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CANNABIS INDICA (U. S. P.)—INDIAN CANNABIS.

“The flowering tops of the female plant of *Cannabis sativa*, Linné: grown in the East Indies”—(U. S. P.).

Nat. Ord.—Urticaceæ.

COMMON NAME: *Indian hemp*.

ILLUSTRATION: Bentley and Trimen, *Med. Plants*, 231.

Botanical Source.—*Cannabis sativa* is a herbaceous annual, growing from 4 to 9 feet high, covered with a very fine, rough pubescence, scarcely visible to the naked eye. The stem is erect, branched, bright-green, and angular. The leaves are alternate or opposite, on long, lax petioles, digitate and scabrous, with linear-lanceolate, sharply serrated leaflets, tapering into a long, smooth, entire point; the stipules subulate. The flowers are borne in axillary clusters, with subulate bracts; the males are lax and drooping, and branched and leafless at the base; the females are erect, simple, and leafy at the base. The calyx of the male is downy; of the female, covered with short, brownish glands. The fruit is an ovate, 1-seeded achenium; the seeds are roundish-ovate, slightly flattened, 1 or 2 lines long, without odor, of a sweetish, oleaginous, unpleasant taste, and glossy, and grayish in color (L).

History.—Hemp (*Cannabis indica* of Lamarck), is indigenous to Persia and northern India, and is cultivated in many other countries. It is naturalized in North America, Brazil, and Europe. The hemp of this country (the preparations of which are often referred to as *Cannabis sativa* in contradistinction to *Cannabis indica*, an error which should not be continued), is identical with the Eastern plant in its botanical characters, but differs somewhat from it in its physical qualities, the India plant being more powerful in its effects on the system, and which is probably owing to the influence of climate, cultivation, etc., or perhaps, from the absence of some ethereal ingredient. In the Eastern countries an infusion of hemp, prepared with cold water, is much employed as an intoxicating drink.

Several native names are applied to different parts or products of this plant. Thus the leaves and smaller stalks, dried and broken coarsely, and intermixed with a few capsules, is known as *bhāng* (Hindustan), *siddhi* (Bengal), *sabzi* (Bombay), and *hashish* (Arabia). Our modern term *assassin* is said to have arisen from this word, the name *Hashshashin* (assassin), having been applied to a murderous Persian sect, which, in its religious rites, used hemp (hashish) to intoxication. *Bhāng* is almost tasteless, and is of a dark-green color. It is smoked with tobacco, or without the latter, but usually is incorporated into a sweetmeat known as *majun*. The flowering and fruiting tops, from which the resin has not been removed, are known as *ganja*, *ganjah*, or *gunjah* in India, and as *guaza* in London and other drug markets. These occur as compressed, brittle, brown-green shoots, or as stiff, ligneous stems with flowering and fruiting shoots attached, both varieties having a glutinous aspect. Like *bhāng*, it is without a pronounced taste.

The concrete resinous exudation of the plant is known in India by the name of *churrus* or *charas*. This is peculiar in being the production of those plants, scarcely more than 3 feet high, growing in elevated situations (6,000 to 8,000 feet, Jameson). The natives, clothed in leather apparel, run among the hemp plants, beating them, and thus gather the resin which adheres to their garments, from which it is afterwards removed by scraping. Or it may be obtained by rubbing the ripened fruit-tops between the hands, from which it is afterward scraped and formed into balls. This kind is most valued, and is known as *momeea* (waxen *churrus*). A third and more dangerous method is that of stirring dried *bhāng* and collecting the dusty, resinous powder shaken therefrom. Hemp has long been raised for its textile fibers and for its oily seeds. The fibers are largely used in making cordage, and the seeds for feeding birds, and for the expression of oil of hempseed, mostly prepared in Russia, which is used in mixing paints, and manufacturing varnish and soap, and has been used as an illuminating oil, though not well suited for this purpose. The Poles and Russians, it is said, eat the roasted seeds with bread as a condiment (*Amer. Ency.*, Hemp).

Description.—CANNABIS INDICA. "Branching, compressed, brittle, about 5 Cm. (2 inches) or more long, with a few digitate leaves, having linear-lanceolate leaflets, and numerous sheathing, pointed bracts, each containing 2 small, pistillate flowers, sometimes with the nearly ripe fruit, the whole more or less agglutinated with a resinous exudation. It has a brownish-green color, a peculiar, narcotic odor, and a slightly acrid taste"—(*U. S. P.*).

FRUCTUS CANNABIS, Hempseed.—Hempseed is about $\frac{1}{8}$ to $\frac{1}{6}$ of an inch in length, subglobular, somewhat compressed, and possessing a marginal keel, whitish in color. The testa is brownish or olive-gray, smooth, shining, brittle, and marked with veins. The inclosed greenish seed is oily, with a sweetish, oleaginous taste, and but a faint odor.

Chemical Composition.—The leaves of cannabis contain chlorophyll, coloring matter, extractive, a volatile oil, a green, resinous body, gummy extractive, a bitter body, albumen, lignin, sugar, and salts, as potassium nitrate, silica, phosphates, and other salts. The chemistry of the active constituents is not yet well determined. Not since T. & H. Smith (1846), declared that the soporific, calmative,

Fig. 54.



Cannabis sativa.

and other properties, resided in the resin *cannabin*, have any very material advances been made. Personne (1857) thought the activity of the drug depended upon its volatile oil, the vapor of which is stupefying. He succeeded in separating it into two parts—*cannabene* ($C_{18}H_{20}$), a fluid, and *cannabene hydride* ($C_{18}H_{22}$), a crystallizable solid. The oil rectified (over sodium), is miscible with alcohol, boils at 256° to 258° C. (492.8° to 496.4° F.), and has a density at 0° C. (32° F.), of 0.9292. Bromine energetically attacks it (Valente, 1881).

The *cannabin* of T. & H. Smith is the alcoholic or resinous extract employed in medicine; it is prepared from the dried flowers and incipient fruit, with the smaller branches of the plant (*gunjah*). This extract is prepared according to the directions of Messrs. Smith, as follows: "Digest bruised *gunjah* in successive quantities of warm water till the expressed water comes away colorless; and again for two days, at a moderate heat in a solution of carbonate of sodium, in the proportion of 1 part of the salt to 2 of *gunjah*. Coloring matter, chlorophyll, and inert concrete oil being thus removed, express and wash the residuum, dry it, and exhaust it by percolation with rectified spirit. Agitate with the tincture, milk of lime containing an ounce of lime for every pound of *gunjah*, and after filtration, throw down the excess of lime by a little sulphuric acid. Agitate with the filtered liquor a little animal charcoal, which is afterward to be removed by filtration. Distill off most of the spirit, add to the residual tincture twice its weight of water in a porcelain basin, and let the remaining spirit evaporate gradually. Lastly, wash the resin with fresh water till it comes away neither acid nor bitter, and dry the resin in thin layers." This resinous extract contains the taste and odor of *gunjah*, and its activity is not impaired when exposed in air for 8 hours to a temperature of 82.2° C. (180° F.). One hundred pounds of dry *gunjah* yield about 6 or 7 pounds of this extract (P). It has a dark, dull-green color, a peculiar narcotic, somewhat fragrant odor, and a hot, somewhat bitter, and acrid taste. It is mostly soluble in alcohol, chloroform, ether, oil of turpentine, olive oil, and partially in benzol; its terebinthine solution deposits minute scaly crystals on standing. It burns without leaving a residue. When water is added to its solution in alcohol, a white precipitate falls. It may be distinguished from the extract of common hemp by the following tests: Resinous extract of Indian hemp only partially dissolves in liquor potassæ, while that of common hemp dissolves readily; nitric acid, sp. gr. 1.38, converts the former, with red fumes and rapid reaction, into an orange-red resinoid substance, amounting to nearly the same quantity as the resin under treatment, while the extract of common hemp gives but a small amount of resinoid (Prof. W. Procter).

In the year 1876, Preobraschensky obtained a volatile alkaloid which he believed to be nicotine, but Dragendorff suggests the possible admixture of tobacco, as the latter and hemp are frequently smoked together; at least others have not succeeded in isolating nicotine from hemp. By using the methods for extracting nicotine, Siebold and Bradbury (1881), extracted a very minute quantity of *cannabinine*, a varnish-like mass. In 1883, Matthew Hay arrived at the conclusion that several alkaloids are contained in the plant—one of which, in crystalline form and possessing tetanic properties, he succeeded in isolating in minute quantity and named *tetano-cannabine*. Jahns (1889), however, claims this body to be identical with choline. In 1891, H. T. Smith extracted a varnish-like alkaloid, possessing the odor of coniine; of this he formed a sulphate which crystallized from alcohol. More recently (1895), F. Marino-Zuco, and G. Vignolo (*Gazetta Chimica Italiana*, 1895, part I, pp. 262-8), have attempted to determine definitely the constituents of the drug. They succeeded in obtaining from the drug by means of water acidulated with sulphuric acid, an alkaloidal base, the hydrochloride of which formed a deliquescent, crystalline mass, which to the heart is a powerful depressant. As vegetable acids destroy or render practically inert the action of *Cannabis indica* (Polli), it is not readily accepted that a stronger acid should be expected to extract the active principle or principles (*Pharm. Jour.*, 1895). The *Pharmaceutical Journal*, 1895, remarks: "The chemistry of this remarkable and powerful drug still remains to be elucidated, therefore, and the active principles to which its complex action is due yet await isolation. It may, perhaps, serve as a hint to investigators, to recall a statement which appears in Schlimmer's (Persian) *Pharmacopeia* (p. 102), from which it appears that the der-

wishes make an extremely somniferous preparation by boiling the tops of Indian hemp in fresh butter or oil of almonds. 'Of this a sufficiently minute quantity introduced into an ordinary culinary preparation will cause an entire family to sleep for 24 or 72 hours, without the taste of cannabis being detected.' Assuming the intoxicant action and the odor of Indian hemp to be due to a volatile constituent likely to be driven off by the boiling process, the use of the oil as a solvent might serve to separate the most important active principle, and another might be separated by distillation. Hitherto most of the processes adopted appear to have yielded products incapable of causing the characteristic action of the drug." Gastinel's *hashiscin* is an alcoholic extract of gunjah, from which the water-soluble principles are excluded. Bombelan's *pure cannabin*, Merck's *cannabin tannate*, or Kobert's *cannabindine*, are not thought to be the active principle proper (*Pharm. Jour.*, 1895).

Action, Medical Uses, and Dosage.—Administered to healthy persons in large doses, cannabis creates more or less disturbance in the digestive tract, affects the nervous system with convulsive movements and sudden shocks, causes congestion of the brain, confused ideas, exalted imagination with frequently changing pictures, torpor, and sleep; the cerebral symptoms being more constant, while the others vary to a great extent, sometimes nothing occurring but a few confused ideas followed by sleep. The long-continued use of this article induces injected eyes and bloating of the face, prostration, dropsy, sudden attacks of dangerous mania, and occasionally catalepsy and imbecility, followed by a marasmic state, ending in death. Death has not been known to result directly from the effects of cannabis, except when continually used until marasmus is induced, when death may occur from the latter condition. The symptoms of acute poisoning vary greatly, probably owing to the uncertain character of the drug employed. Collapse, unconsciousness, stupor, catalepsy, extreme debility, irresponsive pupils, cold, clammy skin, spasms and convulsions are among its toxic effects. A marked feature is the anæsthesia produced, and it is asserted that the Chinese formerly performed surgical operations under its use. The effects from large doses are best combatted by vegetable acids, especially lemon juice, coffee, emetics, cold applications and leeches to the temples. Probably strychnine and faradization of the respiratory muscles are the most effective means. By some coffee is said to increase its effects. Indian hemp is considered anodyne, hypnotic, antispasmodic, and phrenic, producing sleep even where morphine has failed, and without impairing the appetite, repressing the secretions, or causing constipation like opium and its preparations. It frequently allays *pain*, and has been found of great benefit in *hysteria*, *chorea*, and other *nervous affections*. Its effects upon the system vary under different conditions, thus: It lessens pain, checks spasmodic action, improves the appetite, causes sleep, exhilaration of spirits, and, in increased doses, inebriation, with phantasms, catalepsy, illusory delirium, and strong aphrodisia. Its continued use, however, lessens the venereal appetite and power. It occasions dilatation of the pupils and prevents normal perception more strongly than any other agent. A peculiarity observed in those who take cannabis is the strong and voracious appetite induced. Medicinally, in small doses, its effects are less intense than those of opium, and the excretions are not so much suppressed by it; it does not disturb digestion, rather increases the appetite, seldom induces sickness of the stomach, never causes congestion, and disturbs the expectoration far less than opium, also effects the nervous system much less, and produces a more natural sleep without interfering with the actions of the internal organs. Cannabis is one of the most important of our remedies, but, like our best agents, it must not be used indiscriminately, but its cases should be specifically selected. The great indication for cannabis (the keynote) is *marked nervous depression*. With this indication present it will fulfil a multitude of uses. Specifically selected it has been efficient in *delirium tremens*, *wakefulness in fevers*, *neuralgia*, *gout*, *rheumatism*, *infantile convulsions*, *low mental conditions*, *insanity*, etc., and in *inflammatory conditions* in cases where opium disagrees, and is often preferable to opium. *Acute mania* and *dementia*, *epilepsy*, *hysterical catalepsy*, *cerebral softening* (with potassium bromide), *anæmia of the cerebral cortex*, *paralysis agitans* and *senile tremors*, *traumatic* or *idiopathic tetanus*, and *irritable reflexes*, are among the nervous disorders in which it exerts a positively beneficial and soothing action, when depression is the guide

to its selection. In mental disturbances the guides to its use are mental oppression, a dull, drowsy, or stupid countenance (a dreamy condition), with dizziness and violent throbbings in the head, and a morbid fear of becoming insane. The patient sometimes has an "exaggerated idea of time and space" (Webster). The drug is a useful hypnotic for the *insane*. As a remedy for *pain*, it ranks among the first; the more spasmodic the pain the better it acts. The neuralgic pains of depression are those most quickly relieved. It should be administered in painful states of the stomach, as *gastric neuralgia*, *nervous gastralgia*, in *gastric ulcers*, where opium is inadmissible, and in pain due to indigestion. The pains attending *lientery*, *after-pains*, the passage of *renal* and *hepatic calculi*, *gout*, *neuralgia of the uterus*, *cancer*, *locomotor ataxia*, are all met by it, and, added to purgatives, it mitigates their griping effects. It relieves the itching of *cutaneous disorders*, particularly that of *senile pruritus* and *eczematous affections*. *Migraine*, *nervous headache*, *facial*, and other *neuralgias*, whether due to catamenial wrongs or attending the menopause, as well as those depending upon fatigue, are relieved when nervous depression is the most marked symptom. *Head-pains*, due to *tumors*, have been asserted to yield to cannabis. The pains of *chronic rheumatism*, *sciatica*, *spinal meningitis*, *dysmenorrhœa*, *endometritis*, *subinvolution*, and the vague pains of *amenorrhœa*, with depression, call for cannabis. Owing to a special action upon the reproductive apparatus, it is accredited with averting *threatened abortion*. It is a prominent remedy for certain spasmodic conditions and especially in the *choreic states* of weak women and children. It mitigates *whooping-cough* and other *convulsive coughs*; alleviates *palpitation of the heart*, with stitching pain in the part; quiets *hysterical manifestations*, and allays the distressing symptoms of *spasmodic asthma*, and *periodic hyperæsthetic rhinitis*. It is a valuable remedy in *senile catarrh*, with harrassing cough and profuse mucous expectoration, and, both internally and by inhalation, it has afforded relief in the *painful cough of consumptives*.

Cannabis is said in many cases to increase the strength of the uterine contractions during parturition, in atonic conditions, without the unpleasant consequences of ergot, and for which purpose it should be used in the form of tincture (see below), 30 drops, or specific cannabis, 10 drops, in sweetened water or mucilage, as often as required. In *menorrhagia*, the tincture in doses of 5 or 10 drops, 3 or 4 times a day, has checked the discharge in 24 or 48 hours.

The greatest reputation of cannabis has been acquired from its prompt results in certain disorders of the genito-urinary tract. In fact, its second great keynote or indication is *irritation of the genito-urinary tract*, and the indication is even of more value when associated with general nervous depression.

It is, therefore, useful in *gonorrhœa*, *chronic irritation of the bladder*, in *chronic cystitis*, with painful micturition, and in *painful urinary affections* generally. It makes no difference whether a *urethritis* be specific or not, or whether it is acute or chronic, the irritation is a sufficient guide to the selection of cannabis. Use it in *gonorrhœa* to relieve the ardor urinæ, and to prevent urethral spasm and avert chordee, and in *gleet*, to relieve the irritation and discharge; employ it also in *spasm of the vesical sphincter*, in *dysuria* and in *strangury*, when spasmodic. Burning and scalding in passing urine, with frequent desire to micturate, are always relieved by cannabis. The following is said to be a certain cure for *gonorrhœa*: Take, while in blossom, equal parts of the tops of the male and female hemp (*Cannabis sativa*), bruise them in a mortar, and express the juice; to this add an equal portion of alcohol. Dose, from 1 to 3 drops every 2 or 3 hours. It should be remembered that the American hemp has the same properties as the Indian hemp, but is a much feebler product—the difference, therefore, not being, as some have indicated, in action, but merely in degree. Cannabis has been recommended in *diabetes* and *hematuria*, and in *Bright's disease*, with painful voiding of bloody urine, it is strongly endorsed. By its control over the mental functions, it controls lascivious thoughts, dreams and desires, and is, therefore, of some value in *nocturnal seminal emissions*. Probably its control over urethral irritation contributes to its value here. In this manner *impotence* is said to have been cured by it. Cannabis has some reputation as a remedy for *chronic alcoholism*, and for the cure of the *opium habit*.

Externally, the resin may be applied endermically or in embrocation with oils, ointments, chloroform, etc., in *inflammatory* and *neuralgic affections*. It may

also be used in injections. The green plant collected in the spring, and 2 or 3 twigs placed in or between beds, will, it is asserted, certainly and effectually cause bedbugs to remove from the room in which they are used. Hemp seed, in infusion, has been found very useful in *after-pains*, and in the bearing-down sensation accompanying *prolapsus uteri*. A combination of cannabis, collodion, and salicylic acid has been used to destroy corns, the extract of the hemp acting as an anodyne.

A tincture may be made by dissolving 24 grains of the resinous extract in a fluid ounce of rectified spirit; for ordinary purposes, its dose is from 10 to 30 drops. The extract varies in strength, which will require a variation in the doses. When well prepared, the dose is from $\frac{1}{2}$ grain to 1 grain; but this may vary from 1 grain to 20 grains, depending entirely on the quality of the article. The English extract is a good preparation, and of all extracts, the smaller dose should first be employed. The tannate of cannabine, in doses of 5 to 15 grains, is said to be an efficient hypnotic, though many declare it inefficient for this purpose. The best preparation is the specific cannabis, which may be given in doses of a fraction of a drop to 10 drops. The ordinary prescription for its specific effects is: *R* Specific cannabis, gtt. v to xxx; aqua, flʒiv. *Mix.* Dose, a teaspoonful every $\frac{1}{2}$ to 2 or 3 hours.

Specific Indications and Uses.—Great nervous depression; irritation of the genito-urinary tract; painful micturition, with tenesmus; ardor urinæ, scalding, burning, frequent micturition; low mental conditions; wakefulness; insomnia, with unpleasant dreams during momentary sleep; spasmodic and painful conditions, with nervous depression; mental illusions; menstrual headache; palpitation of the heart, with sharp stitching pains in the heart; hallucinations; cerebral anemia, from spasm of cerebral vessels.