

beverages, drunkenness is still all too frequent. Other examples arise to the mind such as that of the Sikhs in India who take their one or two opium pills a day and appear to derive benefit therefrom, but amongst whom excessive use of opium is of the rarest occurrence, and the aboriginal natives of South America make use of cocaine in the same way and benefit by its use, but never give way to its abuse. Then let us look at the other side of the picture and see the effect of the sudden introduction to races, of a type of narcotic to which they were not hitherto accustomed. The ravages of distilled spirits among the native races of Africa, North America and the South Sea Islands after their introduction by Europeans are well known, and cocaine and opium or its alkaloids claimed and still claim many more victims in Europe and other countries, into which they were introduced relatively recently, than they do in their countries of origin where they have been used for hundreds of years. To sum up this paragraph, narcotics appear to establish some kind of immunity or resistance to their abuse in races that have used them for a long time.

Consideration of these facts raises the question as to the best method of dealing with the drug menace. While there is no doubt that preventing the introduction of new narcotics into countries not accustomed to them is of prime importance, it is doubtful if the long view would not be preferable regarding the control of narcotics that have already been in use for centuries. By this we mean that limited official efforts at restriction with the hope of the eventual disappearance of the dangerous aspect of drug addiction would perhaps be preferable to the sudden stoppage of supplies in the attempt to stamp out completely and at once the use of a certain drug. The failure of prohibition in the United States of America with its tremendous

increase in crime and excesses of all kinds as secondary effects to the attempt to stop the use of alcohol altogether, as well as the rise in the clandestine consumption of poisonous trade spirit as a drink, is a striking indictment against this method of control. Another difficulty regarding the absolute prohibition of these drugs is that their cultivation and manufacture cannot be totally prohibited because large amounts are necessary for their legitimate use, the treatment and cure of disease.

Addicts to any drug can be treated, and often successfully, to overcome their craving. A striking example is the success of the lecithin and glucose treatment of opium addiction practised in recent years at the Calcutta School of Tropical Medicine. This is also a complicated problem, because although it is agreed that a great deal can be done in freeing a slave to the habit from the influence of a drug, it is now considered by those with experience in this matter that a large number are bound to relapse. Although such reasons as the example of companions, business worry, prolonged painful illness, etc., are given and accepted as explanations of beginning the habit, it is now stated that, in addition to one of these causes, there is an inherent weakness in the individual which is the basic cause of his subordinating his own initiative to the power of a drug. Even if he is relieved of this influence by treatment and the craving disappears for a time, the weakness is still there and is likely again to become manifest by a relapse into his former habit of excessive drug taking.

A short article of this kind is not the place for the discussion of preventive measures in detail as the problem is much too vast, so we have confined ourselves to the statement of a few aspects of the subject to indicate in some slight degree its complexity and difficulty.

Special Articles

USE OF HEMP DRUGS IN INDIA*

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Historical and General

Introductory.—The habitual use of drugs of a stimulative and restorative character was prevalent in India probably long before any of the other countries of the modern world. The juice of the Soma plant was a favourite drink of the Aryan settlers and was regularly taken by them many centuries before the Christian era. What

exactly was the Soma plant is not known, though a number of plants such as *Cannabis sativa*, *Ephedra vulgaris*, *Asclepias acida*, etc., have been implicated. During the Hindu period, i.e., up to the 8th or 9th century A.D., alcoholic beverages were used by the people as well as the preparations made from hemp drugs. These produced not only a sedative effect, but also brought about euphoria in the form of pleasant dreams, forgetfulness and, it would also appear from the writings of that period, voluptuous satisfaction. Opium and poppy were introduced on the west coast about the 9th century A.D. by the advent of the Mohammedan traders and opiates soon came into use. A study of the records shows that during the period of the Moghul Empire alcoholic beverages, opiates and hemp drugs were freely used. A

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decoction made from poppy capsules known as 'koknar' was extensively used all over India. A beverage containing wine, opium, Indian hemp and poppy capsules, known as 'Chaharbargha' (four-leaved), was drunk by the well-to-do classes in the time of Akbar (1556 to 1605) and later. Opium on account of its stronger effects appears to have taken a great hold on the people, and poppy was extensively cultivated all over the country during this period and was indulged in by all classes.

The hemp drugs commonly used in India are derived from the flowers, fruits, leaves (and the resinous matter derived from the leaves), young twigs, and bark of the stem of the plant known as *Cannabis sativa* Linn. The plant belongs to the family *Cannabinaceæ* and has been found growing in a state of nature to the south of the Caspian Sea, in Siberia, in the desert of Kirghiz in Russian Turkestan, in Central and Southern Russia and along the southern lower slopes of the Caucasus mountains. In China, where probably it is indigenous on the lower mountain tracts, it has been known since the 6th century B.C. It grows in almost a wild state in Iran and in the Western Himalayas and Kashmir, and it extends to the east of Assam.

For some time the European form of the plant was supposed to be distinct from the Asiatic, the chief value of the latter consisting in its narcotic properties; but this distinction has now disappeared from the literature on the subject. *Cannabis indica* Lamk., the Indian plant, has thus been reduced to *C. sativa* Linn.

The hemp drugs are used in India in three principal forms, *ganja*, *charas*, and *bhanga*. *Ganja* is the female flowering tops and twigs covered with resinous exudation, *charas* is the resinous exudation found on the leaves, young twigs, bark of the stem, and even on the young fruits; *bhanga* is composed of the mature leaves and in some parts of India of the fruits also.

Early historical references. (a) *In Hindu medicine.*—Mention of hemp drugs is found in the classical literature as well as in the works on medicine of many countries old in the world. The plant is referred to in the ancient Sanskrit literature under the three names: 'bhanga', 'indracana' and 'vijaya' or 'jaya'. The earliest mention of the word 'bhanga' occurs in the Atharva Veda which, according to Western scholars, dates from 2000 to 1400 B.C.

The first mention of 'bhanga' as a medicine occurs in the works of Susruta (6th to 7th century A.D.) where it is described along with a number of other drugs as an antiphlegmatic. In the 10th century A.D., the intoxicating properties of the plant seem to have been already recognized. In the 14th century, the intoxicating properties of 'bhanga' were certainly well known as it is mentioned in some of the dramatic literature of that period.

In Sarangadhara Samhita, a medical work written about 1500 A.D., it is described as an excitant and is mentioned along with opium in the same passage. In the Bhavaprakash (about 1600 A.D.), a number of important properties of the hemp drugs are given with special stress on its digestive and stimulant effects on biliary secretions.

(b) *In Arabian and Persian medicine.*—Hemp is frequently mentioned in the early Arabic and Persian literature. The oldest work in which it is noticed is

a treatise by Hassan (658 A.D.). In the Arabian Nights, frequent references to hemp have been made under the old name 'benj'. The Arabic name 'benj' and the Persian name 'beng' are so closely related phonetically to the Sanskrit 'bhanga' that there is a strong presumption of their origin from the latter source.

(c) *In European literature.*—Hemp is also frequently mentioned in the early classical literature of Europe. The ancient Scythians seem to have been acquainted with the narcotic properties of the plant as well as with its fibre. They used to induce a state of excitement amongst themselves by inhaling its vapour. More recently, hemp was brought to the notice of European medicine through the accounts of Sylvestre-de-lacy in 1809 and Rouyer in 1810. These authors were attached to Napoleon's expeditionary forces in Egypt and during their stay there, collected a large amount of information regarding hemp drugs and published their findings and observations.

PRODUCTION OF HEMP DRUGS IN INDIA

(a) *Wild growth.*—As has been already stated, hemp grows wild over extensive tracts in northern India and along the slopes of the Himalayas. It is interesting to note that hemp seems to have the capacity for growing with equal luxuriance under almost any climatic conditions. With the change of climate, and the consequent alteration in the conditions of growth, however, some of the important characters of the plant are changed or modified. Thus, in Europe, hemp produces a valuable fibre, while showing little or no tendency to produce the narcotic principle, which in Asia constitutes its chief value. On the mountain tracts of upper India, hemp yields a fairly good fibre, but in Kashmir and Ladakh, its narcotic principles become much more predominant. When hemp is cultivated in the plains of India, the resin (*charas*) is not generally secreted but the young female flowers and shoots show a tendency to develop the narcotic principle (*ganja*) instead. In other parts of India again, the narcotic property is often not developed until the fruits are mature.

The plant grows wild throughout the Himalayas from Kashmir to the east of Assam at an altitude up to 10,000 feet above sea-level. It extends down the southern slopes of the mountains and from there into the Punjab and the Gangetic plain for a limited distance. It is found in the hill tracts of Assam whence it spreads to the mountainous tracts of East Bengal. The southern boundary of this area begins approximately at Peshawar and runs through the middle of the Punjab and the United Provinces, from where it follows the course of the Ganges. In this region, the plant propagates itself from self-sown seeds but it is possible that the growth on the lower slopes of the Himalayas and in the Terai is to a large extent accounted for by the aerial dissemination of seeds from the mountains. The plant appears to be very hardy once it is well established. The soil need not be rich, but it should be well drained and permeable.

(b) *Cultivation.*—Though hemp grows wild in many parts of India, it has to be properly

cultivated in order to obtain, for commercial purposes, its fibre or its narcotic principle as the case may be. For a good growth of hemp a rich soil as well as elaborate methods of cultivation are required.

Present extent of hemp cultivation.—The Indian Hemp Drug Commission (1893–1894) obtained statistics of the area under cultivation and found that after deducting the area under fibre cultivation (which yields little or no narcotic principle), the total area under cultivation for narcotic purposes did not exceed 6,000 acres. At present cultivation of hemp drugs for the production of ganja and bhang by the wholesale vendors is only permitted under licence and is considerably less than 2,000 acres.

The cultivation of the hemp plant for intoxicating purposes is absolutely prohibited in Assam, United Provinces, and in the minor provinces of Delhi, Baluchistan, Coorg and Ajmere-Merwara, while in some of the major provinces, it is permitted, for the production of ganja only, in limited areas and subject to careful restrictions. Thus, in the Bombay Presidency the cultivation is allowed in four villages of Nagar taluk in Ahmednagar district. In Bihar and Orissa, ganja is cultivated in Bhagalpore district. In the Madras Presidency, ganja is cultivated only in the village of Santaravur. In the Central Provinces and Berar, cultivation of the plant is restricted to a small area in Khandwa district. These areas are only able to meet the actual demand for their respective provinces. The main supply of ganja, however, comes from a place called Naogaon in the Rajshahi district of Bengal. This small area supplies ganja to the whole of the Bengal Presidency and also to other provinces, Indian States, and foreign territories where cultivation is prohibited.

If we compare the present figures with those published by the Indian Hemp Drug Commission in 1893–94, we are struck with the progressive decline of hemp-drug cultivation in India. For years together, the Government of India has followed a policy of gradually cutting down the area of hemp under cultivation and the total yearly outturn with the idea of reducing the hemp-drug addiction to a minimum. Hemp is not cultivated in this country for the production of charas and therefore these remarks do not apply to this form of the drug.

(c) *Manufacture of bhang, ganja and charas.*—Hemp drugs that are obtained by cultivation or from spontaneous growth require further treatment at the hands of experts before they are fit for consumption as narcotics.

1. *Manufacture of bhang* (synonyms 'siddhi', 'subzi', 'putti', 'sawi').—Bhang consists of specially dried leaves and flowering shoots of both female and male plants, wild or cultivated. The inclusion of male plants and male flower heads in the manufacture of bhang is not considered of special advantage as the male flowers are believed to contain very little of the active principle. Recent work has thrown doubt on this belief.

The narcotic principle in hemp develops only when the plant matures, reaching its maximum about the time of flowering and then it gradually begins to disappear when the leaves and the flowers turn yellow. Therefore, for the manufacture of good bhang, the leaves should be separated when they are just mature and when there are no signs of decay or withering. The usual time for gathering leaves varies in different localities but generally it is done during the months of May and June in the plains and during July and early August in the hills.

2. *Manufacture of ganja.*—Ganja ['ganja yala' (Tamil) and 'bhangu' (Telugu)] consists of dried flowering tops of the cultivated hemp plant which become coated with a resinous exudation, chiefly from the glandular hairs, in consequence of being deprived

of the opportunity of setting seeds. To secure these results, the male plants are removed from the field at an early date. As the female plants begin to form ganja, all the large leaves on the stem and branches are also removed. The smaller leaves and the brackets of inflorescence become agglutinated into a mass called ganja. Fresh excise ganja has a rusty green colour with a characteristic odour. The colour and the smell are considered to be features of merit but as a rule ganja which has least mixture of leaf is regarded as the best. The plants thus collected require further treatment to form the ganja of commerce sold by the excise vendors. In Bengal the entire plant is cut, while in Bombay the flowering tops are generally pulled off by hand.

3. *Manufacture of charas.*—Charas is the name given to the resinous matter collected from the leaves and flowering tops of the plant and constitutes the active principle of hemp. Charas, as sold in this country, is a greenish mass, with a peculiar and characteristic odour. When kept for some time, it becomes hard and friable and acquires a brownish-grey colour, thereby losing most of its narcotic properties.

Although the hemp plant, when cultivated in tropical countries such as India, Africa and Malaya, becomes rich in narcotic principles, it seldom yields enough resin to be collected as charas. On the plateaux of Central Asia and southern Himalayas (Nepal) charas is sometimes collected, but it is poor both in quality and yield. The best quality and the maximum amount of resin is obtained from plants grown in Yarkand in Chinese Turkestan in Central Asia.

Manufacture of charas in Chinese Turkestan.—In Chinese Turkestan at an altitude of 3,000 to 5,000 feet above sea-level, *Cannabis sativa* grows extensively in a state of nature. It is also cultivated along with other field crops. The plant flourishes well in these plateaux often attaining a height of 8 to 10 feet. It matures during the month of September or October when big tufts of flowers appear at the top of each plant, which can be collected and used in the preparation of finished charas. The method of charas manufacture in these areas is entirely different from that in use in India. The female flower heads are first dried, then broken and crushed between the hands into a powder, which is passed through sieves so that it attains the fineness and consistency of sand or saw dust. This powder, which is still green, is stored in bags made of raw hide for four or five months during the winter. With the onset of the hot weather the material is taken out and exposed to the sun for a short time, sufficient to allow the resin to melt. It is stored again in hide bags of 10 lb. to 14 lb. capacity. After a few days, the agglutinated mass is again taken out and kneaded well by means of wooden rods so that a certain amount of oily matter appears on its surface. The process of kneading is repeated till each bag yields about one to two lb. of oil. At this stage charas is transferred into fresh hide bags and is ready for sale and distribution.

Trade and traffic in charas.—Charas forms one of the most important articles of trade between Central Asia and India. It is usually brought down from Yarkand in the month of August when the mountain passes are opened and it reaches Leh in Kashmir by September or October. The payment for charas is usually made in kind and not in currency. All forms of piece-goods which are apparently in great demand in Central Asia are generally accepted as barter.

The traffic in charas has always been carefully regulated by the Punjab Government; the charas bundles are checked at Panamik and again at Leh in Kashmir State to ensure that any bundle which reached Leh (where the Punjab Government has established a warehouse and maintains a special staff) was again accounted for either in Kashmir State or in one of the Punjab warehouses. Each bundle of charas, which ordinarily weighs about 50 seers (100 lb.), is recorded in Leh and forwarded either to Kulu or to Rawalpindi, or is consumed locally under the control of Kashmir State authorities in the State. There are four warehouses in the Punjab, at Sultanpur (in Kulu),

Hoshiarpur, Amritsar, and Rawalpindi. The Government of Chinese Turkestan have now totally stopped the import of charas into India.

Illicit traffic in charas and measures to combat it.—Contraband charas comes into India nowadays mostly through Chitral and to a certain extent through independent tribal territories. It is also brought across the Indus river principally to the neighbourhood of Peshawar. The drug is mainly smuggled by travellers who carry small quantities at a time upon their persons. Very often it is said to be exchanged for smuggled cocaine from Calcutta and other parts. In fact, it has been stated that the practice of charas smuggling in the Punjab and the North-West Frontier Province has been responsible for the introduction of the cocaine habit in those areas.

In parts of India where the consumption of the drug is totally prohibited, there is reason to believe that illicit charas is still being sold to a certain extent. In other parts where the consumption is permitted but the duty is high our inquiries reveal that smuggling is far from being checked and the drug is frequently obtainable through illicit sources.

THE NARCOTIC PRINCIPLES OF HEMP DRUGS

An interesting feature about the formation and development of the narcotic principle is that this process is generally found to be associated, and sometimes runs parallel with some distinct morphological modification of the plant anatomy. In some plants, the leaves are the chief organs where the narcotic resin is found; in others, the flowering tops assume the important rôle of storing and secreting the resin; while in a third group, the fruits and the surfaces of stems take upon themselves the secretory function. The first group of plants where the narcotic is primarily stored in the leaves yields the bhang of commerce, the second group affords ganja, and third group is considered particularly suitable for the production of charas. The factor or factors which are responsible for such modifications in the physiology of the hemp plant are not known.

The resinous substance contained in hemp is considered the most important principle responsible for the physiological activity of the drug. The resin as obtained from the plant apparently contains a number of compounds, one of which is *cannabinol* (Cahn) and which is probably the active principle. There is no satisfactory evidence to show that the other constituents are physiologically active.

Deterioration of the narcotic principle.—The narcotic principle of the hemp drugs deteriorates with age, though it is difficult to give the precise period during which a preparation can retain its activity under ordinary conditions of storage. The popular impression is that hemp drugs retain their activity for a period of at least two years without appreciable loss. Some authorities consider that the potency remains intact for a much longer period. The experience of the excise authorities in the plains of India is that ganja retains most of its activity for one year and during the second year it begins gradually to lose its potency until it becomes quite useless and unsaleable at the end of two years. It must be realized, however, that the retention of physiological activity of the three different types of hemp drugs, like that of many other medicinal products, largely depends on the climate and also on the care exercised during its storage. Bhang is not as susceptible to deterioration as ganja and may keep in fairly good condition for three to four years, if not

directly exposed to sun and air. This comparatively slow deterioration of bhang is supported to a certain extent by the subjective symptoms complained of by the bhang addicts.

With regard to the keeping properties of charas, it is still more difficult to make any definite statements. However, the general opinion of dealers in this drug is that charas is very potent during the first year, after which it gradually loses its activity until the fourth year, when it becomes practically inert and useless.

MODES OF CONSUMPTION

Ganja and charas are mostly smoked, while bhang is taken by the mouth in the form of a beverage or a confection. The latter method, eating of hemp for narcotic purposes, would appear to be a much older method of indulgence than smoking.

1. *Hemp drinking and eating.*—The beverage made from bhang is known by different names in different parts of India. It is called 'thandai', 'siddhi', 'sardai', 'sawi', and 'sukha' in the Punjab and United Provinces; in Bombay and Central Provinces, it is known as 'bhang' or 'ghota' or 'pang'; in Bengal, it is called 'siddhi'; in Rajputana and Central India, 'dudhii'; in South India hemp beverages are known as 'ramras' or 'ram-rasam' and correspond to 'dudhii' and 'siddhi' of upper India.

The simplest form of consumption consists of a drink made from bhang leaves by pounding them together with a little black pepper and sugar and adding enough water to reach the desired strength. Various kinds of special beverages are prepared by the middle and well-to-do classes by the addition of almond kernels, sugar, iced milk, curds, etc. A number of other ingredients are at times added to improve the taste and possibly with the idea of enhancing the euphoric effects produced by these drugs. Amongst these, aniseed, ajowan, cucumber, melon and poppy seeds, rose petals, saffron, cloves, cardamoms, musk and essence of rose are the most common. Besides their common use as a beverage, bhang leaves are sometimes chewed for their sedative effects. This is done at times when it is not convenient for the individual to prepare the beverage, for instance during travelling, and also during the winter season when the system does not require large quantities of fluid.

A number of preparations containing bhang are made in different parts of India. Sweetmeats containing bhang are sold and even ice cream containing powdered leaves is available in some towns.

2. *Hemp smoking.*—Ganja and charas are usually consumed by smoking. Different kinds of apparatus have been improvised in various parts of the country for smoking hemp drugs, the one commonly used being an earthenware 'chillum' (used for smoking tobacco) with an elongated neck. The ordinary 'chillum' used for smoking ganja and charas resembles a funnel with a long neck and a somewhat wide base.

The method of smoking is simple. Ganja is first moistened with a little water to render it soft. The mass is then kneaded till it changes to a pulpy mass. A small amount of tobacco (almost equal in amount to the ganja taken) is then placed in the 'chillum' and the 'prepared ganja' is placed on the top of it. The usual practice is to place the prepared mass of ganja (or charas as the case may be) between two thin pieces of broken earthenware pottery. After the 'chillum' is prepared, a piece of glowing charcoal or a piece of

smouldering cow-dung cake is placed in it. The smoke is inhaled into the lungs by powerful inspiratory efforts and the narcotic principles are at once taken into the blood. The smoke is retained in the lungs as long as possible and is then allowed to escape slowly through the nostrils, the mouth being kept shut. The longer the smoke is retained inside the lungs the better the effects obtained. Apart from the 'chillum' method just described ganja and charas are also smoked by the ordinary 'hooka', the smoke being allowed to pass through water before it is inhaled. This is the common method employed in the north-western districts of the Punjab and the North-West Frontier Province, but it has not become popular in other provinces in India where smoking of hemp drugs is prevalent. Recently, cigarettes containing bhang have been used in certain towns. Both bhang and charas are occasionally smoked in an ordinary tobacco pipe, but this method has not become very popular.

Unlike opium smoking, which is indulged in by the smoker alone and away from his friends, hemp smoking is always preferred and enjoyed in the company of others. The smokers, usually two to five in number, sit down in a small circle and the prepared 'chillum' is passed round from one to the other so that each can take two or three deep pulls at it. Ganja or charas worth at least four to six pice (1 or 1½ penny) is required for preparing a full 'chillum'. The quantity of hemp procurable at this price is usually sufficient to produce narcotic effects of a mild degree on three to five persons.

Charas is smoked more or less in the same way as ganja but there is some difference in the initial preparation of the drug. Charas is usually warmed a little in the early stages and is mixed with approximately double its quantity of tobacco before being put in the 'chillum'. Charas is generally considered to be a stronger preparation and, therefore, a smaller quantity of the drug is used.

Besides ganja and charas, bhang leaves are also smoked at times. 'Sirkali' or the flowering tops of the hemp plant are sometimes cut and dried and smoked in a 'chillum' alone or mixed with tobacco.

USES OF HEMP DRUGS IN INDIA

Hemp drugs have been used in India from very early times in order to overcome fatigue and worry, for production of euphoria, and to give courage to warriors during times of stress. The present use of these drugs may be conveniently considered under three main headings:

(i) use in connection with religious and social customs, (ii) medicinal uses, and (iii) employment for narcotic and euphoric purposes.

(i) *Uses in connection with religious and social customs.*—The use of hemp drugs in connection with religious and social practices is still met with in almost all the provinces of India, though to a much smaller extent than in the past.

In Bengal, for instance, the custom of offering a beverage prepared from the leaves of the hemp plant to the members of the family and to the guests present on the last day of the Durga Puja (Bijaya Dasami) still persists. In Tarakeshwar Temple in Bengal ganja is used as an offering on the Shivaratri (Shiva's night). Less commonly, it is used in other religious festivals such as Trinath Puja, a religious ceremony observed also by certain Mohammedan sects in slightly different form. In Puri (Orissa) ganja and bhang are largely used by the attendants and worshippers of Jagannath. In the United Provinces where Durga Puja is observed in a manner similar to that in Bengal, the use of bhang is not so much in vogue. It is, however, taken by certain classes on the occasion of the Holi and Dewali festivals, marriage ceremonies

and other family festivities. Among the Sikhs, the use of bhang as a beverage was quite common 20 or 30 years ago and these beverages were freely distributed to devotees attending some of their religious places and shrines. Drinking of bhang is also in vogue in Rajputana at the festival of Kama (Indian cupid) by the Rajputs of Bondil. In the Central Provinces 'ghota' is used among the lower classes at the time of different festivals. In Bombay, worshippers of Shiva generally use ganja, while the Marwaris and merchant classes who belong to religious sects such as Jains use bhang on festive occasions. In Madras, the use of hemp drugs in religious and social life is less common than in other provinces. Assam is the only province where bhang is used practically not at all at the present time, probably because of the prevalence of the use of opium in that province.

It may be pointed out that charas, which is a foreign product and which has been comparatively recently introduced into India, is not in any way connected with religious worship or observances.

From the foregoing description it is evident that the use of hemp drugs in social and religious customs is still in vogue though it has considerably decreased during the last two or three decades. Even to-day a religious mendicant smoking ganja is not only tolerated but is looked upon with some veneration and is even considered to possess supernatural powers of healing disease and infirmities, by some of the illiterate classes. Sects of 'sanyasis', 'mahantas' 'mantra-data gurus' or religious preceptors are held in great respect although they indulge freely in hemp drugs. In fact, offering of hemp to them is considered to be an act of piety.

(ii) *Medicinal uses.* (a) *Indian hemp in Hindu medicine.*—In the Ayurvedic medicine, the first mention of the hemp plant occurs in the work of Susruta written before the 8th century A.D. In this work hemp leaves are recommended along with a number of other drugs as antiphlegmatic, as a remedy for catarrh accompanied with diarrhoea and as a cure for fever arising from excess of 'bile' and 'phlegm'. The hemp plant was believed by the ancient Aryans to possess cooling and febrifuge properties. On account of its narcotic properties it was probably also used as an anæsthetic by the ancient Indian and Chinese surgeons.

(b) *Indian hemp in Mohammedan or Unani medicine.*—Rumphius (1095 A.D.) in the *Herbarium amboinense* states that the Mohammedans frequently used the male hemp plant in the treatment of gonorrhoea, asthma, and also in the treatment of a condition, popularly called 'stitch in the side'. He also adds that the powdered hemp leaves are stomachic and check diarrhoea and excessive biliary secretion. He mentions the use of hemp as an enema in strangulated hernia, and as an antidote in poisoning with orpiment. In *Makhzanul aldawaiya*, the well-known Arabic book on materia medica, the author dwells on the wonderful properties of the hemp plant. It is said to be a cordial, a bile absorber, an appetizer, and that its moderate use prolongs life. The powdered bark is recommended as an external application to fresh wounds and sores. A poultice made by boiling the roots and leaves of the hemp plant is prescribed for application to inflamed parts as a cure for erysipelas and for allaying neuralgic pains. The oil expressed from the hemp seeds is known as 'kandiryak' and is used in Kashmir as well as in certain parts of the Punjab as an application for rheumatic pains.

(c) *Indian hemp in western medicine.*—The introduction of Indian hemp into western medicine may be traced back to the period when Napoleon's expeditionary forces occupied Egypt. In India, O'Shaughnessy in 1839 tried Indian hemp as a sedative of the central

nervous system in such diseases as tetanus, hydrophobia, rheumatism, chorea, and convulsions in children. Christison also carried out clinical trials in Indian patients and considered it to be an anodyne, hypnotic, and antispasmodic next only to opium. Later, Aaronson used it on some of his patients undergoing surgical operations and they testified that the drug subsequently had some pain-relieving properties. During the period that followed the report of these early workers, Indian hemp was used for its analgesic and hypnotic properties in such affections as asthma, neuralgia, neuritis, migraine, sciatica, myodynia, gastrodynia, enteralgia, tinnitus, dysmenorrhœa, muscular and joint pains, etc. It was also used to relieve the lightning pains of tabes, fornication, numbness, paræsthesia, convulsions, etc. On account of its diuretic and sedative properties a decoction of hemp leaves has also been used in cystitis and urethritis.

(d) *Indian hemp in veterinary medicine.*—For diseases of cattle, hemp leaves are frequently used mixed with such ingredients as spices, salt or sugar candy. The smoke produced by the burning hemp plant is considered to be a disinfectant for sheep folds. Ganja is considered to be a good remedy against intestinal worms and in 'foot sore' disease. Bhang is sometimes used to increase the flow of milk in cows. Bhang mixed with salt is often administered to cattle as a preventive against diarrhœa, which is of common occurrence in India during the monsoon months. The use of these drugs is chiefly based on hearsay and tradition.

(e) *Indian hemp as a household remedy.*—The hemp drugs are popularly used as household remedies in the amelioration of many minor ailments. A mild beverage made from bhang leaves is believed to sharpen appetite and help digestion. Indian hemp is commonly used as a smoke and as a drink for its supposed prophylactic value against malaria in malarious tracts. Bhang beverages form one of the popular household remedies for gonorrhœa and dysuria. On account of their mild diuretic and sedative properties these drinks probably give a certain amount of symptomatic relief. Likewise, the use of bhang in dysmenorrhœa, asthma, and other spasmodic conditions is not uncommon. A poultice made from fresh leaves is a common household remedy for painful affections of the eyes, conjunctivitis, swollen joints, orchitis, and other acute inflammatory conditions.

(iii) *Use of hemp for euphoric, intoxicating and aphrodisiac purposes.*—The habitual use of hemp drugs for the production of euphoria and intoxication is widespread not only in India but throughout Asia and Africa. According to reports in published literature, it is a fairly common habit in the southern states of the United States of America where it is generally known as 'marihuana'. The rapid development of its use since 1935-1936 and widespread traffic in it has been the source of very great concern to the Bureau of Narcotics. Particularly disturbing is the fact that the victims comprise for the most part members of the younger generations and even boys and girls of school age are not excepted.

These drugs are said to alleviate fatigue and also to increase the 'staying power' in severe physical stress. In India, fishermen, boatmen, washermen, and cultivators who have to spend long hours of the day in rivers, tanks and water-logged fields often resort to hemp drugs in some form or other in the belief that these will give them a certain amount of protection against catching cold. Mendicants who roam about aimlessly in different parts of India and pilgrims who have to do long marches often use hemp drugs habitually. Sadhus and fakirs visiting religious shrines usually carry some bhang or ganja with them and often indulge in them. It is not an uncommon sight to see them sitting in a circle and enjoying a smoke of ganja in the vicinity of a temple or a mosque. Labourers who have to do hard physical work use hemp drugs in small quantities to alleviate the sense of fatigue, depression and sometimes hunger. A common practice amongst labourers engaged on building or excavation work is to have a few pulls at a ganja pipe or to drink

a glass of bhang towards the evening. This produces a sense of well-being, relieves fatigue, stimulates the appetite, and induces a feeling of mild stimulation, which enables the worker to bear the strain and perhaps the monotony of his daily routine of life more cheerfully. The low cost and easy availability of these drugs are important factors in their use by the working classes, whose economic condition is low in this country. Hemp drugs are perhaps the only narcotic drugs which fall comfortably within their means and they make use of them as occasion arises. A dose worth two to four pice ($\frac{1}{2}$ to 1 penny) is often sufficient for producing the desired effect in a few individuals.

Hemp drugs are also sometimes used to induce a state of intoxication which will excite emotion and give a sense of bravado so that daring acts may be committed. As has been said the Rajput warriors, during their frequent encounters with the Moham-medan invaders in the old days, used to indulge in bhang so that any nervousness present might be banished, and a feeling of determination created either to win or die on the field of battle. This practice is seen even in these days in connection with wrestling contests and athletic sports and games needing great physical effort and endurance. Indulgence in hemp drugs, unlike alcohol, rarely brings the habitué into a state of extreme intoxication where he loses entire control over himself. As a rule, the intoxication produced is of a mild nature and those who indulge habitually can carry on their ordinary vocations for long periods and do not become a burden to society or even a social nuisance.

Another purpose for which hemp drugs are largely used in this country is for their aphrodisiac effect. The belief regarding their stimulant effects on the sexual organs has been in existence for a very long time. According to the physiological data obtained it is possible that hemp drugs by their action on the higher centres of the brain, may excite ideas and delusions of a sexual nature, but no experimental data are available to show that they have any specific action on the lower sexual centres in the cord or directly on the organs.

The use of hemp drugs for euphoric, intoxicant, and aphrodisiac purposes, although quite common 20 to 30 years ago, has gradually declined and at the present time it is almost entirely confined to the lower strata of society. Amongst the upper and middle classes, the use of hemp drugs is nowadays considered to be derogatory, in spite of the fact that the practice was held in great esteem in ancient India, and early literature is full of references to the virtues of this drug.

This change in outlook with regard to indulgence in them is not difficult to understand. One reason is that hemp drugs are popular with the lower strata of society which contain a large number of undesirable and criminal elements, and the well-to-do and respectable classes are giving them up on account of this association. Another and perhaps a more important reason for the decline of the use of hemp drugs is probably traceable to the peculiar blunting of the sense of relativity in which the idea of time and space may be lost. By affecting the higher nervous pathways concerned in the balanced co-ordination of time and space, the use of Indian hemp, unlike other drugs which produce euphoria, is more likely to place the habitué in an awkward position and bring him into ridicule. Behaviour problems are also known to arise commonly with them. These lapses naturally become immediately apparent in social and club life and make the company of such persons undesirable. The upper and middle classes, therefore, abstain from the use of these drugs as far as possible. Whatever may be the reasons for the decline in the use of hemp drugs, statistical data undoubtedly show a marked decrease in their consumption during recent years, especially among the upper classes.

ABUSES OF HEMP DRUGS

The hemp drugs are rarely employed to produce a state of intoxication which is so intense that the

individual may lose all control over himself. Although their habitual use is common, these drugs are not often indulged in to such an extent as to constitute a definite abuse. The deliberate abuse of bhang is met with among certain classes of religious mendicants in this country, their main purpose being to get into a state of frenzy which, according to their traditional ideas, is conducive to mental concentration and communion with God. Such a frenzied state is used as a cloak for creating belief in the minds of the credulous illiterate masses. A large number of religious fanatics in temples and in places of pilgrimage undoubtedly are hemp-drug addicts of long standing.

Another class of people who are prone to abuse hemp drugs are some of the nomadic classes who have no fixed home and who move about from place to place living in small camps by the roadside exposed to all sorts of inclement weather.

It is commonly believed that bhang drinking is comparatively less harmful than the practice of smoking ganja and charas. There appears to be a good deal of truth in this popular belief. Although the use of bhang as a cooling beverage is encountered in many parts of India and cases of excessive indulgence are not frequently met with, instances of frank abuse and harmful effects following therefrom are as a rule uncommon. This, of course, does not mean that bhang does not produce any deleterious effects on the system. Impairment of digestion is a common occurrence with bhang drinkers of long standing, who take excessive quantities. This naturally results in injury to their general health and vitality. There is definite and demonstrable stimulation of the higher cerebral and medullary centres, but this is seldom intense and, therefore, the harm done is comparatively small. The smoking of ganja and charas on the other hand, although it affects the digestion to a lesser extent, brings about a state of intense intoxication as a result of action on the higher centres in the brain and, if the abuse is continued for a considerable time, it may lead to mental derangement, behaviour problems, crime and insanity. These habits, therefore, constitute an important social problem. Moreover, ganja and charas are possibly more likely to produce intense addiction than bhang. Habitual use of bhang can be discontinued without much trouble but the withdrawal from the ganja and charas habits is accompanied by unpleasant symptoms and is much more difficult, though negligible compared to those associated with drugs like opium or cocaine.

PRESENT EXTENT OF HEMP-DRUG ADDICTION

Total consumption of hemp drugs.—The total consumption of hemp drugs, according to excise returns of 1934-35, amounted to 1,031,496 lb. in British India and this works out approximately at 4.24 lb. per 1,000 of population per annum (census of 1931). The consumption of these drugs in British India in 1912-13 worked out at 15 lb. per 1,000 of population per annum. It will be seen therefore that, during the last 20 years, the use of these drugs has been reduced to nearly a quarter of what it was. When the three preparations, bhang, ganja, and charas, are considered individually, the amounts consumed in 1934-35 were as follows:—

	Seers or	lb.
Bhang	292,166	584,332
Ganja	162,153	324,306
Charas	61,429	122,858
TOTALS	515,748	1,031,496

The United Provinces consume the largest amount of hemp drugs, the total consumption in that province being 287,926 lb. during 1934-35; next in order come the Punjab, Bengal, Bombay, and Central Provinces.

As regards the incidence of the hemp-drug habit,

Sindh shows the highest incidence with a consumption of 35.12 lb. per 1,000 of population per annum, then comes Delhi with 23.84 lb., Ajmere-Merwara 14.6 lb., Baluchistan 8.22 lb., the Punjab 7.6 lb., North-West Frontier Province 5.94 lb., United Provinces 5.94 lb., Bombay 4.4 lb., Assam 2.18 lb., Bihar and Orissa 2.2 lb., Bengal 1.6 lb., and Central Provinces and Berar 1.6 lb., respectively.

It is very difficult to form an accurate idea of the number of persons addicted to the three forms of hemp drugs as there are many occasional consumers, and there is no system of registration of addicts. It is only possible therefore to form a very rough estimate of the number of addicts from the total amount of the three preparations consumed and the average dose taken.

The average daily dose of bhang, ganja, and charas has been carefully worked out by us in more than 1,500 addicts. This is approximately as follows:—

	Grains
Bhang	20
Ganja	18
Charas	15

Assuming that the whole amount was used for euphoric purposes and for habitual consumption (the amount used for medicinal purposes being negligible), the number of hemp-drug addicts in the whole of British India at the present time works out to be 855,844, provided only the amount issued by the excise authorities is considered. From the knowledge we have of the situation all over the country, we are inclined to believe that the actual amount is a good deal higher, as considerable amounts of the drugs are obtained from illicit sources, for example by smuggling or from the spontaneous growth, which can be easily utilized.

The hemp drugs are the narcotics most extensively employed by the poorer classes throughout the country because they are cheap and easily available. Extensive work in the field has enabled us to estimate that the incidence of hemp-drug addiction ranges between 0.5 and 1.0 per cent of the total population in British India. The largest number of addicts are in the United Provinces and next comes Sindh. In these areas the use of hemp drugs is not restricted to any particular community and extends even among the middle classes. Charas is not used in Madras, Assam, Bihar and Orissa, and Central Provinces excepting in a few industrial towns such as Ahmedabad and Jubbulpur. Ganja is used to a comparatively small extent in Sindh, eastern districts of the United Provinces and in N.-W. F. Province and Punjab where it is prohibited.

From our investigations in the field, we conclude that a large number of the inhabitants of this vast country take hemp drugs habitually at the present time, that the habit is on the whole declining and it certainly is not on the increase anywhere, that there is reason to believe that during the last 15 years the use of hemp drugs has more rapidly declined than in the previous similar period; the cause of this decline appears to be the tightening of control by government by reducing the area under cultivation and increasing the price by enhancement of excise duty.

The localities in each province where the incidence of hemp-drug addiction is high are urban and not rural areas. Large industrial towns or large agricultural centres, as a rule, have large labour populations in low economic circumstances. They have to work very hard and they usually indulge in these drugs as cheap euphorics. Thus, in towns such as Calcutta, Bombay, Madras, Ahmedabad, Cawnpore, the consumption is high on account of this large industrial population. The mining areas also show a high incidence, due to the preponderance of labour forces. Burdwan district in Bengal with its large mining industries shows a comparatively higher incidence than other parts of Bengal, with the exception of Calcutta.

Religious centres and important places of pilgrimage also show a high incidence of the use of hemp drugs. This is due to the presence of hordes of mendicants who collect at such places.

HEMP-DRUG ADDICTION IN DIFFERENT PROVINCES IN INDIA

Bengal.—During 1936-37 the consumption of different forms of hemp drugs in Bengal, according to the Excise Reports, was as follows: ganja 64,974 lb., bhang 16,736 lb., and charas 1,452 lb.

The incidence of the use of different forms of hemp drugs is high chiefly in the western zone, composed of 24-Parganas, Burdwan, Birbhum, Midnapore, and Hooghly districts. The high consumption in these areas is attributed to large labour forces engaged in various industries such as jute and cotton mills, iron and steel works, coal fields, etc., which abound in this area.

In most of the districts of East Bengal, the demand for bhang as an intoxicant is very small, but it should be remembered that in these districts bhang grows wild, and it is believed to be extensively used as an illicit substitute for ganja. Further, it will be seen that the consumption is highest in Calcutta and its suburbs. The reason of this is that in the city of Calcutta and its suburbs there is a large labour population engaged in different industrial occupations, whose hygienic and economic conditions are such as to lead to the use and abuse of narcotic and euphoric drugs.

Taking the Presidency as a whole the incidence of the use of these drugs is not very high, being only 1.6 lb. per 1,000 of population per annum for all hemp drugs and 1.4 lb., 0.4 lb., and 0.02 lb., for ganja, bhang, and charas, separately. There is no doubt that there is a further decline in these figures.

Bihar and Orissa.—In 1936-37, 57,726 lb. of ganja and 14,470 lb. of bhang were consumed in Bihar. Minor rises occur in the consumption of bhang in the districts of Gaya and Patna, in all probability because of their having places of pilgrimage to which people from other parts of India come in large numbers. The consumption of ganja keeps at a fairly high level throughout the province. The incidence of consumption of total hemp drugs per 1,000 population was 2.2 lb. per annum.

The types of people who use hemp drugs in these provinces are similar to those in Bengal, the only difference being that the incidence of addiction among the middle classes is higher than that in Bengal, particularly in the western districts which adjoin the United Provinces.

Assam.—Cultivation of hemp drugs is not allowed in this province, the supply of ganja being obtained from Rajshahi in Bengal and of bhang from Bhagalpore in Bihar. The amount of ganja consumed in Assam during the year 1935-36 amounted to 20,245 lb. The incidence per 1,000 population works out to be 2.2 lb. The consumption appears to have increased during the last year throughout the province except in Cachar, Sylhet, the Khasi Hills, Jaintia Hills, and the Garo Hills.

The consumption of bhang amounted to 60 lb. during 1935-36 which is very small as compared with other provinces. There are only two bhang shops, one in Cachar and another in Sylhet, but the consumption from excise sources is gradually decreasing, due to smuggling from Manipur and the Naga Hills. Permits are also issued to 47 druggists and Kavirajas who are allowed to store the drug for medicinal purposes. Those addicted to hemp drugs are mostly working class coolies and labourers.

United Provinces of Agra and Oudh.—The total consumption of all these drugs in the United Provinces was 287,942 lb. during 1934-35. Of this amount was 228,724 lb. was bhang, 42,752 lb. charas, and 16,466 lb. ganja. As regards the incidence per 1,000 population per annum is concerned, it works out to be 5.8 lb. of all hemp drugs and 5 lb., 1 lb., and 0.4 lb. for bhang, charas, and ganja, separately.

Punjab.—Only bhang and charas are used in the Punjab, the sale of ganja being strictly prohibited. Total consumption of hemp drugs in this province during 1935-36 amounted to 179,408 lb. out of which 34,502 lb. was charas and 144,906 lb. was bhang.

The total incidence for the two drugs worked out at 7.6 lb. per 1,000 of population per annum and 1.4 lb. and 6.0 lb. for charas and bhang separately.

Delhi province.—As this province adjoins the Punjab and western districts of the United Provinces, the problem of hemp-drug addiction is very similar to these provinces. Bhang and charas are almost entirely used and the supply is obtained from the Punjab. Total consumption of these drugs during 1934-35 was 15,130 lb. out of which 5,702 was charas and 9,428 was bhang. The average consumption per 1,000 population per annum works out at 23.8 lb. and the province stands second in India with regard to the incidence of consumption.

North-West Frontier Province.—The problem of hemp-drug addiction in this province is similar to that in the adjoining provinces of the Punjab and Sindh. Bhang and charas are the only two preparations which are used in this province for addiction purposes. Indian hemp grows spontaneously almost everywhere and can be collected without restriction up to the legal limit of 2 lb. per person. During 1935-36, 6,768 lb. of charas were consumed in this province which gives the incidence of 4.2 lb. per 1,000 population per annum. The drug is used by all classes, who are chiefly Mohammedans.

Bhang is mainly consumed in Bannu and Dera Ismail Khan districts. This is probably because these areas lie on the border of western Punjab districts and Sindh which are both heavy bhang-consuming areas. The total consumption of bhang during the year 1935-36 was 12,242 lb. which gives an incidence of 1 lb. per 1,000 population per annum. The incidence of both forms worked out at 5.2 lb. per 1,000 population.

Sindh.—During 1934-35, 136,480 lb. of hemp drugs were consumed of which 118,660 lb. was bhang, 17,504 lb. charas, and 316 lb. ganja. The consumption of bhang is rather high throughout the province, and works out at 35.12 lb. per 1,000 population per annum.

Baluchistan.—The total consumption of hemp drugs during 1935 amounted to 3,352 lb., of which 2,164 lb. was charas, 1,186 lb. bhang, and only 2 lb. ganja. The average consumption of all the hemp drugs put together was 8.2 lb. per 1,000 of population per annum.

Bombay Presidency.—The total consumption of hemp drugs in the Bombay Presidency proper during the year 1936-37 was 79,646 lb., of which 16,214 were bhang, 12,476 lb. charas and 50,956 lb. ganja. Ganja is however the drug of choice, bhang is in little demand and is only used by the Marwari community and people from northern India. The use of charas is prohibited all over the province except in the towns of Bombay and Ahmedabad.

In this province, taken as a whole, it has been roughly estimated that about 1 per cent of the population use hemp drugs habitually in some form or other at the present time. The incidence of all drugs works out approximately to 4.4 lb. per 1,000 of population per annum. That for ganja, bhang, and charas is 8.4 lb., 2.8 lb., and 0.8 lb., respectively. There appears to be no doubt that, on the whole, habitual indulgence has considerably declined during recent years.

Central Provinces and Berar.—The total consumption of hemp drugs in this province works out at 1.6 lb. per 1,000 population per annum and that of bhang and ganja to 1.2 lb., and 2 lb.

Coorg.—The amount of ganja consumed during 1935-36 was 318 lb. and the incidence of hemp-drug addiction worked out at 1.8 lb. per 1,000 population per annum.

Madras Presidency.—The population of southern Madras uses hemp drugs to a lesser extent than that of northern parts. During 1934-35 the total consumption of ganja and bhang amounted to 89,172 lb., out of which only 12,158 lb. was bhang, the rest being ganja. The total average consumption amounted to 1.8 lb. per 1,000 population per annum. The incidence is somewhat high in Madras and Salem districts, in the former on account of its being an industrial centre and in the latter because it is a rich agricultural centre. The consumption of both ganja and bhang is low in all other districts. The use of charas is practically unknown. There are altogether 544 licensed shops in the presidency.

EFFECT OF HEMP-DRUG ADDICTION ON GENERAL HEALTH

From an analysis of the statements of addicts (1,238) as to whether the general health is affected in any way, we have observed that in about 52.10 per cent no ill effects were admitted. In 24.47 per cent health was believed to be affected to a minor degree and in 14.78 per cent to a marked degree. There were, on the other hand, 8.64 per cent who stated that they had improved in their general health since they took to indulgence in hemp drugs. The last group of persons were mostly those addicted to the use of bhang and who were in the habit of taking small doses in the neighbourhood of 10 grains a day. It is also evident that the evil effects were admitted more frequently in the case of ganja and charas addicts than in the case of bhang addicts, in 65.02 per cent as compared with 23.7 per cent, in this series. Further analysis showed that with increased dosage, the adverse effects were admitted to be more pronounced.

It will thus be seen that the general health may not suffer when hemp drugs are consumed in doses below 20 grains daily; further increase in the dosage is attended with deleterious effects and consumption exceeding 180 grains a day may damage the health seriously and rapidly.

Physical effects

Moderate habitual use of ganja or charas may or may not be attended with harmful effects, and in the case of bhang there is evidence that no apparent harm may result if it is taken in moderate quantities. Of all the preparations of Indian hemp, bhang is popularly believed to be the least harmful. According to the Indian Hemp Drug Commission (1893-1894) it is the refreshing beverage of the people, corresponding to beer in England and moderate indulgence in it is attended with less injurious consequences than similar consumption of alcohol in Europe. This view has been corroborated by our own experience in the field.

Bhang drinkers, unlike other drug addicts, are robust and physically well-built individuals. Its moderate habitual use does not lead to malnutrition, on the other hand appetite is said to be stimulated. The cases, in which loss in weight occurs, are probably those who are at the same time addicted to some other pernicious drugs such as opium, cocaine, or alcohol. In a certain number of our cases from the well-to-do and priestly classes, an atonic condition of the voluntary muscles of the body was commonly met with. These individuals were flabby and therefore had a tendency to become obese. The appearance of bhang addicts taking excessive doses is generally sleepy and they often have a vacant look. In about 60 per cent of those indulging in Indian hemp, the conjunctivæ are congested and have a yellowish-red tinge which becomes intense when the dose is repeated.

The confirmed ganja and charas addicts, especially those taking large doses, often exhibit signs of deterioration of general health. The excessive smokers are thin, emaciated persons with a sallow or muddy complexion, and dull grey eyes. Excessive smoking also produces chronic catarrhal laryngitis and considerable bronchial irritation may result.

The daily repeated dosage of these drugs overburdens the alimentary and excretory systems, the appetite declines and food is not properly assimilated. The addicts lose weight rapidly and may suffer from general cachexia; the skin becomes pale and dry and is often covered with scales; the nails, teeth and hair, which are often affected, become dry and lose their lustre. The general bodily nutrition suffers, because the money, which should be spent for the purpose of procuring wholesome and nutritious food, is used to buy the drug itself. Impairment of vitality is thus produced, which renders the system incapable of resisting an intercurrent disease. Addicts are generally more sensitive to the vicissitudes of weather than ordinary individuals.

EFFECTS ON THE CENTRAL NERVOUS SYSTEM

The main effect of hemp-drug addiction is on the central nervous system. These effects can be grouped under two headings:—

A. Temporary effects, *i.e.*, those that are only present when the person is actually under the influence of the drug.

B. Permanent effects, *i.e.*, the sequelæ of the prolonged use of these drugs.

A. Temporary effects

Soon after taking a moderate dose by mouth the pulse increases somewhat in fullness and frequency, the face becomes flushed, and there is a feeling of warmth all over the body; the appetite becomes sharpened and there is a tendency to talk. In rare instances aphrodisiac sensations are experienced. The sensation of pain is definitely dulled and there is a feeling of partial anæsthesia all over the body. The pupils are slightly dilated.

With larger doses the above symptoms become more pronounced; the pulse becomes rapid and sometimes irregular at first and slows afterwards. The temperature varies according to whether the individual is excited or depressed. This stage is usually followed by drowsiness and deep sleep.

Ganja and charas smoking.—The immediate effects of moderate doses in a habitual consumer is the initial feeling of anxiety and restlessness, which is followed by a refreshing and stimulating feeling. The sense of fatigue is alleviated, pleasurable sensations are produced so that the consumer is happy, and congenial towards everybody. Restlessness is removed and there is a quietening effect on the nervous system, which induces a sense of forgetfulness of all mental worries.

The effects in many cases are attended with hallucinations of sight, hearing, and general sensibility. The senses become hyper-acute and more subtle. Disturbance of the sensations of taste and smell may also occur during the later stages. Deep sleep generally follows in the majority of cases an hour or more after indulgence.

There are individuals amongst ganja and charas smokers on whom the effect of intoxication is quite different from that ordinarily obtained. They lose all sense of proportion and become irresponsible.

Bhang or 'siddhi' drinking or hemp eating.—Bhang is somewhat extensively used for occasional indulgence and for religious purposes; its symptomatology therefore deserves special mention. The effects produced by this drug are more lasting than those produced by smoking ganja and charas. With moderate doses the individual feels cheerful. The appetite is sharpened. With some there is a sensation of forgetfulness and relief from worries and troubles of life, others get good sleep after the day's hard work, still others feel active and interested in life and their surroundings, after taking a dose.

Most bhang addicts, after a regular dose, become reflex and emotional; the control of the higher centres is lost and the sense of judgment is impaired to an appreciable degree. The stage of intoxication generally lasts from three to five hours and then sleep supervenes. The addict on waking next morning does not experience any marked nausea or vomiting nor are the bowels affected (constipated) as in the case of other intoxicants. Some of the addicts complain of slight dizziness and congestion of the eyes and feeling of heaviness in the head on waking next morning.

Duration of effects. Ganja and charas smoking.—Smoking produces its effects more rapidly than consumption by the mouth because by the latter method the absorption of the resin, which is combined with large quantities of colloidal matter, is considerably delayed from the gastro-intestinal tract. With pure resin absorption is of course much quicker. According to Russell, in the case of ganja smoking the mental effects appear within three to five minutes while in the case of charas they may appear with the first pull from the pipe ('chillum'). In the case of ganja, the effects last from half to one hour or even longer, in the case of charas from 15 to 20 minutes. With bhang the symptoms may set in from 20 to 30 minutes or may be delayed and may last from two to twelve hours.

B. Permanent effects

Mental effects.—Mental injury is more likely to occur in the case of those individuals who take large doses and for prolonged periods.

The effects of different preparations are interesting. Emotional character and judgment are affected more in the case of bhang, while memory

and sleep are more disturbed in the case of ganja and charas. Bhang habitués were also more peevish and hypochondriacal than those indulging in ganja and charas. The incidence of gross injuries to the central nervous system such as insanity and moral depravity appears to be more frequent amongst the ganja and charas habitués than the bhang drinkers. Epileptic fits are, on the other hand, more frequent amongst the bhang habitués.

Effects on sleep.—We are inclined to believe that sleep is disturbed more in the case of ganja and charas addicts and little or not at all in the case of those addicted to bhang. This may be due to the fact that bhang as a sedative has a mild and prolonged action, while ganja and charas have rapid and intense effects in which euphoria and stimulation are more pronounced.

Use of the hemp drugs in relation to mental disorders and crime.—We have come across a few instances of insanity resulting from the abuse of bhang or charas or ganja. The testimony of many of the competent medical authorities in this country also sponsors this belief. The abuse of hemp drugs injures the constitution in the same manner as an excessive indulgence in any other narcotic drug. It does not necessarily produce insanity, except perhaps in those who have predisposition to it. It may, however, lead to rough manners and apathy and extraordinary behaviour on the part of the individual. Those who smoke ganja and charas excessively are often quarrelsome and do not heed the consequences of their deeds. We have examined records of murder and crime cases in jails and mental hospitals and have found that only in a very few instances (1 to 2 per cent) the temporary or the permanent mental derangement induced by hemp drugs was directly responsible for a crime.

As regards the relationship between hemp-drug addiction and crime, there are instances where the addicts committed criminal acts under the effect of these drugs, especially after smoking ganja or charas, under grave provocation or in cold blood and with premeditation. Such instances do not necessarily prove any definite relationship between hemp drugs and crime. Indulgence in alcohol undoubtedly gives rise to a feeling of bravado and courage by depressing the higher controlling cerebral centres, and there are many instances in which it has led to crime of a very grave nature. With regard to hemp drugs, however, the situation may be viewed from a different angle. Hemp drugs are cheap and are generally used by the poorer classes, who belong to the lower strata of society, to which most of the criminals in this country belong. This may be an explanation of the fact that proportionately more consumers of hemp drugs, especially ganja and charas smokers, are found among bad characters than among the population in general. Moreover the associated poverty of the addicts may lead them to commit thefts and other petty offences, but

this does not throw the entire responsibility on the hemp drugs.

So far as premeditated crime is concerned, especially that of a violent nature, hemp drugs in some cases may not only not lead to it, but they may actually act as deterrents. The result of continued and excessive use of these drugs, in our opinion, is to make the individual timid rather than to lead him to commit a crime of violent nature. Our opinion in this respect, based on the study of a large series of addicts, is that the tendency of the drug appears to be to develop or bring into play the natural disposition of the consumer and to emphasize his true character and peculiarities.

TYPES OF HEMP-DRUG ADDICTS

There is nothing inherent in the make-up of a normal individual which draws him towards the habitual use of narcotic drugs. The basic factor underlying addiction is always some defect or abnormality in the mental make-up of the individual. The causes leading to drug addiction are almost identical all over the world. The reasons for which the habit is started are psychological and are sufficiently convincing to the addict himself and he intentionally carries on the habit in spite of being aware of its dire consequences. The addicts in this country can be divided into four main groups:—

Group I.—Persons belonging to poorer classes, such as day labourers, or domestic servants. These people are the principal consumers of ganja and charas. They keep to small doses and as a rule suffer from little or no injury to their general health.

Group II.—Those individuals who use these drugs in the same way as opium, for their narcotic effects. The members of this group are idlers and persons below average mental equilibrium. Ganja and charas are mostly used by this group and the damage to their health is more perceptible than in the case of group I.

Group III.—Those who use hemp drugs in order to obtain stimulant effects combined with intoxicating effects in the same way as from alcohol. This practice exists mostly amongst the idle rich.

Group IV.—Mostly religious mendicants (sadhus and fakirs) and the priestly classes. Hemp drugs are used in all forms by them in order to overcome the feeling of hunger and in order to help them to concentrate on religious and meditational objectives, and also sometimes by the unaccustomed to excite passion and emotion.

SUMMARY AND CONCLUSION

(1) The hemp plant grows wild over extensive tracts in northern India along the southern slopes of the Himalayas, coming well down into the plains. Its cultivation for narcotic purposes is strictly controlled and is confined to selected areas under careful supervision of the excise authorities.

(2) The resinous substance contained in the hemp plant is the active principle responsible for its physiological activity. The resin, as obtained from the plant, contains a number of compounds, one of these being *Cannabinol* which is probably the active principle. The potency of hemp drugs deteriorates with age.

(3) *Charas* and *ganja* are preparations from the same plant and differ in the amount of the narcotic principles they contain; the physiological effects produced by them are similar, differing in degree. *Ganja* and *charas* are mostly smoked, while *bhanga* is usually taken by the mouth in the form of a beverage.

(4) The present use of hemp drugs in India may be considered under three main headings:—(i) use in connection with religious and social customs; (ii) medicinal uses; and (iii) use for narcotic and euphoric purposes.

(5) The use of hemp drugs in order to produce euphoria and mild stimulation, although still common, is gradually declining. It exists mostly at the present time among the lower and working classes.

(6) As euphorics, hemp drugs, unlike alcohol, rarely produce severe intoxication, especially in those who take them habitually. Abuse of these drugs sufficient to produce intoxication of a pronounced type exists only amongst the idle and vicious classes in the cities and towns.

(7) The total consumption of hemp drugs in British India during the year 1934-35 amounted to 1,031,496 lb., which works out approximately at 4.24 lb. per 1,000 of population per annum (according to the census figures of 1931) as compared with 15 lb. during 1912-13. The United Provinces are the largest consumers of hemp drugs, next in order come the Punjab, Bengal, Bombay, and Central Provinces and Berar, respectively.

Charas is mostly used in the northern and western parts of India, *i.e.*, the North-West Frontier Province, the Punjab and the western districts of the United Provinces. In Sindh, Rajputana, and western districts of the Punjab and the United Provinces, *bhanga* is more commonly used in the form of a cooling and refreshing beverage suitable for the hot and dry summer months. In the rest of India, *i.e.*, Bengal, Bihar and Orissa, Bombay, Madras, etc., *ganja* is the drug of choice.

From the survey we have carried out and from the total consumption of hemp drugs and daily dosage of addicts we have roughly estimated that there are at least between 855,844 and 1,000,000 hemp-drug addicts in this country, *i.e.*, approximately 0.3 to 0.5 per cent of the population of this vast country take hemp drugs habitually at the present time.

(8) The moderate use of *ganja* and *charas* may or may not be attended with harmful effects, while in the case of *bhanga* there is definite evidence that no harm may result to the general health with moderate doses. On the other hand confirmed *ganja* and *charas* addicts, especially

those taking large doses, often exhibit signs of deterioration of general health. The daily repeated doses, especially if large, overburden the digestive and the excretory systems with the result that the appetite is lost and food is not properly assimilated.

(9) Hemp drugs are, even at the present time, used as sexual stimulants by the lower classes. They lead to temporary stimulation of the psychic areas, and the mental excitement thus resulting gives the semblance of aphrodisiac effects, especially in those individuals who are sexually inclined.

The incidence of sterile marriages amongst hemp-drug addicts worked out to nearly twice that of the normal population.

(10) Effects on the central nervous system can be divided into two stages: (a) an initial stage of stimulation and exhilaration, and (b) a stage of depression when the sedative effects become more marked. The effects during each stage are largely influenced by racial and personal idiosyncrasy and may be entirely modified by the individual temperament.

(11) From a careful study of a series of 1,238 addicts we are inclined to believe that continued

and excessive indulgence in these drugs tends to impair the normal functioning of the nervous system, renders the addict incapable of mental exertion, and causes general debility and premature decay.

(12) We have come across a few instances of insanity resulting from the abuse of bhang or charas or ganja. The abuse of hemp drugs injures the constitution in the same manner as an excessive indulgence in any other narcotic drug. It does not necessarily produce insanity except perhaps in those who have predisposition to it.

REFERENCE

Chopra, R. N., and Chopra, G. S. (1939). *Indian Med. Res. Mem.*, No. 31. Thacker, Spink & Co. (1933), Ltd., Calcutta.

HÆMATOLOGICAL TECHNIQUE

By L. EVERARD NAPIER, M.R.C.P. (Lond.)
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PART V of this series has been unavoidably postponed this month. It is hoped to resume their publication in July or August.

Medical News

BOMBAY MEDICAL COUNCIL

SUMMARY of the proceedings of the meeting of the Bombay Medical Council held on the 9th February, 1940.

The Council proceeded to consider the complaint by Dr. V. B. Mankad, M.B., B.S., and five other medical practitioners of Ahmedabad against Dr. Ganpatram Gokaldas Patel, M.B., B.S., D.O.M.S. (Lond.), in respect of the charges, *viz*,

(a) of directly or indirectly procuring, or sanctioning or acquiescing in the publication and free distribution among patients of a handbill or leaflet in Gujarati, the said handbill or leaflet commending or directing attention to the professional skill, services, popularity, amiable temper, the care and caution had by Dr. Patel in the treatment of eye diseases; it was alleged that the mention of Surya Bhuwan Hospital was intended to be an advertisement to solicit more practice;

(b) issuing cards or tickets containing not only the number and name of the patient thereon but also the name and address, etc., of Dr. Patel which, it was alleged, constitute an advertisement;

(c) under the cloak of a semi-charitable eye-clinic, it was alleged, he was carrying on private practice charging only one anna to every out-door patient of the Surya Bhuwan Eye Hospital.

These acts appear, it was alleged, to contravene the provision of clauses (a) and (m) of rule 1 in Section II of the Code of Medical Ethics and clause (a) of section 6 of the Warning Notice.

Mr. C. C. Parikh, Advocate from Ahmedabad, was allowed to appear for Dr. V. B. Mankad, Dr. D. E. Anklesaria, Dr. M. M. Parikh and Dr. M. D. Anklesaria, four of the complainants herein, as a special case.

Mr. G. C. O'Gorman, Bar-at-Law, and Mr. H. R. Pardiwalla, Bar-at-Law, instructed by Messrs. Majumdar and Dalal, Solicitors, appeared for Dr. G. G. Patel, the practitioner.

Upon the conclusion of the deliberations, the following resolution was put from the chair:—

'That the facts alleged against Dr. G. G. Patel, M.B., B.S., D.O.M.S. (Lond.), in the Notice of Inquiry have been proved to the satisfaction of the Council.'

The said resolution was declared lost, as a result whereof Dr. Patel was held not guilty of the charges preferred against him in the Notice of Inquiry.

The Council then proceeded to consider the question of amendment of rules 61 and 64 of the Rules of the Council relating to travelling allowance and passed a resolution approving of the amendments recommended by the executive committee in regard to the said rules.

The Council then proceeded to consider the question of recognition of the D.O.M.S. of the College of Physicians and Surgeons of Bombay as an additional registrable qualification and decided to grant recognition to the D.O.M.S. of the College for registration as an additional qualification and further resolved that the same be included in Table (G) of the Bombay Medical Register.

The Council then proceeded to consider the application of Dr. J. N. DeSylva, L.M. & S., for restoration of his name to the Bombay Medical Register and resolved that the consideration of his application be adjourned *sine die* and that he be asked to submit certified copy of the judgment in the proceedings now pending against him.

The Council then proceeded to consider a letter dated the 7th August, 1939, from the Secretary, Medical Council of India, forwarding therewith a copy of letter dated the 4th July, 1939, from the Registrar, South African Medical Council, Pretoria, and decided to accept the recommendation of the executive committee that any person whose name is erased from the Register of South Africa where he was formerly a registered medical practitioner for infamous conduct in a professional respect should not be entitled to have his name entered in the list of the Bombay Medical Register, provided the Medical Council of the said country