**On the preparations of the Indian hemp, or Gunjah (Cannabis indica): their effects on the animal system in health, and their utility in the treatment of tetanus and other convulsive diseases / by W.B. O'Shaughnessy.**

ON THE

# PREPARATIONS

OF

# THE INDIAN HEMP,

OR

## GUNJAH,

(CANNABIS INDICA).

THEIR EFFECTS ON THE ANIMAL SYSTEM IN HEALTH, AND THEIR UTILITY IN THE TREATMENT OF TETANUS AND OTHER CONVULSIVE DISEASES.

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LONDON:

PRINTED BY S. TAYLOR, 6, CHANDOS-STREET, STRAND.

[Reprinted from the Transactions of the Medical Society of Calcutta, 1838; and from the Provincial Medical Journal, 1843.]

# INDIAN HEMP, &c.

The narcotic effects of hemp are popularly known in the South of Africa, South America, Turkey, Egypt, Asia Minor, India, and the adjacent territories of the Malays, Burmese, and Siamese. In all these countries hemp is used in various forms, by the dissipated and depraved, as the ready agent of a pleasing intoxication. In the popular medicine of these nations, we find it extensively employed for a multitude of affections, especially those in which spasm or neuralgic pain are the prominent symptoms. But in Western Europe its use, either as a stimulant or as a remedy, is equally unknown. With the exception of the trial, as a frolic, of the Egyptian "hasheesh," by a few youths in Marseilles, and of the clinical use of the wine of hemp by Hahnemann, as shown in a subsequent extract, I have been unable to trace any notice of the employment of this drug in Europe.

Much difference of opinion exists on the question, whether the hemp so abundant in Europe, even in high northern latitudes, is identical in specific characters with the hemp of Asia Minor and India. The extraordinary symptoms produced by the latter depend on a resinous secretion with which it abounds, and which seems totally absent in the European kind. The closest physical resemblance or even identity exists between both plants; difference of climate seems to me more than sufficient to account for the absence of the resinous secretion, and consequent want of narcotic power in that indigenous in colder countries.

In the subsequent article I first endeavour to present an adequate view of what has been recorded of the early history, the popular uses, and employment in medicine of this powerful and valuable substance; I then proceed to notice several experiments which I have instituted on animals, with the view to ascertain its effects on the healthy system; and, lastly, I submit an abstract of the clinical details of the treatment of several patients afflicted with hydrophobia, tetanus, and other convulsive disorders, in which a preparation of hemp was employed with results, which seem to me to warrant our anticipating from its more extensive and impartial use no inconsiderable addition to the resources of the physician.

In the historical and statistical department of the subject, I owe my cordial thanks for most valuable assistance to the distinguished traveller the Syed Keramut Ali, Mootawulee of the Hooghly Imambarrah, and also to the Hakim Mirza Abdul Razes of Teheran, who have furnished me with interesting details regarding the consumption of hemp in Candahar, Cabul, and the countries between the Indus and Herat. The Pandit Moodoosudun Gootu has favored me with notices of the statements regarding hemp in the early Sanscrit authors on materia medica; to the celebrated Kamalakantha Vidyalanka, the Pandit of the Asiatic Society, I have also to record my acknowledgments; Mr. DaCosta has obligingly supplied me with copious notes from the "Mukzun-ul-Udwieh," and other Persian and Hindee systems of materia medica. For information relative to the varieties of the drug, and its consumption in Bengal, Mr. McCann, the deputy superintendent of police, deserves my thanks; and, lastly, to the medical gentlemen named in the sequel, I feel much indebted for the clinical details with which they have enriched the subject.

*Botanical Characters—Chemical Properties—Production.*

*Botanical Description.* — Assuming, with Lindley and other eminent writers, that the *Cannabis sativa* and *Indica* are identical, we find that the plant is diœcious, annual, about three

feet high, covered over with a fine pubescence; the stem is erect, branched, bright green, angular; leaves, alternate or opposite, on long weak petioles; digitate, scabrous, with linear, lanceolate, sharply serrated leaflets, tapering into a long smooth entire point; stipules subulate; clusters of flowers axillary with subulate bractes; males lax and drooping, branched and leafless at base; females erect, simple and leafy at the base. Calyx downy, five parted, imbricated. Stamens five; anthers large and pendulous. Calyx covered with brown glands. Ovary roundish with pendulous ovule, and two long filiform glandular stigmas; achenium ovate, one seeded.—*Vide Lindley's Flora Medica, p.* 299.

The fibres of the stems are long and extremely tenacious, so as to afford the best tissue for cordage, thus constituting the material for one of the most important branches of European manufactures.

The seed is simply albuminous and oily, and is devoid of all narcotic properties.

*Chemical Properties.*—In certain seasons and in warm countries a resinous juice exudes and concretes on the leaves, slender stems, and flowers; the mode of removing this juice will be subsequently detailed. Separated and in masses it constitutes the *churrus** of Nipal and Hindostan, and to this, the type or basis of all the hemp preparations, are the powers of these drugs attributable.

The resin of the hemp is soluble in alcohol and æther; partially soluble in alkaline, insoluble in acid solutions; when pure, of a blackish grey color; hard at 90°; softens at higher temperatures, and fuses readily; soluble in the fixed and in several volatile oils. Its odor is fragrant and narcotic; taste slightly warm, bitterish, and acrid.

The dried hemp plant, which has flowered and *from which the resin has not been removed,* is called GUNJAH. It sells for 1s. 6d. to 2s. for 2 lbs. in the Calcutta bazaars, and yields to alcohol

* For very fine specimens of *churrus*, I have to express my thanks to Dr. Campbell, late political resident at Nipal.

twenty per 100 of resinous extract, composed of the resin (*churrus*), and green coloring matter (*chlorophylle*). Distilled with a large quantity of water or spirit, traces of essential oil pass over, and the distilled liquor has the powerful narcotic odor of the plant. The *gunjah* is sold for smoking chiefly. The bundles of *gunjah* are about two feet long and four inches in diameter, and contain twenty-four plants. The color is dusky green; the odor agreeably narcotic; the whole plant resinous and adhesive to the touch.

The larger leaves and capsules, without the stalks, are called "*bang*, *subjee*, or *sidhee*." They are used for making an intoxicating drink, for smoking, and in the conserve or confection termed *majoon*. *Bang* is cheaper than *gunjah*, and, though less powerful, is sold at such a low price that for less than a halfpenny enough can be purchased to intoxicate an "experienced" person.

According to Mr. McCann's notes, the *gunjah* consumed in Bengal is chiefly brought from Mirzapore and Ghazeepore, being extensively cultivated near Gwalior and in Tirhoot. The natives cut the plant when in flower, allow it to dry for three days, and then lay it in bundles averaging two pounds weight each, which are distributed to the licensed dealers. The best kinds are brought from Gwalior and Bhurtpore, and it is also cultivated, of good quality, in a few gardens round Calcutta. In Jessore, I am informed, the drug is produced of excellent quality and to a very considerable extent of cultivation. In Central India, and the Saugor territory, and in Nipal, *churrus* is collected during the hot season in the following singular manner:—Men clad in leathern dresses run through the hemp fields, brushing through the plant with all possible violence; the soft resin adheres to the leather, and is subsequently scraped off and kneaded into balls, which sell from 10s. to 12s. for 2 lbs. A still finer kind, the *momeea* or waxen *churrus*, is collected by the hand in Nipal and sells for nearly double the price of the ordinary kind. In Nipal, Dr. McKinnon informs me, the leathern attire is dispensed with, and the resin is gathered on the skins of naked

coolies. In Persia, it is stated by Mirza Abdul Razes that the *churrus* is prepared by pressing the resinous plant on coarse cloths, and then scraping it from these and melting it in a pot with a little warm water. He considers the *churrus* of Herat as the best and most powerful of all the varieties of the drug.

## *Popular Uses.*

The preparations of hemp are used for the purpose of intoxication as follows :—

*Sidhee, subjee, and bang* (synonymous) are used with water as a drink, which is thus prepared. About three tola weight, 540 troy grains, are well washed with cold water, then dried and rubbed to powder, mixed with black pepper, cucumber and melon seeds, sugar, half a pint of milk, and an equal quantity of water. This is considered sufficient to intoxicate an habituated person. Half the quantity is enough for a novice. This composition is chiefly used by the Mahomedans of the better class.

Another recipe is as follows :—

The same quantity of *sidhee* is washed, dried, and ground, mixed with black pepper, and a quart of cold water added. This is drank at one sitting. This is the favorite beverage of the Hindus who practice this vice, especially the Birjobassies and many of the Rajpootana soldiery.

From either of these beverages intoxication will ensue in half an hour. Almost invariably the inebriation is of the most cheerful kind, causing the person to sing and dance, to eat food with great relish, and to seek aphrodisiac enjoyments. In persons of a quarrelsome disposition it occasions, as might be expected, an exasperation of their natural tendency. The intoxication last about three hours, when sleep supervenes. No nausea or sickness of the stomach succeeds, nor are the bowels at all affected; next day there is slight giddiness and much vascularity of the eyes, but no other symptom worth recording.

*Gunjah* is used for smoking only; one rupee weight, 180 grains, and a little dried tobacco are rubbed together in the

palm of the hand with a few drops of water. This suffices for three persons. A little tobacco is placed in the pipe first, then a layer of the prepared *gunjah*, then more tobacco, and the fire above all.

Four or five persons usually join in this debauch. The hookah is passed round, and each person takes a single draught. Intoxication ensues almost instantly; and from one draught to the unaccustomed, within half an hour; and after four or five inspirations to those more practised in the vice. The effects differ from those occasioned by the *sidhee*. Heaviness, laziness, and agreeable reveries ensue, but the person can be readily roused, and is able to discharge routine occupations, such as pulling the punkah, waiting at table, &c.

The *majoon*, or hemp confection, is a compound of sugar, butter, flour, milk, and *sidhee* or *bang*. The process has been repeatedly performed before me by Ameer, the proprietor of a celebrated place of resort for hemp devotees in Calcutta, and who is considered the best artist in his profession. Four ounces of *sidhee* and an equal quantity of *ghee* (clarified butter) are placed in an earthen or well-tinned vessel, a pint of water added, and the whole warmed over a charcoal fire. The mixture is constantly stirred until the water all boils away, which is known by the crackling noise of the melted butter on the sides of the vessel; the mixture is then removed from the fire, squeezed through cloth while hot—by which an oleaginous solution of the active principles and coloring matter of the hemp is obtained—and the leaves, fibres, &c., remaining on the cloth are thrown away.

The green oily solution soon concretes into a buttery mass, and is then well washed by the hand with soft water so long as the water becomes colored. The coloring matter and an extractive substance are thus removed, and a very pale green mass, of the consistence of simple ointment, remains. The washings are thrown away; Ameer says that these are intoxicating, and produce constriction of the throat, great pain, and very disagreeable and dangerous symptoms.

The operator then takes two pounds of sugar, and, adding a little water, places it in a pipkin over the fire. When the sugar dissolves and froths, two ounces of milk are added; a thick scum rises and is removed; more milk and a little water are added from time to time, and the boiling continued about an hour, the solution being carefully stirred until it becomes an adhesive clear syrup, ready to solidify on a cold surface; four ounces of *tyre* (new milk dried before the sun) in fine powder are now stirred in, and, lastly, the prepared butter of hemp is introduced, brisk stirring being continued for a few minutes. A few drops of uttur of roses are then quickly sprinkled in, and the mixture poured from the pipkin on a flat cold dish or slab. The mass concretes immediately into a thin cake, which is divided into small lozenge-shaped pieces. Thus prepared it sells for 8s. the 2 lbs; one drachm, by weight, will intoxicate a beginner; three drachms one experienced in its use. The taste is sweet, and the odor very agreeable.

Ameer states that there are seven or eight *majoon* makers in Calcutta; that sometimes, by special order of customers, he introduces stramonium seeds, but never nux vomica; that all classes of persons, including the lower Portuguese or "Kala Feringhees," and especially their females, consume the drug; that it is most fascinating in its effects, producing extatic happiness, a persuasion of high rank, a sensation of flying, voracious appetite, and intense aphrodisiac desire. He denies that its continued use leads to madness, impotence, or to the numerous evil consequences described by the Arabic and Persian physicians. Although I disbelieve Ameer's statements on this point, his description of the immediate effects of *majoon* is strictly and accurately correct.

Most carnivorous animals eat it greedily, and very soon experience its narcotic effects, becoming ludicrously drunk, but seldom suffering any worse consequences.

### *Historical Details—Notices of Hemp and its Uses, by the Sanscrit, Arabic, and Persian Writers.*

The preceding notice suffices to explain the subsequent his-

torical and medicinal details. I premise the historical, in order to show the exact state of our knowledge of the subject, when I attempted its investigation.

Although the most eminent of the Arabic and Persian authors concur in referring the origin of the practice of hemp intoxication to the natives of Hindostan, it is remarkable that few traces can be detected of the prevalence of the vice at any early period in India.

The Pandit Moodoosudun Gooptu finds that the "Rajniguntu," a standard treatise on materia medica, which he estimates vaguely at 600 years date, gives a clear account of this agent. Its synonymes are "*bijoya*," "*ujoya*," and "*joya*," names which mean promoters of success; "*brijputta*," or the strengthener, or the strong-leaved; "*chapola*," the causer of a reeling gait; "*ununda*," or the laughter-moving; "*hursini*," the exciter of sexual desire. Its effects on man are described as excitant, heating, astringent. It is added that it "destroys phlegm, expels flatulence, induces costiveness, sharpens the memory, increases eloquence, excites the appetite, and acts as a general tonic."

The "Rajbulubha," a Sanscrit treatise of rather later date, alludes to the use of hemp in gonorrhœa, and repeats the statements of the "Rajniguntu." In the Hindu Tantra, a religious treatise, teaching peculiar and mystical formulæ and rites for the worship of the deities, it is said, moreover, that *sidhee* is more intoxicating than wine.

In the celebrated "Susruta," which is perhaps the most ancient of all Hindu medical works, it is written, that persons laboring under catarrh should, with other remedies, use internally the *bijoya* or *sidhee*. The effects, however, are not described.

The learned Kamalakantha Vidyalanka has traced a notice of hemp in the 5th chapter of *Menu*, where Brahmins are prohibited to use the following substances—*palandoo* or onions, *gunjara* or *gunjah*, and such condiments as have strong and pungent scents.

The Arabic and Persian writers are, however, far more

voluminous and precise in their accounts of these fascinating preparations. In the 1st vol. of De Sacy's "Crestomathie Arabe" we find an extremely interesting summary of the writings of Takim Eddin Makrizi on this subject. Lane has noticed it too with his usual ability in his admirable work, "the Modern Egyptians.' From these two sources, the MS. notes of the Syed Keramut Ali and Mr. DaCosta, and a curious paper communicated by our friend Mirza Abdul Razes, a most intelligent Persian physician, the following epitome is compiled :—

Makrizi treats of the hemp in his glowing description of the celebrated Canton de la Timbaliere, the ancient pleasure grounds, in the vicinity of Cairo. This quarter, after many vicissitudes, is now a heap of ruins. In it was situated a cultivated valley named Djoneina, which we are informed was the theatre of all conceivable abominations. It was famous above all for the sale of the *hasheeha*, which is still greedily consumed by the dregs of the populace, and from the consumption of which sprung the excesses which led to the name of "assassin" being given to the Saracens in the Holy Wars. The history of the drug the author treats of thus:—The oldest work in which hemp is noticed is a treatise by Hasan, who states that in the year 658, M. E. the Sheikh Djafar Shirazi, a monk of the order of Haider, learned from his master the history of the discovery of hemp. Haider, the chief of ascetics and self-chasteners, lived in rigid privation on a mountain between Nishabor and Ramah, where he established a monastery of Fakirs. Ten years he had spent in this retreat without leaving it for a moment, till one burning summer's day when he departed alone to the fields. On his return an air of joy and gaiety was imprinted on his countenance; he received the visits of his brethren and encouraged their conversation. On being questioned, he stated that, struck by the aspect of a plant which danced in the heat as if with joy, while all the rest of the vegetable creation was torpid, he had gathered and eaten of its leaves. He led his companions to the spot,—all ate and all were similarly excited. A tincture of the hemp leaf in wine or spirit seems to have

been the favourite formula in which the Sheikh Haider indulged himself. An Arab poet sings of Haider's *emerald* cup—an evident allusion to the rich green colour of the tincture of the drug. The Sheikh survived the discovery ten years, and subsisted chiefly on this herb, and on his death his disciples by his desire planted it in an arbour about his tomb.

From this saintly sepulchre the knowledge of the effects of hemp is stated to have spread into Khorasan. In Chaldea it was unknown until 728 M. E. during the reign of the Khalif Mostansir Billah; the kings of Ormus and Bahrein then introduced it into Chaldea, Syria, Egypt, and Turkey.

In Khorasan, however, it seems that the date of the use of hemp is considered to be far prior to Haider's era. Biraslan, an Indian pilgrim, the contemporary of Cosröes,* is believed to have introduced and diffused the custom through Khorasan and Yemen. In proof of the great antiquity of the practice, certain passages in the works of Hippocrates may be cited, in which some of its properties are clearly described, but the difficulty of deciding whether the passages be spurious or genuine, renders the fact of little value. Dioscorides (lib. ij. cap. 169), describes hemp, but merely notices the emollient properties of its seeds; its intoxicating effects must consequently be regarded as unknown to the Greeks prior to his era, which is generally agreed to be about the second century of the Christian epoch, and somewhat subsequent to the life-time of Pliny.

In the narrative of Makrizi we also learn that oxymel and acids are the most powerful antidotes to the effects of this narcotic; next to these, emetics, cold bathing, and sleep; and we are further told that it possesses diuretic, astringent, and especially aphrodisiac properties. Ibn Beitar was the first to record its tendency to produce mental derangement, and he even states that it occasionally proves fatal.

* By this term is probably meant the first of the Sassanian dynasty, to whom the epithet of "Khusrow" or Cosroes, equivalent to Káiser, Cæsar, or Czar, has been applied in many generations. This dynasty endured from A.D. 202 to A.D. 636.—*Vide note* 50 *to Lane's Translation of the Arabian Nights, vol.* ii. p. 226.

In 780 M. E. very severe ordinances were passed in Egypt against the practice; the Djoneina garden was rooted up, and all those convicted of the use of the drug were subjected to the extraction of their teeth; but in 799 the custom re-established itself with more than original vigor. Makrizi draws an expressive picture of the evils this vice then inflicted on its votaries—"As its consequence, general corruption of sentiments and manners ensued, modesty disappeared, every base and evil passion was openly indulged in, and nobility of external form alone remained to these infatuated beings."

### *Medicinal Properties assigned to Hemp by the Ancient Arabian and Persian Writers, and by Modern European Authors.*

In the preceding notice of Makrizi's writings on this subject, we have confined ourselves chiefly to historical details, excluding descriptions of supposed medicinal effects. The Mukzun-ul-Udwieh and the Persian MS. in our possession, inform us as to the properties which the ancient physicians attributed to this powerful narcotic.

In Mr. DaCosta's MS. version of the chapter on hemp in the Mukzun-ul-Udwieh, *churrus*, we are informed, if smoked through a pipe, causes torpor and intoxication, and often proves fatal to the smoker. Three kinds are noticed, the *garden*, *wild*, and *mountain*, of which the last is deemed the strongest; the seeds are called *sheadana* or *shaldaneh* in Persia. These are said to be "a compound of opposite qualities, cold and dry in the third degree — that is to say, stimulant and sedative, imparting at first a gentle reviving heat, and then a considerable refrigerant effect."

The contrary qualities of the plant, its stimulant and sedative effects, are prominently dwelt on. "They at first exhilarate the spirits, cause cheerfulness, give color to the complexion, bring on intoxication, excite the imagination into the most rapturous ideas, produce thirst, increase appetite, excite concupiscence. Afterwards the sedative effects begin to preside, the spirits sink, the vision darkens and weakens; and madness,

melancholy, fearfulness, dropsy, and such like distempers, are the sequel—and the seminal secretions dry up. These effects are increased by sweets, and combated by acids."

The author of the Mukzun-ul Udwieh further informs us—

"The leaves make a good snuff for deterging the brain; the juice of the leaves applied to the head as a wash, removes dandriff and vermin; drops of the juice thrown into the ear allay pain and destroy worms or insects. It checks diarrhœa, is useful in gonorrhœa, restrains seminal secretions, and is diuretic. The bark has a similar effect."

"The powder is recommended as an external application to fresh wounds and sores, and for causing granulations; a poultice of the boiled root and leaves for discussing inflammations, and cure of erysipelas, and for allaying neuralgic pains. The dried leaves, bruised and spread on a castor oil leaf, cure hydrocele and swelled testes. The *dose* internally is one *direm*, or forty-eight grains. The antidotes are emetics, cow's milk, hot water, and sorrel wine."

Alluding to its popular uses, the author dwells on the eventual evil consequences of the indulgence; weakness of the digestive organs first ensues, followed by flatulency, indigestion, swelling of the limbs and face, change of complexion, diminution of sexual vigor, loss of teeth, heaviness, cowardice, depraved and wicked ideas; scepticism in religious tenets, licentiousness, and ungodliness are also enumerated in the catalogue of deplorable results.

The medicinal properties of hemp, in various forms, are the subject of some interesting notes by Mirza Abdul Razes. "It produces a ravenous appetite and constipation, arrests the secretions except that of the liver, excites wild imagining, especially a sensation of ascending, forgetfulness of all that happens during its use, and such mental exaltation, that *the beholders attribute it to supernatural inspiration.*"

Mirza Abdul considers hemp to be a powerful exciter of the flow of bile, and relates cases of its efficacy in restoring appetite —of its utility as an external application as a poultice with

milk, in relieving hæmorrhoids, and internally in gonorrhœa. A quarter of a drachm of *bangh* is given in water as the dose in gonorrhœa. He states, also, that the habitual smokers of *gunjah* generally die of diseases of the lungs, dropsy, and anasarca, "so do the eaters of *majoon* and smokers of *sidhee*, but at a later period. The inexperienced on first taking it are often senseless for a day, some go mad, others are known to die."

In the 35th chapter of the 5th volume of "Rumphius' Herbarium Amboinense," p. 208, Ed. Amsterd. A. D. 1695, we find a long and very good account of the hemp, illustrated by two excellent plates. The subjoined is an epitome of Rumphius' article :—

Rumphius first describes botanically the male and female hemp plants, of which he gives two admirable drawings. He assigns the upper provinces of India as its *habitat*, and states it to be cultivated in Java and Amboyna. He then notices very briefly the exciting effects ascribed to the leaf, and to mixtures thereof with spices, camphor, and opium. He alludes doubtingly to its alleged aphrodisiac powers, and states that the kind of mental excitement it produces depends on the temperament of the consumer. He quotes a passage from Galen, lib. i. (de aliment. facult.), in which it is asserted that in that great writer's time it was customary to give hemp seed to the guests at banquets as a promoter of hilarity and enjoyment. Rumphius adds, that the Mahomedáns in his neighbourhood frequently sought for the male plant from his garden, to be given to persons afflicted with virulent gonorrhœa and with asthma, or the affection which is popularly called "stitches in the side." He tells us, moreover, that the powdered leaves check diarrhœa, are stomachic, cure the malady named *pitao*, and moderate excessive secretion of bile. He mentions the use of hemp smoke as an enema in strangulated hernia, and of the leaves as an antidote to poisoning by orpiment. Lastly, he notices in the two subsequent chapters varieties of hemp, which he terms the *gunjah sativa* and *gunjah agrestis*.

In the *Hortus Malabaricus*, Rheede's article on the hemp is a mere echo of Rumphius' statements.

Among modern European writers the only information I could trace on the *medicinal* use of hemp *in Europe*, is in the recent work of Nees v. Esenbeck, from which the following is an extract kindly supplied by Dr. Wallich:—

"The fresh herb of the hemp has a very powerful and unpleasant narcotic smell, and is used in the East in combination with opium in the preparation of intoxicating potions, &c. It is probable that the *nepenthe* of the ancients was prepared from the leaves of this plant. Many physicians, Hahnemann among them, prescribe the vinous extract in various nervous disorders, where opium and hyoscyamus used to be employed, being less heating and devoid of bitterness."*

No information as to the *medicinal* effects of hemp exists in the standard works on materia medica, to which I have access. Soubeiran, Feé, Merat and de Lens, in their admirable dictionary; Chevalier and Richard, Roques (Phytographie Medicale); Ratier and Henry (Pharmacopeé Française); and the Dictionnaire des Sciences Medicales, are all equally silent on the subject.

In "Ainslie's Materia Indica," 2nd vol., we find three notices of this plant and its preparations.

At page 39 "banghie" (*Tamul*), with the Persian and Hindee synonymes of "beng" and "subjee," is described as an intoxicating liquor prepared with the leaves of the *gunjah* or hemp plant.

Under the head "*gunjah*," Ainslie gives numerous synonymes, and tells us that the leaves are sometimes prescribed in cases of diarrhœa; and in conjunction with turmeric, onions, and warm gingilie oil, are made into an unction for painful protruded piles. Dr. Ainslie also gives a brief view of the popular uses and botanical characters of the plant.

*Majoon*, lastly, is described by Dr. Ainslie, page 176, as a preparation of sugar, milk, ghee, poppy seeds, flowers of the datura, powder of nux vomica, and sugar. The true *majoon*,

* Handbuch der Medicin und Pharmac. Botanik, von F. Ness von Esenbeck und Dr. Carl Ebermaier, vol. i, p. 338.

however, as prepared in Bengal, contains neither datura nor nux vomica. I have already described the process by which it has been manufactured before me.

In the "Journal de Pharmacie," the most complete magazine in existence on all pharmaceutical subjects, we find hemp noticed in several volumes. In the "Bulletin de Pharmacie," t. v.a. 1810, p. 400, we find it briefly described by M. Rouyer, apothecary to Napoleon, and member of the Egyptian scientific commission, in a paper on the popular remedies of Egypt. With the leaves and tops, he tells us, collected before ripening, the Egyptians prepare a conserve, which serves as the base of the *berch*, the *diasmouk*, and the *bernaouy*. Hemp leaves reduced to powder, and incorporated with honey or stirred with water, constitute the *berch* of the poor classes. The same work also (Bulletin, vol. i., p. 523, a. 1809) contains a very brief notice of the intoxicating preparations of hemp, read by M. De Sacy before the Institute of France, in July, 1809. M. De Sacy's subsequent analysis of Makrizi, of which I have given an outline, is, however, much more copious in details than the article in the Bulletin.

Professor Royle in his admirable work, entitled "Illustrations of the Botany, &c. of the Himalayas," p. 334, gives a very brief notice of the synonymes and epithets of the hemp resin, and mentions its intoxicating properties, but affords us no information on its medicinal effects.

### *Experiments by the Author—Inferences as to the Action of the Drug on Animals and Man.*

Such was the amount of preliminary information before me, by which I was guided in my subsequent attempts to gain more accurate knowledge of the action, powers, and possible medicinal applications of this remarkable agent.

There was sufficient to show that hemp possesses, in small doses, an extraordinary power of stimulating the digestive organs, exciting the cerebral system, of acting also on the generative apparatus. Larger doses, again, were shown by the historical statements to induce insensibility or to act as a powerful seda-

tive. The influence of the drug in allaying pain was equally manifest in all the memoirs referred to. As to the evil sequelæ so unanimously dwelt on by all writers, these did not appear to me so numerous, so immediate, or so formidable, as many which may be clearly traced to over-indulgence in other powerful stimulants or narcotics—viz, alcohol, opium, or tobacco.

The dose in which the hemp preparations might be administered, constituted, of course, one of the first objects of inquiry. Ibn Beitar had mentioned a *direm*, or forty-eight grains of *churrus;* but this dose seemed to me so enormous, that I deemed it expedient to proceed with much smaller quantities. How fortunate was this caution, the sequel will sufficiently denote.

An extensive series of experiments on animals was in the first place undertaken, among which the following may be cited :—

*Expt.* 1.—Ten grains of Nipalese *churrus*, dissolved in spirit were given to a middling sized dog. In half an hour he became stupid and sleepy, dozing at intervals, starting up, wagging his tail as if extremely contented; he ate some food greedily; on being called to he staggered to and fro, and his face assumed a look of utter and helpless drunkenness. These symptoms lasted about two hours, and then gradually passed away; in six hours he was perfectly well and lively.

*Expt.* 2.—One drachm of *majoon* was given to a small sized dog; he ate it with great delight, and in twenty minutes was ridiculously drunk; in four hours his symptoms passed away, also without harm.

*Expts.* 3, 4, and 5.—Three kids had ten grains each of the alcoholic extract of *gunjah*. In one no effect was produced; in the second there was much heaviness, and some inability to move; in the third a marked alteration of countenance was conspicuous, but no further effect.

*Expt.* 6.—Twenty grains were given, dissolved in a little spirit, to a dog of very small size. In a quarter of an hour he was intoxicated; in half an hour he had great difficulty of movement; in an hour he had lost all power over the hinder extremities, which were rather stiff but flexible; sensibility did not seem

to be impaired, and the circulation was natural. He readily acknowledged calls by an attempt to rise up. In four hours he was quite well.

In none of these or several other experiments was there the least indication of pain, or any degree of convulsive movement observed.

It seems needless to dwell on the details of each experiment; suffice it to say that they led to one remarkable result—that while carnivorous animals and fish, dogs, cats, swine, vultures, crows, and adjutants, invariably exhibited the intoxicating influence of the drug, the graminivorous, such as the horse,* deer, monkey, goat, sheep, and cow, experienced but trivial effects from any dose we administered.

Encouraged by these results, no hesitation could be felt as to the perfect safety of giving the resin of hemp an extensive trial in the cases in which its apparent powers promised the greatest degree of utility.

*Cases of Rheumatism treated by Hemp. Catalepsy produced by one grain.*

The first cases selected were two of acute rheumatism and one of that disease in the chronic form, occurring among the patients in the Clinical Hospital of the Medical College. In the two former but little relief had been derived from a fair trial of antiphlogistic measures, and of Dover's powder with antimonials; in the last case, sarsaparilla at first, and subsequently the Hemidesmus Indicus with warm baths had been tried without advantage.

On the 6th November, 1838, one grain of the resin of hemp was administered in solution, at two, p.m., to each of these three patients.

At four, p.m., it was reported that one was becoming very talkative, was singing songs, calling loudly for an extra supply

* Although I observed no effect from two drachms of hemp resin given to a horse, Messrs. Hughes and Templar, of Calcutta, have since cured four horses of traumatic tetanus by giving half-pint doses of the tincture. —W. B. O'S.

of food, and declaring himself in perfect health. The other two patients remained unaffected.

At six, p.m., I received a report to the same effect, but stating that the first patient was now falling asleep.

At eight, p.m., I was alarmed by an emergent note from Nobinchunder Mitter, the clinical clerk on duty, desiring my immediate attendance at the hospital, as the patient's symptoms were very peculiar and formidable. I went to the hospital without delay, and found him lying on his cot quite insensible, but breathing with perfect regularity, his pulse and skin natural, and the pupils freely contractile on the approach of light.

Alarmed and pained beyond description at such a state of things, I hurried to the other patients—found one asleep, the third awake, intelligent, and free from any symptoms of intoxication or alarm.

Returning then to the first, an emetic was directed to be prepared, and while waiting for it I chanced to lift up the patient's arm. The professional reader will judge of my astonishment, when I found that it remained in the posture in which I placed it. It required but a very brief examination of the limbs to find that the patient had by the influence of this narcotic been thrown into that strange and most extraordinary of all nervous conditions, into that state which so few have seen, and the existence of which so many still discredit—the genuine *catalepsy* of the nosologist.

It had been my good fortune years before to have witnessed two unequivocal cases of this disorder. One occurred in the female clinical ward in Edinburgh, under Dr. Duncan's treatment, and was reported by myself for the "Lancet," in 1828. The second took place in 1831, in a family with whom I resided in London. This case was witnessed by Dr. Silver, Mr. G. Mills, and several other professional friends. In both these cases the cataleptic state was established in full perfection, and in both the paroxysm terminated suddenly without any evil consequence.

To return to our patient; we raised him to a sitting posture,

and placed his arms and limbs in every imaginable attitude. A waxen figure could not be more pliant or more stationary in each position, no matter how contrary to the natural influence of gravity on the part.

To all impressions he was meanwhile almost insensible; he made no sign of understanding questions; could not be aroused. A sinapism to the epigastrium caused no sign of pain. The pharynx and its coadjutor muscles acted freely in the deglutition of the stimulant remedies which I thought it advisable to administer, although the manifest cataleptic state had freed me altogether of the anxiety under which I before labored.

The second patient had meanwhile been roused by the noise in the ward, and seemed vastly amused at the strange aspect and the statue-like attitudes in which the first patient had been placed, when on a sudden he uttered a loud peal of laughter, and exclaimed that "four spirits were springing with his bed into the air." In vain we attempted to pacify him; his laughter became momentarily more and more incontrollable. We now observed that the limbs were rather rigid, and in a few minutes more his arms or legs could be bent, and would remain in any desired position. A strong stimulant drink was immediately given, and a sinapism applied. Of the latter he made no complaint, but his intoxication led him to such noisy exclamations that we had to remove him to a separate room; here he soon became tranquil, his limbs in less than an hour gained their natural condition, and in two hours he represented himself to be perfectly well and excessively hungry.

The first patient continued cataleptic till one, a.m., when consciousness and voluntary motion quickly returned, and by two, a.m., he was exactly in the same state as the second patient.

The third man experienced no effect whatever, and on further inquiry it was found that he was habituated to the use of *gunjah* in the pipe.

On the following day it gave me much pleasure to find that both the individuals above mentioned were not only uninjured

by the narcotic, but much relieved of their rheumatism; they were discharged quite cured in three days after.

The fourth case of trial was an old muscular cooley, a rheumatic malingerer, and to him half a grain of hemp resin was given in a little spirit. The first day's report will suffice for all:—In two hours the old gentleman became talkative and musical, told several stories, and sang songs to a circle of highly delighted auditors, ate the dinners of two persons subscribed for him in the ward, sought also for other luxuries we can scarcely venture to allude to—and finally fell soundly asleep, and so continued till the following morning. On the noon-day visit, he expressed himself free from headache or any other unpleasant sequel, and begged hard for a repetition of the medicine, in which he was indulged for a few days and then discharged.

In several cases of acute and chronic rheumatism admitted about this time, half-grain doses of the resin were given, with closely analogous effects; alleviation of pain in most, remarkable increase of appetite in all, unequivocal aphrodisia, and great mental cheerfulness. In no one case did these effects proceed to delirium, or was there any tendency to quarrelling. The disposition developed was uniform in all, and in none was headache or sickness of stomach a sequel of the excitement.

### *Case of Hydrophobia.*

A case now occurred in which the influence of a narcotic, capable either of cheering or of inducing harmless insensibility, would be fraught with blessings to the wretched patient.

On the 22nd November, at eight, a.m., a note in English was handed to me by my servant, entreating my assistance for the Hakim Abdullah, then at my gate, who had been bitten by a rabid dog three weeks before, and who feared that the miserable consequences of the bite already had commenced. I found the poor man in a carriage; he was perfectly composed, though quite convinced of the desperate nature of his case. He told me that the evening before, on passing near a tank, he started in alarm, and since then was unable to swallow liquid.

His eye was restless, suspicious, and wild; his features anxious; his pulse 125; his skin bedewed with cold moisture; he stated nevertheless that he wished for food and felt well. A small red and painful cicatrix existed on the left fore-arm.

He was immediately removed to the hospital, where I accompanied him. By his own desire water was brought in a metallic vessel, which he grasped, and brought near his lips; never can I forget the indescribable horrors of the paroxysm which ensued. It abated in about three minutes, and morbid thirst still goading the unhappy man, he besought his servant to apply a moistened cloth to his lips. Intelligent and brave, he determinately awaited the contact of the cloth, and for a few seconds, though in appalling agony, permitted some drops to trickle on his tongue; but then ensued a second struggle, which, with a due share of the callousness of my profession, I could not stand by to contemplate.

Two grains of hemp resin in a soft pillular mass were ordered every hour; after the third dose, he stated that he felt commencing intoxication; he now chatted cheerfully on his case, and displayed great intelligence and experience in the treatment of the very disease with which he was visited. He talked calmly of drinking, but said it was in vain to try—but he could suck an orange; this was brought to him, and he succeeded in swallowing the juice without any difficulty.

The hemp was continued till the sixth dose, when he fell asleep and had some hours' rest. Early the ensuing morning, however, Mr. Siddons, my assistant, was called up to him, and found him in a state of tumultuous agony and excitement; tortured by thirst he attempted to drink; but I will spare the reader the details of the horrors which ensued.

The hemp was again repeated; and again, by the third dose, the cheering alleviation of the previous day was witnessed. He ate a piece of sugar-cane, and again swallowed the juice; he partook freely of some moistened rice, and permitted a purgative enema to be administered; his pulse was nearly natural; the skin natural in every respect; his countenance was happy. On

*one* subject only was he incoherent, and even here was manifested the powerful and peculiar influence of the narcotic. He spoke in raptures of the ladies of his *zenana*, and his anxiety to be with them. We ascertained, however, that he had no such establishment.

Four days thus passed away, the doses of hemp being continued. When he fell asleep, on waking the paroxysms returned, but were again almost immediately assuaged as at first. Meanwhile, purgative enemata were employed, and he partook freely of solid food, and once drank water without the least suffering. But about three, p.m., of the fifth day he sunk into a profound stupor, the breathing slightly stertorous; in this state he continued, and without further struggle death terminated his sufferings at four, a.m., on the 27th of November.

Reviewing the preceding summary of this interesting case, it seems evident that at least one advantage was gained from the use of the remedy—the awful malady was stripped of its horrors; if not less fatal than before, it was reduced to less than the scale of suffering which precedes death from most ordinary diseases. It must be remembered, too, that in this, the first case ever so treated, I possessed no data to guide me as to the dose or manner of administration of the drug. The remarkable cases of tetanus detailed in the sequel throw light on these important points, and will lead, in future cases, to the unhesitating administration of much larger quantities than at first I ventured to employ. I am not, however, rash enough to indulge the hope which involuntarily forces itself upon me, that we will ever from this narcotic derive an effectual remedy for even a solitary case of this disease; but next to cure, the physician will perhaps esteem the means which enable him "to strew the path to the tomb with flowers," and to divest of its *specific* terrors the most dreadful malady to which mankind is exposed.

While the preceding case was under treatment, and exciting the utmost interest in the school, several pupils commenced experiments on themselves to ascertain the effects of the drug. In all, the state of the pulse was noted before taking a dose,

and subsequently the effects were observed by two pupils of much intelligence. The result of several trials was, that in as small doses as a quarter of a grain the pulse was increased in fulness and frequency; the surface of the body glowed; the appetite became extraordinary; vivid ideas crowded the mind; unusual loquacity occurred; and, with scarcely any exception, great aphrodisia was experienced.

In one pupil, Dinonath Dhur, a retiring lad of excellent habits, ten drops of the tincture, equal to a quarter of a grain of the resin, induced in twenty minutes the most amusing effects I ever witnessed. A shout of laughter ushered in the symptoms, and a transitory state of cataleptic rigidity occurred for two or three minutes. Summoned to witness the effects, we found him enacting the part of a Rajah giving orders to his courtiers; he could recognise none of his fellow students or acquaintances; all to his mind seemed as altered as his own condition; he spoke of many years having passed since his student's days; described his teachers and friends with a piquancy which a dramatist would envy; detailed the adventures of an imaginary series of years, his travels, his attainment of wealth and power; he entered on discussions on religious, scientific, and political topics, with astonishing eloquence, and disclosed an extent of knowledge, reading, and a ready apposite wit, which those who knew him best were altogether unprepared for. For three hours and upwards he maintained the character he at first assumed, and with a degree of ease and dignity perfectly becoming his high situation. A scene more interesting it would be difficult to imagine. It terminated nearly as suddenly as it commenced, and no headache, sickness, or other unpleasant symptom followed the innocent excess.

In the symptoms above described we are unavoidably led to trace a close resemblance to the effects produced by the reputed inspiration of the Delphic oracles; perhaps it would not be very erroneous to conclude that it was referable to the same kind of excitement.

### *Use in Cholera.*

An epidemic cholera prevailing at this period, two of the students administered the tincture of hemp in several cases of that disease, and cures were daily reported by its alleged efficacy. Dr. Goodeve was thus led to try it in several cases, and his report was in the highest degree favorable. The diarrhœa was in every instance checked, and the stimulating effects of the drug clearly manifested. The durwan of the college, an athletic Rajpoot, was attacked, and came under my treatment after he had been ill seven hours; he was pulseless, cold, and in a state of imminent danger, the characteristic evacuations streaming from him without effort. Half a grain of the hemp resin was given, and in twenty minutes the pulse returned, the skin became warm, the purging ceased, and he fell asleep. In an hour he was cataleptic, and continued so for several hours. In the morning he was perfectly well and at his duty as usual.

It is but fair to state, however, that the character of the epidemic was not at the time malignant. I admit the cases to be inconclusive, but I conceive them to be promising, and that they deserve the due attention of the practitioner.

Since this passage was written in 1838, the tincture of hemp has been used in a great number of cases, both European and native, in the hospital of the Medical College. I know no remedy equal to it as a general and steady stimulant when given to *Europeans* in half drachm doses during the tractable stage of this disease. I have known the pulse and heat return and the purging checked by a single dose. It allays vomiting much more certainly than the opium preparations, and is not more likely than these to lead to cerebral congestion on the cessation of cholera symptoms. The cheering effect on the patient's spirits is not the least benefit this remedy confers.

In *native* cases much less advantage was obtained; nearly all this class of patients were old gunjah smokers.

### *Use in Tetanus.*

I now proceed to notice a class of most important cases, in

which the results obtained are of the character which warrants me in regarding the powers of the remedy as satisfactorily and incontrovertibly established. I allude to its use in the treatment of traumatic *tetanus*, or lock-jaw, next to hydrophobia, perhaps the most intractable and agonising of the whole catalogue of human maladies.

The first case of this disease treated by hemp was that of Ramjan Khan, aged thirty, admitted to the College Hospital, on the 13th of December, 1838, for a sloughing ulcer on the back of the left hand. Five days previously a native empiric had applied a red hot *gool* (the mixture of charcoal and tobacco used in the hookah) to the back of the left wrist, as a remedy for chronic dysentery and spleen. The patient's brother was similarly cauterised on the same day. In both sloughing took place down to the tendons. Symptoms of tetanus occurred on the 24th of December. The brother, who had refused to avail himself of European aid, had been seized with tetanus at his own home four days previously, and died after three days' illness. On the 26th December spasms set in, and recurred at intervals of a few minutes; the muscles of the abdomen, neck, and jaws became firmly and permanently contracted. Large doses of opium with calomel having been administered for some hours, without the least alleviation of symptoms, and his case having on consultation been pronounced completely hopeless, I obtained Mr. Egerton's permission to subject the poor man to the trial of the hemp resin. Two grains were first given at half past two, p.m., dissolved in a little spirit. In half an hour the patient felt giddy; at five, p.m., his eyes were closed, he felt sleepy, and expressed himself much intoxicated.

He slept at intervals during the night, but on waking had convulsive attacks.

On the 27th, two grains were given every third hour (a purgative enema was also administered, which operated three times); the stiffness of the muscles became much less towards evening, but the spasms returned at intervals as before; pulse and skin natural.

28. Improved; is lethargic but intelligent; spasms occasionally occur, but at much longer intervals, and in less severity.

29. Dose of hemp increased to three grains every second hour. Symptoms moderating.

30. Much intoxicated; continues to improve.

January 1, 1839. A hemp cataplasm applied to the ulcer, and internal use of remedy continued. Towards evening was much improved; spasms trivial; no permanent rigidity; had passed two *dysenteric stools*.

2. Morning report: Had passed a good night, and seems much better. Evening report: Doing remarkably well.

3, 4, and 5. Continues to improve. Hemp resin in two grain doses every fifth hour.

6. Five, p.m.—Feverish; skin hot; pulse quick; all tetanic symptoms gone; passing mucous and bloody stools. Leeches to abdomen; a starch and opium enema with three grains of acetate of lead every second hour; tepid sponging to the body; hemp omitted.

7. Six, a.m.—Still feverish; stools frequent, mucous; abdomen tender on pressure; no appetite; the ulcer sloughy, ragged, and offensive. Opium and acetate of lead continued; abdomen leeched; sore dressed with water. At noon there was slight rigidity of abdominal muscles. Hemp resumed. At three, p.m., became intoxicated and hungry; ulcer extremely dry, foul, and abominably fœtid; towards evening rigidity ceased. Hemp discontinued.

From this day the tetanus may be considered to have ceased altogether, but the dysenteric symptoms continued, despite of the use of opium and acetate of lead; the ulcer, too, proved utterly intractable. Some improvement in the dysenteric symptoms occurred from the 10th to the 15th, when natural stools were passed. He seemed gaining strength, but the wound was in no wise improved; the slough, on the contrary, threatened to spread, and two metacarpal bones lay loose in the centre of the sore; on consultation it was agreed to amputate the arm, but to this the patient peremptorily objected. The mortification

now spread rapidly, and, to our infinite regret, he died of exhaustion on the night of the 23rd of January.

An unprejudiced review of the preceding details exhibits the sedative powers of the remedy in the most favorable light; and, although the patient died, it must be remembered that it was of a different disease, over which it is not presumed that the hemp possesses the least power.

The *second case* was that of Chunoo Syce (treated by Mr. O'Brien, at the Native Hospital), in whom tetanus supervened on the 11th of December, after an injury from the kick of a horse. After an ineffectual trial of turpentine and castor oil in large doses, two grain doses of hemp resin were given on the 16th of December. He consumed in all 134 grains of the resin, and left the hospital cured on the 28th of December.

*Third case.*—Huroo, a female, aged twenty-five, admitted to the Native Hospital on the 16th of December; had tetanus for the three previous days, the sequel of a cut on the left elbow received a fortnight before. Symptoms violent on admission. Turpentine and castor oil given repeatedly without effect; on the 16th and 17th, three grains of hemp resin were given at bed-time. On the morning of the 18th she was found in a state of complete catalepsy, and remained so until evening, when she became sensible, and a tetanic paroxysm recurred. Hemp resumed, and continued in two grain doses every fourth hour. She subsequently took a grain twice daily till the 8th of February, when she left the hospital apparently quite well.

Mr. O'Brien has since used the hemp resin in five cases, of which four were admitted in a perfectly hopeless state. He employed the remedy in *ten grain doses* dissolved in spirit. The effect he describes as almost immediate relaxation of the muscles and interruption of the convulsive tendency. Of Mr. O'Brien's seven cases four have recovered.

In the Police Hospital of Calcutta, the late Dr. Bain has used the remedy in three cases of traumatic tetanus, of these one has died and two recovered.

A very remarkable case has recently occured in the practice

of my cousin, Mr. Richard O'Shaughnessy. The patient was a Jew, aged thirty, attacked with tetanus during the progress of a sloughing sore of the scrotum, the sequel of a neglected hydrocele. Three grain doses were used every second hour with the effect of inducing intoxication and suspending the symptoms. The patient has recovered perfectly, and now enjoys excellent health.

Beside the preceding cases I have heard of two of puerperal trismus treated in native females. Both terminated fatally, an event which cannot discredit the remedy, when it is remembered that the Hindoo native females of all ranks are placed, during and subsequent to their confinement, in a cell, within which large logs of wood are kept constantly ignited. The temperature of these dens I have found to exceed 120° of Fahrenheit's scale.

A curious coincidental proof of the value of hemp in these cases has very recently come to my notice. In the appendix to Sir James Murray's "Medical Essays," p. 16, dated Dublin 1837, occurs the following passage:—"Having written the substance of these pages (Sir James's work) to my brother, then assistant-surgeon of the 60th Rifles, at the Cape of Good Hope, he mentioned that a plant called *dyka*, or wild hemp, which grows on the eastern coast of Africa, is used by the natives for this purpose (the relief of puerperal convulsions), and that they all, male and female, smoke it to bring on perfect relaxation and relief from pain and spasm of any kind during its relaxing influence."

The preceding facts are offered to the professional reader with unfeigned diffidence as to the inferences I feel disposed to derive from their consideration. To me they seem unequivocally to show that when given boldly and in large doses the resin of hemp is capable of arresting effectually the progress of this formidable disease, and in a large proportion of cases of effecting a perfect cure.

The facts are such at least as justify the hope that the virtues of the drug may be widely and severely tested in the

multitudes of these appalling cases which present themselves in all Indian hospitals.

Messrs. Hughes and Templar, eminent veterinary surgeons of Calcutta, have used the hemp resin in five cases of horses suffering from tetanus; of these three have recovered. Dr. Sawyers, of the medical board, has cured a pony similarly affected.

Drs. Esdaile and Macrae have used the hemp with success; the former in a case of tetanus; the latter in one of convulsions from neuralgia of the testis, which had resisted every other remedy, and for which the removal of the organ had been decided on. In the "London Medical Gazette" Mr. Lewis gives a case of tetanus in which the hemp was used with great relief to the symptoms, although it did not effect a cure.

### *Case of Infantile Convulsions.*

A very interesting case of this disease has recently occurred in my private practice, the particulars of which I have the permission of the family to insert in this paper.

A female infant, forty days old, the child of Mr. and Mrs. J. L., of Calcutta, on the 10th of September had a slight attack of convulsions, which recurred chiefly at night for about a fortnight, and for which the usual purgatives—warm baths and a few doses of calomel and chalk—were given without effect. On the 23rd the convulsive paroxysms became very severe, and the bowels being but little deranged two leeches were applied to the head. Leeches, purgatives, and opiates, were alternately resorted to, and without the slightest benefit, up to the 30th of September.

On that day the attacks were almost unceasing, and amounted to regular tetanic paroxysms. The child had, moreover, completely lost appetite and was emaciating rapidly.*

I had by this time exhausted all the usual methods of treatment, and the child was apparently in a sinking state.

* The nurse, I should have mentioned, was changed early in the illness, and change of air resorted to on the river, but in vain.

Under these circumstances I stated to the parents the results of the experiments I had made with the hemp, and my conviction that it would relieve their infant if relief could possibly be obtained.

They gladly consented to the trial, and a single drop of the spirituous tincture, equal to the one-twentieth part of a grain of extract, was placed on the child's tongue at ten, p.m. No immediate effect was perceptible, and in an hour and a half two drops more were given. The infant fell asleep in a few minutes, and slept soundly till four, p.m., when she awoke, screamed for food, *took the breast freely*, and fell asleep again. At nine, a.m., 1st of October, I found the child fast asleep, but easily roused; the pulse, countenance, and skin perfectly natural. In this drowsy state she continued for four days totally free from convulsive symptoms in any form. During this time the bowels were frequently spontaneously relieved, and the appetite returned to the natural degree.

October 4. At one, a.m., convulsions returned and continued at intervals during the day; five drop doses of the tincture were given hourly. Up to midnight there were thirty fits, and forty-four drops of the tincture of hemp were ineffectually given.

5. Paroxysms continued during the night. At eleven, a.m., it was found that the tincture in use during the preceding days had been kept by the servant in a small bottle with a paper stopper; that the spirit had evaporated and the whole of the resin had settled on the sides of the phial. The infant had in fact been taking drops of mere water during the preceding day.

A new preparation was given in three drop doses during the 5th and 6th, and increased to eight drops with the effect of diminishing the violence, though not of preventing the return of the paroxysm.

On the 7th I met Dr. Nicholson in consultation, and despairing of a cure from the hemp, it was agreed to intermit its use, to apply a mustard poultice to the epigastrium, and to give a dose of castor oil and turpentine. The child, however, rapidly became worse, and at two, p.m., a tetanic spasm set in, which lasted

without intermission till half-past six, p.m. A cold bath was tried without solution of the spasm; the hemp was, therefore, again resorted to, and a dose of thirty drops, equal to one and a half grains of the resin, given at once.

Immediately after this dose was given the limbs relaxed, the little patient fell fast asleep, and so continued for thirteen hours. While asleep, she was evidently under the peculiar influence of the drug.

On the 8th October, at four, a.m., there was a severe fit, and from this hour to ten at night twenty-five fits occurred, and 130 drops of the tincture were given in thirty drop doses. It was now manifestly a struggle between the disease and the remedy; but at ten, p.m., she was again narcotised, and from that hour no fit returned.

On the three following days there was considerable griping, and on administering large doses of almond oil several small dark green lumps of hemp resin were voided, which gave effectual relief. The child is now (December 17) in the enjoyment of robust health, and has regained her natural plump and happy appearance.

In reviewing this case several very remarkable circumstances present themselves. At first we find three drops, or three-twentieths of a grain, causing profound narcotism, subsequently we find 130 drops daily required to produce the same effect. The severity of the symptoms doubtless must be taken chiefly into account in endeavouring to explain this circumstance. It was too soon for habit to gain ascendency over the narcotic powers of the drug. Should the disease ever recur, it will be a matter of much interest to notice the quantity of the tincture requisite to afford relief. The reader will remember that this infant was but sixty days old when 130 drops were given in one day, of the same preparation of which ten drops had intoxicated the student Dinonath Dhur, who took the drug for experiment.

*Use in Delirium Tremens.*

I have given the tincture of hemp an extensive trial in this disease, and have had much reason to be gratified with its

effects. In action it resembles opium and wine, but is much more certain than these remedies. I have no hesitation in saying, that in the cases in which the opium treatment is applicable, hemp will be found far more effectual. The changed state of mind it produces is truly wonderful. From the appalling terror which generally predominates, the patient soon passes into a state of cheerfulness, often of boisterous mirth, and soon sinks into a happy sleep. Of course there are many cases in which this, or any other, narcotic should not be employed.

*Delirium occasioned by continued Hemp Inebriation.*

Before quitting this subject, it is desirable to notice the singular form of delirium which the incautious use of the hemp preparations often occasions, especially among young men who try it for the first time. Several such cases have presented themselves to my notice. They are as peculiar as the "delirium tremens" which succeeds the prolonged abuse of spirituous liquors, but are quite distinct from any other species of delirium with which I am acquainted.

This state is at once recognised by the strange balancing gait of the patient, a constant rubbing of the hands, perpetual giggling, and a propensity to caress and chafe the feet of all bystanders of whatever rank. The eye wears an expression of cunning and merriment which can scarcely be mistaken. In a few cases, the patients are violent; in many, highly aphrodisiac; in all that I have seen, voraciously hungry. There is no increased heat or frequency of circulation, or any appearance of inflammation or congestion, and the skin and general functions are in a natural state.

A blister to the nape of the neck, leeches to the temples, and nauseating doses of tartar emetic with saline purgatives have rapidly dispelled the sypmtoms in all the cases I have met with, and have restored the patient to perfect health.

*Conclusion.*

The preceding cases constitute an abstract of my experience on this subject, and constitute the grounds of my belief that in

hemp the profession has gained an anti-convulsive remedy of the greatest value. Entertaining this conviction, be it true or false, I deem it my duty to publish it without any avoidable delay, in order that the most extensive and the speediest trial may be given to the proposed remedy. I repeat what I have already stated in a previous paper — that were mere reputation my object, I would let years pass by, and hundreds of cases accumulate before publication; and in publishing I would enter into every kind of elaborate detail. But the object I have proposed to myself in these inquiries is of a very different kind. To gather together a few strong facts, to ascertain the limits which cannot be passed without danger, and then pointing out these to the profession, to leave them to prosecute and decide on the subject of discussion, such seems to me the fittest mode of attempting to explore the medicinal resources which an untried remedy may afford.

It may be useful to add a formula for making the preparations which I have employed.

The *resinous extract* is prepared by boiling the rich, adhesive tops of the dried *gunjah*, in spirit (sp. gr. 835), until all the resin is dissolved. The tincture thus obtained is evaporated to dryness by distillation, or in a vessel placed over a pot of boiling water. The extract softens at a gentle heat, and can be made into pills without any addition.

The *tincture* is prepared by dissolving the extract in spirit of 835° density.

*Doses, &c.*—In *tetanus* a drachm of the tincture every half hour until the paroxysms cease, or catalepsy or narcotism is induced. In *hydrophobia* I recommend the resin in soft pills, to the extent of ten to twenty grains to be chewed by the patient, and repeated according to the effect. In *cholera*, thirty drops of the tincture every half hour will be often found to check the vomiting and purging, and bring back warmth to the surface. My experience would here lead me to prefer *small* doses of the remedy in order to excite rather than narcotise the patient.

I have only further to add, that since the substance of the

preceding memoir was first published, numerous cases have come to my knowledge in which the *churrus*, or resin prepared by the natives for smoking, has been used with little effect. This was the case in some experiments made by Dr. Pereira with *churrus* which I sent him myself. Age and adulteration have been probably both concerned in rendering this substance inactive. But with the alcoholic extract made from the tops in the way I recommend, the practitioner has only to feel his way, and increase the dose till he produces intoxication as the test of the remedy having taken effect.

Of all powerful narcotics it is the safest to use with boldness and decision.

I have given Mr. Squire, of Oxford-street, a large supply of the gunjah, and that gentleman has kindly promised me to place a sufficient quantity of the extract at the disposal of any hospital physician or surgeon who may desire to employ the remedy. My object is to have it extensively and exactly tested without favor or prejudice, for the experience of four years has established the conviction in my mind, that we possess no remedy at all equal to this in anti-convulsive and anti-neuralgic power.

*(Date of Reprint)* London, January, 1843.

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## INDIAN HEMP.

TO THE EDITORS OF THE PROVINCIAL MEDICAL JOURNAL.

GENTLEMEN, — With reference to my paper on the Indian Hemp, lately inserted in your Journal, I trust I may be permitted to disclaim any wish to advance these preparations as specifics in the treatment of tetanus, or in spasmodic diseases generally. That hemp possesses great, indeed extraordinary, anti-convulsive power, I feel assured from numerous facts which I have myself observed, and which others have also witnessed. The cases of the six horses affected by traumatic tetanus, recorded in my

paper, of which four recovered, are almost enough by themselves to convince any unprejudiced person of the energy and promise of this drug.

Many failures must be expected at first, from the salutary caution all good practitioners must observe in the doses of a remedy with which they are not practically familiar. On this point I have further to remark that in a case of traumatic tetanus, now under treatment, fifteen grain doses of the resin have been given every second or third hour, and of these doses five taken before narcotism was induced.

In cases of tetanus, I consider no trial of the drug at all conclusive, unless it has been pushed to the extent of inducing stupor and insensibility.

Too much importance has been attached by commentators on my paper to the occurrence of *catalepsy* as an effect of this drug; catalepsy I have witnessed unequivocally in many cases, but the effect is not an universal one; I have seen it produced by ten drops of the tincture, and by one grain of the resin. But, on the other hand, I have given fifty grains in one day to a tetanic patient without any such effect being observable.

It seems quite evident, from the experiments made by Mr. Ley and Dr. Pereira, that much larger doses must be used in this country than those we found sufficient in India. The cause of this is possibly to be traced to molecular chemical changes taking place by age in the constituents of the drug, and analogous to those familiar to the profession in the case of hemlock and its active principle.

The tincture, made by dissolving the extract in spirit, I consider the best form of the drug for use in tetanic cases—or the resin may be made into an emulsion, by trituration with a little flour, carbonate of soda, and mucilage. The soda tends to dissolve the resin, and its use is in accordance with the precepts of the ancient Eastern writers, who prescribed hemp with alkaline substances, and used acids in various forms (such as oxymel and sorrel wine) to counteract its effects when taken in overdoses.

In conclusion, I venture to refer to the very interesting cases

lately published by Mr. Ley, in the Provincial Medical Journal. Another memoir from the same able pen, will, I understand, soon appear, and will afford ample evidence of the therapeutic value of this agent. Mr. Ley informs me that of the *anti-convulsive* power of the hemp he entertains no doubt. This is the great, the valuable result to look for; all else is comparatively of but little importance. On some minor points Mr. Ley's results differ from mine. This must be regarded but as a proof of the accuracy of his observations—that he is recording faithfully what he sees, and is not merely treading in the footsteps of another.

I am, Gentlemen,

Your faithful servant,

W. B. O'Shaughnessy, M.D.

London, Feb. 8, 1843.

P.S.—I would take the liberty of inviting experimentalists to the repetition on the hemp resin of the processes for preparing conia and nicotina—namely by distillation with caustic potash or soda and water, receiving the distilled liquid in dilute acid, and redistilling this with an excess of alkali, as before. My departure from India interfered with my trial of this process, and I think it likely to lead to valuable results.

LONDON :
S. Taylor, Printer, 6, Chandos street, Covent-garden.

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