive, and rises, pursued by a crowd of drones, to a great height in the air, where the union occurs, and

is followed by the return of the queen to the hive, when she begins her life of continuous egg-laying. If a new swarm is contemplated, the nuptial flight is delayed until new queens are ready to emerge, and then the first queen escapes, accompanied by workers, to found a new colony. In this case the swarm often travels to a distance, and the possibility of cross-fertilization with drones from another hive is increased. The workers exhibit extraordinary intelligence in connection with the economy of the hive; but they have a tendency to swarm with a frequency which produces several weak and failing stocks instead of a few strong ones.

So long as the weather suggests the possibility of swarming, drones are present in the hive; but as soon as the swarming season is over, these are killed by the workers, if the hive has a breeding queen. If the queen be semi-sterile, or capable of laying drone eggs only, the destruction is delayed. The drones never take any part in the work of the colony, although they feed on the stores collected by the workers. As, further, one drone only is required to mate with the queen, and the mating is followed by death, the over-production of drones or their prolonged preservation is a needless drain on the resources of the colony.

Even on *a priori* grounds, it is obvious that so elaborate a social system as that of the hive-bee is one of gradual growth, especially in view of the numerous structural adaptations involved in the production of the different castes—workers, drones, and queens. In point of fact, the evolution of the habits and structure of the hive-bee may be admirably traced by a study of other bees. Not a few of the wild bees are solitary—*e.g.* *Prosopis*, a genus including several British bees of very primi-

tive nature. Here the mothers dig burrows in wood, earth, or bramble stems, and lay one egg in each of the several cells, each egg being surrounded by food material. After doing this the mother bee dies, and never sees the larvæ which emerge from the eggs. In these bees there are no pollen baskets, the proboscis is very short, and wax is not produced. The cells are lined with a silky material, and the food-store consists of a mixture of pollen and honey—the former being carried in the alimentary canal mixed with the latter, and collected by the mouth. From this primitive condition a series of forms leads up to the highly specialized hive-bee.

See *Insects*, Part II., by D. Sharp, in the *Cambridge Nat. Hist.* (1899). For British bees, see F. Smith's *Brit. Museum Cat. of Brit. Hymenoptera* (new issue 1891). For bees in relation to flowers, see Lubbock's *Brit. Wild Flowers in Relation to Insects*, Nature Series (1885); and Hermann Müller's *The Fertilization of Flowers* (trans. 1883). For the hive-bee, see Sir John Lubbock's *Ants, Bees, and Wasps* (1889); Romanes' *Animal Intelligence* (1881); and Maurice Maeterlinck's wonderful eulogy, *La Vie des Abeilles*, translated as *The Life of the Bee* (1901).

BEE-KEEPING.—Apart from the frequent Scriptural mention of bees and honey, and the allusion to bees in the hieroglyphics of ancient Egypt four thousand years ago, Aristotle the philosopher, in the 4th century B.C., and, two hundred years later, Virgil the poet and Pliny the naturalist, all wrote about bees—Virgil's fourth Georgic being in itself a valuable book on bees and bee-keeping. In mediæval times, too, it is recorded that the Saxon lord of the manor sometimes took part payment for rent of holdings in honey.

The 17th century was prolific

in bee literature, but little additional knowledge was gained, and it was not until Huber, the blind naturalist of Geneva, began his investigations, and in 1792 published his *Nouvelles Observations sur les Abeilles*, that marked progress was made. In 1841 Prokopovitch, a Russian bee-keeper, who owned an apiary of 2,800 colonies of bees, made the first known attempt at constructing a hive with an upper chamber for surplus honey, and frames of combs that were capable of being removed. The introduction of the methods of modern bee-keeping may, however, be said to date from the invention (1851) of the movable frame by the Rev. L. L. Langstroth, an American clergyman, who made perfect the frame devised by the Russian apiarist. The next important advance was made by the introduction of what is known as comb foundation—i.e. thin sheets of beeswax, which, on being passed between embossed metal rollers, have impressed on their surface the outline of the cell base of natural comb. These sheets, when fitted in frames, ensure perfectly straight combs, and are readily adopted by bees as their own handiwork, thus effecting an enormous saving to them in labour and material. The primary merit of this invention is due to J. Mehring, a Bavarian carpenter, who in 1805 discovered that a sheet of wax so impressed would be accepted by bees and built out into comb in a very short time. Mehring's idea has since been improved upon and perfected by the American 'Weed' process of manufacture. Then followed, in 1865, the invention of the honey extractor, by Major Von Hruschka, an Austrian officer. After the cell cappings are removed, the frames of comb are placed in a metal cylinder containing a revolving cage. The

cage is fixed on a vertical spindle, with cog gearing at top, and works on a central pivot. By this means the honey is thrown out without injuring the combs, and the latter are returned to the hive for refilling by the bees.

Other inventions tending to increase the production of honey, and render the management of bees more easy, include the small box or frame of thin wood made to hold about 1 lb. of comb honey, and known as a section. By using these, comb honey is secured in attractive portable form for market and table use. Some millions of these sections are made yearly in America and Canada for use in Britain. By means of the very useful appliance called a super-clearer, bees can now be removed from surplus chambers almost without labour, and an entire avoidance of the former trouble through stings from the insects when being deprived of their stores. The appliance referred to is put on at night, and next morning the honey can be removed quite freed from bees, which have passed into the brood chamber below.

The British Bee-keepers' Association, founded in 1874 under the auspices of Sir John Lubbock (Lord Avebury), has marked a new era in the industry, the parent association having now affiliated to it county bee-keepers' associations all over the kingdom. The education committees of many county councils also now include bee-keeping in their schedules of technical instruction in agricultural pursuits, as a means of helping small farmers, labourers, and cottagers in rural districts. Examinations are also held periodically for the experts' certificates of the Bee-keepers' Association, in order that duly qualified persons may be available as instructors in bee-keeping under the Education Acts.

The amount of honey obtainable from a single colony of bees under the modern system is very remarkable. Formerly 50 or 60 lbs. from one of the old-fashioned skeps was considered an unusually good return, the average from a skep apiary rarely exceeding 30 or 40 lbs. per hive. By the adoption of modern appliances a bee-keeper in the year 1899 secured 352 lbs. of honey from one hive, while the nine hives of his whole apiary yielded 2,088 lbs., or an average of 232 lbs. per hive, in the same year. These results are, however, exceptional, 60 to 80 lbs. being considered a fair annual average in Britain.

See F. R. Cheshire's *Bees and Bee-keeping* (1886); T. W. Cowan's *British Bee-keepers' Guide Book* (18th ed. 1904), *The Honey Bee: its Natural History, Anatomy, and Physiology* (2nd ed. 1904); S. Simmins's *A Modern Bee Farm* (1893); W. B. Webster's *The Book of Bee-keeping* (2nd ed. 1901); *Modern Bee-keeping*, published by British Bee-keepers' Association (9th ed. 1903); *Langstroth on the Hive and Honey Bee* (rev. by C. Dadant and Son, 1889); A. J. Cook's *The Bee-keepers' Guide* (1902); A. I. Root's *ABC of Bee Culture* (1903); Dr. C. C. Miller's *Forty Years among the Bees* (1903); Ed. Bertrand's *Conduite du Rucher* (1895); Dzierzon's *Rational Bee-keeping* (trans. from German by H. Dieck and S. Stutterd, 1882); G. de Layens and Gaston Bonnier's *Cours Complet d'Apiculture* (1897).

Beech. By almost general consent, the beech (*Fagus sylvatica*) is, next to the oak, given the highest rank among British trees. It was an honoured tree among the Romans, and Cæsar especially wrote that he had failed to find beeches in Britain. That the tree is, nevertheless, a native of these islands seems to be certain. The beech occurs almost

throughout Europe, and is the Danish national tree. It will grow on almost any soil that is not water-logged, but thrives best on chalk or limestone.

Gerard referred to the beech-nut as being fattening food for swine and deer, as 'pleasant' to thrushes and pigeons, and as 'greatly delighting mice and squirrels.' They have also been dried and made into flour, and have been used as a source of oil.

In autumn the leaves take on glowing yellow, orange, gold, and purple tints. The male and female flowers occur on the same tree. The former consist of little bunches of brown pendent catkins, each catkin including ten or more flowers; the female flowers are enclosed within a mass of scales, which develops into the prickly husk that ultimately ripens and bursts open in four valves, liberating the two nuts within. The beech is easily propagated by sowing the nuts in March at a depth of one inch in carefully-prepared soil. If kept closely trimmed, it makes an excellent hedge; for not only does it become a closely interlaced arrangement of twigs, but the dead leaves, by remaining attached through most of the winter, add to the density and shelter afforded.

There are some fourteen other species of *Fagus* distributed over the temperate and sub-frigid zones, and there are also many varieties of *F. sylvatica* itself. Of these the copper beech and purple beech are best known. Both these are very beautiful when the leaves are expanding in the spring, but become dull and monotonous as the colour deepens with advancing summer. The weeping beech (*F. s. pendula*) and the fern-leaved beech (*F. s. asplenifolia*) have their admirers. See Johns's *The Forest Trees of Britain* (1869), and

Hulme's *Wild Fruits of the Countryside* (1902).

Beecher, HENRY WARD (1813-87), American preacher and abolitionist, was the son of Dr. Lyman Beecher and brother of Harriet Beecher Stowe. From the first he took a great interest in public questions, identifying himself with the anti-slavery party. In 1847 he was called to the pastorate of Plymouth Congregational Church, Brooklyn. Here he gathered round him the largest congregation in the States. For nearly forty years he laboured with zeal and earnestness. His sermons were marked by great freshness, originality, eloquence, and imagination. He edited the *Independent* in 1861-3, and contributed to it for twenty years. His efforts in favour of abolition were untiring, and in 1863 he delivered in England a course of lectures on the subject. In 1870 he became editor of the *Christian Union*, and edited it until 1881. In 1882 he withdrew from the Association of Congregational Churches, owing to divergence of doctrine. He again visited England in 1886, and died the following year. His works include *The Star Papers* (1855-8); *Lectures to Young Men* (1844; new ed. 1850); *Aids to Prayer* (1864); *Yale Lectures on Preaching*, in 3 vols. (1872-4); *The Life of Jesus Christ* (1871-91); and *Evolution and Religion* (1885). See the *Life of Henry Ward Beecher*, by J. Howard, jun. (1887); *Henry Ward Beecher: a Sketch of his Career*, edited by Lyman Abbott (1883); *Beecher: his Life and Work*, by J. T. Lloyd (1881); and *Henry Ward Beecher: a Biography*, by W. C. Beecher, Rev. S. Scoville, and Mrs. Beecher (1888).

Beecher, LYMAN (1775-1863), American preacher, born at New Haven, Connecticut. Minister (1810) of Litchfield Congregational Church, he soon took foremost

rank as a preacher, and (1832-52) was president of Lane Theological Seminary, near Cincinnati. Three volumes of his works were published in 1852. His *Autobiography* was edited by his son C. Beecher (1864-5). He was father of Harriet Beecher Stowe, of Henry Ward Beecher, and of the following:—CATHERINE ESTHER (1800-78), born in Long I. At the head of a school at Hartford (1822-32), and (1832-4) of a seminary in Cincinnati, she devoted herself to female education by organizing societies for this object, and by numerous writings. CHARLES (1815-1900), editor of his father's *Autobiography*, and author of *Pen Pictures of the Bible* (1855). EDWARD (1803-95), editor of *The Congregationalist* (1849-53) and author of *The Conflict of Ages* (1853), *The Concord of Ages* (1860), and *Scriptural Doctrine of Retribution* (1878).

Beecher Stowe, MRS. See STOWE.

Beechey, FREDERICK WILLIAM (1796-1856), English rear-admiral and geographer, son of the following, served under Franklin in the Arctic expedition of 1818, and under Parry in 1819. He co-operated, by Bering Strait, with polar expeditions from the east (1825), and at various periods was employed in survey work on the north coast of Africa, the coast of S. America, and the Irish seaboard. Author of geographical works, including a *Voyage of Discovery towards the N. Pole* (1843), and an account of his Bering Strait explorations (1831).

Beechey, SIR WILLIAM (1753-1839), English painter, entered as student at the Royal Academy (1772). Elected A.R.A. in 1783, his portrait of Queen Charlotte, painted the same year, procured him the post of portrait painter to her majesty. In 1798 he was knighted and elected R.A. His reputation depends on his por-

traits, which are marked by good colouring, but by stiff and ill-arranged draperies. See *Life* by W. Robertson (1907).

Beechey Island, islet, Arctic Archipelago, N. of Barrow Str., Canada, 74° 43' N., 91° 39' W.; so called from Admiral Beechey. Here Franklin's second expedition wintered for two years, and here memorials have been erected to the members of this and of a later British expedition. There is also a memorial to Lieutenant Bellot, who perished in the Franklin search expedition of 1853.

Beeching, HENRY CHARLES (1859), English divine and man of letters. From 1885 to 1900 he was rector of Yattendon, Berks, and in 1900 was appointed chaplain of Lincoln's Inn, and professor of theology at King's College, London. In 1896 he won the Oxford sacred poem prize. In 1901-3 he was professor of pastoral theology at King's College, London. He was appointed canon of Westminster in 1902, preacher to Lincoln's Inn in 1904, and examining chaplain to the Bishop of Carlisle in 1905. His publications are: *Love in Idleness*, with J. W. Mackail and J. B. B. Nichols (1883); *Love's Looking Glass*, with the same (1891); *In a Garden, and other Poems* (1895); *Pages from a Private Diary* (1898); *Conferences on Books and Men*, under pseudonym 'Urbanus Sylvan' (1900); *Two Lectures introductory to the Study of Poetry* (1901); *Religio Laici* (1902); *Lectures on the Atonement* (1907); *Lectures on the Doctrine of Sacraments* (1908); *Francis Atterbury* (1909); *Revision of the Prayer Book* (1910); and he is editor of *Paradise of Eng. Poetry* (1892), *Lyra Sacra* (1894), *Lyra Apostolica* (1901), *Shakespeare's Sonnets* (1904), and *Ainger's Lectures and Sermons* (1906).

Beeching, JAMES (1788-1858), inventor of self-righting lifeboats,

and originator of the type of fishing vessel used at Yarmouth. In 1851 his lifeboat was awarded the Prince Consort's prize, and was taken as the model for the boats of the National Lifeboat Institution.

Beechworth, tn., co. Bogong, Victoria, Australia, 172 m. by rail N.E. of Melbourne; principal town (alt. 1,805 ft.) of the Murray district and of the Ovens gold field. Pop. 3,000.

Bee-eater, a term applied especially to *Merops apiaster*, a migratory African bird which occasionally visits Britain, but also generally to the members of the family Meropidæ. There are some thirty species, mainly African and Oriental. They have rather long beaks and long swallow-like wings. All wear a gorgeous plumage, green being the prevailing colour. The food of these birds consists almost wholly of wasps and bees. The common bee-eater (*M. apiaster*) is perhaps the most beautiful bird in Europe. Like several related families, the bee-eaters nest usually in colonies, excavating deep tunnels in steep, sandy river-banks.

Beef-eater. (1.) A term popularly applied to some of the retinue of the English royal household, notably to the yeomen of the guard, whose original duties were those of service at the king's table. The word has been derived from the corrupted French *beaufetier*, or *buffetier*, one who waits at the buffet or sideboard. Skeat, however, maintains that its natural English meaning is the right one. See YEOMEN OF THE GUARD. (2.) A bird (*Buphaga africana*) similar to the starling, called also ox-pecker, and found only in Africa. It is seen in small flocks, alighting on the backs of cattle and other animals, where it searches for and picks from their hide the larvæ of botflies, on which it feeds. A variety of the beef-eater is the buffalo bird.

Beefsteak Club is said to have been founded in the reign of Queen Anne. In 1709 it was referred to as a 'new society,' and its members were said to include the chief wits and great men of the nation. A Society of Beefsteaks was established some years later, and to avoid confusion with the above, the members designated themselves 'The Steaks.' The Sublime Society of the Steaks was founded at Covent Garden Theatre in 1735, and numbered amongst its members the Prince of Wales. It was dissolved in 1867. See Arnold's *Life.... of the Sublime Society of Beefsteaks* (1871). Another club of this name was connected with the Theatre Royal, Dublin, and was founded by Sheridan in 1749. There is also a modern Beefsteak Club in London, founded in 1876 by A. J. Stuart Wortley.

Beef-tea is best made by putting the beef into *cold* water, and heating the water slowly, so that the outer fibres of the beef may not be coagulated and so form a seal to keep the juices in. Even the best beef-tea is practically no more than a stimulating drink. It is, however, useful for that very reason, when invalids are more in need of rest for the stomach than of food. It must never be used to replace nutriment where that is needed. The composition of well-made beef-tea is—water, 96.31; fat, 1.00; albuminoids, 0.82; extractives, 2.09; salts, 0.78 per cent. Take a pound of lean beef, free from tendon, fat, etc.; chop fine, and let it lie in a pint of cold water for two hours. Simmer for three hours at a temperature never over 160° F. Make up the water lost with cold water, so that a pint of beef-tea represents a pound of beef. Strain, and carefully express all fluid from the beef. Beef extracts, from which beef tea may be expeditiously prepared,

are numerous, such as Liebig's (Lemco), Bovril, Oxo, etc.

Beefwood, a name applied to the wood of two different kinds of tree—the bully tree (*Swartzia*) of the order Leguminosæ, in Guiana, and the various species of *Casuarina*, found in Australia.

Beelzebub, or, in the Old Testament, BAALZEBUB ('Baal of flies,' *i.e.* a god who controls insect plagues), a deity whose shrine was at Ekron, a Philistine town (2 Kings 1:2). As the later Jews considered heathen gods to be demons, the New Testament transference of the name to Satan is easily understood. The word is now believed to be a derisive corruption of Baalzebul, 'lord of the high house'—*i.e.* the temple—and Matt. 10:25 seems to hint at the original meaning, the 'high house' being now 'the pit.' See BAAL.

Beemster, comm., N. Holland, 12 m. N. of Amsterdam; the largest (8,000 ac.) of the polders or drained grounds of the Netherlands.

Beer. See BREWING.

Beer Acts. By an act of 1830, licences for the sale of beer could be obtained without application to the magistrates; but several acts passed since that date have put beerhouses under magisterial control. The principal act regulating the traffic in beer was the Wine and Beerhouse Act of 1869. The beerhouse licence was equal to one-third of the annual value of the premises, with a minimum based on the population of the district. Brewers paid £1 on the first hundred barrels brewed, and 12s. for every further fifty. For subsequent legislation see under LICENCE AND LICENSING LAWS.

Beeroth, a city of Benjamin (Josh. 18:25, etc.), N. of Jerusalem and S. of Bethel; now the village Bireh, on the main N. road. It has a small church, built in the 12th century, and ancient tombs.

Beersheba, tn. of Palestine, on the S. border of Judah (hence the phrase 'from Dan to Beersheba'—i.e. all Israel), in the territory assigned to Simeon; now Bir-es-Seba. Both as a place of wells and as a sanctuary, it is intimately associated with the history of the patriarchs (see Gen. 21, etc.), and it seems to have preserved its character as a sacred resort even to the times of Amos (ch. 8:14). It was subsequently the station of a Roman garrison, and an episcopal see. The numerous ruins in the district date chiefly from early Christian times. See G. A. Smith's *Hist. Geog. of Holy Land* (1897).

Beestings, or **BEASTLINGS**, a term used for the first milk taken from a cow or other milch animal after calving. It can be distinguished from ordinary milk by its thick yellowish appearance and its viscidness. Beestings has not so much casein as milk, but it has a larger percentage of albumin and thrice the quantity of salts in its composition.

Beeston, par., England, co. of and 3 m. W.S.W. of Nottingham; associated with the cycle and motor industry, and hosiery, silk, and lace manufacture. Pop. 9,000.

Beeswax, a yellow solid secreted by bees to form the honeycomb. It breaks with a granular fracture, and has an agreeable honey-like odour. It is prepared for use by draining away the honey and heating the wax in water, on which it floats, and solidifies on cooling. It melts at about 64° C., is soluble in ether, chloroform, or benzene, but only partly soluble in alcohol. It may be bleached by chlorine or nitric acid, but a much better product is obtained by exposure in thin layers to sunshine, it being at the same time kept moist. Beeswax is used for making candles, waxing polished floors, in medicine as an

ingredient in plasters and ointments, and for many other purposes.

Beet, like spinach, is a member of the order Chenopodiaceæ. All the varieties of beet cultivated in gardens are derived from a species, *Beta vulgaris*, which occurs wild in the countries bordering the Mediterranean, and also in some of the more northern districts of Europe. The Greeks and Romans grew it in their gardens; and Theophrastus, Pliny, and Aristotle make reference to distinct varieties. In Neckam's *De Naturis Rerum* (ed. 1858), published in the 12th century, beetroot is referred to as being then in use in Britain.

There are numerous garden varieties, perhaps the best being Dobbie's globe in the turnip-rooted class, and Cheltenham green top in the long-rooted section. The beet is not a difficult root to grow, but thrives best in a deeply-dug, friable soil, moderately rich from the manure applied for a previous crop. Fresh manure should not be added immediately before sowing, or both form and flavour will be spoiled. Salt is a desirable addition to the soil. Turnip-rooted varieties may be sown in April, May, and July, in drills one inch deep, six inches from plant to plant, and twelve inches from row to row. Thin early, and keep free from weeds. The long-rooted varieties should be given a little more room, and should not be sown quite so early as the earliest of the turnip-rooted. The roots should be lifted in late autumn, placed in a cool shed, and covered with sand or light soil.

Since the middle of the 18th century the beet has acquired commercial importance as a sugar-yielding plant, over six million tons of sugar being prepared from beetroot in Europe annually. The best varieties yield from twelve to sixteen per cent. of

sugar, and from twelve to twenty tons of roots per acre. The beet requires deeply-ploughed and well-worked land; and it is to this that the exceptional fertility of the Prussian province of Saxony, where most of the German beet is grown, is largely attributed.

The growing of beet for sugar is now receiving the serious attention of agriculturists in the British Isles. It has been proved by experimental cultivation in Cheshire, ranging over ten years, that beet can be raised in that county giving a sugar-content of nearly 18 per cent. In Essex beets have been grown giving eighteen tons of roots per acre, and a sugar-content of 16.7 per cent. From these and other results of an equally favourable nature it may be inferred that sugar-beet culture should prove remunerative, provided that sugar factories be established in, or within a reasonable distance of, the beet-producing districts. In 1910 German refiners entered into contracts with English farmers to grow large quantities of beet for export. For the effect of the bounty system, see SUGAR BOUNTIES CONVENTIONS.

Manufacture.—After the beets have been washed and sliced by machinery, hot water is passed among them under pressure, and the diffused juices are conveyed to carbonating tanks, where they are treated with from two to three per cent. of their weight in lime, and afterwards with carbon dioxide, until nearly all the lime is precipitated. The juices are filtered, again carbonated and re-filtered, and evaporated to syrup. A portion of the syrup is next placed in an evaporating apparatus known as a strike pan, where it is evaporated until it reaches a condition of supersaturation. In this condition, if a portion of fresh syrup be introduced, the whole mass in the pan becomes charged with ex-

ceedingly fine crystals of sugar. By manipulation these crystals are made to grow. Eventually it is found that the mass in the vacuum pan consists of a dense mass of sugar crystals mixed with a quantity of molasses. The latter is separated by means of a centrifugal apparatus, and is subsequently reboiled and more sugar crystallized out. The product thus obtained is raw sugar. By means of bone black, sulphurous acids, and certain manipulation, the refined sugars of commerce are prepared therefrom. See SUGAR; also Wythes's *Book of Vegetables* (1901); Vilmorin's *The Vegetable Garden* (1885); Wiley's *The Sugar Beet*.

Beet-fly (*Anthomyia betæ*), an insect the maggots of which feed on the pulp of beet leaves, and thus reduce them to nothing but dry skin. The eggs are laid beneath the leaves, and as soon as the maggots are hatched they start feeding, feed for a month, and then turn to chestnut-brown pupæ. The flies come out in about a fortnight—ashy gray, with black, bristly hairs. There are two broods—one in summer and one in autumn.

Beethoven, LUDWIG VAN (b. Bonn, Dec. 16, 1770; d. Vienna, Mar. 26, 1827), one of the greatest of musical composers. As a child he displayed unusual talent for music, and from the age of four was taught the violin and clavier by his father, a tenor singer in the band of the elector of Cologne at Bonn. When nine years old he was placed with Pfeiffer, and received lessons on the organ from Van der Eeden, and then from Neefe. Before Beethoven was twelve he could play the greater part of Bach's *Wohltemperierte Clavier*, and had acted as deputy organist during Neefe's temporary absence in Münster. About this time he was appointed *concertmaster*—practically conductor—of

the opera band at the theatre. During 1785 he studied the violin with Franz Ries, and in 1787 paid a visit of some months to Vienna, where he had a few lessons from Mozart. His career at this period was greatly influenced by his friendship with the Breuning family and with Count Waldstein—to whom, in 1803, Beethoven dedicated his famous piano sonata (Op. 53). Beethoven had already earned much distinction as a pianist and improviser, but now he enhanced his reputation as a composer by writing a set of brilliant variations for the piano, which he dedicated to his friend the Countess of Hatzfeldt. In July 1792, while on a visit to Bonn, Haydn 'greatly praised' a composition of Beethoven's which had been submitted to him; and in the autumn of that year Beethoven placed himself under Haydn in Vienna, and in that city spent the rest of his life. Not wholly satisfied with his progress under Haydn, he also became a pupil of Schenk; and after Haydn left for England, he studied counterpoint with Albrechtsberger, the violin with Schuppanzigh, the writing of quartets with Aloys Förster, and Italian vocal composition with Salieri. Of the many friends Beethoven made among the aristocracy of Vienna may be mentioned Prince and Princess Lichnowsky, whose admiration for him took the practical form of presenting him with a quartet of valuable instruments and a pension of £60 a year, in addition to giving him a home with them; but the regular hours and formalities soon proved irksome to him. When twenty-eight years of age he began to suffer from partial deafness, which increased to such an extent that from 1822 onwards all communication with him had to be made in writing. Notwithstanding this, many of his greatest works were composed dur-

ing this period. In 1808 Jerome Bonaparte, king of Westphalia, offered Beethoven the post of *maître de chapelle* at Cassel, with an annual salary of £300; but as several noblemen subscribed to a fund which guaranteed him a yearly pension of about £210, he was induced to remain in Vienna. Unfortunately, after the death of Prince Lobkowitz (1816) this pension was reduced to about £110.

At the age of ten Beethoven began the work of composition, and even for some time after the years of his pupilage wrote in accordance with the principles observed by Haydn, Mozart, and others; but at a later period he gradually introduced changes of treatment in individual sections, and also developed considerably some of the musical forms of his predecessors. His greater choice of keys in modulations, his development of the minuet into the scherzo, his unique use and treatment of variations, his revival of *programme* music, which had been almost entirely neglected since its introduction by Bach, also his innovations in the construction of the introduction, coda, finale, and connective phrases of symphonies, may be instanced as indicating the nature of his principal divergences from pre-existing compositions. His symphonies, concertos, chamber music, string quartets, sonatas for violin and for violin and piano, would each have been sufficient to earn for their composer undying fame. His vocal compositions include an oratorio, *The Mount of Olives*, two *Masses*, the *Choral Symphony*, and other great works, besides songs and an opera, *Fidelio*. By executive musicians Beethoven's compositions are acknowledged to be the supreme test, intellectual gifts of the highest order being as essential as technical skill. See *Beethoven*, by Moscheles (1841); *Etude Analytique*

des Symphonies de Beethoven, by Berlioz (1844); *Beethoven*, by Richard Wagner (Eng. trans. 1893); *Beethoven and his Nine Symphonies*, by Sir G. Grove (1896); *Life* by Alice Diehl (1908); and the most exhaustive work yet written, his *Life*, by A. W. Thayer (1866-78; 2nd ed. 1901). Beethoven's *Letters* (trans. by J. S. Shaddock) were published in 1909, and in the same year a study entitled *Beethoven* by Romain Rolland.

Beetles (Coleoptera), a well-defined order of insects in which the cuticle is hard, and the first pair of wings are converted into scalelike wing covers (elytra), which cover and protect the posterior part of the body. The second pair of wings may function as organs of flight, or may be absent; but, as a rule, beetles are not adapted for an aerial life, and live mostly in concealed situations. The order is rich in species, some 150,000 being said to be known. In classifying beetles, reliance is chiefly placed upon the shape of the antennæ and the number of joints in the tarsus. Thus, the lamellicorns—beetles with the terminal joints of the antennæ leaflike—constitute a very familiar series, including the stag-beetles and the very numerous chafers. The diet of beetles is very varied, but all are voracious; the weevils (Rhynchophora) may be mentioned as a group whose destructive habits render them of economic importance.

Beets, NICOLAAS (1814-1903), Dutch writer, born at Haarlem; was pastor of Heemstede (1840) and Utrecht (1854), and professor of theology (1875-84) at Utrecht University, but is chiefly noteworthy as the author of stories and sketches of Dutch life in graceful and humorous prose—*Camera Obscura* (1839; 18th ed. 1888), a Dutch classic, published

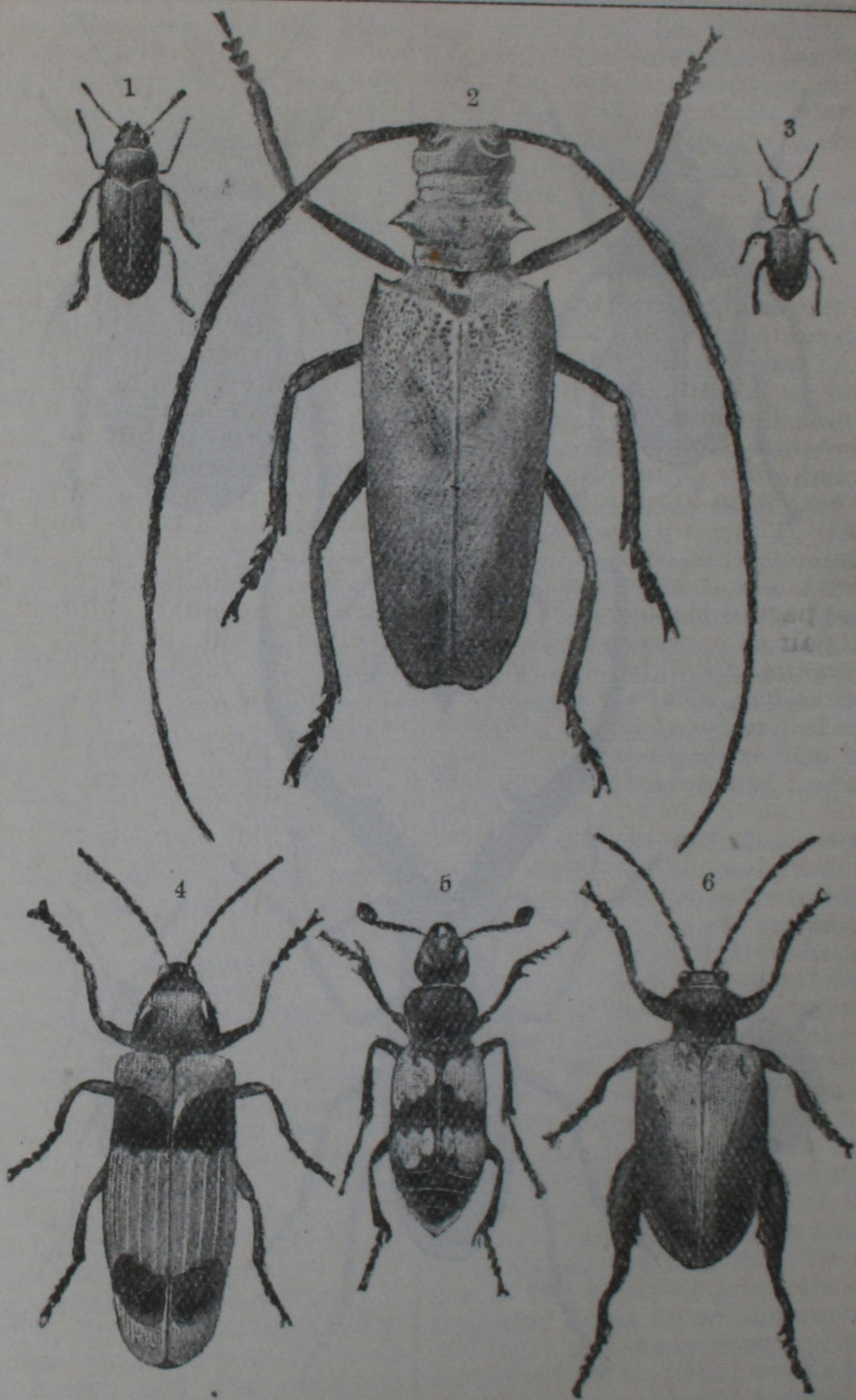
under the pseudonym of Hildebrand, and with a continuation, *Na Vijftig Jaar* (1887). He also wrote critical essays on literature, theological works, and poems (*Dichtwerken*, 5 vols. 1886-91).

Befana (corruption of 'Epiphany'), legendary old woman who, sweeping the house when the Three Wise Men passed by with gifts to the infant Christ, put off seeing them till their return, and is still awaiting them. At her festival (Jan. 5) in Italy her effigy is in places carried about, followed by a crowd. Counterpart to the Wandering Jew and Santa Claus, and fused in Germany with the heathen Berchta, Befana served as a scare to naughty children. On Twelfth Night, in Italy, Befana brings to good children toys and sweets, but to bad children ashes.

Beg, more commonly BEY ('lord'), Mohammedan title of the governor of a district or town, but now also applied to officers, and used by almost every Turk of gentle birth.

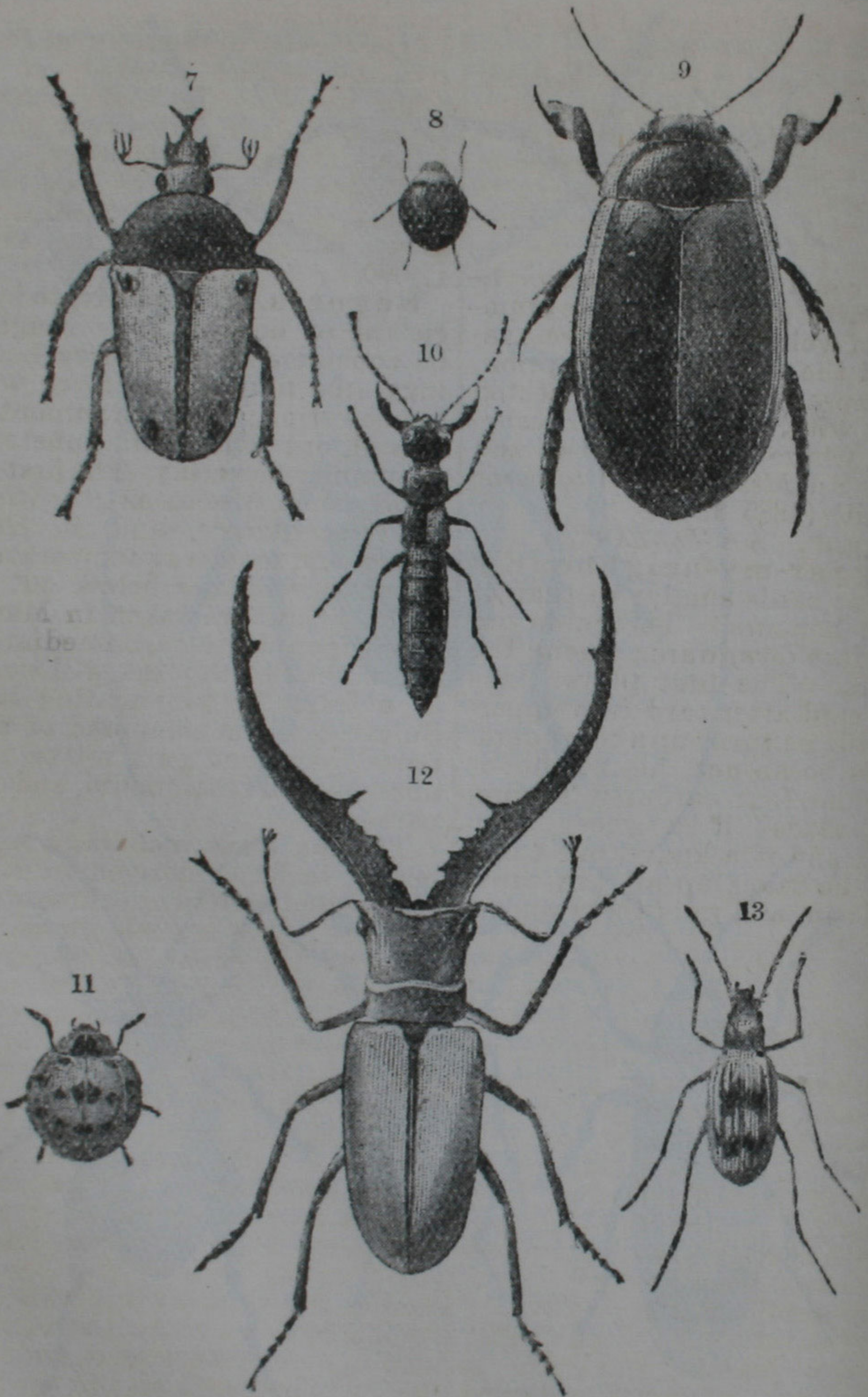
Begas, REINHOLD (1831), German sculptor, was born at Berlin, and became a pupil of Rauch. He first attracted notice by the *Borussia* (1861), on the façade of the Berlin Exchange, and by his statue of Schiller (1863), in the same city. Other works are monuments to the Emperor William (1893-97), Bismarck (1901), the bronze Neptune fountain in Berlin (1891), and very successful busts of the Emperor Frederick III., William II., Bismarck, Moltke, Menzel, and the German Empress (1904).

Begg, ALEXANDER (1840), Canadian author, born in Quebec; served in the North-West rebellion against Riel, and after the organization of Manitoba held several government appointments there. His principal books are *The Creation of Manitoba*, *Ten*



Beetles.—I.

1. *Heteromera* (*Tenebrio molitor*). 2. *Longicornia* (*Batesera rubens*). 3. *Rhynchophora* (*Eustales circumductus*). 4. *Serricornia* (*Chrysochroa Corbettii*). 5. *Clavicornia* (*Necrophorus vespillo*). 6. *Phytophaga* (*Sagra bugneti*).



Beetles.—II.

7. *Lamellicornia* (*Ceratorrhina Smithii*). 8. *Malacodermata* (*Allochotes bicolor*). 9. *Hydradephaga* (*Cybister japonica*). 10. *Brachelytra* (*Ocypus olens*). 11. *Pseudotremera* (*Synonycha grandis*). 12. *Pectinicornia* (*Cyclommatus taranudus*). 13. *Geodephaga* (*Nebria complanata*).

Years in Winnipeg, and *The History of the North-West*.

Begg, JAMES (1808-83), Scottish Presbyterian minister, one of the leaders of the evangelical party in the movement that culminated in the disruption of the Church of Scotland (1843). In the new Free Church, Dr. Begg was the leader of the constitutional (or conservative) party, and the resolute opponent of voluntaryism, of relaxation of the terms of subscription, and especially of the projected union with the United Presbyterian Church in the 'sixties and later. See *Memoirs*, by Professor T. Smith (1885-8).

Beggar. See VAGRANT.

Beggar-my-neighbour, a game at cards similar to that of 'catch honours.' The cards are dealt face downwards among the players. The first player lays down card after card face uppermost till he turns up a court card. If this be an ace, his neighbour pays him four cards; if a king, three cards; if a queen, two cards; and if a knave, one card; while he takes up all the cards laid down, and puts them underneath those in his hand. Play continues till one player obtains all the cards in the pack.

Beggars, THE. See NETHERLANDS—*History*, and GUEUX, LES.

Beghards ('Beggars'), an association of men corresponding to the female Beguinages (see BEGUINES). The earliest record shows them established at Louvain in 1220. About the end of the 14th century they had almost disappeared from Europe.

Begharmi. See BAGHIRMI.

Bégin, LOUIS NAZAIRE (1840), Canadian prelate, was born at Point Levis, and was ordained priest in 1865. Elected bishop of Chicoutimi in 1888, appointed coadjutor to Cardinal Taschereau in 1891, and administrator of the diocese in 1894, he became archbishop of Quebec in 1898. He

has published *La Primauté et l'Infaillibilité des Souverains Pontifs*, *La Sainte Ecriture et la Règle du Foy*, *Le Culte Catholique*, and *Aide Mémoire*, a chronology of Canadian history.

Bègles, tn., dep. of Gironde, France, 2 m. s.e. of Bordeaux, near l. bk. of the Garonne. Pop. 12,000.

Begonia. The cultivated varieties of begonia may roughly be considered under three headings—the fibrous-rooted, or winter-flowering; the ornamental-leaved, or rex; and the tuberous, or summer-flowering. The first includes such species as *B. nitida*, *B. semperflorens*, and *B. Haageana*, and requires a temperature which never falls below 50° at night. Cuttings taken in March from vigorous stems, immediately below the fourth joint, will strike in a frame or propagating box. Suitable soil is composed of two parts loam, one part rotten manure, one part leaf mould, and one part sand.

The rex class includes a number of varieties derived from *B. rex* crossed with two or three other species. They are all grown for their large, beautifully-shaped, and often brilliantly-coloured leaves, their flowers being usually small and insignificant. They do not need so high a temperature as that required for the winter-flowering begonias, but do best in the intermediate house or a warm greenhouse. Propagation is best effected by means of leaf cuttings. Healthy mature leaves with strong midribs may be cut across the veins at intervals and weighted down on to the surface of a light, moist compost, and subjected to bottom heat; or the leaf may be separated and treated in like manner, or cut into pieces, each piece having a vigorous vein, and these separately planted, with the proximal end inserted in the soil.

Of all the classes, however, that of the tuberous-rooted is by far the most important to the gardener. Its profuse flowering habit, the great range and brilliance of its colours—from yellow to bronze, red to orange, white to pink—and the ease with which it may be cultivated, have all contributed to its success. It is half hardy, and the tubers accordingly require to be lifted before frost has touched them; but as they are dormant during the winter, they may be stored in any corner, provided only that the temperature about them does not sink to freezing point. The flowers are either single or double. The male and female organs are borne by different flowers on the same plant. The tubers should be planted early in March, in pots, and started in moderate heat. Keep fairly dry until the plants are an inch high. In May begin to harden off, and at about the end of the month plant out into light, moderately rich, well-cultivated soil, allowing ten inches from plant to plant. Propagation may also be effected by seeds (which must be sown on the surface of moist, well-prepared soil containing plenty of leaf mould, and be left uncovered except by a pane of glass). See Ravenscroft's *Begonia Culture for Amateurs* (1898), Wynne's *Tuberous Begonias* (1888).

Beguines, the members of a religious sisterhood of the third order, at once lay and religious, admission to which does not involve the taking of perpetual vows. The community is called a *beguinage* (*beguinagium*). The balance of opinion seems to favour the view that both the name and the institution are derived from Lambert Beghe, who, about 1184, founded at Liège a house for poor women. The Beguines lived together by the labour of their

hands, under a superior of their own election, and were free to go out to nurse the sick, but not to beg. Similar associations arose of rich and noble ladies following monastic rule, yet at liberty to return to the world. These communities spread in the 13th century in the Rhineland and Low Countries, especially Belgium. A branch, affirming the capacity to live a sinless life, was abolished in 1311. Beguinages still exist at Amsterdam, Breda, and Bruges. In Belgium, where the Beguines wear the ancient Flemish headdress, there are 15, including the Great Beguinage of Ghent, with nearly 1,250 sisters. See Hallmann's *Geschichte des Ursprungs der Belgischen Beghinen* (1843).

Begum, a Hindustani name denoting a woman of high rank, used principally of Mohammedan queens - regnant. The term is also applied to the sultanas of seraglios.

Behaim, BOEHEIM, or BEHEM, MARTIN (c. 1459-1506), German cosmographer, born at Nuremberg; studied under Regiomontanus, and in 1484 accompanied the Portuguese Diego Cão (Cam) to the mouth of the Congo R. In 1486 he settled at Horta, the capital of Fayal, in the Azores. He is remembered for the globe which he constructed at Nuremberg in 1492: it is twenty-one inches in diameter. He also devised a portable sundial to be used in finding the latitude at sea, and is credited with having introduced small astrolabes of brass into the Portuguese navy in place of the unwieldy instruments previously in use. See *Behaim: His Life and His Globe*, by E. G. Ravenstein (1908).

Behar. See BIHAR.

Behemoth, a colossal animal, real or imaginary, described with leviathan in Job 40:15-24, and referred to in the Book of Enoch.

60:7-9, and 4 Esdras 6:49-52. It is generally identified with the hippopotamus, but the representation shows traces of a mythical element. See A. B. Davidson, *Job* (1884), on passage quoted; Cheyne, *Expositor*, July 1897.

Behera, prov. of Lower Egypt traversed by the Alexandria-Cairo Ry.; cotton is extensively cultivated. The area is 1,725 sq. m., of which 950 sq. m. are under cultivation. Pop. 800,000. The capital is Damanhur (pop. 40,000), on the railway, about 40 m. S.E. of Alexandria.

Behistun, BISUTUN, or BAGHISTAN, rock in prov. of Ardelan, Persia, about 22 m. E. of Kirmanshah. It rises to a perpendicular height of 1,700 ft., and bears, about 300 ft. above ground, two cuneiform inscriptions (in three languages—Persian, Assyrian, and Median) recording the deeds of Darius Hydaspes (500 B.C.). These were first deciphered and translated by Sir Henry Rawlinson in 1835-7.

Behm, ERNST (1830-84), German geographer, born at Gotha. His chief work was the compilation (with Hermann Wagner) of *Bevölkerung der Erde* (7 vols. 1872-82). He was also editor of *Geographisches Jahrbuch* (1866-84), and of *Petermann's Mitteilungen* (1878-84).

Behmen, JACOB. See BOEHME.

Behn, APHRA (1640-89), English dramatist and novelist, 'the George Sand of the restoration,' was sent by Charles II. (1665) as a spy to Holland. After her return home she supported herself by her pen, and thus became the first professional Englishwoman of letters. Her dramas (of which the most successful, *The Rovers*, held the stage long after her death) are marked by much coarseness, but also by ability and a genuine lyrical faculty. The best known of her tales is probably *Oroonoko*,

or *The Royal Slave* (1689; new ed. 1889). An edition of her novels appeared in 1905.

Behring. See BERING.

Beibars, or BAYBARS, two Egyptian rulers. (1.) BEIBARS I. (d. 1277) was first a leader of the Bahri Mamelukes, a corps of Turkish slaves who formed the bodyguard of the Egyptian successors of Saladin. Having defeated the crusaders under St. Louis IX. of France, he assassinated a rival chief, Kutz, and was elevated to the throne by the soldiery. His first tasks were to quell a revolt in Syria and repel the Mongol hordes of Hulagu, grandson of Jenghiz Khan. Shortly afterwards a representative (Hakim) of the royal line of the Eastern caliphate (then overthrown by the Mongols) took refuge in Egypt, and was proclaimed caliph by Beibars. But the title of caliph was an empty name; the real rulers of Egypt were Beibars and his military successors. The reign of Beibars was one long course of savage warfare against the Christians in Palestine and against the Mongols, during the course of which he took Antioch, ravaged the vicinity of Acre, and destroyed the Church of the Nativity at Nazareth. He also conquered Armenia, curbed the power of the sect of the Assassins, and subjected Nubia to his rule. He founded the great mosque at Cairo that bears his name, and in other ways embellished the city; he also ruled with enlightenment and vigour. (2.) BEIBARS II., a Circassian by birth, was raised to the throne of Egypt by the Mamelukes in 1309, but reigned less than one year, being strangled by a rival (1310).

Beijerland, or BEYERLAND, isl., Holland, between the Oude Maas and the Hollandsch Diep.

Beilan, tn. and pass in the N. corner of Syria, on trade route from interior to Alexandretta

(Iskanderun). The pass (1,800 ft. high) lies between the Alma-Dagh Mts. and Jebel-el-Ahmar, and is believed to be the ancient Syrian Gates. The town is the site of the battle between the Turks and the Egyptians in 1832. Pop. 5,000.

Beilstein, FRIEDRICH KONRAD (1838-1907), Russian chemist, was born in St. Petersburg, and studied under Bunsen, Liebig, Wöhler, and Würtz, amongst others. He graduated in 1858 at Göttingen, became assistant in the university laboratory in 1860, and extraordinary professor of chemistry in 1865. He was appointed to the professorship of chemistry at the Technological Institute in St. Petersburg in 1866, from which he retired in 1896, holding also during part of the time the professorship in the Imperial Academy of Science, and other posts. Beilstein is world famous for his *Handbuch der Organischen Chemie* (3rd ed. 4 vols. 1892-9; with continuations from 1900 onwards, ed. Jacobson). He also wrote *Anleitung zur qualitativen Analyse* (8th ed., by E. Schulze and Winterstein, 1898).

Beira. (1.) Province of Portugal, stretches right across the kingdom from the Atlantic to the frontier of Spain, and has the Douro for its N. boundary, and the Tagus for part of its S. boundary. Its most prominent feature is the Serra da Estrella, a bare, heath-clad, granite range (6,540 ft. high), seamed by numerous picturesque dells and valleys. The coast belt yields fish and salt, and the high grounds feed sheep and pigs. There are several mineral springs. Area, 9,200 sq. m. Pop. 1,550,000. Chief town, Coimbra. (2.) District, Portuguese E. Africa, occupying the lower course of the Pungwe R., and including the territories of Manica and Sofala. India-rubber and cocoanut trees have been planted. Alluvial

gold is washed in the Mudza valley. (3.) Seaport and cap. of above, at mouth of Pungwe R.; the gateway of Mashonaland, with which it is connected by railway, completed in 1902 (Umtali, 203 m.; Salisbury, 375 m.). A breakwater guards Beira from the encroachments of the river. Beira is visited regularly by cargo and passenger vessels of British (several lines), German, Portuguese, and Swedish lines. Exports (annual value about £400,000) sugar, rubber, beeswax, ground-nuts, cotton, mangrove bark, ivory, and fish; imports (annual value £350,000). Pop. 3,400 (750 whites).

Beiram. See BAIRAM.

Beirut, or BEYROUT. (1.) Seaport on the Mediterranean, cap. of vilayet of same name, in Syria, Turkey in Asia, at the foot of the Lebanon, 55 m. by rail W.N.W. of Damascus, whose port it is. Beirut is the healthiest place on the coast. It is the seat of a Greek and a Maronite bishop. It possesses a university, an astronomical observatory, and a society of Oriental languages. Beirut manufactures silk stuffs, gold and silver thread, porous earthenware, etc., and is the entrepôt for the exports and imports of the whole of Syria—the exports consisting chiefly of silk, wool, oils, soap, lemons, and oranges; and the imports of iron, cotton goods, coffee, and fancy goods. Annual value of imports is about £1,700,000, and of exports £800,000; about one-third of the imports being from the United Kingdom, and more than three-fourths of the exports being to France. Pop. 120,000, two-thirds Christians. Beirut is the ancient Berytus, and was a port of the Phœnicians. It came later under the power of Egypt, from whom it was taken by Antiochus the Great, and so became part of Syria. Conquered for the Ro-

mans by Agrippa, it was made by Augustus a military colony, under the name of Colonia Julia Augusta Felix Berytus. During the crusades it belonged alternately to the Christians and to the Saracens. In 1763 it fell into the power of the Turks; was conquered by Ibrahim Pasha, son of Mehemet Ali of Egypt, in 1831; and played an important part in the Oriental question in 1840, when it was bombarded on Sept. 10 by the allied English, Austrian, and Turkish fleets, until evacuated by the Egyptians. Its modern growth dates from 1843, when steam navigation was introduced. (2.) Vilayet in Syria, Turkey in Asia, with an area of 6,180 sq. m., and pop. of 533,000.

Beishehr Göl, lake, Asia Minor, 50 m. w. of Konieh, 38 m. long by 5 to 10 m. broad. The town of Beishehr is situated on its E. shore, and Kirili near its N.E. shore, whence the lake is also called Kirili Göl.

Beit, ALFRED (1853-1906), S. African financier, born in Hamburg of an old Jewish family. In Beit, Cecil Rhodes found one of the ablest and most loyal of financial supporters; and as one of the directors of the Chartered Company, he gave evidence in the Jameson Commission in May 1897. He was partner in the firm of Wernher, Beit, and Co., a director of the Rand Mines and other mining properties, and of the Rhodesia and other South African railways. In 1902 he founded at Oxford a chair of colonial history, and by his will left large bequests to Cape Town, Johannesburg, and London University for educational purposes, to the city of Hamburg, and for the extension and completion of the Cape to Cairo Railway the sum of £1,200,000.

Beit-el-Fakih, trading centre, Yemen, Arabia, near the Red Sea, 37 m. S.E. of Hodeida. Pop. 8,000.

Beith ('birch tree'), tn., N. Ayrshire, 15 m. N.N.W. of Kilmar-nock. Industries: linen thread, ropemaking, tanning and currying of leather, cabinet-making and upholstery. Pop. 5,000.

Beja. (1.) An episc. tn. (anc. *Pax Julia*) of Portugal, chief town of dist. Beja, 95 m. by rail S.E. of Lisbon. It has a castle, a cathedral, and noted fairs, and manufactures pottery, leather, and olive oil. Pop. 9,000. (2.) Administrative dist. of Portugal, in S. of prov. of Alemtejo. Area, 4,000 sq. m. Pop. 165,000.

Bejan, or BAJAN (cf. Fr. *bec jaune*, Med. Lat. *bejanus*, 'yellow beak'), was the common name for freshmen in universities in the middle ages, and is still used in St. Andrews and Aberdeen. The idea, which appears also in the German *Gelbschnabel*, is that of a young bird whose beak has not lost its first yellow tint.

Bejapur. See BIJAPUR.

Bejar, fort. tn., prov. Salamanca, Spain, 41 m. S. by W. of Salamanca, on railway from that town to Plasencia; has factories of flannels and serges. Pop. 10,000.

Bek, ANTHONY (d. 1310), bishop of Durham (1283), the most magnificent prelate of his day, was one of the English commissioners to arrange the marriage of Prince Edward with Margaret of Scotland (1290), and throughout the negotiations with Baliol was one of Edward's chief advisers. In 1300 his dispute with Prior Richard at Durham brought him into conflict with king and pope; and in consequence of his departure to Rome to prosecute his appeal without the royal permission, Edward seized his temporalities (1302), but Bek regained them on application to the Pope. Bek submitted for a time, but on the accession of Edward II. took ample revenge on his enemies. By this king he was granted the sovereignty of the Isle of Man (1307).

See W. Hutchinson's *Hist. of Durham* (1823), and J. L. Low's *Diocesan Hist. of Durham* (1880).

Bek, THOMAS (d. 1293), lord treasurer of England (1279), bishop of St. David's (1280), was the elder brother of Anthony Bek, whom he consecrated bishop of Durham. In 1290 he took the crusading vow, but probably never left England. See Jones and Freeman's *History of St. David's* (1856).

Bekaa, EL, or **EL BIKA**, a valley between the ranges of the Lebanon, in Syria, stretching from the sources of the Jordan to the upper course of the Nahr-el-Asi (anc. *Orontes*), and traversed by the Nahr-el-Litany (anc. *Leontes*). This valley is the ancient Cœle-Syria (in the O.T. *Hamath*), and has an alt. of 2,600 to 3,000 ft. Its principal town, Baalbek, situated near the source of the Nahr-el-Litany, is mentioned in the hieroglyphic and cuneiform inscriptions as Balbiki, from the Semitic Baal-Beka.

Beke, CHARLES TILSTONE (1800-74), Abyssinian explorer, published his *Origines Biblicæ* in 1834. In 1840 he visited Abyssinia, and made important discoveries as to the true structure of the mountain ranges in E. Africa. In 1848 he organized an expedition to explore the sources of the Nile, starting from Zanzibar; but the expedition was only partially carried out. He visited Theodore of Abyssinia in 1864, to urge the release of Capt. Cameron and the other imprisoned British subjects, and afterwards furnished maps and information to Napier's military expedition (1868). Much of his time was devoted to the identification of Biblical localities, especially of Mount Sinai (1874). Chief works: *The Sources of the Nile* (1860); and *Discoveries of Sinai in Arabia, and of Midian*, published by his widow (1878).

Békés, tn., Békés co., Hungary, 47 m. by rail N. by W. of Avad. Cereals, wine, fruit, and tobacco are produced in the district. Pop. 26,000.

Bekker, ELISABETH (1738-1804), Dutch novelist and poetess, wrote, in conjunction with Agatha Deken, what are practically the first modern Dutch novels—*Historie van Mejuffrouw Sara Burgerhart* (1782; 7th ed. 1886), *Historie van den Heer Willem Leevend* (1784-5), *Brieven van Abraham Blankaart* (1787-89), *Cornelia Wildschut* (1793-6)—long-winded moral works in the style of Richardson, but written in easy, natural language. She also wrote semi-satirical sketches of contemporary life—e.g. *De Menuet en de Dominées-Pruik*—besides dull philosophic poems. See J. van Vloten's *Het Leven en de Uitgelezen Werken van E. W. Bekker* (1866).

Bekker, IMMANUEL (1785-1871), German philologist, born at Berlin, where he became professor of philology in 1810. He is best known by his editions of the classics, including *Homer* (1858), *Plato* (1816-23), *Attic Orators* (1822-24), *Thucydides* (1821-32), *Aristophanes* (1829), and *Aristotle* (1831), the text of which he rectified from manuscripts in the chief libraries of Europe.

Bela, the name of several Hungarian kings of the Arpad dynasty. **BELA I.** deposed his brother Andrew I. in 1060. A strong ruler, he introduced many reforms, and suppressed the last pagan rising. **BELA III.** (d. 1196) succeeded his brother, Stephen III., in 1174. He was a brother-in-law of Philip Augustus of France. His reign of twenty-two years was signalized by wars with the Poles and Austrians, and the recovery of Dalmatia from the Venetians. **BELA IV.** ascended the throne in 1235, and six years later was driven from it by the Mongols under

Batu Khan. He sought refuge in Austria, and regained his throne in 1244. He was one of the greatest kings of Hungary: he curtailed the privileges of the nobles, improved the condition of the peasantry, fostered agriculture, encouraged Germans to settle in his kingdom, and founded towns. He reigned until 1270. See Pauler's *Geschichte d. ungarischen Nation unter den Arpaden* (1900).

Belalcazar, tn., Spain, prov. Cordova, 52 m. N.N.W. of Cordova. Pop. 8,000.

Bel and the Dragon, a book of the Apocrypha, consisting of two legends setting forth the wisdom of the prophet Daniel. In the Septuagint and other translations of the Bible they are attached (like the Song of the Three Holy Children and Susanna) to the canonical book of Daniel. In the first legend Daniel outwits the priests of Bel, the chief Babylonian deity (*cf.* Baal); and in the second he procures the death of a huge sacred dragon, for which presumptuous deed the populace compel the king of Babylon to cast him into the den of lions, where, however, he is miraculously preserved, and fed with provisions brought by the prophet Habakkuk from Judæa. It is probable that the original language of the book was Aramaic, but it is not known when it was appended to the Greek version of Daniel. See APOC-RYPHA; and Ball, in *Speaker's Apocrypha*.

Belasco, DAVID (b. 1862), American dramatist, is the author of a number of popular plays of a melodramatic type. He is a native of San Francisco, became an actor (1874), and, after being stage manager at several San Francisco theatres, went (1881) to New York. His first success as a playwright was with *May Blossom*, in 1884. This has

been followed by *Lord Chumley*, *Men and Women*, *The Charity Ball*, *The Wife*, *The Girl I left Behind Me* (1893), *The Heart of Maryland* (1895), *Zaza* (1898), *Du Barry* (1901), *The Darling of the Gods* (also produced by Sir H. Tree at His Majesty's Theatre, London, 1904), *Sweet Kitty Belairs* (1903), *Adrea* (1904), *The Girl of the Golden West* (1905). He built the Stuyvesant Theatre, New York, which was opened in 1907 with the production of *A Grand Army Man*, written by him in collaboration with Pauline Phelps and Marion Short.

Belbeis (anc. *Bubastis Agria*), tn. in Lower Egypt, 28 m. N.E. of Cairo and 13 m. S.E. of Zagazig, on trade route from Syria; occupied by Napoleon's army in 1798. Pop. 12,000.

Belcher, SIR EDWARD (1799-1877), British admiral, was present at the bombardment of Algiers in 1816. In 1825 he went with Captain F. W. Beechey, in the *Blossom*, to Bering Strait, and in 1829 was promoted to be commander. For some years afterwards he was chiefly employed in surveying duties, but in 1841 he took part in the operations in China. He was appointed in 1851 to command the *Assistance* on an Arctic expedition. He became a rear-admiral in 1861. Among his works are *Narrative of a Voyage round the World in H.M.S. "Sulphur" in 1834-42* (1843), and a treatise on nautical surveying.

Belchite, tn., prov. Saragossa, Spain, 21 m. S.E. of tn. of Saragossa. Here the Spaniards, under Blake, were defeated by the French, under Suchet, on June 18, 1809. Pop. 3,400.

Beledugu, a dist. of W. Africa lying S. of 15° N. lat., and between the Upper Niger and the Upper Gambia.

Belem. (1.) A w. suburb of Lisbon, Portugal, formerly a separate town. Here are a fortress

and a monastery, built to commemorate Vasco da Gama's discovery of the route to India. (2.) Known to foreigners as PARA, cap. of the state of Para, Brazil, situated on an elevated point in Guajara Bay, by the r. bk. of the E. mouth of the Tocantins (or Para R.), 110 m. by rail w. of Braganca, its port. It contains many fine buildings, including the Parliament House, cathedral, and the Theatre da Paz, one of the finest in S. America. Belem is the residence of a bishop, and a centre for the Amazon trade. Pop. about 100,000.

Belemnite, the internal skeleton of an extinct animal allied to the cuttle-fish; and though differing in shape, it is similar in origin to the horny pen of *Loligo* or the 'cuttle-fish bone' of *Sepia*. In perfect specimens the outlines of a squid-like animal are to be seen surrounding the belemnite, with many arms provided with horny suckers; in very rare cases the ink-sac is preserved. Belemnites vary in length from one to fifteen inches, and many species are recognized. They are confined to the Jurassic and Cretaceous rocks, in which they are abundant and typical fossils. See works on *Palæontology* by Nicholson (1872), Woods, and Zittel (1895; Eng. trans. 1900); and Phillips's *British Belemnitidæ* (1865).

Belfast. (1.) Seaport, parl. and co. bor., in Cos. Antrim and Down, Ulster, Ireland; stands at the head of Belfast Lough, and on the river Lagan. It is the most important manufacturing and commercial town in Ireland, and is the centre of the Irish linen trade. The chief manufactures are linen, chemicals, machinery, sails, ropes, and damasks. Shipbuilding, dyeing, bleaching, brewing, distilling, and bacon-curing form the principal industries. The area of its docks and basin is about 136 ac. The

chief docks are the Dufferin (635 ft. long by 225 ft. wide), the Spencer (tidal, 600 ft. long by 550 ft. wide), the York (1,581 ft. long, and provided with first-class sheds), and the Clarendon (tidal). The Abercorn Basin is 727 ft. long and 646 ft. broad. There are three river quays—the Albert, the Queen's, and Donegal. The largest of the four graving docks (the Alexandra) has a length of 886 ft., a width of 128 ft., and a depth of 26½ ft. In the harbour there are three large shipbuilding yards, in which have been built some of the largest ships afloat, including the *Baltic*, 24,000 tons; the *Olympic*, 45,000 tons; the *Titanic*, 45,000 tons (all White Star Line); and the *Maloja*, 15,000 tons, the largest P. and O. vessel. The harbour is at all times safe and accessible. The value of exports approaches £7,000,000, and of imports £2,000,000 per annum. Inland trade is facilitated by a canal connecting the Lagan with Lough Neagh. The most noteworthy buildings are the New City Hall, the municipal buildings, new technical schools, bank buildings (1 ac.), the Queen's College (1849), the Presbyterian College, the Roman Catholic College, and the Free Library. Belfast is well supplied with public parks. There is also a very fine Royal Botanic Garden. Belfast is represented by four members of Parliament, and since 1892 the chief magistrate has enjoyed the title of lord mayor. Pop. 400,000. See Benn's *History of Belfast* (1877), Young's *Historical Notices of Old Belfast* (1896), and *Town Book of the Corporation* (1892). (2.) City and seapt., Maine, U.S.A., co. seat of Waldo co., on Penobscot Bay. Manufactures iron goods, boots and shoes, etc., and has good shipbuilding trade. Pop. 5,000. See Williamson's *History of the City of Belfast* (1877).

Belfast Lough, deep and picturesque arm of the sea (12 m. long by 3 to 4 m. broad), between Cos. Antrim and Down, prov. Ulster, Ireland; generally free from rocks, the only dangerous reef being the Briggs or the Clachan (N. side). Near Belfast is Queen's I. (shipbuilding yards), connected with the mainland.

Belfort. (1.) Small territory (235 sq. m.) in France, forming the remains of the former dep. of Haut-Rhin, ceded to Germany in 1871. It is limited by natural features only in the extreme N., where the Ballon d'Alsace (4,070 ft.) and two spurs separate it from the neighbouring department and from Alsace. It drains to the Saône. The land under irrigation yields good crops, and the meadow-lands are rich. The iron industry is flourishing. Pop. 92,000. (2.) Capital of above, 275 m. by rail S.E. of Paris, and 35 m. W. by N. of Basel. It is a commercial entrepôt for the trade with Switzerland and Germany. The town is in the centre of a vast system of fortifications, which made Belfort one of the first-class citadels of E. France. It commands the passage between the Vosges and the Jura, known as the Trouée de Belfort. In the Franco-German war it was besieged by the Germans. A fierce engagement took place outside its walls on Jan. 15-17, 1871; and on Feb. 13 the garrison capitulated, and were permitted to march out with full honours of war. There are metal-working and textile industries. Pop. 34,600. See Bardy's *Etude historique sur Belfort* (1898-1900).

Belfry, a word which has come to denote a bell-tower, and, in a more restricted sense, the chamber of a church tower in which the bells are hung, but which originally bore a perfectly different meaning. In mediæval times the word was applied to

the wooden tower on wheels which was used by besiegers in attacking a castle, and occasionally to a stationary pent-house, under cover of which an attacking force shot their missiles, and from the upper story stormed the ramparts.

Belgæ, a nation of Germanic origin, who dwelt in the north-east of Gaul, between the Rhine, the English Channel, and the Seine. Cæsar subdued them after prolonged resistance.

Belgard, tn., prov. Pomerania, dist. Köslin, Prussia, 90 m. by rail N.E. of Stettin, and 15 m. S.W. of Köslin. Has noted horse markets. Pop. 8,600.

Belgaum, chief tn. in dist. of same name, Bombay Presidency, India. Has a military cantonment. Pop. 26,000.

Belgiojoso, tn., 8 m. S.E. by rail of Pavia, N. Italy; has an ancient castle of the princes of Belgiojoso, in which Francis I. of France was imprisoned, after the battle of Pavia, in 1525. Pop. 5,000.

Belgiojoso, CRISTINA, PRINCESS OF (1808-71), Italian writer and patriot, born in Milan, where she also died; married in 1824 to Prince Belgiojoso—an unhappy union. Full of enthusiasm for the liberty of Italy, in 1848 she equipped at her own cost a regiment of volunteers. Upon the failure of the rising she retired to Lorient, where she remained until 1855, when her confiscated estates were restored to her. After a short stay in Italy she again went, in 1858, to Paris, where she worked energetically for the plans of Cavour, and at the same time founded in Milan the journal *Italia*. A little later she became the friend of the house of Savoy. She wrote *Essai sur la Formation du Dogme Catholique* (4 vols. 1842-3), *Souvenirs d'Exil* (1850), *Emina: Récits Turco-Asiatiques* (2 vols. 1856), *Scènes de la Vie Turque* (1858), *Histoire de la Maison de Savoie* (1860), etc.

Belgian Congo. See CONGO, BELGIAN.

Belgium, a small country of Europe (area 11,400 sq. m.) lying between France, Prussia, and the Netherlands. The surface slopes generally from the S.E. to the North Sea, and is drained by the Scheldt and the Meuse (Maas) and their numerous tributaries, of which the most important is the Sambre. The triangular region S. of the Sambre-Meuse line consists of a series of plateaus, trenched by ravines and narrow valleys, belonging mostly to the system of the Ardennes. Where it is not marsh and moor land it is heavily wooded. To the N. of the same line the surface is nearly a level plain. Artificial embankments protect the low-lying lands and the seaboard from inundations. The country along the N. boundary, between the Scheldt and the Meuse, known as the Campine, was a region of barren sand; but here and in other parts the peasantry, by spade labour and heavy manuring, have, during the second half of the 19th century, won close upon 270,000 acres to effective cultivation. There are over eight hundred thousand holdings, of which over one-half average about 2 acres in extent. About two-fifths of the total holdings are farmed by the owners. The heavy rent of land forms a serious drawback to agriculture.

The greatest wealth of Belgium lies in its deposits of coal and iron. The former stretch along the Sambre and the Meuse all the way from the Franco-Belgian frontier W. of Mons as far as Liège. The surface area is no less than 555 sq. m., and the annual output is about 24 million tons. The iron mines occur for the most part in the same localities as the coal, and the ore is worked especially in Liège, Seraing, and

Charleroi. The annual production of pig iron, manufactured iron and steel, amounts to over 4 million tons. Zinc yields nearly 4 millions sterling, and argentiferous lead nearly a million annually.

Machinery is manufactured in Brussels and Seraing; hardware in Liège, Charleroi, Dinant, and Malines. Arms are made in Liège; glass and porcelain in Tournai, Brussels, Courcelles, Charleroi, Namur, and Liège. Woollen manufactures flourish at Verviers, Limburg, and Liège. The linen centres are Courtrai, Ghent, Brussels, Bruges, and Alost. Among the other industries are the manufactures of lace, cotton (Ghent), sugar, hosiery, paper, furniture, leather; brewing and distilling; slate and marble quarrying.

The bulk of the foreign trade passes through Antwerp. Ostend, Ghent, Brussels, and Nieupoort come a long way behind. The foreign trade is valued at 250 millions sterling annually. The most important exports, the annual value of which is about 110 millions sterling, are textiles, yarn, minerals, iron and steel, coal, cereals, glass, hides, chemicals, and sugar. The Belgian mercantile marine is about 150,000 tons. There is a fishing fleet, belonging mostly to Ostend, engaged in the cod and herring fishery.

The people consist of two races, Flemings and Walloons, with small numbers of Germans, French, and Dutch. Of the total, who numbered 3,785,814 in 1831, 6,693,810 in 1900, and 7,074,910 in 1904, about 45 per cent. speak Flemish and 41 per cent. Walloon (*i.e.* French), and 11 per cent. speak both languages, now on an official equality. The standing army is recruited by voluntary enlistment, supplemented if necessary by a modified form of conscription. The period of service is eight years in the

ranks and five in the reserve. The war strength is 180,000 men. Almost the whole population belong to the Roman Catholic Church, presided over by the archbishop of Malines and the bishops of Bruges, Ghent, Liège, Tournai, and Namur.

Elementary education was not universally required by law till 1895, and consequently is not so advanced as might be expected. The highest branches of education are provided in the universities of Brussels, Louvain, Ghent, and Liège, and by engineering and mining schools attached to the universities.

The government is a constitutional and hereditary monarchy. Socialism is a great and growing force in the country.

The capital and largest city is Brussels, the other most populous cities are Antwerp, Liège, and Ghent.

See A. Jourdain's and L. van Stalle's *Dictionnaire de Géographie de la Belgique* (1895-6), Smythe's *The Story of Belgium* (1900), C. Scudamore's *Belgium and the Belgians* (1901), and *Annuaire Statistique de la Belgique*.

History.—The kingdom of Belgium originated in 1830, by the severance from the kingdom of the Netherlands of its southern provinces the former Austrian Netherlands and the bishopric of Liège. A provisional government was formed, and was acknowledged by the whole of Belgium. The resolution of the Dutch Parliament that Belgium and the Netherlands should be separately administered, but under the same king, came too late to check the revolution. The crown of the new kingdom was offered to Leopold of Saxe-Coburg, husband of the Princess Charlotte of England and uncle of Queen Victoria, and accepted by him (June 4, 1831). In the ensuing struggle the Dutch forces defeated the

Belgians; but the latter were speedily supported by a French army, and the Dutch ports were blockaded by British and French fleets. King William had, therefore, to recognize the inevitable, and Belgium became definitely (1832) a separate kingdom.

In 1842 a law was passed declaring religious instruction in primary schools compulsory, and entrusting it to the clergy, under state supervision. From this dates the chief political struggle in Belgian history. In the first instance it occasioned the formation of a Liberal alliance (organized by a prominent Freemason named Defacqz), which agitated for extension of the franchise by educational as well as property qualifications, and which gained sufficient hold on the electorate to necessitate the formation of a purely Liberal ministry (with Charles Rogier as premier) in 1847. The Rogier ministry promoted railway construction, abolished the stamp tax on newspapers, and reorganized secondary education, with the intention of freeing it from clerical control (1850). The city of Antwerp, however, evaded the measure in 1853, by putting priests on the governing bodies of the schools and subordinating the teachers to their authority. A more moderately Liberal ministry (1854) legalized this evasion, but was presently (1855) replaced by a militant Clerical ministry, whose promotion of a law facilitating the foundation of ecclesiastically managed charities created such excitement that the king dismissed it and appointed a Liberal cabinet, who found a majority at the general election of 1857. From that year to 1870 the Liberals, led by Frère-Orban, were in power, and effected many useful reforms—the abolition of the *octrois*, or municipal customs duties on provisions (1860), and of

road tolls (1866); a reduction of postal rates (1868), and an abolition of the tax on salt (1870); while in 1867 the right of workmen to combine was recognized. In 1863 the tolls on vessels entering the Scheldt were extinguished by a payment of 36,278,566 fr., of which Belgium found about a third, Great Britain a fourth, and other nations trading with Antwerp the rest.

In 1865 Leopold I. died. He was succeeded by his son, Leopold II.

The ultimate cause of the defeat of the Liberal party was the Flemish movement. There had been a literary revival of the Flemish language about 1840, and attempts had been made to put it on a par with French in official use. The Flemish districts are ultra-Catholic; the Liberal strength is in the districts which speak French or Walloon. The Liberals therefore opposed the movement. At the elections of 1870 Antwerp and Ghent abandoned them, and Clerical ministries succeeded (1870-8). They succeeded in raising Flemish to the dignity of an official language. But the demonstrativeness of the Clerical party, at a time when there was a strong anti-Clerical reaction in other Continental countries, led to a considerable Liberal success at the elections of 1878. The resultant Liberal ministry (under Frère-Orban) carried a primary education law which placed the elementary schools under strict state supervision, the priests being admitted only to give religious instruction at the beginning or end of the school day (1879). The bishops protested, and organized a rival system of voluntary church schools. The premier broke off diplomatic relations with the Vatican (1880), which were not renewed until 1888. The ministry was severely defeated at the elections of 1884, and

the disorganization of the anti-Clerical opposition was intensified by the appearance (1885) of a parliamentary Labour or Socialist party (Parti Ouvrier Belge), which began to agitate for a revision of the constitution which should establish manhood suffrage.

The advisability and the form of a revision were debated for two years by the chamber. The chamber having failed to pass any of the schemes before it (Apr. 1893), the Socialists at once proclaimed a general strike, the mere beginnings of which induced the chamber to accept manhood suffrage, tempered by the plural vote. A second vote was given to fathers of families possessed of a certain amount of property; second and third to persons with certain educational or professional qualifications; and, to ensure that the well-to-do classes should exercise their full influence, voting was made compulsory. The details were worked out by Sept. 1893, and the subsidiary electoral legislation passed in November. Meanwhile a considerable body of opinion had arisen in favour of proportional or minority representation—which the chamber, however, rejected—and during the winter of 1894 a number of experimental elections, under the system proposed, were carried out by voluntary effort in Brussels and elsewhere. The election of Oct. 1894 was notable for the great increase of the Socialist strength, and the appearance of a new 'Christian Socialist' party (Demochrétiens), whose strength was among the agricultural labourers, but whose one candidate, the Abbé Daens, was defeated at Alost and condemned by the church. They did not return a candidate to the chamber till 1902. The Clerical majority was strengthened, and the state schools brought by legislation

more thoroughly under clerical control. Eventually, proportional representation in all parliamentary elections was introduced in 1900. So far it seems to have worked with unexpected ease and success. The Socialist and Progressist parties continued agitating for manhood suffrage pure and simple, the plural vote having been found to strengthen the power of the small Catholic landowners and the priesthood.

In 1906 all sections of the Left combined in support of a common programme—the reform of the franchise, compulsory education, and personal service in the army, instead of recruiting by paid substitute. By a Convention made in 1890 Belgium was given the right of annexing the Congo Free State after a period of ten years. In 1901, when the Convention expired, a bill was passed reaffirming the right of annexation. In 1908 the Treaty of Cession was adopted by the Belgian Parliament, and the Congo Free State became Belgian territory.

Leopold II. died in Dec. 1909, and by his death the Lado enclave reverted to Britain. He was succeeded by his nephew Prince Albert. The neutrality of Belgium is a principle of European public law, guaranteed by the Great Powers under the London Treaties of 1831 and 1839, and steps to protect it were taken by Great Britain during the Franco-German war of 1870. A discussion has recently arisen as to how far the neutrality is affected by the Dutch schemes for fortifying the Scheldt.

The Abbé Balau's *Soixante-dix Ans d'Histoire Contemporaine de la Belgique* (1815-84) gives a Clerical view; so does Charles Woeste's *Vingt Ans de Polémique* (1885). See also Pirenne's *Geschichte Belgiens* (1899-1902), and Demetrius Boulger's *History of*

Belgium (1902). On Socialism in Belgium the standard work is *Le Socialisme en Belgique* (1898), by Vandervelde and Destrée.

Literature.—Belgian literature means the literature written by men and women of Belgian nationality, not literature written in the Belgian language; for there is no Belgian language *per se*. Belgians use as their vehicle of literary expression either French or Flemish. The former has been the official language since 1830, and is the mother tongue of very nearly one-half of the population. The other half speaks Flemish, though this language did not win complete official recognition and full equality with French until 1898—the crowning result of nearly sixty years' struggle. The earliest names of moment on the roll of Belgian literature are Baron de Saint-Genois (1813-67), who wrote *De Grootboekhouder* (1851), *Anna* (1844), and other historical romances; De Coster (1827-79), author of a version of the Flemish folk-tale, *La Légende d'Uylenspiegel*, and historical and realistic romances, as *Légendes Flamendes* (1857) and *Contes Brabançons* (1861). Greyson (1823), another realistic novelist and poet, has written *Juffer Daadje et Duffer Doortje* (1873) and *Teintes Grises* (1890); and the poet Pirmez (1832-83), who was influenced by the French romantic school, wrote *Fewillées, Pensées, et Maximes* (1862; 4th ed. 1881), *Jours de Solitude* (1869; 4th ed. 1883), and *Lettres à José* (1884). The year 1841 is the birth year of the 'Flemish movement,' which had for its objects the literary cultivation of the Flemish language and its establishment on a footing of complete equality with French. The originators and principal promoters of this movement were for the most part publicists, like Willems (1793-1846), called the 'father' of the

movement, Blommaert, Serrure, Rens, Snellaert, Van Duyse, and Vleeschhouwer. But its most influential champion, from the literary point of view, was the novelist Hendrik Conscience (1812-83), who not only wrote good historical novels like *De Leeuw van Vlaanderen* (1838), but is especially famous for excellent little stories of Flemish life, such as *Hoe men Schilder wordt* (1843), *Siska van Roosemael* (1844), *Rikketikke-tak* (1851), *De Arme Edelman* (1851), and *Het Geluk van rijk te zijn* (1855). The most important supporters of Conscience were the poet Ledeganck (1805-47), in, for example, his poetic trilogy, *Les Trois Villes Sœurs* (Ghent, Bruges, and Antwerp); Rijswijck (1811-69), in political verse like *Refrains Politiques* (1844) and *Chansons Populaires* (1846); and De Cort (1834-78), in various volumes of *Liederen*. Flemish tendencies have also been predominant in the poetical productions of Hiel (1834-99), who wrote songs for children; Van Beers (1824-88), in the poem of humble joys and sorrows, *Begga*; De Laeb (1815-91), in the romance *Het Huis van Wesenbeke* (1842), the village tale *Het Lot* (1846), and *Poems* (1848); Gezelle (1830-1900), who recorded his deep love for nature in, for example, *Rijmsnoer* (1897); Pol de Mont (b. 1857), who has put characteristic work into *Claribella* (1893) and *Iris* (1894); De Geyter (b. 1830), in the radical war-cry 'Hymne de Gueux,' in *Charles Quint* (1888), and in *Trois Hommes* (1861); Van Droogenbroeck (1835), in *Rayons de Soleil* (1866); the humorist Vuylsteke (1836), in *L'Amour Silencieux* (1860) and *La Vie d'Étudiant* (1868); Antheunis (1840), in poems of domestic life, *Du Fond du Cœur* (1875) and *Vivre, Aimer, et Chanter* (1879); and, last but not least, Hélène Lapidoth-Swarth (1859), in several volumes of lim-

pid and harmonious verse, such as *Beelden en Stemmen* (1887) and *Riouwviolen* (1889). Virginie Loveling (1835), in poems, but more especially in numerous novels, distinguished for that rare combination real power with a simple style—e.g. *Au Pays Flamand* (1877), *Le Clef de la Maison* (1883), *Sophie* (1886), *Een Dure Eed* (1892), and *Het Land der Verbeelding* (1896)—has well sustained the tradition of Conscience. Sleenckx and others have also ploughed the same furrows; and the study of Flemish folklore has been much developed by Vervliet, Cornelissen, Harou, Penken, and other writers in the Brabant journal *Ons Volksleven*. But since about 1883 French influences have been, on the whole, predominant in Belgian literature—(1) in the writings of the Parnassians; (2) in the works of the mystical Franco-Flemish school. The Parnassians, represented chiefly by Giraud and Arenberg, and the Walloons Gilkin, Gille, and Severin, and other supporters of the organ *Le Jeune Belgique*, aimed at preserving the ease, polish, and precision of the French classical style. The other stream, borne on for the most part by men of Flemish birth, but writing in French, is much more distinguished. It embraces such famous names as Maeterlinck, Eeckhoud, Verhaeren, and Rodenbach. The first strong note of the tendency was struck in Lemonnier's novel *Un Mâle* (1881), and the movement has been energetically championed by Picard (1836). Maeterlinck (b. 1862) has become known outside of Belgium as the author of mystical dramas—*La Princesse Maleine* (1889; trans. 1892), *L'Intruse* (1890), *Les Aveugles* (1890; trans. 1892), and *Monna Vanna* (1902); of an idyll—*Aglavaine et Selysette* (1896; Eng. trans. 1897); and of volumes of aphoristic philosophical reflections—*Le Trésor des Humbles* (1896; trans. 1897), *La*

Sagesse et la Destinée (1898; trans. 1898), and *La Vie des Abeilles* (1901; trans. 1901). Typical illustrations of the 'barbaric' and 'volcanic' temperament of Verhaeren (1855) are the poems *Les Campagnes Hallucinées* (1893), *Les Villes Tentaculaires* (1896), and *Les Villages Illusoires* (1895). Eeckhoud (1854) has written patriotic novels—*La Nouvelle Carthage* (1888) and *Kermesses* (1883 and 1887); and Rodenbach (1855–98) 'patriotic' poems in *Bruges la Morte* (1892), *Le Voyage dans les Yeux* (1893), *Le Carillonneur* (1897). Other poets infected with different forms of the prevailing mystic contemplation are Remonchamps (*Les Aspirations, Vers l'Ame*), Elskamp (*Six Chansons, Tours d'Ivoire, Les Grâces Evangéliques*), and Demolder (*Récits de Nazareth, La Route d'Émeraude*). Cyriel Buysse has written strong novels (*Het Recht van den Sterkste*, 1894; *Sursum Corda*, 1895), after the manner of Zola, but in Flemish. Except for Maeterlinck, Rodenbach (*Le Voile*), H. de Marez (*De Bruid van Quinten Metsys*, 1898), and Buysse (*Het Gezin van Paemel*, 1902), the Belgians have not distinguished themselves as playwrights. But many have won a good reputation in the fields of literary criticism (Max Rooses, Hamelius, Kurth, De Marez, Keymeulen), history (Pirenne, Kurth, De Potter, D'Alviella, G. de Marez), political and social science (Emile de Laveleye, Nys, Banning, Deschamps, Vandervelde), art history and criticism (Max Rooses, Wauters, and others), and on military matters (Brialmont). There are also two local schools of literature—one consisting of writers who use the Walloon dialect of Liège, the other the German speech of Aubel and Arlon, in the neighbouring state of Luxemburg. The Flemish aspirations have been greatly assisted by the foundation in 1886 of the Royal Flemish Academy;

and there is a strong desire growing for an exclusively Flemish university at Ghent. See Potvin's *Hist. des Lettres en Belgique*; P. Hamelius's *Hist. Politique et Littéraire du Mouvement Flamand* (1894); T. Coopman and L. Scharpé's *Geschiedenis der Vlaamsche Letterkunde* (1899–1902), etc.; H. de Marez's *Nieuwe Paden* (1900); L. van Keymeulen's *Esquisses Flamandes* (1899); J. Defrecheux and C. Gothier's *Anthologie des Poètes Wallons* (1895); G. Barral's *Collection des Poètes Françaises de l'Étranger* (1897); Masoin's *Histoire de la Littérature Française en Belgique* (1903).

Belgrade (Serv. *Beograd*), cap. of Servia, at the junction of the Danube and Save; consists of two parts—the citadel and the town, the former standing on a hill 133 ft. high, and containing the tomb of Kara Mustafa. Most of the modern fortress dates only from the days of Prince Eugene (1717). Principal buildings are the 'great' mosque, the cathedral (built 1842) with the crypt of the Obrenovitches, the university (about 1,000 students), the national library (50,000 vols.), the museum, the theatre (built 1871), and the royal palace. Industries are insignificant; but there is a brisk trade, Belgrade being the principal export place of Servia. The strategical importance of the place was recognized from the earliest times. During the 11th and 12th centuries the fortress was held by the Greek emperors till it fell into the hands of the Magyars, who for long successfully disputed its possession with the Servians and Turks. It was heroically defended in 1456 by John Hunyady, and remained one of the greatest obstacles to the advance of the Crescent till captured by Sultan Soliman in 1521. From 1521 to 1688 it remained in the hands of the

Turks, when it was taken by the Austrians, who only retained it for eighteen months, for in 1690 the grand vizier Mustafa Köprili recaptured the place, which continued in the possession of the Ottomans till Prince Eugene retook it in 1717. In 1738 it was retroceded to the Turks, who kept it (despite its temporary capture by Laudon in 1789) till it was finally transferred to the Servians in 1867. In the royal palace here on June 10, 1903, King Alexander I. and his queen, Draga, were foully murdered by army officers. Pop. 80,000. See Joanne's *Etats du Danube* (1895), Wilson's *Belgrade* (1903), and Vivian's *The Servian Tragedy* (1904).

Belgravia, fashionable quarter in s.w. of London, built between 1826 and 1852. Most of it is owned by the Duke of Westminster. See Hare's *Walks in London* (1883).

Belial, a Hebrew word supposed to mean 'worthlessness,' hence 'wickedness.' Found usually in phrases like 'man of Belial,' it came to be regarded as a proper name (so, even in *R. V.*, 1 Sam. 1:16, etc.). Paul uses it as the equivalent of Satan (2 Cor. 6:15); Milton, in *Paradise Lost*, i., as the name of the angel of impurity.

Beliapatam, tn. in Malabar dist., Madras Presidency, India, situated on the l. bk. of Beliapatam R., 4 m. from the cantonment of Cannanore; has trade in pepper and cardamoms.

Belief. This word is used in several senses, which need to be kept distinct. (1.) It may be used to signify an element in all serious judgment (as distinguished from mere imagination and from wilful falsehood)—viz. that the judgment is taken to be true of reality. It is to be observed, however, (a) that this truth may be asserted with various degrees of assurance, from full certainty to the vaguest probability; (b) that the reality may be that of a fictitious world, as,

for example, when it is said that 'Ivanhoe did not *really* marry Rebecca, as Thackeray *falsely* makes him do.' Cf. W. James's *Psychology*, vol. ii. pp. 287 ff. (1890), on 'the various orders of reality.' (2.) Belief may be used in a narrower sense to signify the conviction that attaches to a probability, as distinguished from that which belongs to certain knowledge. (3.) Belief is also used as equivalent to faith in the religious sense—faith as contrasted with sight. In this sense, therefore, belief is opposed, not as probability to certainty, but as one kind of certainty to another. That is to say, the certainties of faith, resting upon moral and spiritual experience, are contrasted with those of physical science, resting upon sense-experience, or observation. See Balfour's *Foundations of Belief* (1895).

Belinsky, VISARION GRIGORIEVITCH (1811-48), Russian literary critic, born at Chembar, gov. Penza; studied at the Moscow University, and entered early upon a journalistic career. In 1834 appeared his first important critical work, the admirable *Survey of Russian Literature since the Eighteenth Century*. It was he who first showed the real value which the works of Pushkin, Lermontov, and Gogol possess for Russian literature. At first he wrote in the spirit of Hegel's and Schelling's philosophy, but later maintained that the essence of literature is to give an idealized picture of actual life. His complete works appeared in 1859-62 (12 vols.; St. Petersburg).

Belisarius (c. 500-565 A.D.), the greatest, perhaps the only, general of the Byzantine empire. He is said to have been a native of Thrace; his name has been explained as Slavonic in origin (*Beli-tsar*, 'white prince'). After Justinian's accession to the throne

in 527 A.D., Belisarius, who had been one of his private guards, was promoted to the highest military command. Between 529 and 532 he was occupied in repelling the inroads of the Persians; but Africa and Italy were the scenes of his greatest exploits. In the African war (533-534) he overthrew the power of Gelimer, king of the Vandals, and destroyed the Vandal kingdom established in Africa. The Italian war, waged against the Ostrogoths, falls into two parts. The first war was caused by Justinian's claiming Sicily. Belisarius conquered Sicily in 535, Naples in 537, defended Rome against a new Gothic king, Vitiges (Mar. 537 to Mar. 538), and took Ravenna with Vitiges (Dec. 539). Then he was recalled by the jealousy of Justinian, and from 541 to 543 was engaged against the Persians under Chosroes. Recalled again, owing to the intrigues of the Empress Theodora and his own wife Antonina, he was heavily fined. In 541 the Goths revolted under a new king, Totila. Belisarius in vain tried to raise their siege of Rome (May 546 to Feb. 547); but when they left the city, he recovered and held it. In 548 court intrigues again led to his recall, and his rival Narses completed his work by finally overthrowing the Ostrogothic kingdom. Belisarius gained his last victory against the invading Bulgarians in 559. In 563 he was accused of conspiring against Justinian, and was kept in prison for eight months, his property being confiscated. The later legend, that he was deprived of his eyes and reduced to beg his bread, is absolutely without foundation. We only know that he died soon afterwards, in March 565. Our chief authorities are the *Histories* of Procopius (his private secretary), Agathias, and Theophanes. See Gibbon's *Decline and Fall*, ch. 41 and 43 (Bury's ed.); Lord Ma-

hon's *Life of Belisarius* (1848); and Bury's *Later Roman Empire* (1893). See BYZANTINE EMPIRE.

Belize, or BALIZE (so named from the Spanish pronunciation of Wallace, a Scottish buccaneer), cap. of British Honduras, on the s. mouth of the Belize R., or Rio Viejo, which is navigable by canoes for 120 m. The ground being swampy, the houses stand on a ballast terrace. The harbour is shallow, and is being silted up, so that vessels are obliged to anchor more than a mile from the town. Pop. 10,000.

Beljame, ALEXANDRE (1842-1906), was professor of English literature at the Sorbonne, Paris, and author of numerous works and translations into French of English classics, among which are *Enoch Arden* (1892) and *Macbeth* (1897). He was Clark Lecturer in English Literature, Trinity College, Cambridge (1905-6).

Bell. Early specimens of bells have been found in Egyptian tombs, and small bronze articles, supposed to be bells, have been dug up in the ruins of Nineveh. Their association with religion dates from a remote age. The festival of the Egyptian Isis was celebrated with the sound of bells. In the book of Exodus bells of gold are mentioned as being suspended from the robes of the high priest. In the prophecies of Zechariah they are spoken of as forming part of the caparison of horses; and Schoettgenais shows that they were attached as ornaments to the garments of Hebrew women and boys, and were also appendages to the royal costume of the ancient Persians. These bells, however, were probably rather jangling ornaments. It is believed that bells were known in India and China long before they were used in Europe. It is uncertain when bells were first used in the Christian Church, although their introduction has been gen-

erally attributed to Paulinus, bishop of Nola (400 A.D.). The rise of Christian architecture and the introduction of towers or turrets were favourable to the increase in the size of bells. Bede mentions bells as being in England about the end of the 7th century, and in the 10th century St. Dunstan appears to have introduced them very generally. Some specimens, however, still preserved, belong, it is supposed, to the 6th century. The bells of Russia are specially famous. The largest bell in the world, the great bell of Moscow, was cast in 1733, and weighs 198 tons; but unfortunately it was cracked in the founding, and was never hung. It now stands on a pedestal within the Kremlin. Another Moscow bell, said to be the largest in use, weighs 128 tons; another, 80 tons; another, 57 tons. Among other large bells are those at Mingoan, 80 tons; Pekin, $53\frac{1}{2}$ tons; Novgorod, 31 tons; Cologne, $26\frac{3}{4}$ tons; Nanking, 22 tons; Rangoon, 22 tons; Vienna, $17\frac{3}{4}$ tons; St. Paul's, London, $17\frac{1}{2}$ tons; Olmütz, 17 tons; Erfurt, $13\frac{3}{4}$ tons; Montreal, $13\frac{1}{2}$ tons; Big Ben (Westminster), over $13\frac{1}{2}$ tons; Paris (1680), $12\frac{3}{4}$ tons; and Great Peter (York Minster), $10\frac{3}{4}$ tons.

Bells seem to have been used in the services of the Roman Catholic Church from the earliest times. The more notable of these are the *Ave Maria bell*, the *vesper bell*, and the *compline bell*. The *sanctus bell*, used in the celebration of the mass, was formerly hung in a small turret outside the church, so that all within hearing of it might prostrate themselves. The *passing bell* was tolled when any one was passing out of life. This custom still survives in many parts of Britain, but the bell is now tolled *after* the death. In excommunication by *bell, book, and candle*, the bell was rung to summon the congregation to the

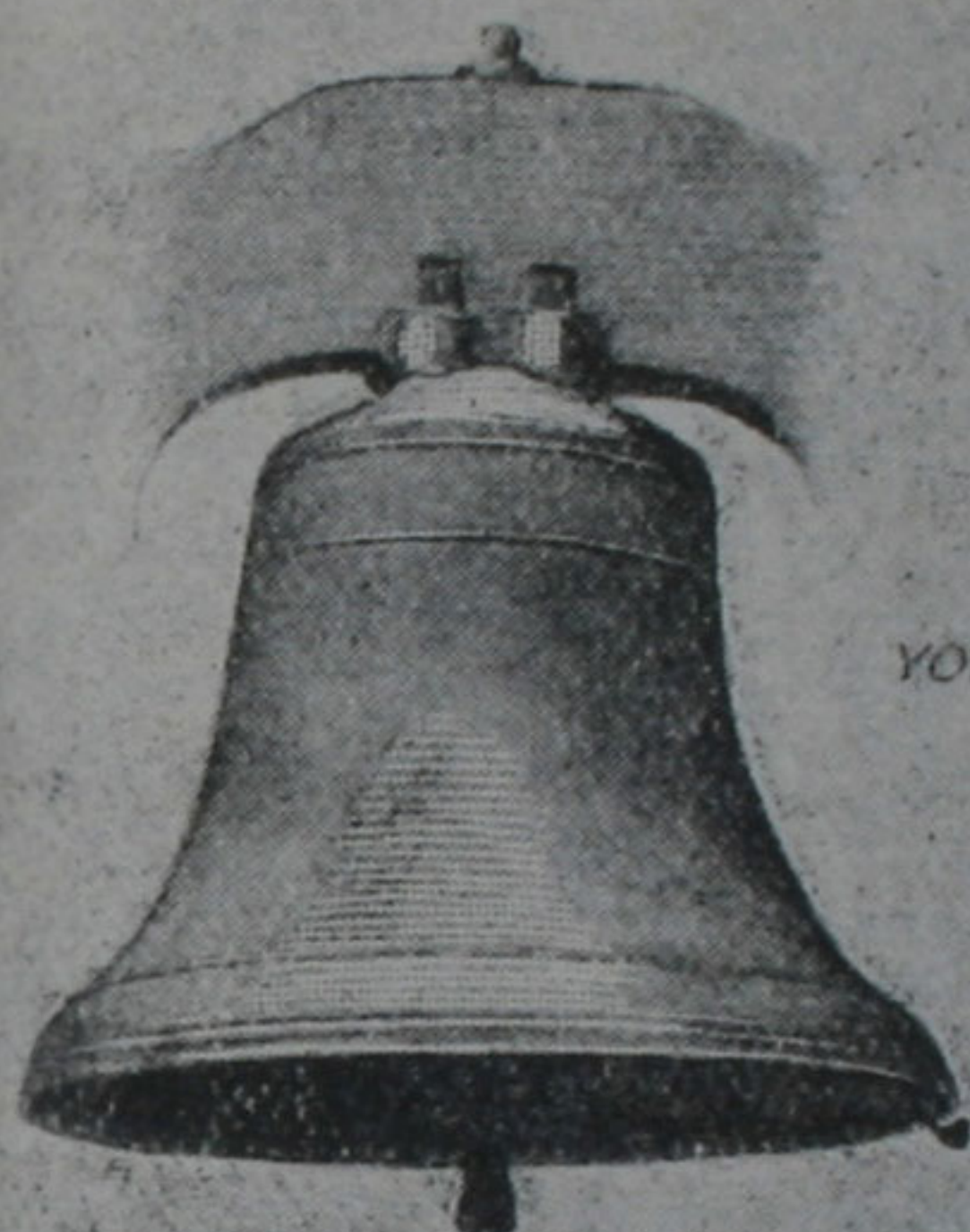
ceremony. The consecration or baptism of bells is still practised in the Roman Catholic Church.

The most familiar secular use of the bell is the tolling or ringing of the hours. Lucian (b. *circa* 125 A.D.) refers to an instrument which marked the hours on a bell by means of water power. The curfew bell (Fr. *couvre feu*), introduced from Normandy by William the Conqueror, was rung at eight o'clock in the evening, to warn all persons to extinguish fire and light—a necessary precaution, when houses were built of wood. The curfew was enforced during the reigns of William I. and William II., but in the time of Henry I. it ceased to be compulsory. The vesper bell was the signal for the massacre known as the 'Sicilian Vespers' (1282), when 8,000 French were butchered in Sicily. The massacre of St. Bartholomew was started by the ringing of the bells of St. Germain l'Auxerrois, Aug. 24, 1572, the eve of the festival of St. Bartholomew.

Bells have been made in a great variety of forms and of a still greater variety of substances; but since the middle ages, for bells which are required to possess a high degree of richness and volume of tone, a modification of the hemispherical form and an alloy of copper and tin—called *bell-metal*—have been universally regarded as superior to all others. For large bells the best results are said to be obtained when the proportion of copper to tin is from three to four parts of the former to one of the latter. The thinner a bell is made in proportion to its size the lower in pitch is its tone, and *vice versa*. The thickest portion of a bell is the part—called the *sound-bow*—against which the clapper strikes. The proportions of bells are not determined by fixed rules, but, generally speaking, in large bells



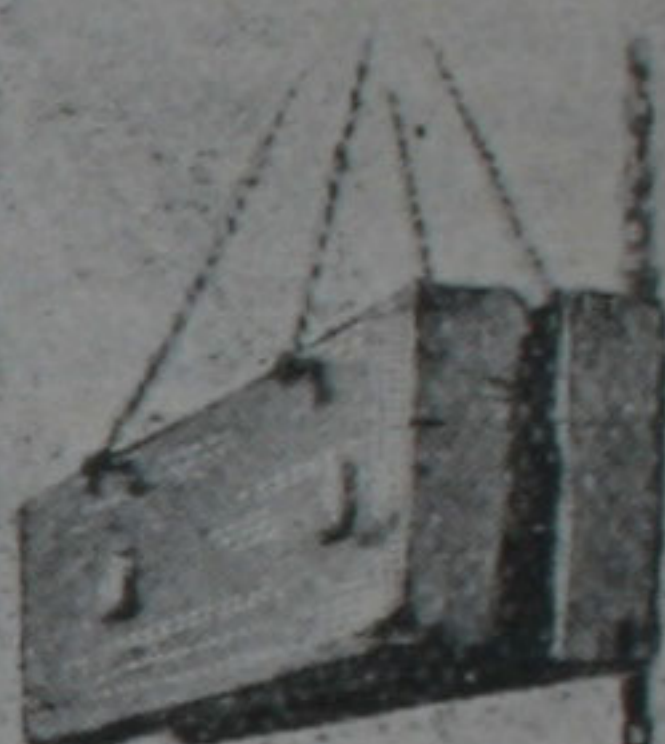
IRISH BELLS. VIth & VIIth CENTURIES



MODERN CHURCH BELL



YOTL. AZTEC BELLS



WOODEN BELLS. (SYRIAN MONASTIC)



EAST AFRICAN CARAVAN BELL



ANCIENT PERUVIAN



"TSAR KÖLOKOL" IN THE KREMLIN, MOSCOW (1733)



XIV CENT ECCLESIASTICAL



HAND BELLS

Various Types of Bells.

the diameter at the lip is usually about fifteen times, and the height about twelve times, the thickness of the sound-bow. Bells are said to be *true* only when the consonant upper-partials—the third, fifth, and octave—are dead in tune with the fundamental or key note of the bell. Bells may be lowered in pitch by thinning the inside of the sound-bow, but the only means of raising the pitch is to lessen the height and diameter by cutting a portion from the rim all round; and this, besides altering, frequently impairs the quality of tone.

With the exception of modifications in methods of manipulation, the art of bell-founding has remained almost unchanged since its invention in mediæval times. Now, as then, bells are cast by forming a bell-shaped model, covering this with a larger mould, and through an opening in the top of the latter pouring in molten metal until the space between the two is completely filled.

Bells are sounded either by being *swung* or by being *chimed*. A *peal* of bells is a suite of bells tuned in certain relations to each other. Peals of 'swung' bells never contain a greater number than twelve, but peals of 'chimed' bells—termed *carillon peals*—may comprise forty or more. In Britain bells 'rung in peal' in their primary or natural order of sequence are usually tuned to produce a succession of diatonic intervals, but 'carillon peals' may be tuned to be capable of producing a complete chromatic scale. *Change-ringing* is the art of constantly varying, in accordance with certain prescribed rules, the order in which peals of 'swung' bells are rung; 'hunting,' 'dodging,' 'place-making,' 'singles,' 'doubles,' and 'triples' are amongst terms which are used to designate methods of manipu-

lation. The number of bells contained in the 'peal' determines the number of changes which can be made—*e.g.* on three bells 6 changes may be rung; on six bells, 720; on twelve bells, 479,001,600. The earliest known work on the subject of change-ringing is Fabian Stedman's *Tintinnologia* (published 1668). Large peals of swung bells are most numerous in England; and in that of St. Paul's, London, which contains twelve bells, the tenor bell weighs over three tons.

Bells may be 'chimed' in various ways, but the term is generally understood to imply that, instead of being swung, the bells are struck, usually on the outside, by a hammer or wooden mallet. On the Continent, in peals of chimed bells which are constructed to play automatically, the hammers are called into action by a spiked revolving barrel regulated by clockwork (see MUSICAL BOX), but for large carillon peals which are played by hand a species of keyboard mechanism is employed. The art of carillon playing is now much neglected, but during the 18th century some carilloneurs in the Netherlands were able to perform intricate fugal works in two and, with the aid of pedals, even in three parts. Amongst celebrated carillon peals on the Continent, some of which are capable of being played either mechanically or by hand, are those of Antwerp, Bruges, Ghent, Louvain, Malines, and Tournai; while of noteworthy English carillons may be mentioned those at Boston, Bradford, Manchester, Rochdale, Shoreditch, and Worcester. The mechanism invented and employed in England for playing carillons is much superior to that in use on the Continent.

Tubular chimed bells are a recent invention, and being comparatively cheap, are likely to

become popular; but so far, though made in sizes to cover a wide extent of compass, they are perhaps best known arranged in sets to form portable carillons.

See also ELECTRIC BELL; and for pneumatic bell, see PNEUMATIC APPLIANCES. Schiller has made excellent use of the processes of bell-casting in his beautiful *Lied von der Glocke*, and Poe of the sound of bells in his poem *The Bells*. See Denison (Beckett), *Clocks, Watches, and Bells* (7th ed. 1883); and Ellacombe's numerous works, especially *Chiming* (1859-60).

Bell, ACTON, CURRER, and ELLIS. See BRONTËS.

Bell, ALEXANDER GRAHAM (1847), inventor of the telephone, son of Alexander Melville Bell, author of *Visible Speech*, was born in Edinburgh, and settled in Canada in 1870; introduced his father's system for the education of deaf-mutes, and was appointed professor of vocal physiology in Boston University (1872). In 1876 he exhibited at the Philadelphia Exhibition the telephone, which he had invented some four years before. He also invented the photophone (1880) and the graphophone (1887), and has published *Lectures on the Mechanism of Speech* (1906), and many scientific and educational monographs.

Bell, ALEXANDER MELVILLE (1819-1905), Scottish-American educator, father of Alexander Graham Bell, was born in Edinburgh, Scotland, and received his education from his father, Alexander Bell, inventor of a method for removing impediments of speech; was lecturer at Edinburgh and London before removing to Canada (1870) and to Washington, D.C. (1881). He invented "Visible Speech," a method of instruction in orthoëpy, which has also been successfully used in teaching deaf-mutes to speak, and he published several works on stenog-

raphy, orthoëpy, and elocution. See *Alexander Melville Bell: Some Memories* (1907).

Bell, ANDREW (1753-1832), founder of the Madras system of education, was born and educated at St. Andrews, Scotland. In 1789 he became superintendent of the Madras Male Orphan Asylum, where he developed the monitorial system of education, explained in his work, *An Experiment in Education* (1797). In 1811 he assisted at the formation of the National Society for Promoting the Education of the Poor, a church organization which founded over 12,000 schools on his method. In 1831 he transferred £120,000 to trustees for various educational purposes, principally in Scotland; half of this went to found the Madras College, St. Andrews. The chairs of education in Edinburgh and St. Andrews have grown out of the Bell Lecture on Education, established 1831. See Southey's *Life of Bell* (1844); Meiklejohn's *An Old Educational Reformer* (1881).

Bell, SIR CHARLES (1774-1842), discoverer of the distinct functions of the nerves; became fellow of the Royal College of Surgeons of Edinburgh (1799), and in 1804 contributed the account of the nervous system to his brother John Bell's *Anatomy of the Human Body*. The same year he removed to London, where his *Anatomy of Expression in Painting* was published (1806). Bell's great achievement was the discovery of the existence of distinct motor and sensory nerves, and the further discovery that the spinal cord gives off filaments of both kinds. The first hint of this discovery was in a letter to his brother George (Nov. 26, 1807), but its final authoritative exposition was made in 1830, in a volume entitled *The Nervous System of the Human Body*. In 1812 he was appointed surgeon to the Middlesex Hos-

pital, and in 1824 professor of anatomy and surgery at the Royal College of Surgeons, London. Knighted on the accession of William IV., Bell accepted the chair of surgery at Edinburgh University in 1836. Besides the volumes mentioned above, he was author of *A System of Operative Surgery* (1807), *Institutes of Surgery* (1838), and several other books, chiefly surgical. See *Letters of Sir Charles Bell* (1870).

Bell, CHARLES FREDERIC MOBERLY (1847), managing director of the *Times* since 1908, having previously acted as correspondent in Egypt from 1865, and as assistant manager. He wrote *Khedives and Pashas* (1884); *Egyptian Finance* (1887); *From Pharaoh to Fellah* (1889).

Bell, GEORGE JOSEPH (1770-1843), advocate, brother of Sir Charles Bell, was admitted to the Scots bar (1791). His *Treatise on the Laws of Bankruptcy in Scotland* (1804), republished in 1810 under the title *Commentaries on the Laws of Scotland* (7th ed. 1870), at once took rank as the authority in the domain of mercantile jurisprudence. Bell was elected to the chair of Scots law in 1822, and served on the commissions which resulted in the Scottish Judicature Act of 1825 and the Scottish Bankruptcy Act of 1839. He also wrote *Principles of the Law of Scotland* (1829; 10th ed. 1899). See *Edin. Rev.*, April 1872.

Bell, HENRY (1767-1830), one of the earliest introducers of practical steam navigation into the United Kingdom, was born at Torphichen, near Linlithgow, Scotland. In Jan. 1812 his boat, the *Comet*, a thirty-ton vessel driven by an engine of three horse power, began plying between Glasgow and Greenock. See STEAM-ENGINE.

Bell, HENRY GLASSFORD (1803-74), Scottish sheriff and author, started the *Edinburgh Literary*

Journal, which ran for three years, in 1828. From its columns he afterwards reprinted two volumes—viz. *Summer and Winter Hours* (1831), and *My Old Portfolio* (1832). His latest work, *Romance and Minor Poems*, appeared in 1892. See Stoddart's *Memoir* (1892).

Bell, HENRY THOMAS MACKENZIE (1856), English poet and critic, born at Liverpool. He went to London in 1884, publishing in the same year *Charles Whitehead*, a monograph on the poet (new ed. 1894). Among his works are *Spring's Immortality, and other Poems* (3rd ed. 1896); *Christina Rossetti: a Biographical and Critical Study* (1898); *Pictures of Travel, and other Poems* (1898); *Collected Poems* (1901); *John Clifford: God's Soldier* (1908); *For God and for the Commonwealth* (1909); and *Poems* (1909).

Bell, SIR ISAAC LOWTHIAN (1816-1904), English metallurgist, born in Newcastle; was connected with chemical works at Washington in Durham, founded the Clarence iron works on the Tees in 1852, and led the way in the development of the Cleveland iron industry. He was M.P. for Hartlepool (1875-80). He was created a baronet in 1885. He published *Chemical Phenomena of Iron Smelting* (1872), and other works.—His son, SIR HUGH BELL (1844), succeeded him in the control of Bell Brothers, Ltd. He is well known as a brilliant writer on economic questions and a strong free-trader. He contested the City of London against Mr. Balfour in 1910.

Bell, JOHN (1691-1780), Scottish traveller, born at Antermoney, Stirlingshire. He went to St. Petersburg in 1714, served as physician to the Russian embassy in Persia (1715-18), and in a similar capacity in China (1719-21). In 1737 he went to Constantinople on a Russian mission, afterwards settling there as a

merchant until 1747, when he returned to Antermony, his estate in Scotland. See his *Travels* (2 vols. 1763), reprinted in Pinkerton's *Collection of Voyages and Travels* (1808-13); *Quart. Rev.*, 1817.

Bell, JOHN (1745-1831), publisher, and the pioneer of popular publications. In 1782 he issued a pocket edition of *The Poets of Great Britain complete from Chaucer to Churchill*, in 109 volumes, with frontispieces. This was followed by similar editions of *Shakespeare* and *The British Theatre*. He established *Bell's Weekly Messenger*, a Sunday county newspaper, and an illustrated monthly, *La Belle Assemblée*. He was the first to discard the long s (f) in printing.

Bell, JOHN (1763-1820), surgeon, elder brother of Sir Charles Bell, became fellow of the Royal College of Surgeons, Edinburgh (1786), and in 1790 established himself in that city as an independent lecturer on anatomy and surgery. For twenty years Bell remained the leading operating surgeon in Edinburgh, and showed himself a bold innovator in surgical practice. Chief works: *Anatomy and Physiology of the Human Body* (1793-98); *Discourses on the Nature and Cure of Wounds* (1793-5); *Principles of Surgery* (1801-8; new ed. 1826).

Bell, JOHN (1797-1869), American politician, a native of Tennessee, studied law at Nashville University; was member of Congress (1827), secretary of war (1841), member of United States Senate (1847), and Union candidate for the presidency (1860).

Bell, JOHN (1811-95), an English sculptor, born in Norfolk. His first exhibited work was a religious group (Royal Academy, 1832). His *Eagle-slayer* (1837) was exhibited in 1844; the well-known *Dorothea* belongs to 1841. For the Houses of Parliament he executed the statue of Lord Falk-

land (1847), and among his public works are the *Guards' Memorial* in Waterloo Place, London (1858), the *Crimean Artillery Memorial* (Woolwich), the *Wellington* monument at the Guildhall (1855-6), and the *United States* group in the Prince Consort Memorial, Hyde Park (1873). He also executed statues of Sir Robert Walpole (1854), Newton, James Montgomery the poet, and Cromwell. His other works are nearly all of a poetic character, the chief being *The Babes in the Wood* (S. Kensington), *Andromeda*, *Una and the Lion*, and *Imogen*. He was largely instrumental in bringing about the International Exhibition of 1851, and in projecting the S. Kensington Museum.

Bell, JOSEPH (1837), Scottish surgeon, born in Edinburgh, where he has since practised. He was editor (1873-96) of the *Edinburgh Medical Journal*; and has published *Manual of Surgical Operations* (7th ed. 1894) and *Notes on Surgery for Nurses* (6th ed. 1906).

Bell, ROBERT (1800-67), Irish journalist and miscellaneous writer, edited the *London Atlas* for many years, contributed the 'History of Russia' and 'Lives of English Poets' to *Lardner's Cyclopædia*, became editor (1840) of the *Monthly Chronicle*, and published three comedies—*Marriage* (1842), *Mothers and Daughters* (1843), and *Temper* (1847)—together with two novels. His great work is his unfinished annotated edition of the English poets in 24 vols. (1854-7; new ed. 1866-7).

Bell, ROBERT (1841), late director and chief geologist of the Geological Survey of Canada, is a native of Toronto. Joining the Canadian Geological Survey in 1857, he was geologist and medical officer on the expedition of the *Neptune* in 1884, and of the *Alert* in 1885, to Hudson Strait and Bay. The western branch of the *Nodaway*, which he

surveyed in 1895, is named after him. He was from 1863-7 professor of chemistry and natural science at Queen's University; received the King's or Patron's gold medal of the Royal Geographical Society of London (1906); Cullum gold medal of the American Geographical Society (1906); has published over two hundred reports and papers on geology, biology, geography, and folklore.

Bell, ROBERT CHARLES (1806-72), line engraver, was a native of Edinburgh. He reproduced many important pictures of contemporary Scottish artists, including Sir William Allan, J. E. Lauder, Sir Noel Paton, and Sir David Wilkie. Allan's *Battle of Prestonpans* (1872) was his most important plate.

Bell, THOMAS (1792-1880), dental surgeon and zoologist, was appointed dental surgeon to Guy's Hospital (1817), professor of zoology at King's College, London (1836), secretary of the Royal Society (1848-53), president of the Linnæan Society (1853-61). Chief works: *Hist. of British Quadrupeds* (1837; revised 1874); *British Reptiles* (1839); *British Stalk-eyed Crustacea* (1853); and an edition of White's *Selborne* (1877).

Belladonna, a name for the deadly nightshade or common dwale (*Atropa belladonna*), a perennial poisonous plant of the order Solanaceæ, indigenous to S. Europe and Asia, and cultivated in the United States. It has a much-branched rhizome, which yearly sends up rank stems to the height of three feet; its leaves are alternate, broad, pointed, and from three to eight inches long. The flowers arise singly in the axils of the leaves, and are of a greenish purple colour; the berries, about the size of cherries, are deep violet black, and have a sweet taste. The whole plant has a heavy, unpleasant smell, especially when crushed. Belladonna is useful in medicine chiefly by virtue of its

active principle atropine, procured from the root by extraction, first with alcohol, and at a later stage with chloroform, after which it forms colourless crystals. There are two extracts of belladonna, a tincture, a plaster, ointment, and liniment; atropine is also used hypodermically, in an ointment, and in lamellæ or discs, for ophthalmic purposes. For external application, belladonna is prepared with alcohol, chloroform, or some other volatile substance, that it may penetrate the unbroken skin. It affects the sensory nerve terminations, depressing them, and thus acting as a local anæsthetic and anodyne. Hence its use in superficial inflammation, and in muscular rheumatism, gout, and neuralgia. It also affects the special nerves to sweat-glands and milk-glands, and is therefore useful in hyperidrosis, and as an antigalactagogue. Applied to the eye, it dilates the pupil by paralyzing accommodation, and is therefore used by the ophthalmic surgeon when examining the fundus of the eye, and to prevent adhesions of the iris in inflammation. Internally given, its action proceeds on the same lines. It lowers all secretions except those of the kidneys, and it lessens sensitivity. It is used for lessening sweat production in phthisis. The brain is not affected by medicinal doses, but poisoning has been caused by the free application of belladonna to inflamed or broken skin. The commonest form of poisoning is found among children who have eaten the berries, all parts of the plant being poisonous. In such cases dryness of the mouth and throat is followed by dilated pupils, a flushed face, uncertainty of gait, and possibly delirium and stupor, followed by death. Treatment is first by the stomach-pump or emetics, and next by such a

stimulant as hot coffee, with warmth, and, if need be, artificial respiration. Pilocarpine and morphine are said to be antidotes, but can only be administered by a medical man, while the other remedies could and should be used at once. Another effective and simple antidote is vinegar. Belladonna is also prescribed for nausea, vomiting, spasmodic coughs such as whooping-cough, hay-fever, and asthma. See MATERIA MEDICA and TOXICOLOGY.

Belladonna Lily (*Amaryllis belladonna*), a native of Cape of Good Hope, has been grown in Britain since 1712. It has large bulbs; its leaves develop in early summer, and die down before the flowering stems appear. The flowers, pale rose, are in umbels, and about the size of white lilies.

Bellagio, tn. and summer resort, prov. Como, Italy, charmingly situated on the s. shore of the Lake of Como, at the apex of the peninsula which divides the two s. arms of the lake. It has numerous handsome villas and gardens—the Villa Melzi, built in 1810–15, being the most noteworthy. There is steamboat communication with Como and Lecco. Pop. 3,600.

Bellahouston, s.w. suburb of Glasgow, in par. of Govan, Lanarkshire, Scotland.

Bellaire, city, Belmont co., Ohio, U.S.A., 4 m. s. of Wheeling; has numerous manufactures of glass and of agricultural implements. Iron, coal, and limestone are found. Pop. 10,000.

Bellamy, EDWARD (1850–98), American communist and author, was trained for the bar, and practised journalism. He is remembered for one book, *Looking Backward, 2000–1887* (1888), an anticipation of his ideal socialistic community. The rest of his life was devoted to the propaganda of this ideal.

Bellamy, GEORGE ANNE, 'GEORGIANA' (?1731–88), actress, was daughter of Lord Tyrrawley, ambassador at Lisbon. Her first success was as Monimia in *The Orphan*, produced by Rich, Nov. 22, 1744. She afterwards acted at Dublin and at Covent Garden, and played Juliet with Garrick (1750). See her own *Apology* (6 vols. 1785); Genest's *Account of the English Stage* (1832).

Bellamy, JACOBUS (1757–86), Dutch poet, was born at Flushing. He was first apprenticed to a baker, but sent (1782) by a clergyman to Utrecht University. He published *Gezangen mijner Jeugd* (1782), *Roosje* (1784), *Vaderlandsche Gezangen* (1783), and *Gezangen* (1785).

Bell Animalcules. See VORTICELLA.

Bellarmino, or BELLARMINE, ROBERT FRANCIS ROMULUS (1542–1621), Roman Catholic theologian, was born at Montepulciano in Tuscany. He became a Jesuit, and lectured at Louvain. Later he held an appointment in the Collegium Romanum, and in 1590 accompanied the legation sent into France by Pope Sixtus v. He was made cardinal in 1599, and archbishop of Capua in 1601, but resigned this post in 1605. For some years before his death he was archbishop of his native town. He died at Rome. He was a rigorous ascetic, and one of the greatest theologians (especially as regards polemics) that the Roman Catholic Church has produced. Works: *Disputationes de Controversiis Christiana Fidei* (1581, '82, '93, 3 vols.), *De Potestate Summi Pontificis* (1610), *Institutiones Hebraicae Linguae*, *De Scriptoribus Ecclesiasticis*, *De Ascensione Mentis in Deum*. A *Life*, founded on autobiography, was written by Fuligatti (1624). Complete editions of his works (5 vols. 1721, and 12 vols. 1870–74).

Bellary. (1.) District, Madras, India, with a dry and healthy climate, but subject to famine, owing to the scarcity of water. Iron, copper, antimony, and alum are found, and there are manufactures of cotton and woollen goods. Area, 5,714 sq. m. Pop. 950,000. (2.) Chief town of above district, a cantonment and cotton centre, with an important railway station, 270 m. N.W. of Madras. The fort is situated on a rock 450 ft. high, and the town lies below. Pop. 58,000.

Bellasis, EDWARD (1800-73), English serjeant-at-law and parliamentary counsel. He acted as one of the trustees over the Shrewsbury estates (1856-67), and in the litigation between the Earl of Shrewsbury and the Duke of Norfolk as to their possession. Bellasis, as a member of one of the old Roman Catholic families of England, wrote numerous pamphlets on the Oxford Tractarian movement.—EDWARD (b. 1852), son of the above, called to the bar (1873); made a study of heraldry, and was appointed Lancaster Herald (1882), and registrar of the College of Arms (1894). His many published works include *The Laws of Arms* (1879); *Memorials of Mr. Serjeant Bellasis* (1893-5).

Bellatrix (γ Orionis), a white star of 1.6 photometric magnitude, situated in the right shoulder of Orion. Bellatrix is a typical helium star. No parallax has been determined for it. It is receding from the sun at the rate of 5.5 m. a second.

Bellay, JOACHIM DU (1524-60), French poet, was born at Lyré, near Angers. In 1548 he met Ronsard, with whom he formed a close friendship; he also joined the group of poets who constituted the Pléiade, a society formed to create a French school of renaissance poetry. It was at this time that he wrote his famous prose work, the *Deffense et Illustration*

de la Langue francoyse (1549). Within a year followed the *Recueil de Poésie* and *L'Olive*. His grace and facility were excelled by none but Ronsard. Later works: *Les Antiquitez de Rome* (1558), *Regre* (1559), *Les Jeux rustiques* (1560). Best edition, Marty-Laveaux's (1866-7). See W. H. Pater's *Studies in the Hist. of the Renaissance* (1873).

Bell-bird, a name given to various birds on account of their note, especially to *Chasmorhynchus niveus*, the campanero of the Spanish settlers in Guiana, one of the chatterers; and to *Anthornis melanura* in New Zealand, a member of the family Meliphagidæ. The former is remarkable for possessing a jet-black caruncle, about three inches long, which depends from the beak, and becomes elongated when the bird utters its bell-like note. See J. J. Quelch, in *The Field*, Nov. 26, 1892.

Belle Alliance, LA, a farm in the centre of the French position at the battle of Waterloo, lies 13 m. S. of Brussels, in Belgium. Belle Alliance is the name the Prussians give to the battle.

Belle de Nuit, the French name of the herb *Mirabilis jalapa*, the 'marvel of Peru.' It has large smooth leaves and clusters of flowers, which expand at night and wither in the morning.

Belleek, par. and vil., Co. Fermanagh, prov. Ulster, Ireland, at W. end of Lough Erne, 3 m. E. of Ballyshannon; noted for its china manufactory.

Bellefontaine, city, Ohio, U.S.A., co. seat of Logan co., 30 m. N. of Springfield. Manufactures railway wagons, carriages, and bridges. Pop. 7,000.

Belle-Ile-en-Mer, isl., Atlantic Ocean, 7 m. S. of Quiberon Pt., dep. Morbihan, France, 10 m. long, 2 to 5 m. wide. Area, 34 sq. m., with a few harbours and a pilchard fishery. Off its coast the British fleet under Hawke de-

feated the French under Conflans in 1759. It was taken by the British in 1761, but restored in 1763. Pop. 9,800.

Belle Isle. (1.) Rocky island (British), 9 m. long and 3 broad, at Atlantic entrance to Str. of Belle Isle, Newfoundland; has two lighthouses. It is noted as the place of origin of the Newfoundland dog. (2.) An isl. of Conception Bay, Newfoundland, about 6 m. by 3; it is fertile and picturesque, having lofty cliffs. (3.) STRAIT OF, the shallow N. outlet of the Gulf of St. Lawrence, between Labrador and Newfoundland; used by vessels in the summer season only. During the winter it is blocked by ice. Its length is 80 m., and its breadth 12 m., and it is divided by Belle Isle.

Belle-Isle, CHARLES LOUIS AUGUSTE FOUQUET, DUC DE (1684-1761), French marshal, grandson of the famous intendant Fouquet, was born at Villefranche in Aveyron. He served with distinction in the war of the Spanish Succession, and was made governor of Metz and a marshal of France. In the war of the Austrian Succession he shared with Broglie the command of the forces, stormed Prague in 1741, and the following year conducted the masterly retreat to Eger. He became minister of war in 1758, and created the military Order of Merit in 1759.

Bellenden, JOHN (fl. 1533-87), Scottish poet and translator, employed by James V. to translate Hector Boece's Latin *History of Scotland*, editions of which appeared in 1536, 1541, and in another unknown year; it was reprinted at Edinburgh in 1821, edited by Thomas Maitland, Lord Dundrennan. This was followed, also at the king's request, by a translation of Livy, which was first published at Edinburgh in 1822, edited by Lord Dundrennan. Those translations are among the

earliest examples now extant of Scottish prose. On the title-page of the Boece translation, Bellenden is described as 'archdene of Moray, channon of Ros.' After the reformation he retired to Italy, where he is supposed to have died.

Bellenden, WILLIAM (c. 1555-1633), classical scholar, was of the Scottish family of Ballantyne or Bellinden, and is said to have been professor at the University of Paris. A distinguished classical scholar and laborious student of Cicero, he published *Ciceronis Princeps* (1608), a collection of Cicero's remarks on regal government; *Ciceronis Consul* (1612), a similar work concerned with consular authority; *De Statu Prisci Orbis* (1615); *De Tribus Luminibus Romanorum* (1634)—unfinished—an elaborate history of Roman institutions drawn from Cicero. C. Middleton compiled his *Life of Cicero* (new ed. 1823) from Bellenden's works.

Bellerophon, son of Glaucus, king of Corinth; his original name was Hipponous, but he was called Bellerophon from having killed Bellerus. He was sent by Proetus, whose wife, Anteia (post-Homeric Sthenobœa), fell in love with him, to Iobates, king of Lycia, with a letter requesting him to procure his death. But by the aid of the winged horse Pegasus, Bellerophon killed the monster Chimæra, defeated the Solymi and the Amazons, and finally cut down an ambush of the bravest Lycians. Later the wrath of the gods fell on him, and he wandered, 'devouring his soul,' in loneliness through the Aleïan fields. Later stories say that he tried to fly to heaven on Pegasus, but that Zeus sent a gadfly, the bite of which caused the horse to throw his rider, who was lamed by the fall. See Homer's *Iliad*, bk. vi.; Hesiod's *Theog.* 325; and Horace's 4th *Ode*, 11.

Bellerophon, British battleship of 18,600 tons and 21½ knots, launched at Portsmouth in 1907; Parsons turbine engines. Armament, ten 12-inch guns and small quick-firers.

Bellerophon, a genus of univalve molluscs abundant in the earlier geological formations. The shells are globular, coiled in a flat spiral in one plane; the mouth is large and circular, with a deep notch in the outer lip, which, as the animal continues to grow, is gradually filled in with calcareous matter, forming a band or keel along the centre of the convex aspect of the shell. See Zittel's *Palæontology*; Nicholson's *Palæontology*; Woodward's *Manual of the Mollusca*.

Belleville. (1.) Manufacturing tn. in Hastings co., prov. Ontario, Canada, at mouth of Moira R., 48 m. N.W. of Kingston by rail; contains the Albert College. It has mills, foundries, and kilns. Pop. 9,000. (2.) City, Illinois, U.S.A., co. seat of St. Clair co., situated in the S.W. part of the state, 14 m. S.E. of St. Louis, on three railways—the Illinois Central, the Louisville and Nashville, and the Southern. It is a manufacturing place of some importance, and has large breweries, iron-works, and flour mills. The seat of a Roman Catholic bishop. Pop. 21,000. (3.) Tn., Essex co., New Jersey, U.S.A., a N. suburb of Newark, on the Passaic R. Manufactures chemicals, rubber goods, wirecloth, and has brass foundries. Pop. 8,000.

Bellevue, city, Campbell co., Kentucky, U.S.A., on the Ohio R. opposite Cincinnati, of which it is a residential district. Pop. 6,500.

Bellew, HAROLD KYRLE (1857), actor and playwright, achieved a rapid success on the English stage, and after winning considerable favour in America (1885-6), he began in 1887 to

appear with Mrs. Brown Potter. They have been especially successful as Romeo and Juliet, and as Leander and Hero in Mr. Bellew's play, *Hero and Leander*. His later rôles include that of Brigadier Gerard in Conan Doyle's play, and he has appeared in *The Thief*. He is the author of *Yvonne* and *Iolande*.

Belley, tn., dep. Ain, France, near R. Rhone, 42 m. E. of Lyons, with an interesting cathedral (9th century) and bishop's palace (1609); produces the best lithographic stones in France. Pop. 5,700.

Bellflower. See CAMPANULA.

Belli, GIUSEPPE GIOACHINO (1791-1863), Italian dialect poet, was born at Rome. In his youth he held a government post, and was secretary to a prince; but afterwards he devoted himself to poetry, writing in the Roman dialect more than 2,000 sonnets descriptive of the life of contemporary Rome (1831-46). His son published some 800 of his sonnets, with many alterations; and these in their original shape were afterwards edited by L. Morandi (*Città di Castello*, 1886-9, 6 vols.).

Bellicent, the half-sister of King Arthur, wife of King Lot of Orkney (this does not agree with Malory), and mother of Gawain, Mordred, and Gareth. See Tennyson's *Idylls of the King*.

Belligerent is the term applied to a nation in a state of war. Its use marks an important distinction in international law between a *de facto* government at war and a subject state or race in rebellion. In the former case belligerent states are bound by the laws of war, in the interest of humanity, to the conduct of the campaign on civilized methods, while they are also brought under definite obligations with respect to neutral powers. Recognition of belligerents by neutrals ensures the

moral, and if necessary the material, support of the latter in the case of any violation of the laws of warfare. In the case of non-recognition of parties as belligerents, these conditions do not obtain. In some instances, even when a nation is divided by internecine strife, recognition of the combatants as belligerents may become inevitable. Such was the case when, during the American civil war, Britain and France recognized the Southern States as a belligerent power. The usual condition of such recognition is, broadly speaking, the existence of hostilities of some magnitude, and the maintenance of a civil government within the disaffected area.

In a more restricted sense, the term is applied to the individual. Combatants are, by the Hague Convention, required to be led by a responsible person, to wear a distinctive emblem, and to observe the customs of war. Individuals failing to observe these conditions, and making what may be termed private war, are liable to be treated as marauders.

Belligerents, Rights and Duties of. A brief and necessarily imperfect account of the rights and duties of belligerents as between enemies is all that can be attempted here. For the mutual rights and duties of belligerents and neutrals see NEUTRALITY and CONTRABAND. A belligerent has the right to use every means which he considers necessary to bring his enemy to terms. This broad and general right, however, is modified amongst civilized states by the humane usage of nations, and by international compact. These modifications, in their widest and perhaps in their ideal application, are summarized in the project of an international declaration concerning the laws and customs of war drawn up by the Brussels

Conference of 1874, but not ratified. Great Britain expressly repudiated them as tending to 'facilitate aggressive wars, and to paralyze the patriotic efforts of an invaded people.' Nevertheless, though not binding, they are useful as indicating a definite code in accordance with the advanced views of the time, and possible of a more or less complete adoption in the future. The first eight articles of the project define military occupation, and give the victorious belligerent the right to take possession of all the property belonging to the government of the vanquished state, together with railways, ships, telegraphs, arms, and munitions of war, whether privately owned or not: these it must administer as usufructuary. Parish property, religious, charitable, educational, artistic, and scientific establishments come under the head of private property (see below). The belligerent occupying a territory may levy all the taxes, dues, duties, and tolls already established in the vanquished state, and must carry out, as far as possible, the ordinary law and administration. Art. 12 prohibits the use of poison or poisoned weapons, the murder of enemies or antagonists who lay down their arms, the employment of arms, projectiles, or substances which cause unnecessary suffering, such as explosive bullets (prohibited by the declaration of St. Petersburg in 1868, and signed by most European states), and the abuse of a flag of truce, the national flag, the Geneva Cross, or the insignia or uniform of the enemy. Succeeding articles forbid the attack or bombardment of open or undefended towns or villages, and in case of bombardment of a fortified place directs that hospitals, religious, artistic, scientific, and charitable buildings, not used at the same time for military

purposes, shall be spared, such buildings being indicated by special visible signs. No town taken by storm shall be given up to plunder. Lawful and disarmed enemies are prisoners of war, to be maintained and treated with humanity, and not to be deprived of their personal property. They may be interned in any locality, but may not be placed in confinement unless such is absolutely necessary. They may be employed on public works, but not in the operations of war. Prisoners attempting to escape may after summons be shot, and if retaken may be punished, but an escaped prisoner retaken is not liable to punishment for his previous escape. Exchange of prisoners and release on parole are lawful. If parole is broken and the prisoner is recaptured, he is deprived of the rights accorded to prisoners of war. War correspondents and other non-combatants with an army may be treated as prisoners of war, but spies and marauders have no such rights. For duties of belligerents with regard to the sick and wounded, see GENEVA CONVENTION. The honour and rights of the family, the life and property of individuals, and their religious convictions and exercises, should be respected. Private property cannot be confiscated, and pillage is expressly forbidden. Regulations are also made as to the duties of belligerents with regard to flags of truce, capitulations, armistices, belligerents interned and wounded treated in neutral territory.

A distinct step towards the adoption of this code was made by the Peace Convention at the Hague in 1899, when the following three special declarations were adopted: 1. Prohibition of the throwing of projectiles and explosives from balloons or by other analogous means; this pro-

hibition to be in force for five years. 2. Prohibition of projectiles intended solely to diffuse asphyxiating or deleterious gases. 3. Prohibition of the use of bullets, such as the dum-dum, which expand easily in the human body. See WAR; DECLARATION OF PARIS; DECLARATION OF LONDON; HAGUE CONFERENCE; INTERNATIONAL LAW; also Maine's *International Law* (1899); Wheaton's *International Law* (4th ed. 1904); Hall's *Peace Conference at the Hague* (1900).

Bellingham, city, Whatcom co., state of Washington, U.S.A., on Puget Sound, 70 m. N. of Seattle, with a very fine landlocked harbour, was formed (1903) by the union of Whatcom and Fairhaven. It has lumber mills and salmon canneries. Pop. about 26,000.

Bellingham. See PERCEVAL SPENCER.

Bellingshausen, FABRIAN GOTTLIEB VON (1778-1852), Russian explorer and naval commander; headed an expedition which sailed in 1819 for the Antarctic regions, and discovered Peter Island and Alexander Land, bestowing on them their respective names. Returning to Russia in 1821, he subsequently received the command of the Russian fleet in the Baltic, and finally became military governor of Cronstadt. A report of his work of exploration appeared in 1831.

Bellini, name of a family of Italian painters, founders of the great Venetian school of the 15th and 16th centuries. (1.) JACOPO or GIACOMO BELLINI (c. 1400-66), b. in Venice; pupil of Pisanello, and of Fabriano, with whom he went to Florence. His frescoes in Verona have been destroyed; two of his pictures are extant; his sketch-book is in the British Museum. He was a portraitist of repute, and opened a school in Padua. (2.) GENTILE BELLINI

(?1426-1507) settled in Venice in 1460. On account of his fame as a portrait painter, he was invited (1479) to Constantinople to paint the sultan, Mohammed II.; he also visited Rome. The glory of Venice was expressed in his great pageant pictures, such as his *Corpus Christi*, his *Miracle of the True Cross*, the *Preaching of St. Mark* (in the Brera, Milan). The National Gallery, London, is rich in examples of his work. (3.) GIOVANNI or GIAMBELLINI BELLINI (1428-1516), the greatest artist of the 15th century in Italy; he united purity of religious aim with perfection of artistic power. In 1582 he was appointed state painter, and his studio became a famous school in which Titian, Giorgione, and Tintoretto were trained. The National Gallery, London, possesses his portrait of the doge, Leonardo Loredano, and three religious subjects. See Ruskin's *Arrows of the Chace* (1880); Roger Fry's *Giovanni Bellini* (1899); Kugler's *Schools of Painting in Italy* (1851).

Bellini, VINCENZO (1801-35), an Italian operatic composer, born at Catania, Sicily; studied at the Conservatorio, Naples. His most popular operas are *La Sonnambula* (1831), *Norma* (1831), and his last work, *I Puritani* (1835). *La Sonnambula* was an unparalleled success when it was produced in London, with Madame Malibran as Amina, the heroine. It is interesting to note that it was in the part of Amina that both Adelina Patti and Albani made their first appearances in Britain. Though Bellini had little dramatic power, he possessed a gift of delicious melody. See *Life* by A. C. Lloyd (1908).

Bellinzona, cap. of the Swiss canton of Ticino, with a station on the St. Gothard line, 40 m. below Airolo, and 20 m. above Lugano. Pop. 5,000.

Bellis Perennis. See DAISY.

Bellite, an explosive prepared from nitrate of ammonia and mono- or di-nitro-benzene. It can be stored and transported with safety, not being exploded by a blow or by friction. It was discovered in 1886, and is said to be three times more powerful than ordinary gunpowder.

Bellman, KARL MIKAEL (1740-95), poet and improvisator, who used the pseudonym of Fredman, and is the most original figure in Swedish literature, was the prince of boon companions, full of the joy of life, frivolous, indolent, and good-natured. His experiences of Stockholm taverns were preserved in verse of exquisite pathos and humour, in *Fredmans Epistlar* (1790) and *Fredmans Sångar* (1791). Gustavus III. gave him a small pension. He generally accompanied his songs with the lute, and the admirable adaptation of tunes to words gives to his works their absolutely unique character. It is very difficult, however, for any one but a Swede properly to appreciate his genius. Burns is the British poet whom he resembles most. See eds. of works by Sondén (1835-6) and Carlén (1855-61; new ed. 1881); also Björkman's *Memoir* (1893), and Erdmann's (1899).

Bell-metal, an alloy used in the manufacture of bells. See BELL.

Bello, FRANCESCO, Italian epic poet (c. 1450-1505), known from his blindness as Cieco da Ferrara, lived at Mantua and Ferrara in great poverty. His poem in 45 cantos, *Mambriano* (first ed. 1509), is a chivalrous romance depicting the adventures of an Oriental prince, and is one of the books which directly inspired the *Orlando Furioso* of Ariosto.

Bello Horizonte, the new capital of Minas Geraes, Brazil, on the slopes of the Serra de Espinhaco, N.W. of the old capital, Ouro Preto, and 390 m. by rail N.N.W. of Rio de Janeiro. There are

gold mines in the neighbourhood. Pop. 25,000.

Bellona, the Roman goddess of war, and sister or wife of Mars. Her worship is possibly of Sabine origin, but her first temple at Rome was only founded in 296 B.C., in the Campus Martius. See Keightley's *Mythology of Ancient Greece and Italy*.

Bellot, JOSEPH RENÉ (1826-53), French naval officer and explorer, born at Paris; distinguished himself in Madagascar (1845), and joined the British Franklin expedition (1851). Two years later he accompanied another Franklin expedition, in which he perished. Bellot Strait is named after him. See *Journal*, ed. Lemer (1854).

Bellot Strait, between N. Somerset I. and Boothia, and connecting Gulf of Boothia and Franklin Channel, N. America.

Bellows-fish, the Cornish name for a group of fishes, sometimes known as sea-snipes, of the family *Tetrodontidæ*, of which other species are popularly known as trumpet-fish, swell-fish, bottle-fish, egg-fish, globe-fish, swell-toad, blower, box-fish, etc., from their peculiar inflated appearance.

Belloy, PIERRE LAURENT BUIRETTE DE (1727-75), French dramatist, a native of Auvergne, entered the dramatic profession, and acted with success in Russia. At Paris, in 1760, he produced *Zelmire*, a marked success, followed by *Le Siège de Calais* (1765), also well received, and *Gaston et Bayard* (1771), which procured his admission to the Academy. Among his other plays are *Gabrielle de Vergy* (1770) and *Pierre le Cruel* (1772). His collected works were published by Gaillard in 1779 and 1787, and a selection by Anger in 1811. See Brongniart's *Pierre Belloy* (1887).

Bell Pepper, the fruit of the *Capsicum grossum*, or Guinea pepper; used in the East as a vegetable, and for pickling.

Bell Rock, or INCHCAPE ROCK, rocky reef (submerged), 6 ac. in extent, off coast of Forfarshire, Scotland, 12 m. E.S.E. of Arbroath, surmounted by lighthouse 120 ft. high. The tradition that the bell placed there by the abbot of Aberbrothock was removed by a pirate whose vessel was at length wrecked on the reef is celebrated in Southey's ballad, *The Inchcape Bell*. See Campbell's *Notes on the Bell Rock* (1904).

Bells, a nautical term used to express the time of day. Thus the twenty-four hours are divided into periods of four hours. Each half-hour of these represents one bell. Thus, beginning at twelve o'clock, half-past twelve is 'one bell,' one o'clock 'two bells,' half-past one 'three bells,' two o'clock 'four bells,' continuing up to four o'clock, when the round begins again.

Bells, THE, the name of a well-known poem by Edgar Allan Poe; also the title of the English version of Erckmann-Chatrian's *Le Juif Polonais*, in the dramatic form of which Sir Henry Irving created the part of Mathias.

Bellshill, tn., N. Lanarkshire, Scotland, 10 m. S.E. of Glasgow; has coal and iron mines. Pop. 9,000.

Bell-the-Cat. See DOUGLAS, ARCHIBALD.

Belluno. (1.) Mountainous prov. of N. Italy, covered almost entirely by the Dolomite Alps (11,000 ft.), and stretching between Tyrol and Venetia. Its principal stream is the Piave. Area, 1,292 sq. m. Pop. 220,000. (2.) Episcopal town, cap. of above, stands on a hill (1,265 ft. above sea-level) above the Piave, 72 m. by rail N. by W. of Venice, with a fine Renaissance cathedral (1515) and silk mills. Pop. 20,000. Belluno is the Roman Belunum; it fell into the hands of Venice in the beginning of the 15th century. Pope Gregory XVI. was

born here in 1765, and the town gave a ducal title to the French marshal Victor.

Belmez, busy and flourishing tn., prov. Cordova, Spain, 35 m. by ry. N.N.W. of Cordova; centre of important coal field now actively worked. Pop. 10,000.

Belmont, tn., Cape of Good Hope, on ry., 60 m. S.W. of Kimberley. Here, on Nov. 23, 1899, Lord Methuen drove the Boers from a strong position on the railway, and two days later stormed Enslin (or Gras Pan).

Belogradum. See BELGRADE.

Beloit, city, Rock co., Wisconsin, U.S.A., on the S. boundary of the state, 85 m. N.W. of Chicago. It contains Beloit College (1847). Its manufactures include reaping and mowing machines, petrol engines, and paper. Pop. 13,000.

Belomancy, divination by means of arrows. In Ezek. 21:21, 22, Nebuchadnezzar had recourse to this form of divination. It was in extensive use among the Arabians. It was practised by shuffling before the image of the god several marked arrows, and by taking the one which was drawn to give the answer.

Belon, PIERRE (1517-64), French naturalist, was born at Soulletière, near Mans. Under the patronage of the Cardinal de Tournon, he travelled for scientific purposes in Greece, Asia Minor, Palestine, and Egypt (1546-9). In 1553 he published his *Observations* during these journeys; he also wrote books on sea-fishes (1551) and birds (1555).

Belone, the typical genus of a group of fishes called the gar, or gar-fish, which have both jaws prolonged into long, narrow, but strong bills. Some of the Belones of the Indian and Pacific Oceans reach a length of five feet.

Belovar, tn., Hungary, cap. of co. of same name, 70 m. W. by S. of Funfkirchen. Pop. 6,000.

Belpasso, tn., prov. Catania, Sicily, on the S. slope (1,805 ft.) of Mt. Etna, 9 m. N.W. of Catania. It replaces the old town of Belpasso, which in 1669 was overwhelmed in an eruption of the mountain. Pop. 10,000.

Belper, par. and mrkt. tn., Derbyshire, England, on Derwent, 7 m. N. of Derby, on Midland Ry.; cotton yarn, hosiery, engineering works, and iron works. Pop. of par. 11,000.

Belphoebe, a character in Spenser's *Faërie Queene*, bk. iii. and iv., twin-sister of Amoret. Belphoebe (who is meant for Queen Elizabeth) represents a stern and self-reliant chastity.

Belsham, THOMAS (1750-1829), English Unitarian divine, was appointed minister of the Independent chapel at Angel Street, Worcester, in 1778, and head of Daventry Academy (1781). He was successively professor of divinity at the Hackney College (1789), minister of the Gravel Pit Unitarian chapel (1794), in succession to Priestley, and of Essex Street chapel (1805). Author of *Memoirs of Theophilus Lindsey* (1812); *Elements of the Philosophy of the Human Mind* (1801); *Letters to the Bishop of London in Vindication of Unitarianism* (1815). See Williams's *Memoirs* (1833).

Belsham, WILLIAM (1752-1827), English political writer and historian, brother of the preceding, devoted his life to the furtherance of Whig doctrines. He wrote *Essays, Philosophical, Historical, and Literary* (1789-91), and *Remarks on the Nature and Necessity of Political Reform* (1793). His historical works were reissued in 1806 in 12 vols., under the title of *History of Great Britain to the Conclusion of the Peace of Amiens*.

Belshazzar, according to Dan. 5 the son of Nebuchadnezzar, and the last Chaldean king of Babylon, who was slain, and his em-

pire subjugated, by the Medes, under Darius. Secular history now agrees with the monuments in stating that the last king of Babylon was Nabonnedos (Nabuna'id), who was conquered by Cyrus, and the consequent difficulty of finding a historical place for Belshazzar has long been recognized. The inscriptions reveal further, however, that Nabonnedos had a son named Bel-sharuzur, who seems to have acted in Babylon as prince-regent, and whose identity with the Belshazzar of Daniel is therefore hardly open to doubt. See Sayce, *Higher Criticism and the Monuments*, p. 525 f. (3rd ed. 1894).

Belt, GREAT, strait between Zealand and Fünen, Denmark, the middle channel connecting the Baltic and the Kattegat; about 40 m. long, and from 11 to 17 m. broad, the depth varying from 30 to 150 ft. Navigation is rendered difficult by shoals, and in winter by ice.

Belt, LITTLE, strait between Jutland and Fünen, the w. channel connecting the Baltic and the Kattegat; about 30 m. long, and from 1 to 12 m. broad, the depth varying from 30 to 180 ft. The hindrances to shipping are similar to those of the Great Belt. During the first four months of the year it is generally frozen.

Belt and Rope Gearing.

When shafts are too far apart to be connected by toothed wheels, a continuous rotary motion may be transmitted from the one to the other by means of endless flexible bands, belts, or ropes and suitable pulleys, the friction between the bands and pulleys being sufficient to overcome the resistance which the pulleys offer to motion. Because of its tendency to slip on its pulley, a belt should not be used in cases where the ratio of the number of revolutions between the shafts has to remain

fixed. At the same time, this possible slipping of the belt may save the machine which is being driven from serious injury in the event of a sudden increase of the driving pressure. Belts are made of leather (oak-tanned or raw-hide); cotton; waterproof canvas; india-rubber and canvas; gutta-percha, canvas, and balata; llama hair, etc.

Leather Belts.—Most belts are made from oak-tanned leather; but raw-hide belts are strongly recommended by some belt makers, as the fibre is not dried or hardened, but remains soft and pliable, and retains the full strength, toughness, and elasticity of the green hide. Raw-hide belting is certainly stronger than ordinary tanned leather, and it is much thinner.

Chain or Link Belting is made of a series of short pieces or links of leather joined together by pins. The links hinge on these pins; consequently a link belt, without undue straining, can drive a comparatively small pulley, and is very suitable for high speeds. Messrs. Tullis make this class of belt with a flexible centre, and arched on the running side to fit the convexity of the pulley (Fig. 1). The illustration also shows

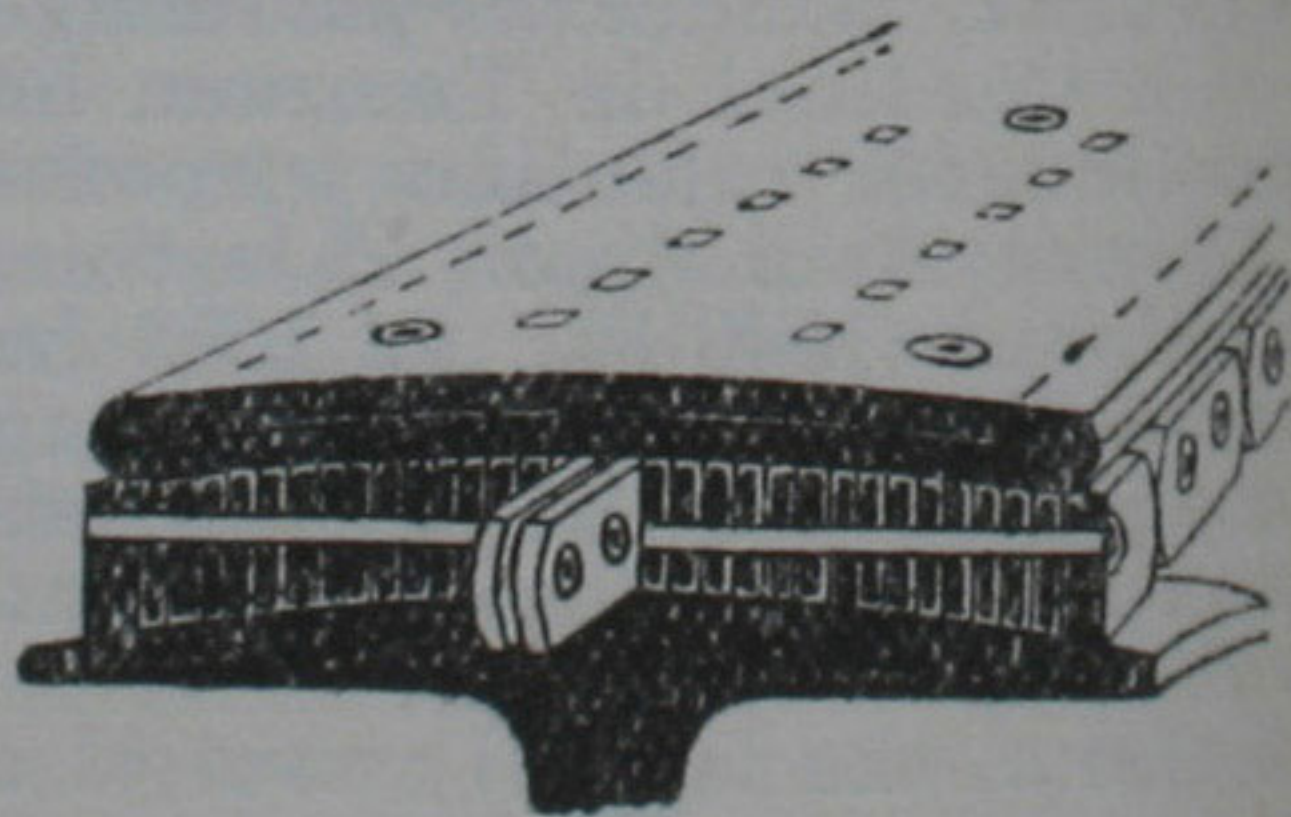


FIG. 1.

another feature in belt-driving—the running of one belt on the top of another. An ordinary double belt is here shown working independently on the top of the link belt. The outside belt is thus practically working on a pulley

with a leather face. Ordinary flat belts (two or more) are compounded in the same way. They may all drive the same pulley, or be taken to different pulleys. This system allows a large increase in the power transmitted, without increasing the width of pulleys. The belts are not in any way connected together, and the outer belt 'creeps' over the inner belt. This creeping action does not, however, affect the efficiency of the drive.

Hendry's Patent Laminated Belting consists of a number of narrow leather strands placed side by side on edge and sewn together. The strands are well stretched before being built up, so that the after-stretching of the belt should

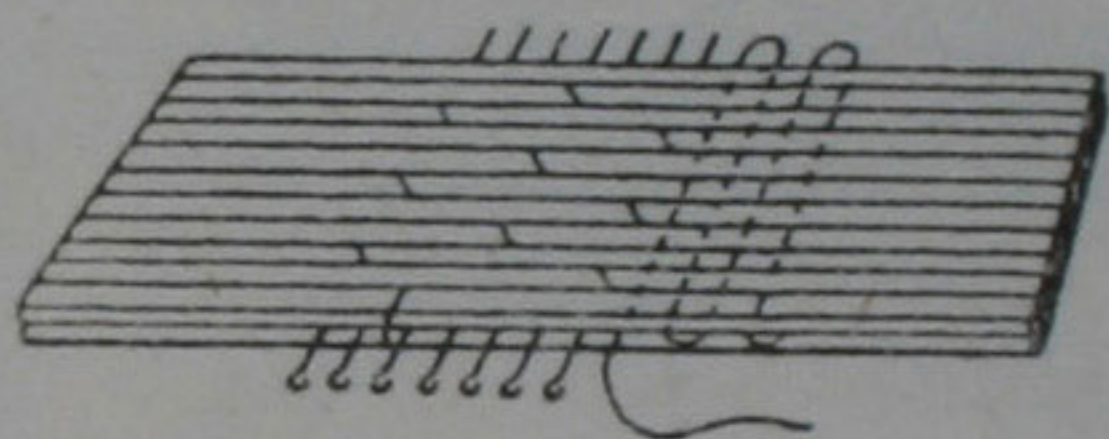


FIG. 2.

be very small. It can be made continuous—*i.e.* without a cross-joint—and in this respect it is distinctly valuable. The construction of the belt and the method of making a splice are shown in Fig. 2.

Woven Leather Belts.—Another very interesting form of belt, single or double, is made from continuous thongs of leather, woven together by a specially constructed loom to any width or length. These belts are generally made continuous, but if necessary, a joint may be made in the usual way by lapping and lacing, or by means of a splice similar to an ordinary rope-splice. The chief features of these belts are said to be great strength, lightness, pliability, and non-liability to air-cushioning. As practically all the stretch is removed from the belt during manufacture, there is very

little after-stretch, and the belt runs straight.

Cotton Belting.—The Gandy cotton belts are made from hard woven American cotton duck or

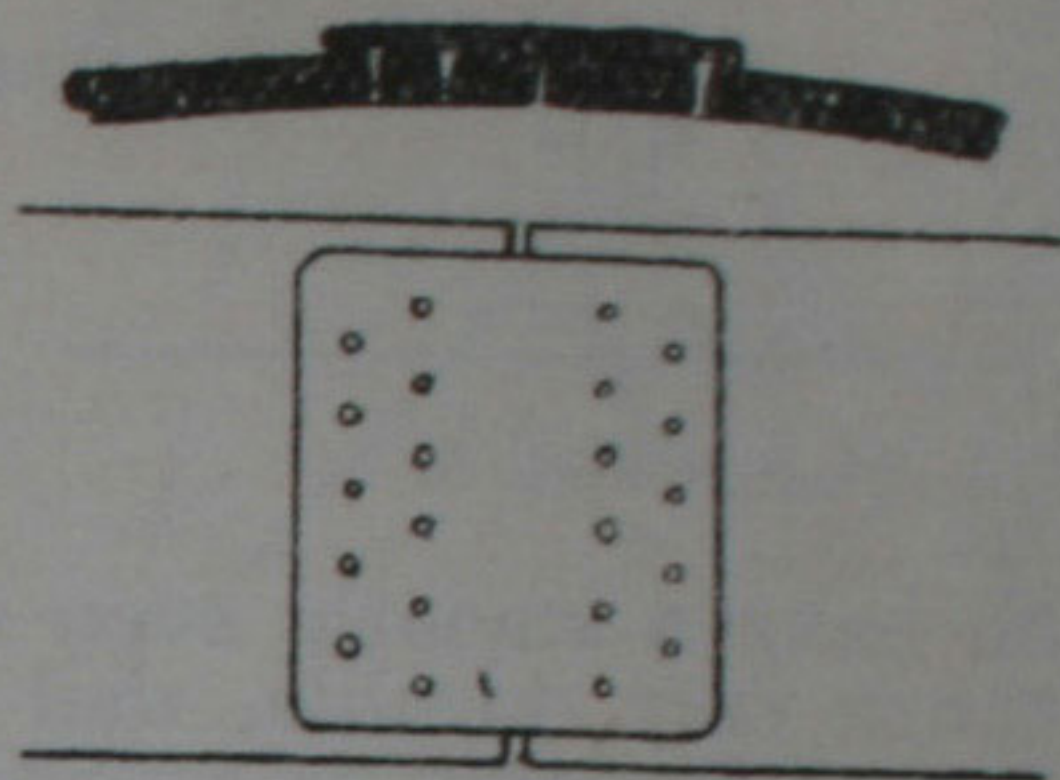


FIG. 3.

canvas. A special width is woven for each width of belt, so as to secure two selvage edges and uniformity of cross-section. The canvas thus woven is folded and stitched, and after being treated with oil and paint is stretched in a frame. This belt is waterproof and unaffected by temperature, so that it is suitable for exposed situations. Another cotton belt is made of several plies of canvas, treated with gutta-percha and balata; it possesses considerable strength, and is thoroughly

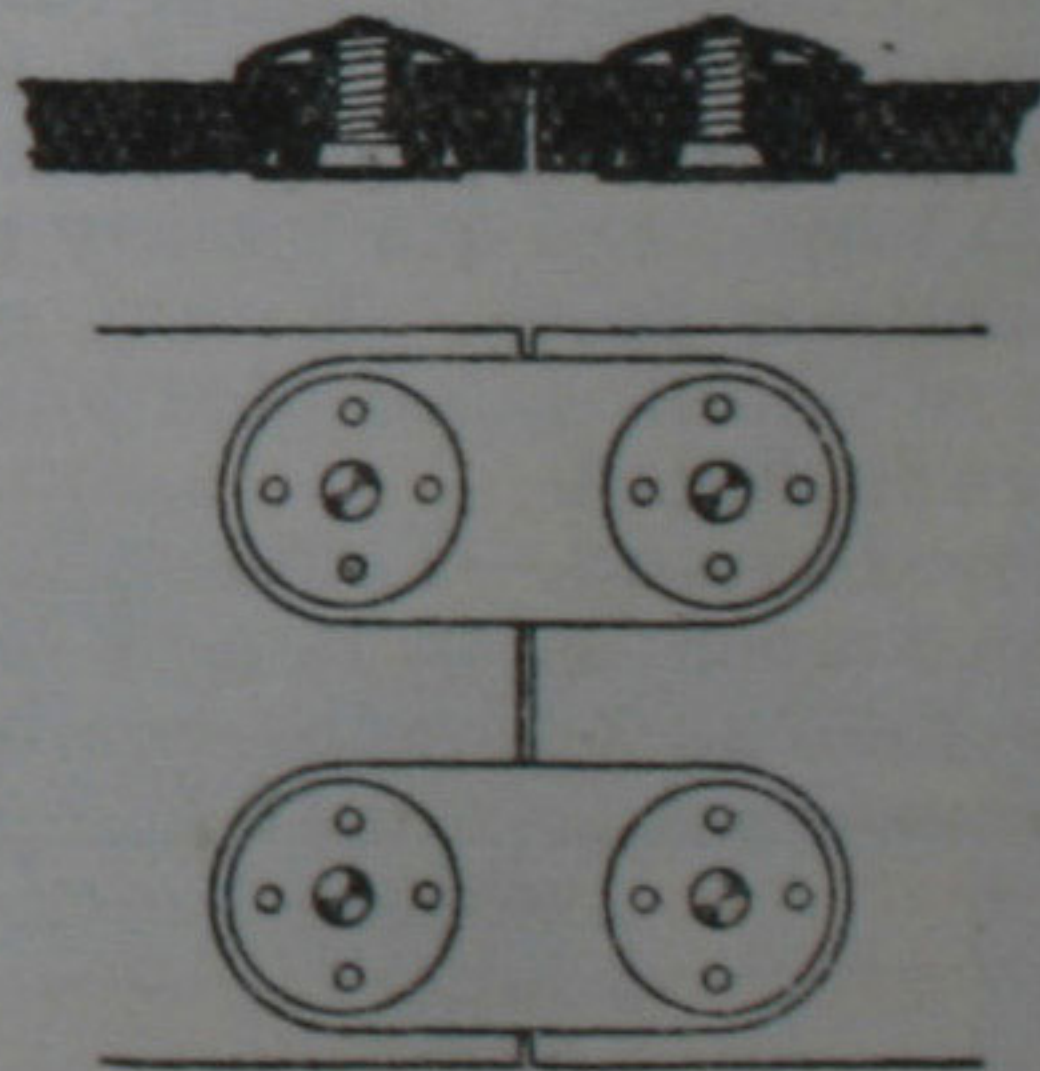


FIG. 4.

waterproof. A third belt is manufactured from American cotton canvas, cemented in layers by vulcanized india-rubber, and covered by a specially prepared compound of india-rubber. The rubber is

forced into the canvas while passing through the rolls of a special form of calender. These belts,

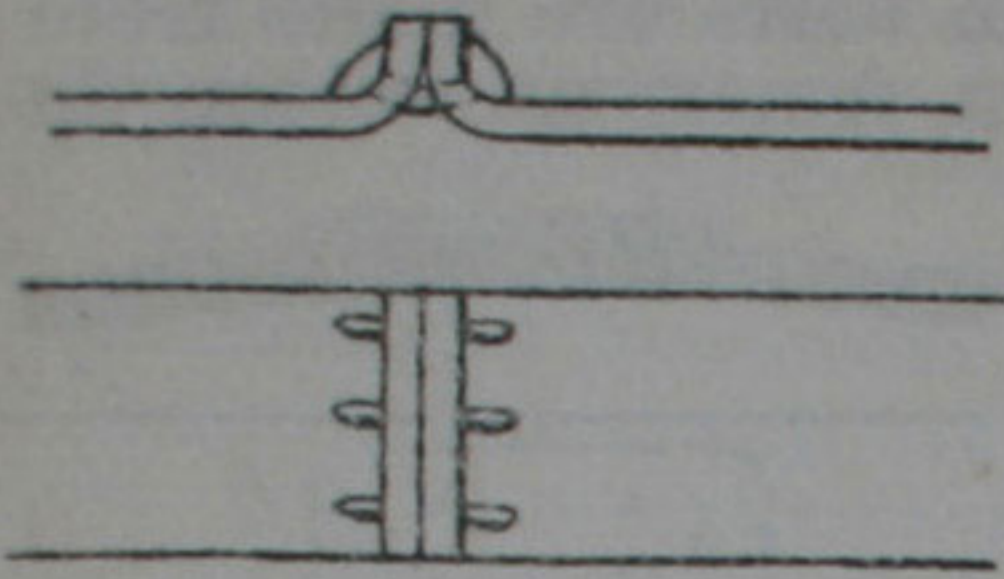


FIG. 5.

which have a smooth, even surface, are very durable, and are unaffected by damp or exposure; the tensile strength per unit width is greater than that of leather belting, and they obtain a very good grip of the pulley. Resistance to slip round the pulley is naturally a most valuable property of a driving belt. These belts can be made endless, or may be jointed by using a suitable belt-fastener.

Belt-Fasteners.—The following illustrations show a few of the most commonly used belt-fasteners, the method of attachment to the belt being clearly indicated in each case. Harris's (Fig. 3) and Jackson's (Fig. 4) fasteners are very suitable for india-rubber or canvas belts. Green's belt-fasteners (Fig. 5) are made of tough brass, and are mainly used for leather belts. A very good form of double-laced butt joint is shown in Fig. 6.

Rope-Driving.—This method of power-transmission is now being widely used, especially for large

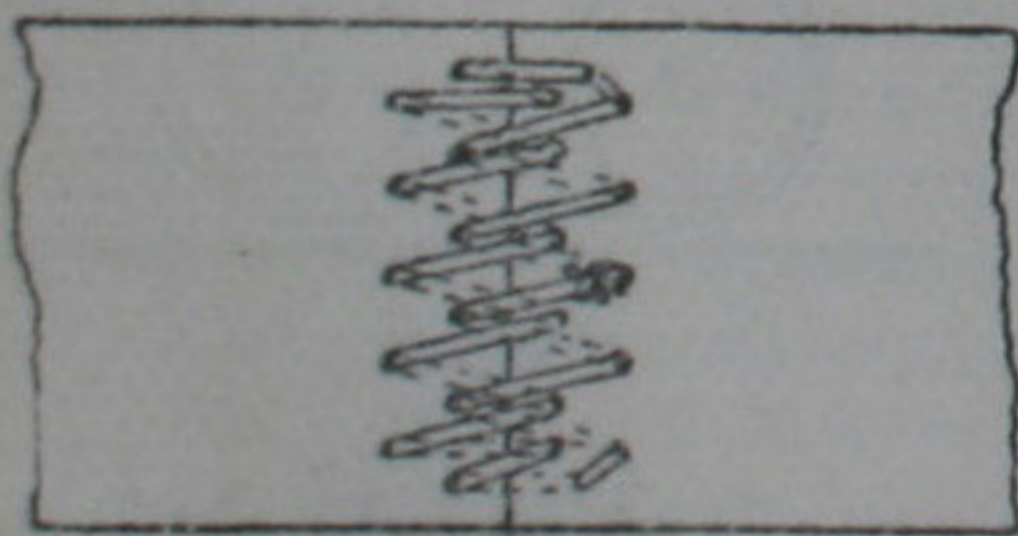


FIG. 6.

installations. The ropes are made of hemp, manilla, or cotton. The pulleys used for this kind of gear-

ing are made with V grooves on their peripheries. (See Fig. 7.) The angle of groove generally adopted is 45° , and it should be so constructed as to avoid all possible chance of the rope reaching the bottom. With ropes the resistance to slipping is largely augmented by the wedging action of the grooves, so that the ropes are put on the pulleys with very little initial tension. The Lambeth cotton rope (Fig. 8), manufactured at Blackburn, is made up of four strands twisted round

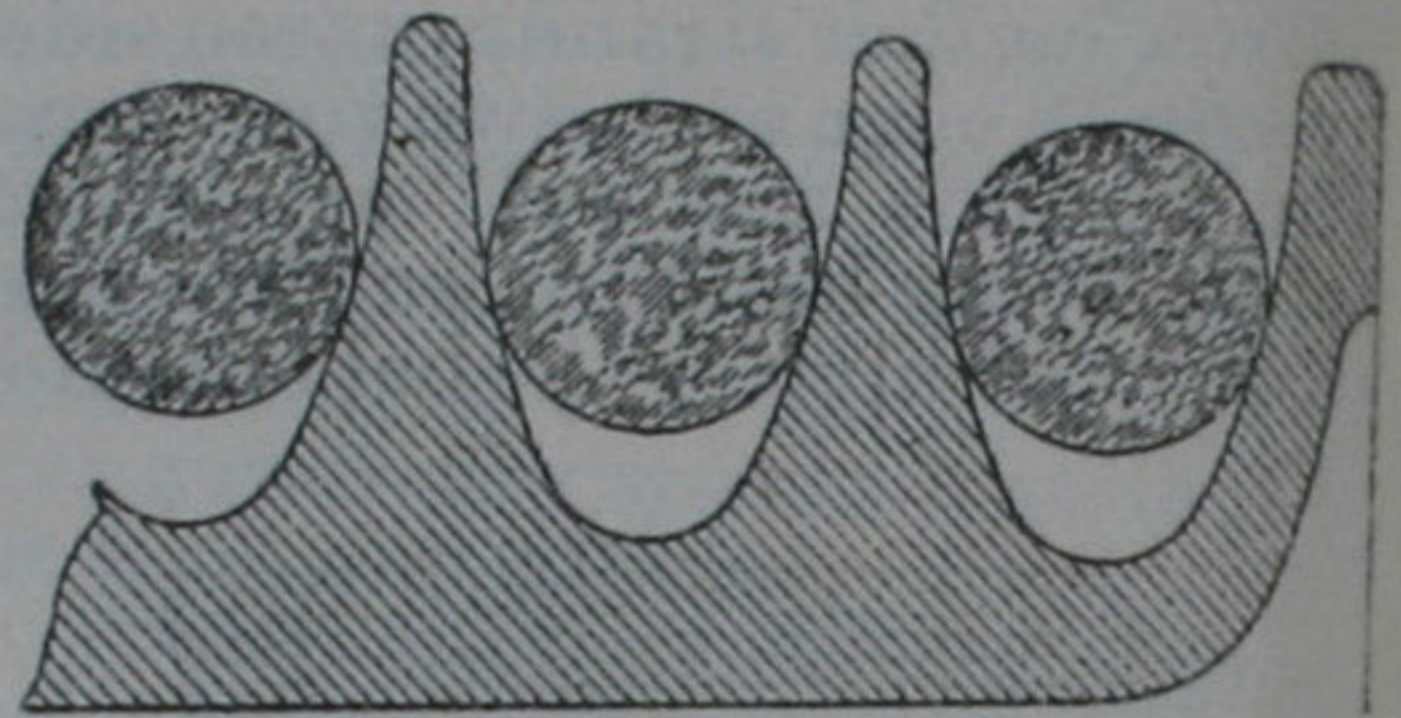


FIG. 7.

a central core; each strand is covered spirally with ten twisted cords of cotton yarn, which serves as a protecting envelope to the



FIG. 8.

inner or working part of the strand, and preserves it from contact and wear in the groove, without interfering with its flexibility or strength. No pulley for rope-driving should be less than thirty times the diameter of the rope, as the internal compressive stresses set up on the inside of a rope by bending quickly round a too small pulley soon break up the rope. The following extract from a table compiled by Mr. C. N. Pickworth shows the horse power that may be safely transmitted by

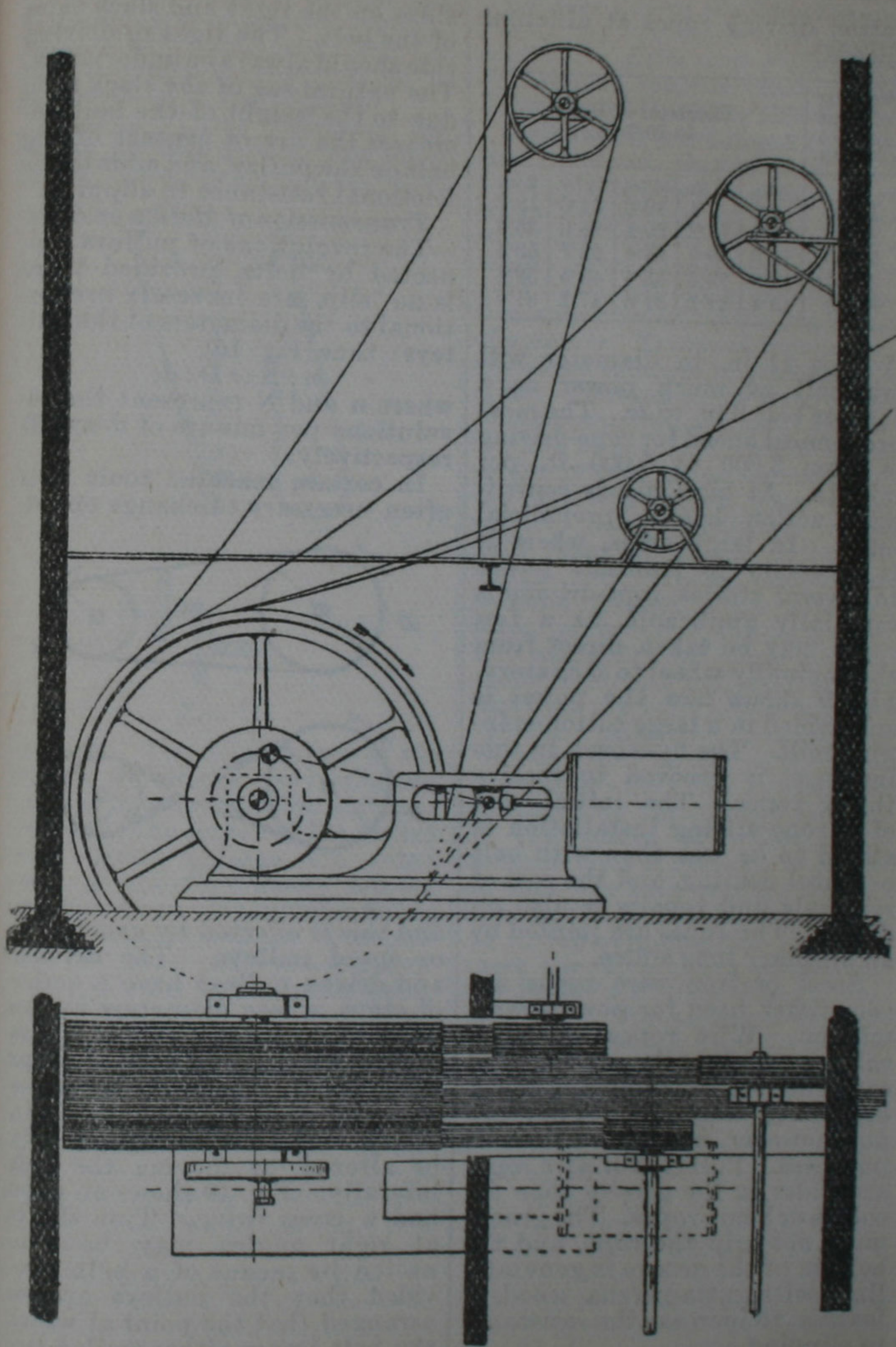


FIG. 9.

cotton driving ropes at different speeds:—

Velocity of Rope in Feet per Min.	Diameter of Rope in Inches.				
	1 in.	1½ in.	1¾ in.	1¾ in.	2 in.
1,000	4.5	7.1	10.2	14.0	18.2
2,000	9.1	14.2	20.5	28.0	36.5
3,000	12.6	19.8	28.4	38.7	50.4
4,000	14.8	23.2	33.4	45.5	59.4
5,000	15.4	24.1	34.6	47.1	61.5

A rope 1½ in. in diameter will transmit as much power as a leather belt 6 in. wide. The most economical speed for rope-driving is from 3,600 to 5,000 ft. per minute. At high speeds centrifugal action has a prejudicial effect. In large mills, where it is necessary to transmit power to several stories, rope-driving is especially applicable, as a few ropes may be taken direct from the engine fly-wheel to each story. Fig. 9 shows how the power is subdivided in a large cotton-spinning mill. The fly-wheel, in this instance, is grooved to receive thirty ropes. The initial cost of a rope-driving installation is stated to be less than with belt or wheel gearing, and the cost of renewals and repairs is also reduced. The ropes are jointed by an ordinary long splice.

Steel or iron wire ropes are sometimes used for power-transmission. Wire ropes are naturally exceptionally strong, and can be used for transmitting power over long distances. They are not, however, much used for mill purposes. Pulleys for wire ropes are wider in the groove than for cotton or hemprobes. The groove must not grip the rope, and the bottom of the groove is generally lined with gutta-percha, wood, or leather, to increase the resistance to slipping.

Transmission of Power by Belts.

—The effective driving force is the difference between the ten-

sions on the tight and slack sides of the belt. The tight or driving side should always be underneath. The natural sag of the slack side, due to the weight of the belt, increases the arc of contact of the belt on the pulley, and adds to the frictional resistance to slipping.

Transmission of Motion by Belts.

—The revolutions of pulleys connected by belts, provided there is no 'slip,' are inversely proportional to the diameters of the pulleys: thus (Fig. 10),

$$n : N :: D : d,$$

where n and N represent the revolutions per minute of d and D respectively.

In certain machine tools it is often necessary to change speed,

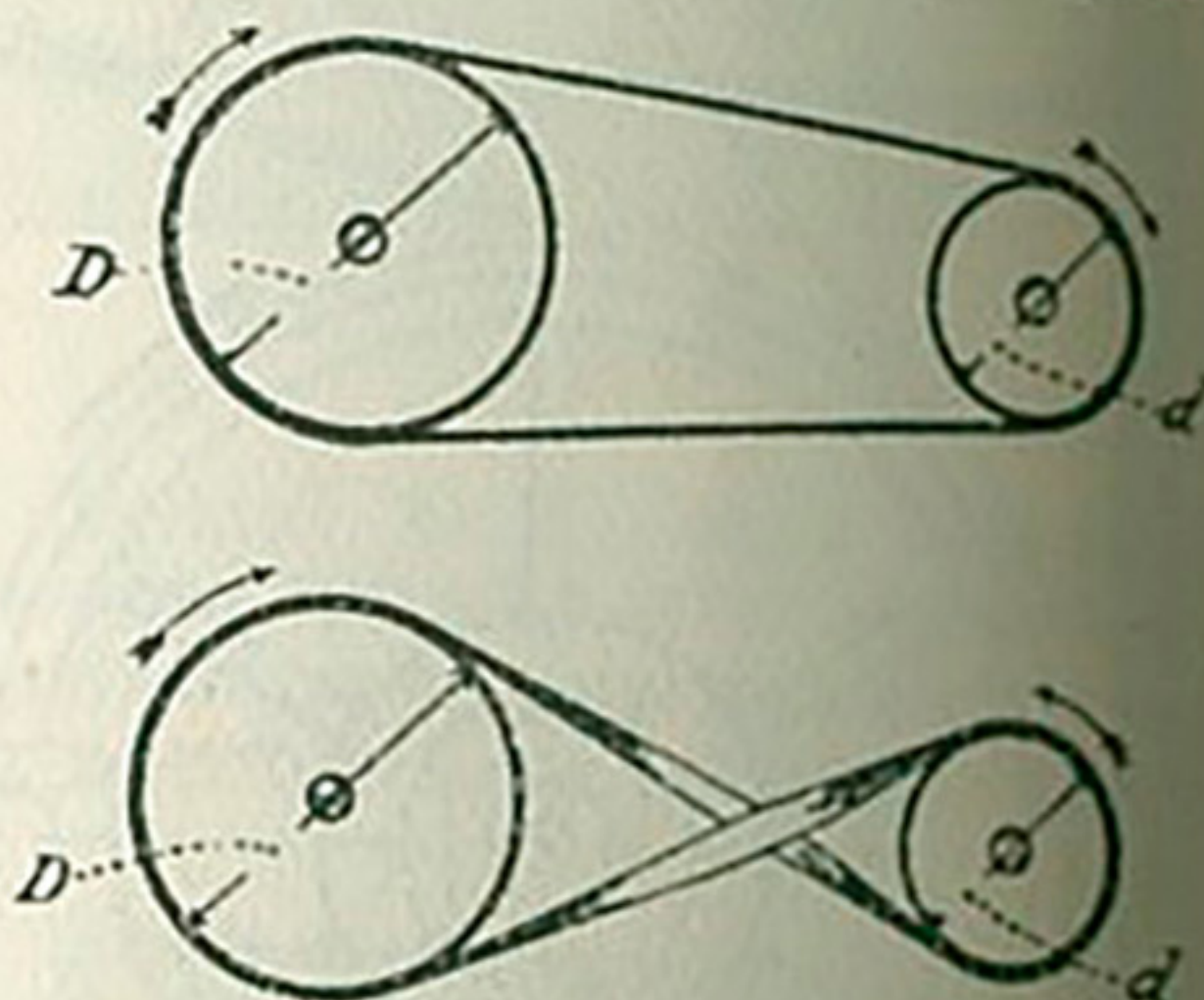


FIG. 10.

and this is effected by using cone or speed pulleys. The driving and driven pulleys have a series of steps, whose diameters are so proportioned that the belt fits each corresponding pair of steps with equal tension. In some cases the pulleys are tapered in such a way that the speed may be altered by moving the belt laterally. Fig. 10 shows an open and a cross drive. Two shafts at right angles may be connected by means of a belt, provided that the pulleys are so arranged that the point at which the belt leaves either pulley lies in the plane passing through the centre of width of the other pulley (Fig. 11). Motion may be

conveyed by belts in almost any direction, provided suitable guide-pulleys are introduced, and the above condition observed as to the position of the pulleys.

Pulleys.—These necessary adjuncts in belt-driving are made of cast iron, wrought iron, steel,

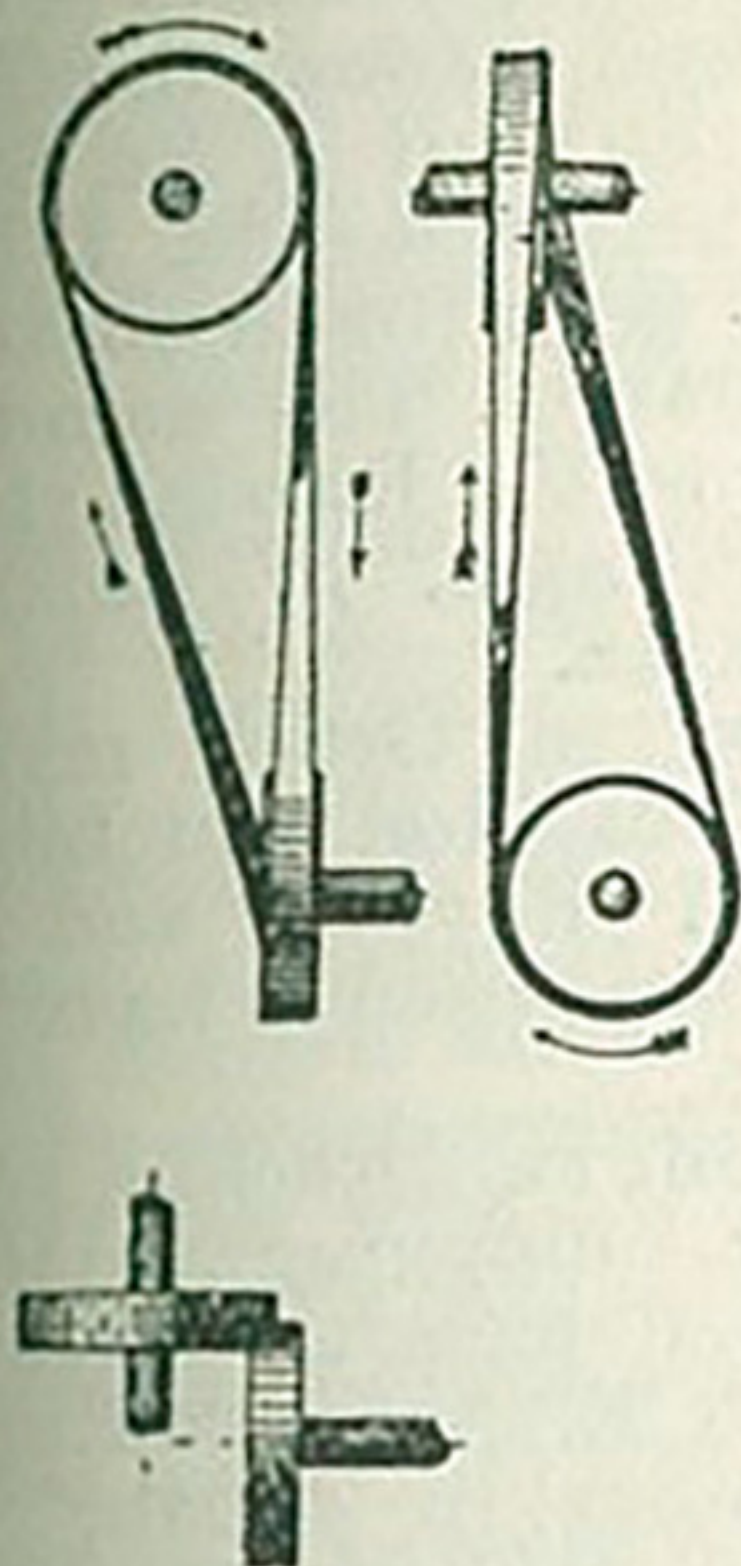


FIG. 11.

or wood. The driving face of the pulley should be very slightly convex, in order that the belt may remain in the centre of the pulley face. Split pulleys are often used, as they are easily erected or taken down without interfering with the shaft bearings. Wrought-iron and steel pulleys are generally split, the pulley arms being sometimes made of cast iron, though latterly, for safety at high speeds, wrought iron and steel have been used. Wood split pulleys, which are now extensively used, possess the following advantages over iron pulleys: great lightness (thereby lessening the weight on shaft and bearings, and reducing friction); easy attachment to shaft (no keys being required); better grip between belt and pulley. Wood pulleys are now made from 4 to 72 in. in diameter, and from 3 to 18 in. in width.

See *Elements of Machine Design*, Part I., by Professor Unwin (new ed. 1901); *Belts and Pulleys*, by J. Howard Cromwell (1885); *Belt-Driving*, by Halliday (1894).

Beltane, a word found in Scotland, Ireland, Cumberland, and Cornwall, applied in a secondary sense to the first of May (or, in some districts, to St. John's Eve and St. Peter's Day), but originally used to denote the great fire festivals which marked the beginning of summer. Traces of human sacrifices at them were particularly clear. Beltane cakes were baked for the occasion, and used in casting lots to determine which of the company was to be sacrificed as the Beltane witch (the death penalty being mitigated into a mild form of social outlawry). Songs and dances, known as Beltane games, were also an accompaniment of the ceremony. The antiquity of these observances is further indicated by the fact that the bonfire was kindled by the primitive method of 'forced' or 'need' fire (Gael. *tein-eigin*)—*i.e.* from combustion produced by the violent friction of two pieces of wood. The Beltane rites continued to linger on into the 19th century in certain parts of the British Isles. As to the etymology of the word there has been much discussion. See Frazer's *Golden Bough*, vol. iii. (1900). For accounts of Beltane observances, see *Old Statistical Accounts of Scotland* (1794-99).

Belt Case (Belt *v.* Lawes), celebrated libel action, heard at Westminster by Baron Huddleston and a jury on forty-three days between June 21 and Dec. 28, 1882. Both plaintiff and defendant were sculptors, and Belt had been in Lawes's employment before setting up for himself. The libels complained of were contained in an article written by Lawes in *Vanity Fair* (Aug.

1881), and in a letter written by him to the lord mayor of London. In the article Lawes charged Belt with passing off as his own certain sculptures 'worked up' by persons in his service, and by them invested with whatever artistic merit they possessed. The trial was remarkable, not only for its duration, but for the number and position of the witnesses (several B.A.'s being called on the artistic questions involved), the extraordinary complications and side issues which resulted, and the curious disclosures which were made. The jury found for Belt, with £5,000 damages.

Beltrami, EUGENIO (1835-1900), Italian mathematician, remembered for the important departures which he made in the study of geometry. He held the theory that non-Euclidian geometry deals with surfaces of constant negative curvature. He published *Saggio di Interpretazione della Geometria non-Euclidia* (in *Giornale di Matematico VI.*), and other valuable papers on mathematics and physics.

Beltrami, GIULIO CESARE (1779-1855), Italian traveller and patriot, born at Bergamo; was forced to leave Italy in 1821, in consequence of his relations with the Carbonari societies, and went to America, where he conceived the idea of searching for the sources of the Mississippi. In 1823 he took part in the scientific expedition under Major Long; but leaving his companions, he succeeded in discovering the sources of the Mississippi, and in 1824 published, at New Orleans, *La Découverte des Sources du Mississippi*. He afterwards made a long journey through Mexico, and proceeded to London in 1827, where he published *A Pilgrimage in Europe and America, leading to the Discovery of the Sources of the Mississippi* (1828). His latest work was *Le Mexique* (2 vols. 1830).

Beluchistan. See BALUCHISTAN.

Beluga, or WHITE WHALE (*Delphinapterus leucas*), a cetacean allied to the narwhal, but without the remarkable tusk of that animal. The beluga is from twelve to sixteen feet in length, as the name indicates is white in colour, and is found in large numbers in the Gulf of St. Lawrence and in the Arctic seas. It has occasionally been found off the coast of Scotland. The name is also applied to the Russian sturgeon.

Belur-tagh, or BOLOR-TAGH. See PAMIRS.

Belus, in Greek mythology, son of Poseidon and Libya, and father of Ægyptus and Danaus. He was supposed to have founded Babylon.

Belvedere (*Kochia scoparia*), a plant belonging to the order Chenopodiaceæ, a native of Central and E. Asia, and employed medicinally in Japan. It is a common ornamental plant in British gardens, and is sometimes called the 'summer cypress.'

Belvedere, a summer-house or kiosk on a rising ground, or a room built above the roof of a house for the purpose of viewing the surrounding country. In France the term is also used for a summer-house in a garden.

Belvidere, city, Illinois, U.S.A., co. seat of Boone co., 68 m. W.N.W. of Chicago. Sewing machines, motor cars, and boilers are manufactured. Pop. 7,000.

Belvisia (*Napoleona imperialis*), an African plant closely allied to the mangrove, with flowers of a brilliant red, blue, or white colour, and an edible fruit resembling the pomegranate.

Belvoir Castle, Leicestershire, England, 8 m. W. of Grantham, the seat of the Duke of Rutland. The original building was a fortress, erected soon after the Conquest by Robert de Todeni, standard-bearer to William I.

and was several times burned down or otherwise destroyed. The present pile is a modern castellated, hollow quadrangle, restored by Wyatt, measuring 252 ft. along the east front, and containing a noble apartment called the Regent's Gallery, 127 ft. long. The castle stands on an isolated hill, and commands a view of thirty miles over the picturesque Vale of Belvoir. A fire destroyed part of it in 1816, including a famous picture gallery.

Belz, tn., Galicia, Austria, 35 m. N. of Lemberg. Pop. 5,000.

Belzoni, GIOVANNI BATTISTA (1778-1823), Egyptologist, was born at Padua. In 1803 he came to England, and for some time supported himself and his English wife by street acrobatic performances; but with an engagement at Astley's Amphitheatre his circumstances improved, and he devoted much time to studying mechanics. In 1812 he began to travel, visiting Portugal, Spain, and Egypt, where he designed a hydraulic machine for raising the waters of the Nile. He then visited Thebes, and removed the Young Memnon statue, which he sent to London. He investigated the temple of Edfu, visited Elephantina and Philæ, discovered the temple of Abusimbel, worked at Karnak, and found a magnificent tomb in the Bibân-el-Moluk. He was the first to enter the second pyramid at Gizeh, and to visit the oases west of Lake Moeris. In 1821 he published a record of his discoveries (*Narrative of Recent Discoveries in Egypt and Nubia*). He then attempted to reach Timbuktu, but died of dysentery on his way inland from Benin.

Bem, JOSEPH (1795-1850), Polish general, a native of Tarnov, Galicia. He took part in the Polish rebellion of 1830-31, and specially distinguished himself at

Ostrolenka. After the fall of Warsaw (1831) he took refuge in Paris. In 1848 he was at the head of 10,000 Hungarian insurgents, with whom he overran Transylvania, but was defeated by the allies at Schässburg on July 31, and again at Temesvar on Aug. 9. Bem fled to Turkey, adopted Islamism, and entered the Turkish army, receiving the title of Amurat Pasha. He was sent to Aleppo in 1850, to suppress an Arab attack upon the Christian population, and there died of fever. See Pataky's *Bem in Siebenbürgen* (1850).

Bemba, LAKE. See BANGWEOLO.

Bembex, a genus of Hymenopterous insects specially noticeable for their burrowing propensities, and generally known as 'sand-wasps.' They are found chiefly in warm climates, where they affect sandy banks, on which the females deposit their eggs, provide food for the larvæ, and then close up the holes with earth.

Bembo, PIETRO (1470-1547), Italian humanist, born in Venice. He learned Greek under Laskaris, and became a leading member of the academy of Aldus Manutius at Venice. From 1513 to 1521 he was secretary to Pope Leo X., and in 1539 was made a cardinal, receiving in 1541 the see of Gubbio, and later that of Bergamo. His works greatly contributed to the creation of a good style, both in Latin and in Italian. Among them are: *Epistolæ* (1535); *Rerum Veneticarum Libri XII.*, from 1487 to 1513 (pub. 1551); *Carmina* (1533), clever imitations of Petrarch; *Prose nelle quali si ragiona della Volgar Lingua* (1525), an epoch-making book for Italian grammar; *Gli Asolani* (1505), philosophical talks about love; and *Rime* (1530). His *Tutte Opere* appeared in Venice (1729, 4 vols.) and Milan (1808 and 1824, 12 vols.).

Bembridge Beds, fresh-water deposits belonging to the Oligocene, and consisting of a creamy limestone composed of fresh-water shells—*e.g.* *Paludina*, *Planorbis*, *Limnæa*—and blue and red calcareous marls. The little nucules of the fresh-water plant *Chara* are abundant in the limestone. Remains of the mammals *Anoplotherium* and *Palæotherium* have been obtained in these beds. The name is derived from Bembridge in the Isle of Wight. See Woodward's *Geology of England and Wales* (1887); *Mem. Geol. Surv. I. of Wight* (Reid and Strahan, 1889).

Ben. (1.) A Lowland Scotch word denoting the inner part of a house, the *ben* (or *be-in*), in opposition to the *but* (*be-out*), or outer chamber. (2.) Gaelic for 'mountain' (Cymric form, *pen* or *penn*), occurring as a prefix in the British Isles (*Ben Nevis*, *Pen-nigant*, *Penmaenmawr*, *Twelve Pins*) and in S. Europe (*Pennine Alps*, *Apennines*, and *Pindus*). (3.) A Hebrew syllable signifying 'son,' as in Benjamin and Benoni.

Benacus, LACUS. See GARDA.

Benadir, an administrative division of Italian Somaliland, E. Africa, extending from the Juba N. to Meghed.

Benalla, tn., Victoria, Australia, in Delatite co., 110 m. N.E. of Melbourne; in agricultural and fruit-growing district. Pop. 3,000.

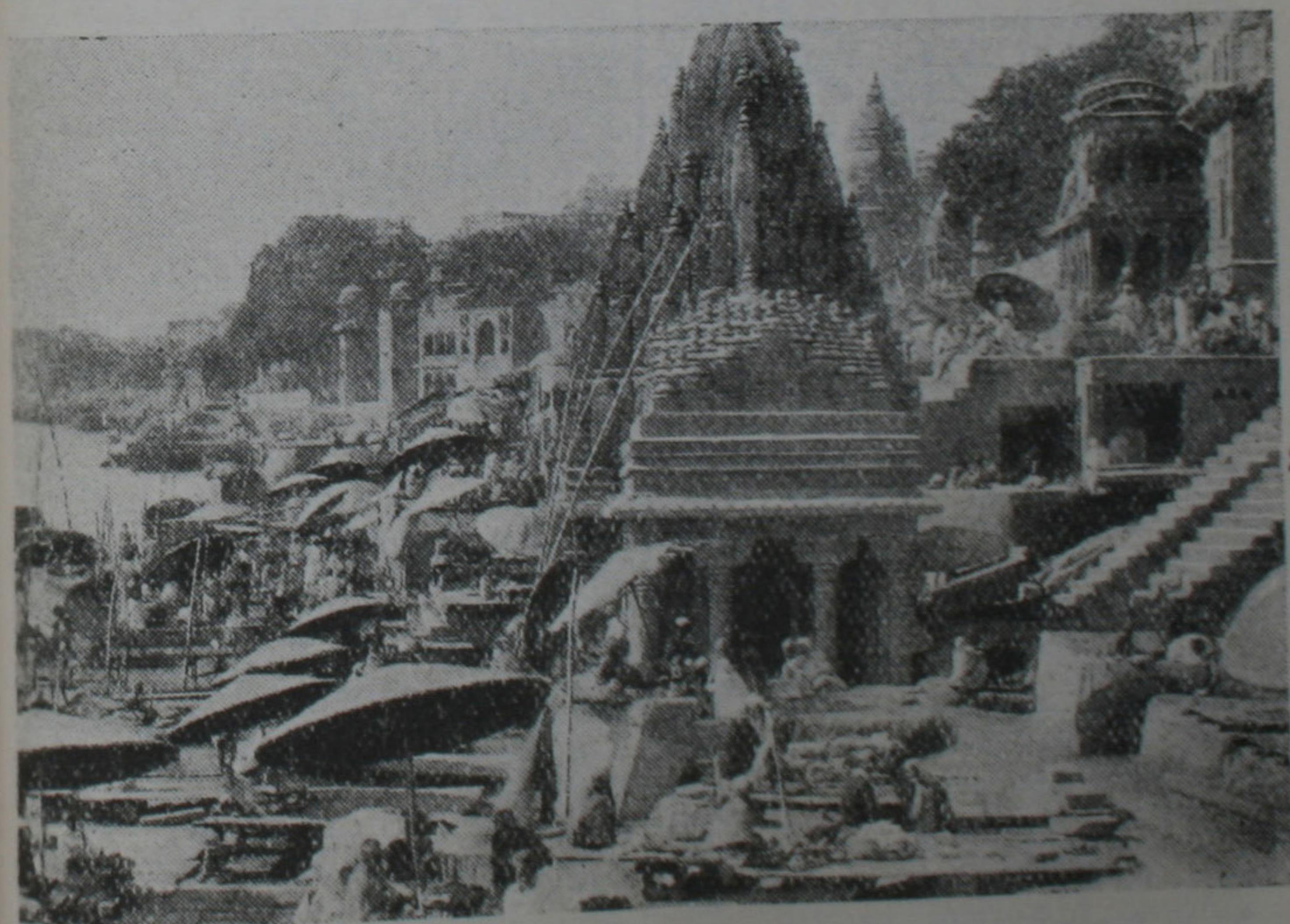
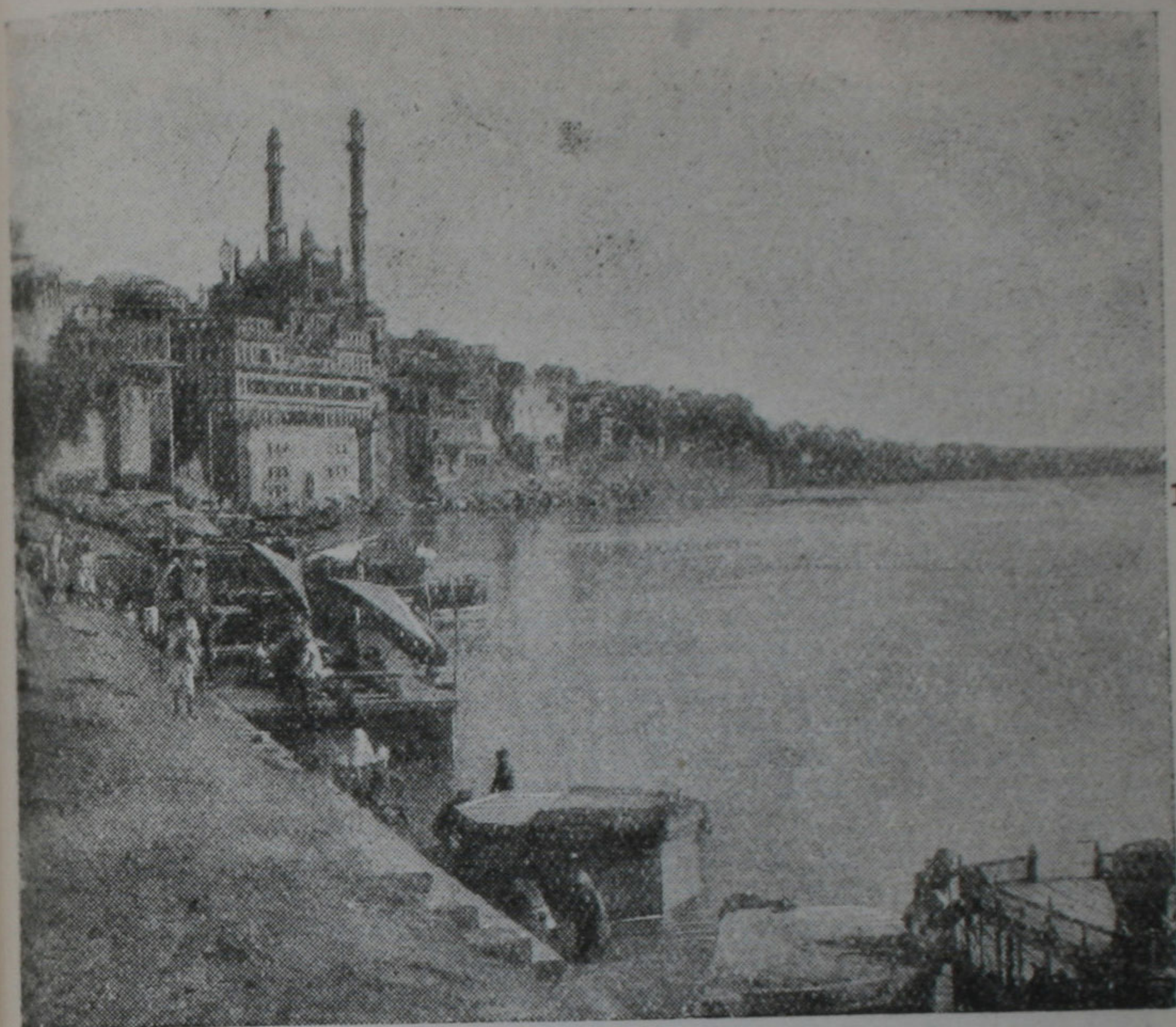
Benares. (1.) Chief tn. of dist. and div. of same name, United Provinces, India; is situated on the l. bk. of the Ganges, 400 m. N.W. of Calcutta. Its narrow, tortuous, ill-kept streets are crowded with temples, Hindu and Buddhist. Extensive embankments of stone steps (*ghâts*) lead down to the sacred river, here accessible to large steamers. The city is the chief seat of Brahmanical learning, and is

annually visited by swarms of pilgrims from all parts of Asia. The centre also of wealth and commerce, it includes the manufacture of silk, cloth of gold, and gold filigree among its important industries. It has a large market for Manchester goods, and for sugar, saltpetre, and indigo, produced in the surrounding country. Sikrol, the European quarter, lies to the N.W. of the native city. Here, among other public buildings, is a college established by the British government in 1791 for the study of Sanskrit. Benares is one of the oldest cities in the world, and has been the 'holy city of the Hindus' for over twenty-five centuries. Pop. 210,000. See Havell's *Benares: the Sacred City* (1905); Murdoch's *Kasi or Benares* (1894); and Kennedy's *Life and Work in Benares* (1884). (2.) Division; area, 10,423 sq. m.; pop. 5,000,000. (3.) District; area, 1,009 sq. m.; pop. 880,000.

Benavente, ancient walled tn., prov. Zamora, Spain, 35 m. N. of Zamora. It is the centre of an agricultural district. Here Moore began his retreat to Corunna (1808). Pop. 5,000.

Benbecula (Gael. 'mountain of the fords'), isl. between N. and S. Uist, Outer Hebrides, Inverness-shire, Scotland; contains numerous bays, and is largely engaged in the rearing of cattle and in fishing. Pop. 900.

Benbow, JOHN (1653-1702), British vice-admiral, acted as master of the fleet in the battle off Beachy Head in 1690, and at Barfleure and La Hogue in 1692. In 1693-4 he was in charge of a squadron which burned Dieppe, bombarded Havre and Calais, and otherwise annoyed the French coast. In 1695 he became rear-admiral, and in 1698 took command of a force in the Channel. In 1699 he commanded in the W. Indies. In 1700 he became a vice-



Views in Benares.
1. The Great Mosque of Aurungzebe and adjoining ghats. 2. The Manikarnika Ghat.

admiral, and in 1702 returned to the W. Indies, where the French, under Du Casse, were active against the English. On August 19 he attacked the enemy, and although deserted by some of his captains, he carried on a running fight for five days almost single-handed. Benbow, who lost his leg, and was also wounded in the head, conducted the action from a cradle on his quarter-deck. Du Casse, however, escaped. Benbow died from his injuries at Jamaica.

Bencher. See INNS OF COURT.

Bench-warrant, a warrant signed at the assizes by a judge and at sessions by two justices for the arrest of a person against whom an indictment has been found before the court issuing the warrant, and who is not in custody.

Bencoolen, or BENKULEN (Du. *Benkoelen*), seapt. tn. of the Dutch E. Indies, on the w. coast of Sumatra, in $3^{\circ} 47'$ s. lat. Vessels anchor 3 m. from the town. Fort Marlborough, the residence of the governor of the residency, was built in 1714. Pop. about 7,000. The residency of Bencoolen stretches along the Sumatran coast from $2^{\circ} 30'$ to $5^{\circ} 58'$ s. lat., and embraces an area of 9,440 sq. m., with a population of about 160,000. This part of Sumatra was an English possession from 1685 to 1825, when it was exchanged for the Dutch settlements on the Malay Peninsula.

Ben Cruachan, mt., Argyllshire, Scotland, between Loch Awe and Loch Etive. Alt. 3,690 ft.

Benczur, JULIUS (1844), Hungarian painter, born at Nyireghaza. In 1867 he painted *The Departure of Ladislaus Hunyady*, and afterwards executed for the king of Bavaria several historical portraits, as *Louis XV. in the Boudoir of Dubarry*, *Louis XVI. and his Family at Versailles*, etc. In 1877 he produced a magnificent historical canvas, *The*

Baptism of St. Stephen, King of Hungary, now in the National Museum at Budapest. In 1883 he was appointed professor, and later became director, of the Academy of Painting in Budapest, where he devoted himself to portrait-painting, and executed numerous portraits of the Hungarian aristocracy—Koloman Tisza, Count Julius Andrassy, and Count Julius Karolyi.

Bend, in heraldry one of the honourable ordinaries, is a figure with parallel edges, extending diagonally right across the shield from the dexter chief to the sinister base. Its size (*i.e.* width) is, if charged, one-third of the field; if uncharged, one-fifth. It is supposed to represent the scarf or shoulder-belt of a knight. The bend has three diminutives—the *bendlet*, which is (in width) half the bend; and the *cost* or *cotice*, which is half the bendlet; the third is the ribbon, of the same width with the cost, but coupé at the ends. The bend sinister is the bend dexter reversed—*i.e.* sloping from the sinister chief to the dexter base. It is needless to blazon the direction of a bend, however, unless it be sinister. The bend sinister has two diminutives—the *scarp* (half the bend) and the *baton* (half the scarp, and coupé at the ends). **BENDY**, one of the varied fields, is formed by dividing the field into an equal number of bends of two alternating tinctures. 'In bend,' or 'per bend,' is said of charges or partition lines when placed in the direction of a bend. There is a popular error that the bend sinister is a mark of illegitimacy, but no such association originally attached to it, and the use of the bend sinister has no necessary connection with illegitimacy or dishonour. It is true that it has been used to denote bastardy, but it is then more usual to find it diminished

to the bendlet or baston, which latter seems to have been the real mark of illegitimacy. The common but utterly incorrect expression *bar sinister* arises from the fact that the French name for a bend sinister is *une barre*; but this is totally distinct from a *bar* in English, which is a horizontal piece: a *bar sinister* is therefore an impossibility. See HERALDRY.

Benda, GEORG (1722-95), Bohemian musical composer and musical director at Berlin (1740), Gotha (1748), Hamburg (1778), and again at Gotha in 1766. His *Ariadne in Naxos*, *Pygmalion*, and *Medea* enjoyed a high reputation.

Bendall, CECIL (1856-1906), English Orientalist, fellow of Caius College (1879-85); became assistant in department of Oriental MSS. and books at the British Museum (1882-98); and was appointed professor of Sanskrit in University College, London (1885). His works include *Catalogue of Buddhist Sanscrit MSS. in the University Library, Cambridge* (1883), *A Journey of Literary and Archæological Research in Nepal and Northern India* (1886), and *Cikshasamuccaya* (1897-1902).

Bendemann, EDUARD (1811-89), German painter of Jewish descent, born in Berlin; studied under W. von Schadow. In 1832 he produced *The Jews in Babylon*, now in the museum of Cologne, which excited a good deal of attention; in 1835 he produced another great work, *Jeremiah on the Ruins of Jerusalem*, now in the royal palace at Hanover. In 1838 he was appointed professor of the academy at Dresden, and at the same time was entrusted with the painting of a series of frescoes (historical, allegorical, and religious) in the throne-room and ball-room at the royal palace. This work, upon which he was engaged till 1855, illustrates *The Progress of the Hu-*

man Race. Of his later pictures the more important are: *The Carrying Away of the Jews into the Babylonian Captivity* (1872), now in the National Gallery at Berlin; and *Penelope* (1877), in the museum at Antwerp. Bendemann represents the older German school of historic painting, his canvases being nobly conceived and accurately drawn, but lacking in force and passion.

Bender, or BENDERI, chief tn. of Bender dist., Bessarabia, Russia, on r. bk. of the Dniester, 62 m. N.W. of Odessa; has an active trade in cereals, wine, wood, and cattle. Bender was the asylum of Charles XII. of Sweden after his overthrow at Poltava (1709). It was acquired by Russia in 1812. Pop. 35,000.

Bender Abbas, or BANDAR ABBAS (formerly *Gombrun*, or *Gombroon*), seapt., prov. Kerman, Persia, 12 m. N.W. of Ormuz, on N. side of Ormuz Str.; so named after Abbas I., who, with the assistance of the English, drove the Portuguese out of Ormuz (1622), and transferred the trade to this new port. Under the Anglo-Russian Convention Bender Abbas is in the British sphere of influence. Much trade is done with Europe and India, chiefly in British vessels. Exports (valued at £200,000 per annum) include dates, almonds, raisins and other fruits, drugs, raw cotton, dyeing materials, and wool. Pop. 7,000.

Bender Gez, seapt., Persia, prov. of and 20 m. W. of Astrabad, at the S.E. corner of the Caspian Sea. Its exports are valued at £300,000 per annum, of which two-thirds is raw cotton.

Bendigo (formerly *Sandhurst*), cap. of the co. of Bendigo, Victoria, Australia, and the chief town of a large district devoted to gold-mining and farming. The gold field, 30 sq. m. in area, has, since its discovery in 1851, yielded gold to the value of

£70,000,000. The town stands on Bendigo Creek, a trib. of the Campaspe, 101 m. by rail N.N.W. of Melbourne. Pop. 30,000. See Mackay's *Hist. of Bendigo* (1891).

Bendzin, tn., Piotrkow gov., Russian Poland, 100 m. S. by W. of Lodz; has zinc works and coal mines. Pop. 22,000.

Benedek, LUDWIG AUGUST VON (1804-81), Austrian general, was of Hungarian birth, but entered the Austrian army in 1822. After suppressing the revolt in W. Galicia (1846), he distinguished himself at Mortara and Novara (1849) in Italy, and at Raab, Komorn, Uj-Szegedin (1849) in Hungary. He again won further credit in the Italian campaign of 1859. He was appointed governor of Hungary in 1860, and subsequently commander-in-chief at Venice. In 1866 he commanded the northern Austrian army against Prussia, but at Sadowa, on July 3, the Austrian troops suffered a complete and disastrous defeat.

Beneden, PIERRE JOSEPH VAN (1809-94), Belgian zoologist, became head of the Louvain Museum of Natural History in 1831, and in 1835 was appointed to a chair at the University of Ghent, followed in 1836 by a professorship at the Catholic University, Louvain. He became president, in 1881, of the Belgian Academy of Sciences. In collaboration with Gervais, he published *Zoologie médicale* (1859) and *Ostéographie des Cétacés vivants et fossiles* (1868-80); and alone, *La Vie Animale et ses Mystères* (1863), and other works.

Benedetti, VINCENT, COUNT (1817-1900), French diplomatist, born at Bastia in Corsica; was ambassador at Berlin in the last years of the second (French) empire, and was directly concerned in the sudden declaration of war by France against Prussia in 1870. His *Ma Mission en Prusse* (1871) and *Essais Diplomatiques* (1895-

99) are very important for the understanding of Bismarck's diplomacy in 1866-70.

Benedicite, the canticle more properly called 'The Song of the Three Holy Children,' recorded in the Apocrypha as chanted by Shadrach, Meshach, and Abednego (therein styled Ananias, Azarias, and Misael) in the 'burning fiery furnace.' In the Prayer Book it is inserted as an alternative to the Te Deum in the morning service. Grace before meat, in the Catholic Church and in colleges, is also known as Benedicite. See Humphry's *Treatise on the Book of Common Prayer* (6th ed. 1885).

Benedict, the name of fourteen popes and of one anti-pope. BENEDICT VIII., elevated to the papal chair in 1012, crowned the Emperor Henry II., and defeated the Saracens, who had invaded his territory. He died in 1024. BENEDICT IX., 'the boy pope,' took office in 1033, but was deposed by Henry III. in 1048. The last of the Benedicts was Prospero Lambertini, BENEDICT XIV., who succeeded Clement XII. in 1740, and was a patron of literature and science, distinguished for the standard treatise which he wrote on the subject of 'beatification.' He died in 1758.

Benedict, surnamed BISCOP (c. 628-690), an Anglo-Saxon monk who journeyed several times to Rome, whence he brought books, pictures, and relics for the monastery which he afterwards founded (674) at Wearmouth. He also erected (682) another religious house at Jarrow, 6 m. distant. Leland ascribes to him *Concordantia Regularum*, a commendation of the rules of St. Benedict.

Benedict, ST. (480-543), founder of the first religious order in the West, was born of a wealthy family at Nursia, near Spoleto, and was at a very early age convinced of the necessity of a

life of solitary meditation. Appointed abbot of the monastery of Vicovaro, he left it because the life of the monks was not severe enough. In the course of a few years numbers flocked after him, including the sons of wealthy Romans and uncivilized Goths, and he was able to found twelve monasteries. After some time he sought (about 529) another retreat, and, accompanied by a few followers, founded the monastery of Monte Cassino, near Naples, which afterwards became one of the richest and most famous in Italy. Here he had an interview with Totila, king of the Goths, whom he sternly reprovved. In 515 he wrote his *Regula Monachorum*, which ultimately became the standard rule of the Western monastic orders. See Dugdale's *Monasticon* (1655), Mabillon's *Annales Ordinis S. Benedicti* (1703-39), and Stubbs's Preface to the *Memorials of S. Dunstan* (1858).

Benedict, SIR JULIUS (1804-85), musical composer and pianist, born at Stuttgart; was a favourite pupil of both Hummel and Weber, and held appointments as conductor at Vienna (1824) and Naples (1826). After becoming known as the composer of several operas, Benedict, acting on the advice of Malibran, went to London (1835), and was conductor at Covent Garden, Drury Lane, the Monday popular concerts, and various musical festivals. In 1850-51 he acted as concert director during a successful tour made through America by Jenny Lind. Besides much miscellaneous music, he composed two symphonies, the oratorios *St. Peter* (1870) and *St. Cecilia* (1867), the cantatas *Undine* (1860) and *Graziella* (new ed. 1882), the operas *The Gipsy's Warning* (1838), *The Crusaders* (1846), *The Brides of Venice* (1844), and *The Lily of Kil-*

larney (1862). He was knighted in 1871.

Benedictine. See LIQUEURS.

Benedictines, an order of monks who profess to follow the rules of St. Benedict. The Benedictines, constituting the great body of religious properly called monks, wear a loose black gown with large, wide sleeves, and a capoch or cowl on their heads, ending in a point behind. They are sometimes styled Black Monks, but are not to be confounded with the Black Friars, who were Dominicans. By this order the English were converted to the Christian faith. St. Augustine, Archbishop of Canterbury, was a Benedictine. At the dissolution of the monasteries the number of Benedictine institutions was 186, with revenues amounting to over £65,000. Since its institution the order has given to the Roman Catholic Church no less than 40 Popes (including Gregory VII. and Urban II.). The Benedictines have produced eminent men of learning. In 1904 there were 128 Benedictine monasteries, numbering 4,565 inmates. See *The Holy Rule of St. Benedict* (1885), Montalembert's *Monks of the West* (trans. Gasquet, 6 vols., 1895), Cardinal Newman's *Mission of St. Benedict* (1858) and *The Benedictine Schools* (1859), Taylor's *Index Monasticus* (1821), Ranbek's *Saints of the Order of St. Benedict* (1890), Weldon's *Chronicle of the English Benedictine Monks* (1882), and W.E. Addis and T. Arnold's *The Catholic Dictionary* (1897).

Benediction, the prayer for blessing pronounced by the minister at the close of divine service, usually either in the words of 2 Cor. 13:14, or in the form given at the end of the communion service of the Church of England. The custom of receiving benediction by bowing the head is of very ancient usage. In the Roman

Catholic Church the benediction of the Blessed Sacrament—a comparatively modern rite—is a solemn function in which, after the host has been exposed in a monstrance, the priest, wearing the cope and the veil, makes the sign of the cross with the monstrance over the people. The Congregation of Rites orders this benediction to be given in silence.

Benedictus (Lat. 'blessed'), the hymn of Zacharias (Luke 1:68), used from ancient times in the services of the churches of Rome and England. The term is also applied to a part of the Roman mass service, beginning '*Benedictus qui venit.*' as well as to a musical setting of the same.

Benedix, (JULIUS) RODERICH, (1811-73), German author, actor, and singer, went on the stage in 1831, and for the next ten years appeared in various towns. From 1842 to 1861 he was mainly at Cologne, as director of the Stadttheater, teacher of dramatic art, and man of letters; from 1861 to his death he lived at Leipzig. His earliest success was *Das be-mooste Haupt* (1841); other plays worth mentioning are *Doctor Wespe*, *Eigensinn*, *Das Gefängnis*, *Die Zärtlichen Verwandten*, and *Mathilde*. He was a master of the comedy of situation rather than of character, and pictured German middle-class life. He published a selection from his shorter plays—*Haustheater* (1862); a selection from the longer plays is the *Volkstheater* (1882). Besides this dramatic work he wrote *Bilder aus dem Schauspielerleben* (1847), *Die Lehre vom mündlichen Vortrag* (1852; 8th ed. 1897), *Das Wesen des deutschen Rhythmus* (1862). His posthumous work, *Die Shakespearomanie* (1874), was much criticised.

Benefice. In England this term is applied to an ecclesiastical living in the Church of England, and sometimes, in a

more general sense, to any form of ecclesiastical preferment in that church. A clergyman obtains a benefice by presentation by the patron of the advowson, or, if the patron is a bishop, by collation (which has the same effect as presentation), followed in each case by admission by the bishop, institution (by which the clergyman is vested with spiritual powers), and induction (which gives him the temporalities). A benefice may be lost by simony, or the possession of more livings than is lawful (see PLURALISM), or continued disobedience to authority (see PUBLIC WORSHIP REGULATION), or by non-residence. A clergyman must reside on his benefice nine months in the year; but the bishop can authorize non-residence on the ground of mental incapacity or ill-health of the incumbent, his wife, or child, or if no residence is obtainable; and the bishop, with the consent of the archbishop, can grant leave in other cases. In Scotland the term 'benefice' may still be used of a living of the Established Church, consisting in the older parishes of the glebe, the manse, and the stipend from teinds, and in *quoad sacra* parishes of the manse and stipend, generally provided out of voluntary endowments; but it is not so generally used as in England, except with reference to the old state of things before the reformation, when benefices consisted of temporalities or lands, which have nearly all gone to the crown, and spiritualities or teinds, which still belong to the church. (See TEINDS.)

Beneficiary. See TRUST.

Benefit of Clergy was the term applied to the privilege by which a clerk in holy orders, when charged with an offence before a court, was entitled to have the case removed to the

ecclesiastical courts. At first the offender could either purge himself on oath before the ecclesiastical courts, or he suffered degradation. At a later date imprisonment for life in the bishops' prison was substituted for degradation. Compurgation and imprisonment by the bishop were abolished in 1576. The privilege, which had been extended to peers in 1547, was eventually granted to all clerks—*i.e.* all persons who could read—and could only be claimed once. The offender was branded in the hand with M for a murderer, and T for a thief. The graver offences were successively excepted from the privilege by statute, and 'benefit of clergy' was abolished for peers in 1827, and commoners in 1841.

Benefit Societies. See FRIENDLY SOCIETIES.

Beneke, FRIEDRICH EDUARD (1798–1854), German philosopher, born at Berlin. His *Erkenntnisslehre*, or 'Theory of Knowledge' (1820), in which he opposes the philosophy of Hegel and Kant, shows a strong sympathy with the Scottish metaphysicians. In his view the basis of all philosophy consists in empirical psychology, and mental phenomena are to be treated by the methods of natural history. In 1832 he succeeded Hegel as professor of philosophy at Berlin. His system can be most readily grasped from his *Lehrbuch der Psychologie als Naturwissenschaft* (1833; new ed. 1877). There are Memoirs of him in German by J. Friedrich (1898) and Gramzow (1899).

Beneschau, tn., Austria, in the centre of Bohemia, 25 m. S.S.E. of Prague. Pop. 7,000.

Benevento. (1.) Mountainous and agricultural province, South Italy, midway between the Gulf of Naples and the Gulf of Manfredonia. Area, 837 sq. m. Pop. 265,000. (2.) The ancient

Beneventum, capital and archiepiscopal see of above, stands on a hill, 60 m. by rail (*viâ Aversa*) N.E. of Naples. On the N. side of the town, which still retains its mediæval walls, stands the 'Golden Gate,' an exceptionally handsome triumphal arch, erected in 116 to do honour to the Emperor Trajan. The Lombardo-Saracenic cathedral dates from the 12th and 13th centuries. The church of St. Sophia, also Lombardic in style, was built four centuries earlier than the cathedral; it has been modernized. Pop. 25,000. Beneventum was a Sabine town, and was occupied by Rome in 300 B.C. Close by, Pyrrhus, king of Epirus, was defeated by the Romans in 275 B.C. Benevento was in part destroyed by Totila, king of the Goths, in 545 A.D. From the 6th to the 11th century it was the chief town of a Lombard duchy or duchies, but in 1053 was conferred by the emperor Henry III. upon the Pope. Owing to its commanding position on the Apian Way, it had long been a place of importance. In 1266 the German king Manfred was defeated and slain near Benevento by Charles of Anjou. The town was captured by the French in 1798; and in 1806 it was created a principality by Napoleon, and conferred upon Talleyrand. Benevento was nearly destroyed by an earthquake in 1668.

Benevolence, forced loans demanded from the English people by Edward IV. and succeeding sovereigns. Though such exactions had been not unknown before, it was in 1473 that the word was first used. Benevolences, though under the guise of a willing offering by the subject, were absolutely compulsory, and the custom became one of the chief grievances of the nation. Nominally abolished by Parliament in 1484, it yet persisted until the

time of the Stewarts. The first clause in the Petition of Right, 1628, made such benevolences illegal. See *Political History of England*, vol. vii. (1907).

Benfey, THEODOR (1809-81), German Orientalist, and a very distinguished student of comparative philology and folklore, was born at Nörten, near Göttingen. For some time a teacher at Frankfort, he was appointed extra professor of Sanskrit and comparative philology at Göttingen in 1848, and professor in 1862. The chief result of his early studies was his *Griechisches Wurzellexikon* (1839-42). His works on Sanskrit include an edition of the *Sâma Veda* (1848), *Handbuch der Sanskritsprache* (1852-4), *Kurze Grammatik der Sanskritsprache* (1855; Lond. 1868), his edition of the *Pantschatantra* (2 vols. 1859), and his *Sanskrit Eng. Dict.* (1866).

Bengal, BAY OF, a N. extension of the Indian Ocean, which has India on the w., and Burma and the Malay Peninsula on the E. It receives the waters of the great rivers Salwin, Irawadi, Brahmaputra, Ganges, Mahanadi, Godavari, and Kistna. At its E. side are the Andaman, Nicobar, and Mergui Islands, and at its S.W. corner the island of Ceylon. It measures more than 1,200 m. from N. to S., and 1,350 m., at its widest part, from E. to W.

Bengal, EASTERN. See EASTERN BENGAL AND ASSAM.

Bengal Gram, the seed of an Indian leguminous plant (*Cicer arietinum*), often called chick pea, which is used as food for cattle. Oxalic acid exudes from the plant, and is used by the natives as a refrigerant in fevers.

Bengal Hemp (*Crotalaria juncea*), a leguminous plant which produces a commercial fibre; is known also as sunn, shunum, and taag. It is also called Madras hemp and sun-hemp, and is used

in the manufacture of cordage, fishing-nets, canvas, paper, and gunny-bags.

Bengali Language, one of the chief languages of India, spoken by upwards of 40,000,000 people, is an offshoot from Sanskrit, containing admixtures of Arabic and Persian. Grammars, etc., of the language have been published by Yates and Wenger (1885), Nicholl (1885), Varmā (1900), and Ghatk (1903). Dictionaries: Mitter (1870); English-Bengali by Marshman (1828), Sykes (1874), and Vasa (1895). See Dutt's *Literature of Bengal* (1895).

Bengal Lights, coloured fires used as signals and in pyrotechny. Potassium chlorate, antimony sulphide, and sulphur are the chief ingredients which enter into their composition. The grinding and mixing require the greatest care and skill, as the mixture is highly explosive. For these and other coloured fires, see Cooley's *Cyclopædia of Practical Receipts* (1892).

Bengal North-western Railway was incorporated in 1882, and is a single-track system of rails on the metre gauge in N. India between the rivers Gandak and Gogra, and between the Gogra and the Ganges, in the neighbourhood of Ghazipur and Benares. The mileage in operation at the end of 1909 was 1,866, including 774 worked for the state. The earnings of the company for the year 1909 amounted to about £800,000, and the expenses to about £425,000, the ratio of expenses being 47.3 per cent. The dividend for the year ending December 1909 was 8 per cent.

Bengal Presidency, a division of the British Indian empire, is bounded on the N. by Nepal; on the E. by Eastern Bengal and Assam; on the S. by the Bay of Bengal and the Madras Presidency; and on the W. by the Central Provinces, Rewah, and the