HEMP (in O. Eng. *henep*, cf. Dutch *hennep*, Ger. *Hanf*, cognate with Gr. κάνναβις, Lat. *cannabis*), an annual herb (*Cannabis sativa*) having angular rough stems and alternate deeply lobed leaves. The bast fibres of *Cannabis* are the hemp of commerce, but, unfortunately, the products from many totally different plants are often included under the general name of hemp. In some cases the fibre is obtained from the stem, while in others it comes from the leaf. Sunn hemp, Manila hemp, Sisal hemp, and Phormium (New Zealand flax, which is neither flax nor hemp) are treated separately. All these, however, are often classed under the above general name, and so are the following:—Deccan or Ambari hemp, *Hibiscus cannabinus*, an Indian and East Indian malvaceous plant, the fibre from which is often known as brown hemp or Bombay hemp; Pité hemp, which is obtained from the American aloe, *Agave americana*; and Moorva or bowstring-hemp, *Sansevieria zeylanica*, which is obtained from an aloe-like plant, and is a native of India and Ceylon. Then there are Canada hemp, *Apocynum cannabinum*, Kentucky hemp, *Urtica cannabina*, and others.

The hemp plant, like the hop, which is of the same natural order, Cannabinaceae, is dioecious, *i.e.* the male and female flowers are borne on separate plants. The female plant grows to a greater height than the male, and its foliage is darker and more luxuriant, but the plant takes from five to six weeks longer to ripen. When the male plants are ripe they are pulled, put up into bundles, and steeped in a similar manner to flax, but the female plants are allowed to remain until the seed is perfectly ripe. They are then pulled, and after the seed has been removed are retted in the ordinary way. The seed is also a valuable product; the finest is kept for sowing, a large quantity is sold for the food of cage birds, while the remainder is sent to the oil mills to be crushed. The extracted oil is used in the manufacture of soap, while the solid remains, known as oil-cake, are valuable as a food for cattle. The leaves of hemp have five to seven leaflets, the form of which is lanceolate-acuminate, with a serrate margin. The loose panicles of male flowers, and the short spikes of female flowers, arise from the axils of the upper leaves. The height of the plant varies greatly with season, soil and manuring; in some districts it varies from 3 to 8 ft., but in the Piedmont province it is not unusual to see them from 8 to 16 ft. in height, whilst a variety (*Cannabis sativa*, variety *gigantea*) has produced specimens over 17 ft. in height.

All cultivated hemp belongs to the same species, *Cannabis sativa*; the special varieties such as *Cannabis indica*, *Cannabis chinensis*, &c., owe their differences to climate and soil, and they lose many of their peculiarities when cultivated in temperate regions. Rumphius (in the 17th century) had noticed these differences between Indian and European hemp.

Wild hemp still grows on the banks of the lower Ural, and the Volga, near the Caspian Sea. It extends to Persia, the Altai range and northern and western China. The authors of the *Pharmacographia* say:—"It is found in Kashmir and in the Himálaya, growing 10 to 12 ft. high, and thriving vigorously at an elevation of 6000 to 10,000 ft." Wild hemp is, however, of very little use as a fibre producer, although a drug is obtained from it.

It would appear that the native country of the hemp plant is in some part of temperate Asia, probably near the Caspian Sea. It spread westward throughout Europe, and southward through the Indian peninsula.

The names given to the plant and to its products in different countries are of interest in connexion with the utilization of the fibre and resin. In Sans. it is called *goni*, *sana*, *shanapu*, *banga* and *ganjika*; in Bengali, *ganga*; Pers. *bang* and *canna*; Arab. *kinnub* or *cannub*; Gr. *kannabis*; Lat. *cannabis*; Ital. *canappa*; Fr. *chanvre*; Span. *cáñamo*; Portuguese, *cánamo*; Russ. *konôpel*; Lettish and Lithuanian, *kannapes*; Slav. *konopi*; Erse, *canaib* and *canab*; A. Sax. *hoenep*; Dutch, *hennep*; Ger. *Hanf*; Eng. *hemp*; Danish and Norwegian, *hamp*; Icelandic, *hampr*; and in Swed. *hampa*. The English word *canvas* sufficiently reveals its derivation from *cannabis*.

Very little hemp is now grown in the British Isles, although this variety was considered to be of very good quality, and to possess great strength. The chief continental hemp-producing countries are Italy, Russia and France; it is also grown in several parts of Canada and the United States and India. The Central Provinces, Bengal and Bombay are the chief centres of hemp cultivation in India, where the plant is of most use for narcotics. The satisfactory growth of hemp demands a light, rich and fertile soil, but, unlike most substances, it may be reared for a few years in succession. The time of sowing, the quantity of seed per acre (about three bushels) and the method of gathering and retting are very similar to those of flax; but, as a rule, it is a hardier plant than flax, does not possess the same pliability, is much coarser and more brittle, and does not require the same amount of attention during the first few weeks of its growth.

The very finest hemp, that grown in the province of Piedmont,

Italy, is, however, very similar to flax, and in many cases the two fibres are mixed in the same material. The hemp fibre has always been valuable for the rope industry, and it was at one time very extensively used in the production of yarns for the manufacture of sail cloth, sheeting, covers, bagging, sacking, &c. Much of the finer quality is still made into cloth, but almost all the coarser quality finds its way into ropes and similar material.

A large quantity of hemp cloth is still made for the British navy. The cloth, when finished, is cut up into lengths, made into bags and tarred. They are then used as coal sacks. There is also a quantity made into sacks which are intended to hold very heavy material. Hemp yarns are also used in certain classes of carpets, for special bags for use in cop dyeing and for similar special purposes, but for the ordinary bagging and sacking the employment of hemp yarns has been almost entirely supplanted by yarns made from the jute fibre.

Hemp is grown for three products—(1) the fibre of its stem; (2) the resinous secretion which is developed in hot countries upon its leaves and flowering heads; (3) its oily seeds.

Hemp has been employed for its fibre from ancient times. Herodotus (iv. 74) mentions the wild and cultivated hemp of Scythia, and describes the hempen garments made by the Thracians as equal to linen in fineness. Hesychius says the Thracian women made sheets of hemp. Moschion (about 200 B.C.) records the use of hempen ropes for rigging the ship "Syracusia" built for Hiero II. The hemp plant has been cultivated in northern India from a considerable antiquity, not only as a drug but for its fibre. The Anglo-Saxons were well acquainted with the mode of preparing hemp. Hempen cloth became common in central and southern Europe in the 13th century.

Hemp-resin.—Hemp as a drug or intoxicant for smoking and chewing occurs in the three forms of bhang, ganja and charas.

1. *Bhang*, the Hindustani *siddhi* or *sabzi*, consists of the dried leaves and small stalks of the hemp; a few fruits occur in it. It is of a dark brownish-green colour, and has a faint peculiar odour and but a slight taste. It is smoked with or without tobacco; or it is made into a sweetmeat with honey, sugar and aromatic spices; or it is powdered and infused in cold water, yielding a turbid drink, *subdschi*. *Hashish* is one of the Arabic names given to the Syrian and Turkish preparations of the resinous hemp leaves. One of the commonest of these preparations is made by heating the bhang with water and butter, the butter becoming thus charged with the resinous and active substances of the plant.

2. *Ganja*, the guaza of the London brokers, consists of the flowering and fruiting heads of the female plant. It is brownish-green, and otherwise resembles bhang, as in odour and taste. Some of the more esteemed kinds of hashish are prepared from this ganja. Ganja is met with in the Indian bazaars in dense bundles of 24 plants or heads apiece. The hashish in such extensive use in Central Asia is often seen in the bazaars of large cities in the form of cakes, 1 to 3 in. thick, 5 to 10 in. broad and 10 to 15 in. long.

3. *Charas*, or churrus, is the resin itself collected, as it exudes naturally from the plant, in different ways. The best sort is gathered by the hand like opium; sometimes the resinous exudation of the plant is made to stick first of all to cloths, or to the leather garments of men, or even to their skin, and is then removed by scraping, and afterwards consolidated by kneading, pressing and rolling. It contains about one-third or one-fourth its weight of the resin. But the churrus prepared by different methods and in different countries differs greatly in appearance and purity. Sometimes it takes the form of egg-like masses of greyish-brown colour, having when of high quality a shining resinous fracture. Often it occurs in the form of irregular friable lumps, like pieces of impure linseed oil-cake.

The medicinal and intoxicating properties of hemp have probably been known in Oriental countries from a very early period. An ancient Chinese herbal, part of which was written about the 5th century B.C., while the remainder is of still earlier date, notices the seed and flower-bearing kinds of hemp. Other early writers refer to hemp as a remedy. The medicinal and dietetic use of hemp spread through India, Persia and Arabia in the early middle ages. The use of hemp (bhang) in India was noticed by Garcia d'Orta in 1563. Berlu in his *Treasury of Drugs* (1690) describes it as of "an infatuating quality and pernicious use." Attention was recalled to this drug, in consequence of Napoleon's Egyptian expedition, by de Sacy (1809) and Rouger (1810). Its modern medicinal use is chiefly due to trials by Dr O'Shaughnessy in Calcutta (1838–1842). The plant is grown partly and often mainly for the sake of its resin in Persia, northern India and Arabia, in many parts of Africa and in Brazil.

Pharmacology and Therapeutics.—The composition of this drug is still extremely obscure; partly, perhaps, because it varies so much in individual specimens. It appears to contain at least two alkaloids—cannabinine and tetano-cannabine—of which the former is volatile. The chief active principle may possibly be neither of these, but the substance cannabinon. There are also resins, a volatile oil and several other constituents. Cannabis indica—as the drug is termed in the pharmacopoeias—may be given as an extract (dose $\frac{1}{4}$-1 gr.) or tincture (dose 5-15 minims).

The drug has no external action. The effects of its absorption, whether it be swallowed or smoked, vary within wide limits in different individuals and races. So great is this variation as to be inexplicable except on the view that the nature and proportions of the active principles vary greatly in different specimens. But typically the drug in an intoxicant, resembling alcohol in many features of its action, but differing in others. The early symptoms are highly pleasurable, and it is for these, as in the case of other stimulants, that the drug is so largely consumed in the East. There is a subjective sensation of mental brilliance, but, as in other cases, this is not borne out by the objective results. It has been suggested that the incoordination of nervous action under the influence of Indian hemp may be due to independent and non-concerted action on the part of the two halves of the cerebrum. Following on a decided lowering of the pain and touch senses, which may even lead to complete loss of cutaneous sensation, there comes a sleep which is often accompanied by pleasant dreams. There appears to be no evidence in the case of either the lower animals or the human subject that the drug is an aphrodisiac. Excessive indulgence in cannabis indica is very rare, but may lead to general ill-health and occasionally to insanity. The apparent impossibility of obtaining pure and trustworthy samples of the drug has led to its entire abandonment in therapeutics. When a good sample is obtained it is a safe and efficient hypnotic, at any rate in the case of a European. The tincture should not be prescribed unless precautions are taken to avoid the precipitation of the resin which follows its dilution with water.

See Watt, *Dictionary of the Economic Products of India.*