

On the physical and medicinal Qualities of Indian Hemp (Cannabis Indica); with Observations on the best Mode of Administration, and Cases illustrative of its Powers. By M. Donovan.

If the history of the Materia Medica were to be divided into epochs, each determined by the discovery of some remedy of transcendant power, the period of the introduction of Indian hemp into medicine would be entitled to the distinction of a new era. I indulge in the expectation that this powerful agent, when physicians have fully developed its properties, will rank in importance with opium, mercury, antimony, and bark. The public and the Profession owe a deep debt of gratitude to Professor O'Shaughnessy, whose sagacity and researches have brought to light a medicine possessed of a kind of energy which belongs to no other known therapeutic agent, and which is capable of effecting cures hitherto deemed nearly hopeless or altogether impracticable.

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With the view of contributing my humble efforts to render so excellent a medicine more generally known in this country, I undertook to procure and make trials of it, and to ascertain various particulars relative to its commercial varieties, its powers, and best forms of administration.

On the question whether the *cannabis sativa* and *cannabis Indica* are different species, there has been some difference of opinion; most botanists believe that they are the same, and differ chiefly in the size of the plant. Hemp grown in Ireland is, however, much better furnished; and the flowers are clustered in much greater number and luxuriance than is figured in Roxburgh's plate, given by Professor O'Shaughnessy. Were a system of classification founded on chemical constitution, the two plants would have good claims to distinction of species. The smell of British hemp is odoriferous, like mixed mint and wormwood, and totally different from Indian, which is rather disagreeable; the taste is also different—that of the former disgusting, of the latter, aromatic.

But the chief difference lies in the resin contained abundantly in the Indian plant, which, as Lamarck observed, does not exist in the European. Merat and De Lens are of opinion that the strong smell, the bitterness, and above all, the great resemblance of the two plants, give reason to believe that domestic hemp possesses the narcotic quality equally with the Oriental; and they recommend comparative experiments to be made, in order that a favourable result might add a precious medicine to our native *materia medica*.

This suggestion, certainly an important one, induced me to make the experiment. I accordingly sowed hemp-seed in the proper season; it ripened in the beginning of October. Of the whole herb I made a tincture, four ounces to one pint of rectified spirit. The expressed tincture was allowed to evaporate spontaneously until very little remained, and this was dried by a gentle heat; it weighed 53 grains.

Having diffused the mass in an ounce of diluted alcohol, I swallowed first half a drachm, then a drachm, then two drachms, and lastly half an ounce, all within two days, but no effect of any kind followed. In the last dose there were twenty-eight grains of solid extract; one grain of resinous extract of Indian hemp, if of good quality, would produce powerful effects. I therefore conceive that domestic hemp is thus proved to be destitute of the principle which renders the Indian plant so desirable an excitant to the voluptuous people of the East. Indeed hemp might be expected to fall under the general law, that in hot climates all plants are more sapid, odorous, and resinous.

Difference of climate has a remarkable effect on the growth and appearance of hemp. In Great Britain it seldom exceeds three feet in height. In India, Ainslie says that it reaches nine feet or more, while O'Shaughnessy says three feet. In China, where its intoxicating powers are well known, it grows considerably higher; and its seed does not immediately degenerate: for Chinese hemp-seed sown in England grew, at the rate of eleven inches a week, into a gigantic plant more than fourteen feet high, thirty-two of which afforded three pounds and a quarter of dried hemp. (*Phil. Trans.* 1782). The seed of the plant, in both Europe and Asia, is oily, and, as is generally said, destitute of narcotic power; yet it is singular that in the time of Galen it appears "it was customary to give hemp-seed to the guests at banquets as a promoter of hilarity and enjoyment," a practice difficult to reconcile with its affirmed inertness. Some have reported the seed to be emmenagogue, and all agree that it is demulcent, which may be very true, provided that such a class as demulcents exists.

It would be worth while to ascertain whether our common flax possesses powers analogous with those of hemp; that it is deleterious is well known.

Previously to entering on the chief objects of this com-

munication it will be of importance to those who have not read Professor O'Shaughnessy's difficultly procurable essay, to give, in an abridged form, a view of his chief cases.

Two persons labouring under acute rheumatism, and one under the chronic form of it, none of whom derived much relief from ordinary treatment in the hospital of Calcutta, got each one grain of resin of hemp at 2 o'clock, P. M. At 4, one had become very talkative, was singing songs, calling loudly for an extra supply of food, and declaring himself in perfect health. The two other patients were unaffected. At 6, the first was asleep; at 8, he was found insensible. "I chanced (says Professor O'Shaughnessy) 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 *cataplexy* of the nosologist.

"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. To all impressions he was meanwhile almost insensible; he made no sign of understanding questions; could not be aroused.

"The second patient had, meanwhile, been roused by the noise in the ward, and seemed vastly amused at the strange aspect of the statuelike 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 uncontrollable. 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 expressed himself perfectly well and excessively hungry. The first patient continued cataleptic till 1 P. M. when consciousness and voluntary motion quickly returned, and in an hour he was exactly in the same state as the second patient. 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 Cooly, 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. He 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, nor was there any tendency to quarrelling. The disposition developed was uniform in all, and in none was headach or sickness of stomach, a sequel of the excitement.”

Professor O'Shaughnessy then details a terrific case of hydrophobia in which, although the patient died, his previous sufferings were much mitigated: "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." He afterwards says. "In hydrophobia I would 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."

At a time when an epidemic cholera, not of a malignant character, prevailed, several persons were cured by resin of hemp. Dr. Goodove's report of it, tried in several cases, was in the highest degree favourable. Professor O'Shaughnessy had a patient who had been attacked seven hours before: he was pulseless, cold, and in imminent danger; the characteristic evacuations streaming from him without effort. Half a grain of hemp resin was given to him, 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. "In cholera ten 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 lead me to prefer small doses of the remedy, in order to excite rather than narcotise the patient."

The powers of Indian hemp in tetanus have been proved to be remarkable. Two men, brothers, had been cauterized by a native empiric in the back of the wrist. In both, sloughing ulcers took place down the tendons; both were attacked with tetanus; one, refusing to avail himself of European aid, died in three days; the other, under Dr. Egerton, was treated with large doses of opium and calomel, without the least alleviation of the symptoms; spasms recurred at intervals of a

few minutes: the muscles of the abdomen, neck, and jaws became firmly and permanently contracted. Professor O'Shaughnessy, with Dr. Egerton's permission, gave (December 26th) two grains of hemp resin; in half an hour the patient felt giddy; he soon grew sleepy, and expressed himself much intoxicated. He slept at intervals during the night, but on waking had convulsive attacks. Two grains of hemp resin were given every third hour; and at length three grains every second hour; on the 30th, the spasms were trivial; no permanent rigidity. In fine, the tetanic symptoms disappeared, but the ulcer on the wrist, in no wise improved, threatened to spread; amputation was proposed, but resisted by the patient; mortification spread rapidly, and he died of exhaustion.

The second case was tetanus arising from the kick of a horse. Two grain doses were administered of the hemp resin until he consumed in all 134 grains, between the 26th of November and the 28th of December, on which day he left the hospital cured.

Third case.—A female received a cut on the elbow, which induced tetanus. On the 16th and 17th of December, 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. Two grains of the resin were given every fourth hour; tetanic symptoms returned, but at length gave way; and on the 8th of February 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 is 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."

Mr. Richard O'Shaughnessy, of the Calcutta Medical College Dispensary, has reported a remarkable recovery from a deplorable case of traumatic tetanus, arising from two suppurating wounds on the scrotum. The jaw was firmly closed on the 26th of July: the patient was ordered a grain of hemp resin every two hours. This he took till the 29th, when it appears he was worse than at first: his belly was as hard as a board; his jaw firmly locked; there was considerable pain of the back; and he suffered much from incessant thirst and sleeplessness. "A short time after I went into the room (says Mr. O'S.) he got a paroxysm, during which his head was drawn violently backwards, and the trunk at the same time was bowed forwards, but the extremities were completely unaffected. During the paroxysm, perspiration seemed to burst from every pore, in large drops which rolled in a stream upon the bed." On this day two grains of hemp resin were ordered every two hours.

On the 30th he was rather easier: his bowels being confined the hemp was discontinued for a few hours, until after the operation of a purge of calomel (gr. 12), castor-oil, and turpentine. On account, probably, of this discontinuance, he was much worse all day; the paroxysms came on every ten minutes, and with increased violence each time, until towards evening, when the pills were resumed as before. He then gradually became more tranquil, and the paroxysms returned less frequently.

31st. Ordered to-day five grains of hemp resin every two hours: his appetite is particularly good. "August 1st. He is better to-day; slept a little last night; and said he felt *very happy*; the anxious expression of countenance is replaced by a funny, half-tipsy look: paroxysms greatly diminished in frequency. 3rd. Ordered one drachm of the tincture of hemp (three grains to one drachm of spirit) every second hour. 4th. He looked as happy as possible this morning, said and did many funny things during the night.

Had but one paroxysm since commencing the tincture; slept well; all the pains much diminished: tincture to be continued. 5th. Had no paroxysm all yesterday: can open his mouth a little, and swallows without difficulty: pulse almost natural, as it has been all through. The hemp was discontinued for a few hours, on account of the exhibition of purgative medicine.

"6th. I find him to-day much worse than he has been since he commenced taking the large doses of the tincture of hemp—as the influence of the hemp wore away the disease appeared to advance; however, at the approach of evening, after the tincture was resumed, he got more tranquil. I now saw it of no use to attempt giving any more medicine for the bowels, so I determined on having the hemp regularly administered, to keep him constantly under its influence, and thereby, if possible, to tire out the tetanus, for the drug was certainly keeping the disease at bay." He therefore got a drachm of the tincture, night and day, every second hour, for several days.

On the 10th his bowels acted of their own accord; "he had no paroxysm now for several days, and in every respect he appeared to be recovering fast." On the 12th, "he said he now slept well, was free from thirst, and his bowels acted regularly. He could open his jaw and eat and drink without pain: he was so well that I discontinued my attendance and pronounced him cured. What is very remarkable, notwithstanding the long use of hemp, he became latterly much more excited by it than before, so much so, that instead of giving it every two hours, I was obliged to order it to be given only three times a-day, and at last only morning and evening. He now lost all appetite, and felt weaker than he complained of being at any time during his illness."

Soon after his recovery he suffered from inguinal hernia, which was explained by supposing that some of the fibres of the conjoined tendons had given way, no bad proof of the violence of the spasm from which he suffered.

"In conclusion (says Mr. O'S.), I have merely to remark, that I never treated a case from which I derived so much satisfaction, or used a medicine I felt so much indebted to for my patient's recovery, as the hemp, but for which I am certain that this man would have died in a very few days after I first saw him; experience having taught me such would be the fate of every unfortunate victim it might fall to my lot to witness writhing under the tortures of this awful malady. I may add that the *tincture is evidently the best and most powerful form for administering this drug; a drachm of it, which was only equal to three grains of the extract, having had a much more decided effect than five grains of the latter.*"

The next case is recorded by Professor O'Shaughnessy: it was one of infantile convulsions in a child 53 days old; the paroxysms were very severe. Calomel, purgatives, opium, leeches, and all the usual methods of cure were exhausted; the attacks now were almost unceasing, and amounted to regular tetanic paroxysms. Three drops of the tincture of hemp resin, equal to three-twentieths of a grain of the resin, were given within an hour and a half; the infant fell asleep in a few minutes, and remained asleep for four hours and a half; then awoke, screamed for food, took the breast freely, and fell asleep again. A drowsy state ensued, which continued four days, the child being totally free from convulsive symptoms in any form. The convulsions then returned; up to midnight there were thirty-five fits; the medicine was resumed, but with no effect, for the bottle containing the tincture had been closed with a paper stopper by the servant: the alcoholic portion evaporated, and the resin was precipitated on the bottle, so that the water of the spirit only was given to the child. A new tincture was now used, but with so little effect that the hemp was laid aside. The violence of the disease enforced its resumption; the dose had been eight drops, but now it was increased to *thirty*, equal to a grain

and half of the resin. Immediately after this the tetanic spasm was relaxed, the child fell asleep, and continued in a state of narcotism for thirteen hours. Next day, in the space of eighteen hours, twenty-five fits occurred, and 130 drops of the tincture were given in thirty-drop doses. At ten o'clock at night the child was again narcotised, and from that hour no fit returned; she remained in the enjoyment of robust health, and has regained her natural plump and happy appearance.

Professor O'Shaughnessy makes the following important remarks:—"In reviewing this case several very remarkable circumstances present themselves. At first we find *three* drops 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 ascendancy over the narcotic powers of the drug."

I have thus freely extracted from this valuable Essay because, on account of its being published in Calcutta, it is little known in this country. I know not what impression the cases may eventually make upon the medical profession. To me they appear the evidences of a glorious triumph achieved over one of the most dreadful maladies that can afflict human nature. It is yet to be seen whether practitioners will persevere in that treatment, which thousands of human sacrifices have proved ineffectual, to the exclusion of a remedy which, in the great majority of cases, saved the lives of the unfortunate sufferers. In violent and generally fatal diseases, it is the custom of some, in the plenitude of assumed wisdom, to meet the proposal of a new remedy with a derisive smile, and its reported success with scepticism or sarcasm. Is this philosophical, justifiable, or reasonable—is it not to pronounce a disease incurable because no mode of cure has as yet been discovered?

Or is a merciful dispensation of Providence to remain unacknowledged because the manifestation of it appeared late in the history of the world, or because the instrument of it lived in our own times, or was one of our friends and companions?

It is not my province any further to urge the due appreciation of Professor O'Shaughnessy's discovery. The reflecting portion of the Profession will decide for themselves, whether, as ministers of relief to the sick, they are at liberty to withhold an impartial trial to a medicine of such proved power. I content myself with expressing my belief that Indian hemp will one day or another occupy one of the highest places amongst the means of combating disease.

I now proceed to state the result of observations made by myself and others on the effects of this medicine :

Having procured several samples of Indian hemp, I made a tincture from one of them by digesting, with heat, sixty-four ounces of the dried summits in two gallons of rectified spirit. Of this, some was reserved for use, and the rest was converted into the resinous extract by evaporation at a very low heat. Samples of resinous extract were obtained from various other sources, as also a sample of *Citrus*; and I distilled a spirit and a water from the dried summits of the plant itself.

My next object was to test the powers of these various forms. Of the distilled spirit I swallowed six drachms without effect; the distilled water had no more power; but it was thus proved that the process for procuring resinous extract does not expel any of the active principle. After a few preliminary doses, I swallowed three drachms of the tincture of the herb (containing four grains of resin) without the least effect. On different days, I took four grains of each of the samples of resinous extract, and found them equally powerless. In fine, all the Indian hemp and all its preparations, of which I could at that time obtain samples, were so infe-

rior in power, compared with the energy of those employed by Professor O'Shaughnessy, that it became obvious how much the plant suffers from age, from being collected at an improper season, or from careless manipulation. When the medicine fails, we are therefore to be cautious in pronouncing a general censure, the particular sample employed being, perhaps, only to blame.

For want of better, many of the cases that follow were treated with the above-mentioned preparations. But fortunately I at length procured a quantity of the true resinous extract, prepared at Calcutta, under the immediate inspection of Professor O'Shaughnessy, the energy of which was such that half a grain was a powerful dose.*

In the following reports of cases, reference is made to the preparations that were accessible to me at the time, and they are distinguished by peculiar names—namely, “*weak resinous extract*,” of which, as already mentioned, four grains were a powerless dose; the “*tincture of the summits of the herb*,” of which three drachms were of no greater efficacy; the “*strong resinous extract*” of which half a grain was a powerful dose; and its tincture, containing two grains to one drachm of rectified spirit, which is designated “*the strong tincture*.”

The interest which I took on this subject was not a little enhanced by anticipation of the benefit which I expected to derive, personally, from the medicinal powers of Indian hemp; and I resolved to give it a full trial on myself previously to proposing it to others. My case is as follows:—From early life, I have occasionally suffered from a pain of the neuralgic character, the seat of which, at different times, was the heel, the ankle, the sole, the instep, and sometimes the back of the thigh. The attack generally lasted one or two days,

* Professor O'Shaughnessy has kindly undertaken to forward to me, by the next Overland Mail, a large quantity of resinous extract from hemp, of this year's growth, made under his own superintendance.