

Description of the Hashish Experience

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At about the same period as the more imaginative descriptions by the French voluptuaries and the American adventurers were composed, various members of the medical profession and otherwise scientifically trained people observed and reported the effects of hashish on themselves, their friends and their patients. This general display of interest was occasioned by the sudden prominence of Indian hemp as a medicinal agent. The therapeutic applicability of this drug had been advocated by Aubert-Roche in 1839, by O'Shaughnessy in 1843 and by Moreau de Tours in 1845. Each of these physicians contributed descriptions of the pharmacologic and what might be called the psychopharmacologic effects.

Moreau de Tours made numerous experiments on himself, normal individuals and patients. He reported that with smaller doses of dawamesc, a person does not feel particularly different and only experiences a mild feeling of expansion. With larger doses there is a marked euphoria, slight pressure in the temples and upper cranium, retarded breathing, slightly accelerated pulse, a feeling of warmth over the whole body with the exception of the feet which are usually cold and a heaviness and numbness of the hands and arms. With still larger doses, there are choreic movements, ringing in the ears, and a feeling of oppression in the region of the heart. Subjectively there is no such effect. There is a development of tonic spasms, particularly of the flexors, all with short or long intermissions. There are numerous psychologic phenomena such as a feeling of lust without sexual excitation, an indescribable feeling of peace, happiness and delight, a

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distorted, a powerfully heightened effect of music, fixed ideas and delusional convictions which change rapidly, irresistible impulses and illusions and hallucinations which are closely allied to insanity.

Rech, in 1847, reported the effects of hashish administered to a number of young interns. Three main types of effects were obtained: (1) a disturbance of digestive functions; (2) purely nervous effects; and (3) confusion of mental faculties. The first manifested itself as a loss in appetite, dryness of the mouth, burning thirst, pain in the epigastrium and inclination to vomit with sometimes outright vomiting. These effects pass off rapidly and are of subordinate importance with respect to another symptom, namely, a coldness in the extremities. The second group of effects includes involuntary contractions, a disturbance of locomotion, a feeling of paralysis and a convulsive laughter, which is sometimes disagreeable but more often is pleasant. In one case the lower extremities seemed to be as heavy as lead and nailed to the floor, another felt a heaviness in all extremities and felt as if he were walking in snow. The purely mental effects lasted longer and were **most** prominent. The subjects could not converse rationally, ideas displaced one another without relationship, memory and the sense of passing time were extinguished. Imagination was intensely stimulated; the most brilliant ideas flashed by; some had hallucinations and thought they were transformed. A deep torpor gradually set in. Of all the intellectual capacities, the power of comprehension remained in the most normal state.

Donovan took large doses of extracts made from hemp plants grown near Dublin. No effects were obtained. However, ten drops of the tincture of *Cannabis indica* from Calcutta caused marked effects. The walls of the room seemed to move in on him. His thoughts came more slowly and finally were extinguished. This condition lasted for two hours after which he recovered and manifested a strong appetite.

Clarke had substituted cannabis for morphine in a case of mania. The first dose from a renewed supply produced marked depression with cyanosis. Some of the same sample was taken by the author who had a typical hashish experience, also accompanied by cyanosis and by partial paralysis of the left arm.

De Luca was prompted by curiosity to swallow two to three grains of a sugary paste containing hashish recently brought from the Orient. Effects began in a quarter of an hour and prevented him from continuing work. Movements seemed to progress from without to the interior of the body. There was a sensation of things entering through the fingers and proceeding directly to the brain. These sensations were not unpleasant and did not seem to derange intellectual faculties. Space seemed greatly exaggerated, there were sensations of walking on air and of great superiority to other people. Ideas passed with great rapidity and seemed to be very clear and exact. The effect lasted about four hours. Ideas then began to come more slowly, distances diminished, nervous movements disappeared and finally the only thing noticeable was that the lips were not as moist as usual.

H. C. Wood, Jr., of Philadelphia, was chiefly interested in determining if there was any activity in American grown cannabis. He made an alcoholic extract from male plants grown for fiber purposes in Lexington, Kentucky. An estimated twenty to thirty grains of this extract were ingested at 4:30 P.M. Apparently forgetting or disregarding this fact, he went on a professional call and at 7:00 P.M., while attending a patient, the effects suddenly became evident. By 7:30 the feeling of hilarity had rapidly increased.

It was not a sensuous feeling, in the ordinary meaning of the term . . . It did not come from without; it was not connected with any passion or sense. It was simply a feeling of inner joyousness; the heart seemed bouyant beyond all trouble; the whole system felt as though all sense of fatigue were forever banished; the mind gladly ran riot, free constantly to leap from one idea to another, apparently unbound from its ordinary laws. I was disposed to laugh; to make comic gestures . . . There was nothing like wild delirium, nor any hallucinations that I can remember. . . I think it was about eight o'clock, when I began to have a feeling of numbness in my limbs, also a sense of general uneasiness and unrest, and a fear lest I had taken an overdose. I now constantly walked about the house, my skin to myself was warm, in fact my whole surface felt flushed; my mouth and throat were very dry; my legs put on a strange, foreign

feeling, as though they were not part of my body. I counted my pulse and found it 120, quite full and strong . . . My legs felt as though they were waxen pillars underneath me . . . I began to have marked "spells," periods when all connection seemed to be severed between the external world and myself . . . The duration of these to me were very great, although they really lasted but from a few seconds to a minute or two . . . The periods of unconsciousness became at once longer and more frequent, and during their absence intellection was more imperfect, although when thoroughly roused, I thought I reasoned and judged clearly. The oppressive feeling of impending death became more intense . . . Under the influence of an emetic I vomited freely without nausea and without much relief. . . When I awoke early in the morning, my mind was at first clear, but in a few minutes the paroxysms, similar to those of the evening, came on again, and recurred at more or less brief intervals until late in the afternoon. All of the day there was marked anesthesia of the skin. At no time was there any marked aphrodisiac feelings produced. There was a marked increase of the urinary secretion. There were no after-effects, such as nausea, headache or constipation.

A Dr. Thomas, who was called, reported that zinc sulphate produced free emesis in fifteen minutes and after that the pulse rate fell from 136 to 104 and the warmth of the skin was restored. The mental state was not affected by the emetic.

Another, and evidently more potent, extract was subsequently prepared from the same Kentucky hemp. Three-quarters of a grain of this resin produced effects but of a much milder sort than the original experience. There were no marked periods of unconsciousness but only a feeling of hilarity, a prolongation of time and a total inability to fix the attention except for short periods. A friend took one grain of this same resin and experienced approximately the same effects. In addition, however, he became ravenously hungry, ate excessively and experienced a marked degree of sexual excitement which lasted several days.

Kuykendall had administered cannabis frequently in neu-

ralgia and obtained only the exhilarating effects. However, in an experimental trial on himself, terrifying sensations were experienced. The intoxication reached its greatest intensity in about one and a half hours and lasted about six hours.

Wiltshire had a patient who expressed reluctance at taking any further doses of cannabis because the first produced peculiar sensations. In order to reassure her of the innocence of this drug, he took fifteen drops of the fluid extract and was surprised to be affected by the typical hashish sensations.

I remember perfectly well all the phenomena that were produced; even when I was engrossed with the idea that death was at my door . . . Felt much intoxicated, body growing larger; indescribable sounds came to my ears; imagined that the blasts of old winter were lashing at my windows and walls. Reason good; memory heightened . . . A feeling of aphrodisia possessed me; fast upon this comes a feeling of alarm and restlessness . . . My heart now began to beat fearfully, thought it would leave its walls. Moments seemed hours . . . Head now felt as though it would burst. Consciousness of my corporeal existence had somewhat left me, though I could see, and feel with my hand my lower extremities, as in perfect health, but expressed to my physician that I had better not go to sleep, for fear I would not awake . . . At one time I could feel a sense of tremor passing over my body . . . I began to improve and walked around the room with a feeling of delightful calmness, and with thoughts so pleasant that I remarked to my friends, "this is true ecstasy."

The writings of Bayard Taylor prompted Duncan to try cannabis on his patients. Since no effects were obtained, the preparation was considered worthless and, to establish this more certainly, he took three teaspoonsful of the tincture. Four hours later, typical effects were manifested.

I was so giddy that I could not stand still, and the damned in the infernal regions could have felt no more agonizing terrors. My skin was burning up with heat, pulse so fast that I could hardly count it, and a general paralysis taking possession of my whole person, more

especially my stomach . . . The most intense headache accompanying the other symptoms. I was in this condition about three hours, having several times concluded I was dying, with not altogether the most comfortable feelings, being decidedly in doubt as to my final destiny, disposed rather to view myself as lost. At the expiration of three hours, the pulse became normal, the skin cool and moist, and the paralysis gradually wore off. Then of all the happy mortals that ever existed, I was the most supremely so. I saw the most beatific visions, the most beautiful women, angelic in their mental and physical configurations. If all the gold of Solomon's Temple had been offered me, I would not then have relinquished my perfect happiness and mutual repose counterbalancing the exciting experience of the previous three hours. These mental hallucinations lasted, I suppose, four to five hours. Then came the reactionary feeling, dull, heavy headache for forty-eight hours; uncertain in gait, and terrible mental confusion . . . Whilst I would not be without the experience gained, relative to its action, I would not for the same length of time undergo similar doubts and feats, to say nothing of the unpleasant after effects.

An English physician, who preferred to remain anonymous, reported some self-experiments in which he took doses of one-fourth to two grains of the extract without effect. Likewise, a dose of one dram of the tincture produced no effect. Some months later, a fresh specimen of tincture was obtained and one dram of this was taken.

The effect this time was quick and alarming. In fifteen minutes I was unable to walk, shook all over, and felt my mind in a whirl with fast-flowing, grand, or grotesque ideas of a more or less constantly unpleasant nature, and all tintured by an undercurrent of restlessness and anxiety; occasionally, for a brief interval, I would suddenly drop, so to speak, into my normal state, and be able to think clearly about my condition, only to soon relapse into the same condition of wild and more or less painfully vague and intense perverted mental action. This condition lasted two or three hours and

then gradually passed into a deep sleep, from which I awoke the next morning none the worse for my somewhat rash experiment.

Von Mering made a number of experiments with an extract of *charas* resin and described, in summary, the condition which is ordinarily produced. According to him the extremities are heavy and without sensation, there are muscle tremors, ringing in the ears, difficulty in hearing, defective perception, a feeling of heat or cold in the head, vertigo, flashes before the eyes, dryness of the mouth and a feeling of oppression and anxiety. After this a very pleasant phase of the effects develops. The subject becomes hilarious, laughs very loudly, phantasies move rapidly; sensory delusions are manifested and visions come and go in quick succession. Consciousness is retained. Illusions are present if the eyes are closed; but disappear when they are opened. In this state most individuals sleep for hours. Side actions of headache and vertigo are infrequent. Bowel movements are not affected; appetite is distinctly increased. The pulse is usually accelerated in the beginning. The pupils are dilated during the hashish effects. With some individuals there is a muscular rigidity.

The observations which Marshall carried out on himself were unique in one particular, i.e., he was the first to use the vacuum distilled product termed "cannabinol." "With doses of twenty mgm., the first symptom was usually loss of power for mental work. A typical condition of mental exhaustion set in. Sentences could not be conceived except by powerful efforts, and these were not often forthcoming. . . . After intermediate doses (fifty mgm.) the ability to work was lost altogether . . . Pleasurable tingling in the limbs, very slight ataxia and other symptoms similar to those obtained after larger doses were present. Time passed quickly. Sleepiness was sometimes but not always present. As an early symptom, a peculiar indistinctness of the periphery of the visual field occurred, and later it was found that the point of regard was made to travel with difficulty, as along the line of a page. Depression usually continued throughout the following day . . . After a large dose of cannabinol my own pulse increased in frequency. Constipation was rarely present. Salivation was not usually observed, dryness of the mouth

being a more constant symptom . . . A most interesting condition, after large doses, is the occurrence, **alternately**, of loss of control and lucid intervals. The crude drug seemed to produce more **excitement** than pure cannabinol." This latter is attributed possibly to the associated terpenes in the crude drug.

Binet-Sanglé, along with a companion and in the presence of an observer, swallowed 0.2 grams of a pill of extract of hashish. The effects became manifest in about half an hour. There was intense thirst, the saliva had a peculiar taste, the head seemed full and there was a peculiar restlessness. Voluntary movements were uncertain and almost ataxic. On the other hand, tactile sensibility seemed to be more acute. Objects, when viewed directly seemed enormously exaggerated, but in the peripheral field of vision they were of normal dimensions, i.e., there was a sort of "macropsie centrale." The perception of space was also distorted. Sounds were extraordinarily intensified and caused painful sensations. Suggestive ideas became so vivid they amounted almost to hallucinations. There were spells of laughter usually preceded by ecstatic emotions. Fatigue and confused mental processes persisted into the next day. The companion experienced marked respiratory depression, congestion in the face, transitory muscular incoordination, visual hallucinations and intermittent spasms of laughter.

Robinson tried the fluid extract on himself and his friends and recounted the effects with special emphasis on the ludicrous aspects of the experiences. Manifestations particularly noted were **uncontrollable** laughter, the revival of previous ideas, a lost sense of time, euphoria, erotic sensations, occasional nausea, a double sense of consciousness, alternating sensations of lightness and heaviness and, most prominently, a feeling of immense geniality and mirth, accompanied by sentiments of the most expansive good will. One of the subjects awoke the next morning with a ravenous appetite which was attributed as much to the great expenditure of energy in laughing as to any direct effects of the drug.

Burr has recorded the experiences which he and a fellow interne had when under the influence of hashish. At 7: 30 P.M. he took sixty minims of Parke-Davis' tincture of Cannabis *indica* after having eaten an hour and a half previously. At

10:00 he noticed that he couldn't tell the difference between an ace and a club and couldn't see to read because his eyes were so widely dilated. His mouth became dry; he became intensely thirsty and drank three quarts of water during the evening. At 10:30 he suffered a general convulsion which lasted three minutes. He felt well; his speech was not affected. The convulsion resembled an attack of hysteria. He had a pronounced feeling of well-being and was supremely happy in a quiet, mentally unexcited way. He was not boisterous or noisy and was able to describe his sensations clearly. There was no increase in intellectual power. Sex ideas were entirely absent and he said that Venus herself couldn't have tempted him. After the first convulsion he became very hungry and ate a whole cold chicken, a large loaf of bread and some butter. He had six convulsions in four hours; they were all like the first and ended abruptly. The convulsions appeared willful in that he willed to convulse; he knew that he was throwing his arms about, that he was writhing like a snake, acting like a clown, making silly grimaces. But he could not will to do otherwise. He could restrain a convulsion for a few minutes, but soon the will to convulse overcame the will to inhibit. At 11:00 P.M. ideas of time became prolonged. One minute seemed like twenty. This distortion wasn't due to a rapidity of ideas; it wasn't due to ennui. He had some feeling of space enlargement and also had ideas of double consciousness. He was himself, yet was somebody else, sitting in a boat floating through the sky amid pink clouds. This was his only hallucination; it occurred about six times, and lasted about a minute each time. At 4:00 A.M. he became drowsy and went to bed. He got up five hours later and went to work. Throughout the day he felt comfortably tired. He was dreamy, had a sense of unreality, and was unable to keep his attention concentrated on any long conversation. During the experiment there was no change in respiratory rate. His pulse was 100. He passed large quantities of dilute urine. There was no tactile anesthesia, no paresthesia and no loss of power in the limbs.

Four days later his friend took the same dose of the same drug from the same bottle. His symptoms were quite different. Two hours after swallowing the drug he was suddenly seized with a sense of death by suffocation. This hallucination lasted for four minutes. Similar seizures came on every

twenty minutes for about three hours. There was no disturbance of the pulse or the respiration. Even when he thought he was suffocating, his breathing was quiet and regular. He had no other symptoms and went to sleep three hours later.

Schneider took three cc. of the fluid extract of *Cann. indica* experienced mental effects in ten to twenty minutes and intense apprehension in thirty minutes. After one hour,

quite suddenly there is developed an indescribable feeling of exaltation and of grandeur. The words "fine," "superfine" and "grand" come to my mind as being applicable to the feeling. This indescribable feeling is purely subjective. Self-consciousness is completely annihilated for the time being. The concepts time, place and space have vanished. The confines of my room are no longer existent. I say to myself, "If this drug can produce such marvellous effects, I will certainly take it often! "

The feeling of exaltation came in waves. The mouth and lips were dry. An hour and a half after taking the drug:

I am capable of anything and everything. No task would be too great, no problem too difficult. The exalted feeling is wholly indescribable and appears to be general and all-inclusive. [During the next three hours] the feeling of supreme exaltation and grandeur continues for varying degrees. The idea of oneness with all nature and with the entire universe seems to take hold. There is no material body or personality . . . The skin is now moist but the mouth continues dry. I have momentary visions or glimpses of vast beautiful landscapes, showing wonderful color effects . . . I do not visualize persons nor do persons play any part in the mental imagery . . . There is a marvellous color imagery, blue, purples and old gold predominating with most delicate shading effects . . . Beautiful gardens filled with flowers appear. Again, grotesque monsters of ever-varying forms and without producing any terrifying effects . . . I regret that others cannot share with me this feeling of well-being . . . Evidently sleep gradually set in and continued undisturbed until the usual rising time. No special

sensation on rising. Feeling, if anything, more than usually refreshed. All of the sensations recorded above have completely vanished. The recollections of the experiences are however very clear and vivid. Mouth continued dry until morning. No after effects of any kind. The action of the kidneys is increased but no effects as to the intestinal tract.

Six days later, a second dose was taken which did not produce any distinct mental exaltation or feeling of grandeur. Color and form imagery were poorly developed as compared to the first test. Months later, a third dose which was identical with the first, did not produce any feeling of exaltation and grandeur. The color imagery, though, was specially marked. The next day there was a slight feeling of nausea.

One month later, eight cc. of the original fluid extract were taken. The idea of a dual nature and the color imagery were not as marked as before and there were none of the feelings of exaltation and grandeur.

Probably for a period of not less than six hours I suffer from nightmare. I am convinced that the end has arrived and that I cannot recover.

Dizziness and nausea develop and some nausea persists into the next day.

Among others who have similarly experienced and described the hashish episode may be mentioned Ragsky, Judie, Hamburg, Bell, Owen, Campbell, von Schroff, Polli, Richet, Beane, Renz, Williams, and Lange.

The therapeutic exploitation of Indian hemp in Europe and America, which dates from about 1840, correspondingly resulted in a great many instances of individuals suffering a hashish experience which was wholly unexpected and often undesired. There are several general factors responsible for the high degree of variability in cannabis effects-and these are further augmented when the drug is given to invalids. The patient's condition itself is subject to more than ordinary variations. We have repeatedly seen that animals in poor condition are more severely affected by this type of drug

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than healthy animals and this parallel is hardly needed in order to emphasize the fact that debilitated patients are much more likely to respond unfavorably than normal individuals. The collection of descriptions which follows is characterized by a high proportion of cases in which there was marked motor and sensory depression. The effects on consciousness were predominantly the agonizing sort rather than the euphoric. The case of a patient receiving an unexpected overdose represents one of the least favorable conditions of mental preparation, and it is generally recognized that the state of mental preparation for a hashish episode is an important determining factor in the character of the resulting cerebral effects.

The dosages taken by these individuals usually are given in specific terms but these have only a casual bearing on the actual dosage of active material. Bioassays of any degree of reliability were not introduced before 1900 and satisfactory chemical assays have not yet been introduced. Accordingly, the dosages which were administered have only an approximate significance in terms of any standardized activity.

One of the first to describe a case of this sort was Brown. He was called to see a druggist's clerk who had taken six grains of the solid extract in installments. About three and one-half hours after the first dose he became nervous and dizzy, felt an irresistible inclination to run, a great desire to urinate, great thirst. Spasms supervened, during which, at times the flexors and extensors, at times the abductors and **adductors** of the whole body were thrown into violent alternate action. The spasms increased in severity and frequency for half an hour and then gradually diminished after emesis had been induced. The spasms were unaccompanied by pain but did produce a sense of weariness. At no time was there delirium or loss of consciousness. The symptoms lasted in severity about an hour, then gradually diminished. Twenty-four hours later the desire for constant motion and occasional slight spasm persisted but soon passed away.

Kelly administered thirty mg. of the extract to a woman of sixty who had severe rheumatic pains. She experienced a marked reaction, her fingers became icy cold and benumbed. She heard noises and had visions of objects before her eyes. The phenomena passed away in a few hours. The dose was later repeated with the same result.

Strange was called to see a phthisical patient who had

accidentally been given an overdose of the extract. Three hours after taking the extract, the patient had suffered such a marked reaction that he was thought to be dying.

There was complete superficial anesthesia, the patient declaring that he could touch nothing. He felt as if dead; could scarcely recognize anything. He had intense dread of death; a frightened countenance; the pupils were dilated, but contracted slightly to light. Vomiting, which was not present, was induced by mustard and water, and the green extract came up with the mucus of the stomach. During the whole time, I was cheered by the fact that the pulse did not fail, nor was there any clammy perspiration.

The patient fell asleep after two hours and next morning ate a ravenous breakfast.

Mary Hungerford had been taking small doses of Indian hemp without any appreciable effects. A very large dose was then taken which produced near unconsciousness in a short time. There was a much exaggerated appreciation of sight, motion and sound.

It was not only death I feared with a wild, unreasoning terror, but there was a fearful expectation of judgment, which must, I think, be like the torture of lost souls . . . In place of my lost senses I had a marvelously keen sixth sense or power, which I can only describe as an intense superhuman consciousness that in some way embraced all the fine and went immeasurably beyond . . . As time went on, and my dropping through space continued, I became filled with the most profound loneliness.

These effects persisted for a considerable length of time.

Sticker administered Cannabinon in about thirty cases with no particular after effects except in the instance of a young man who took 0.1 gram of the drug. Effects began in one-half hour. There was intense anxiety and depression with a tonic-clonic twitching of muscles of the extremities. Shortly after that there was complete paralysis of the motility of the extremities. During the next few hours there

were several long periods of psychic exaltation. He went to work the next morning but there were minor residual effects for some time. Using this same preparation, "Cannabinon," Richter, Buchwald, and Pusinelli have similarly observed cases in which the ordinary doses of 0.1 to 0.3 grams caused alarming symptoms.

Seifert reported the case of a patient who took 0.1 grams "Balsamum Cann. *Indica*" and became violently delirious with residual effects which lasted several days.

Hamaker was called in to see a young physician who had taken forty-one drops of Squibb's fluid extract of *Cann. indica* with the idea of testing the quality of the medicine. He was walking on the floor excitedly, laughing and talking continuously, but not incoherently. At times he would cry, and then suddenly change to laughing. He was abnormally irritable and said he felt as if he were "rattling around among the centuries." There were redness of the eyes and profuse lachrymation, with a fast pulse. He subsequently became drowsy and afterwards reported that during the beginning of the experience he had a feeling of dread of danger which had passed off quickly.

Prentiss reported the case of a dentist suffering from an irritable cough who took five drops of a Parke Davis "liquid preparation" in installments. The effects became manifest in two hours. He became oblivious to all surroundings, excessively happy and, after potassium bromide was administered, eventually fell asleep. The next morning he reported that all the sensations were agreeable and in no way accompanied by unpleasant emotions. The effect came on in waves until he lost himself.

He was moving through space with lightning speed, and in his path were clouds of the most beautiful, ever-changing colors, and when he touched them each one played a beautiful tune.

Windscheid observed a twenty-eight-year-old healthy male who took about three grams of extract of *Cann. indica* within a period of two and one-quarter hours. After two and one-half hours, he was suddenly seized with a feeling of apprehension, intense excitement with exalted ideas and hallucinations. An hour and a half later he became apathetic

and extremely thirsty. Windscheid found him with dilated pupils, hyperesthesia and tremors, particularly in the extremities. The pulse of 172 was weak but regular. On the following day, only mild hallucinations were experienced, the pulse was 120, he was hyperesthetic and had heightened skin and patellar reflexes and reactive pupils. After an apathetic period of eight days he was about normal. This was considered a case of special resistance to an enormous dose.

Winter reported a case of poisoning in a fifty-seven-year-old woman who was healthy but of weak constitution. The patient had taken increasing doses (20 to 300 mg.) of the extract to combat the pain of trigeminal neuralgia. Then for several weeks she had taken three doses each day of 0.3 grams each, without any disturbing effects. On stopping the medication for two days and starting again on the third with one dose of 0.3 grams, marked depression set in after a few hours. The patient became weak and somnolent, did not respond to questioning, reflexes were absent and pupils were dilated. After an hour, the patient recovered to some extent but later relapsed to an excitable, delirious state followed by despondency and weeping. After two hours of such condition she fell into a deep sleep and awoke the next morning with only a little dullness and very slight recollection of the experience.

Geiser reported that seven minims of a fluid preparation of cannabis produced severe effects in an elderly woman suffering from malarial cachexia. There were none of the usual hallucinations but there was a marked exhibition of deafness, labored breathing, weak pulse and alternating loss of consciousness. The drug had been given to relieve migraine.

Fischlowitz was called to attend a physician who had taken one teaspoonful of the fluid extract of *Cannabis indica* in order to relieve a troublesome cystitis. He had fallen asleep but awoke with unpleasant dreams one-half hour after taking the drug. He thought he had slept for hours, and had a feeling of tingling all over his body, especially around the angles of his jaws and in the region of his stomach. He soon developed a happy frame of mind and became quite garrulous. He complained of the tingling and uneasiness in his limbs, said his legs were as heavy as lead and that when walking he felt as if wading through feathers. His throat felt parched, the conjunctivæ were reddened, the pulse ranged from 100 to

118 and the respiration was very rapid. Four hours after taking the drug he fell asleep and awoke the next day with no residue other than a frontal headache.

Minter reports an instance of a prescription containing Indian hemp which was taken regularly for about a month with no symptoms other than drowsiness after the first three doses. On taking the last dose, however, the patient had severe effects which began in a few minutes. The impressions and hallucinations were of an unpleasant sort. After a restless night, the patient awoke with a very vivid recollection of his experience.

Sawtelle administered twenty-five drops of fluid extract of Cannabis *indica* in installments to a well-developed, middle-aged man suffering from a severe occipital neuralgia. On visiting him that night, he found the neuralgia was relieved but that the patient was in a state of increased mental and motor activity, which was soon followed by partial delirium and hallucinations. The pupils were dilated. The hallucinations were of a jovial character. The patient talked freely and pleasantly, and when relating some incident he would burst into laughter. He first thought the ceiling was falling and placed himself in position for protection by extending his arms and calling loudly for help. He then moved his bed to the opposite side of the ward and imagined he saw pieces of timber floating in space about him. He left his bed and went to a corner of the ward where he became intensely excited over what he took to be a fight between a large and a small dog. After watching the imaginary fight for a few moments, he returned to the bed and remarked that the large dog had torn the small one into pieces and expressed sympathy for the small dog. At first he attempted to leave the room through a window and it was necessary to restrain him. Symptoms continued for three days. From the first the pulse was full and strong, respiration normal; during the night he was troubled with erection of the penis. There was slight anesthesia of the lower extremities and the patient complained of weakness of the legs for several days after the other effects of the drug had passed off.

Atlee prescribed ten minim doses of tincture of *Cann. indica* for a twelve-year-old boy, suffering from headache. He took one dose of the prescription and, in a few minutes, said he felt a burning pain in the pit of his stomach and soon

became strange in his manner saying that his legs were humping about, that he heard a ticking like a watch, that he saw the room on fire, saw pictures falling down, etc. Examination showed a weak pulse with a rate of 120 and dilated pupils which reacted sluggishly to light. He was given two drams of brandy and ten grains of citric acid in syrup of lemon. A blister was applied to the nape of the neck. He soon began to revive, his color improved and, in about two hours and a half had recovered, his headache was gone and he was able to walk home. The same dose of tincture was given to another child the same morning with no ill effects.

Baxter-Tyrie was called in to see a young lady who had first taken three half-grain pills of Indian hemp for the relief of headache. When these had caused no apparent effect she had concluded that the preparation was a "fraud" and, to demonstrate her conviction, had proceeded to swallow nine more of the same pills. When observed four hours later, she was in a state in which fits of laughter and incoherent ravings alternated with comparatively lucid intervals. She complained of various hallucinations and delusions, chief of which were a complete perversion of the relations of time and a loss of identity. She was now herself, now again a different individual, and the modifications of her behaviour in relation to her dual personality were grotesque. Coffee and strychnine were administered and she was entirely normal the following day.

Bicknell reports a case in which three grains of an English extract produced effects which were most distinguished by convulsive movements and opisthotonos. The opisthotonos was later relieved only by violent friction over the affected parts. At no time was there fear or foreboding of a fatal result.

Benedict reports having seen about twenty cases of intoxication attributable to variations in susceptibility, voluntary increase or repetition of dose by patients.

The sole symptom of intoxication has been anxiety and subjective feeling of danger from the drug.

Downer was called in to see a young girl who had introduced tobacco dust into her nose after the manner of taking snuff. (The tobacco was subsequently shown to

contain *Cannabis indica*.) The girl became frankly intoxicated, talked incoherently and giggled in a fatuous manner. She could not move her lower limbs, the feet and lower legs being completely anesthetic and there was a general paresthesia. She was oblivious to her surroundings unless well shaken, when she took some notice and would answer questions. After the administration of an emetic and coffee she slowly improved.

Baker-Bates has recently reported an instance from England in which a young man grew hemp in his garden and several times smoked the dried leaves and tops. He experienced mild symptoms which included loss of sense of time and space, vivid dreams or hallucinations and subsequent drowsiness.

Incredulous about his experiences, his fiancée, aged twenty-two, smoked—and to some extent inhaled—about two-thirds of a cigarette, made from the top of a fruiting plant. This was at about 10:10 P.M.. Soon afterwards she fell asleep and a few minutes later, on being disturbed, she awoke with a start and exhibited apprehension. The eyes were bright, the hands were twitching, and she appeared intoxicated; she asked where she was—probably deceived by hallucinations—but seemed happy. At about 10:25 P.M. she was taken for a short walk, which was interrupted by outbursts of laughter and of affection; her speech became slurred from dryness of the mouth and her gait increasingly unsteady. At 10:30 P.M. she was taken to a doctor and the history explained; he recorded that she was pale, but able to stand and walk although feeling dizzy; she was very excited and talkative and made stiff purposeless movements with her hands; her state was highly emotional, even amorous, towards her companion; at one moment gay, she was next anxious and said she felt “enclosed”; she exaggerated the passage of time and was confused about spatial dimensions; her tongue and mouth felt parched and words were pronounced with difficulty, while sentences lapsed into incoherencies; the eyelids were half closed; the pupils dilated, but reacted to light; the pulse was rapid, but strong. She was transferred by police ambulance to the casualty depart-

ment of the Liverpool Stanley Hospital where she arrived at 11 P.M. in a collapsed condition. Her symptoms at that time were loss of power in the legs and inability to stand; dizziness, dryness of the mouth, and palpitation; and lengthened estimation of the passage of time. She believed her condition had lasted many hours and, although fully conscious of her existence, she imagined she was "outside her own body," enclosed in a small space, and surrounded by a mist from which she could not escape. This imaginary mist did not impair her vision for distant objects. On further examination speech was found to be confused, rambling, and often inarticulate. She was unable to stand steadily or without support, and showed great incoordination in the movements of the hands. There was tachycardia (140 per minute) and also marked inspiratory dyspnoea. No other abnormality was found. Following general treatment for shock the patient recovered in nine hours and there were no sequelae except severe headache.

Approximately forty more case reports of this type are listed in the indexes of the Surgeon General's Office and of Schmidt's *Jahrbücher*. Most of these appeared at fairly regular intervals during the period 1840 to 1900 and, in this respect, closely paralleled the therapeutic popularity of the drug.

Within the last decade the hashish episode has been subjected to extensive analyses in several of the most prominent psychiatric clinics. This series of studies has included a sort of merging of the ancient "hashish" and the current "marihuana." While both are essentially the same, there are differences of degree which at times seem to make almost qualitative differences in the resulting picture. "Marihuana" consists of the dried tops and leaves of American *Cannabis*, which ordinarily is not so rich in active resin as the same plant grown in Asia and Africa. "Anascha" is the term applied to the drug in *Asia Minor* and, more recently, in Russia and, apparently, is quantitatively of about the same degree of activity as marihuana. The manner of use in both cases is almost exclusively by smoking in the form of cigarettes. The ancient "hashish" on the other hand was usually swallowed

Psychiatric descriptions of the Hashish experience.

or, when smoked, was not smoked in cigarettes. Recently "hashish" smoking in the cigarette form has become prevalent in Greece, and in this case the term seems to include both the plant and the resinous exudate.

Of the modern psychiatric studies, the earliest were from clinical groups in Utrecht, Munich and Heidelberg, each of which used an orally ingested form of the drug. The later studies in Russia, Greece and the United States were directly concerned with the more current preparations which are smoked in cigarettes. An additional distinction of these later studies is that the chronic effects were investigated in considerable detail.

Fraenkel and Joël made numerous experiments with normal individuals, their dosages being one hundred mg. of the extract of *Cann. indica* (Parke Davis). Their observations and conclusions may be summarized as follows:

One of the first indications that the drug has begun to act is an oppressive foreboding and feeling of apprehension; something strange and inescapable seems to approach. Activities cease, the feeling of impotence and anxiety becomes overpowering.

When the intoxicated subject surrenders to this new authority, he soon comes to feel even more imprisoned and oppressed by conceptions, ideas, words, actions, emotions and outbursts which no longer seem to belong to him. Images and series of images, long-buried recollections appear, whole scenes and situations project into the present. They excite first interest, sometimes pleasure, finally, since they cannot be controlled or stopped, torture and exhaustion. The subject is astounded and overwhelmed by all that takes place and by what he says and thinks. His laughter, all his expressions happen to him like happenings from the outside world. He passes through experiences which seem to amount to supernatural revelations. All these oppressive forces cannot be dispelled by simply saying "This is not reality it is only the effects of a drug." The character of the delusions, for example, cannot be evolved at will; one recognizes that they are hashish phenomena, yet they remain unaltered. These delusions are mostly illusionary transformations of the outer world, which at first had become very strange and singular. The room widens itself, the floor slopes precipitously, atmospheric sensations develop; vapors and foginess cloud the air;

colors become brighter and more luminous; objects become more attractive or, again, they may become grotesque and menacing. Tormenting doubts of the reality of things assert themselves. It is remarkable what variations take place in all animate things; they assume expressions of mask-like fixity and lifelessness. Physiognomies turn to gypsum, wax, and ivory. True hallucinations are rarely experienced. In the haptic sphere there often develops a disintegration of the feeling of the body's coherence. There are also dynamic sensations such as that of being hurled through space as by a powerful centrifugal force. All this is accomplished not as a continuous development but rather as a continuous change between the dreaming and waking state, a lasting, finally exhausting alternation between completely different regions of consciousness; this sinking or this emerging can take place in the middle of a sentence. For the comprehension of the intoxication-episode, this precipitous change is of great significance. The dream-like phases have an influence on the often grotesque over-evaluation of periods of time, which likewise is a characteristic hashish phenomenon. The mood and affectivity vary according to the consciousness of compulsion, the restriction of activity and the frequently resulting feeling of defencelessness and dependence. Or there may develop a simple feeling of well-being, which can increase to a state of blissful euphoria and ecstatic rapture. An agonising combination of incompatibles, which often exists in the way of thoughts and opinions, can also dominate the affectivity and introduce moods of affective perplexity and disintegration. The intoxicated subject usually reports in a form which varies considerably from the normal. The associations become difficult because of the frequent sharp separation of each recollection from that which preceded. Conceptions cannot be expressed well in words, the situation can become so dominated by an irrepressible mirth that the hashish-eater for minutes at a time is capable of nothing but laughter. Even his other types of expression, facial appearance, gestures, and his whole motor behavior are changed. Contracture states alternate with periods of increased motility, bizarre movements and sudden outbursts. The recollection of the intoxication is particularly clear. Among the bodily symptoms may be mentioned, dry throat, coughing, occasionally increased blood pressure. Fatigue in the usual sense does not develop.

Frequently there is a marked feeling of hunger, and considerable quantities of food are consumed with a pleasure not ordinarily experienced, in spite of the tongue being coated and dry. Objective sensibility is not disturbed. That hashish does not cause any local anesthesia is considered to have been previously emphasized. Aphrodisiac effects are lacking.

At the suggestion of Professor Straub, Kant and Krapf in the Psychiatric Clinic at Munich made a series of self-observations with hashish. Doses corresponding to three to nine grams of "**Herba Cannabis Indica**" were used in the experiments. This medication was prepared by Gayer who extracted the crude drug and then absorbed the potent extract on chocolate powder. The activity of this preparation was previously defined in terms of the amount producing corneal anesthesia in a rabbit. The lowest orally administered dose of the crude drug producing this effect in rabbits corresponded to three grams per kilo. This dose of three grams was also found to be the smallest dose producing recognizable effects in human subjects. Some chocolate tablets containing no drug were used in these human experiments as a control against auto-suggestion. In general, neurologic disturbances were not observed nor was there any depression of surface sensibilities as might have been expected from preceding descriptions. Further, aphrodisiac effects were not experienced. With large doses there was fatigue, thirst, vomiting, vertigo and collapse phenomena with a soft and arrhythmic pulse. Taking hashish stimulated the appetite but never produced intense hunger.

In one person, recognizable effects usually began in thirty to forty-five minutes, while a distinct clouding of the consciousness did not begin until fifty to seventy-five minutes. With the other subject, initial effects were recognized in eighty-five to one hundred five minutes and the first change in the state of consciousness in ninety to one hundred eighty-five minutes. Effects appeared more quickly with the larger doses. Disturbances of consciousness were manifested by a feeling of "the superficiality of things," "a stupid feeling," "a slowing of thoughts." The subject declared "things go away from me, they are taken from me," "I must speak rapidly else I will forget what I mean to say," "a veil of smoke is drawn over the brain," "I can't remove myself from this condition without forcing my will," "I forget everything

except the last sentence." There was a subjective feeling of obliviousness. With some exceptions the mood was one of pronounced euphoria. The subjects felt very well disposed to things in general and had an expanded sense of self-appreciation. Between spells of laughter, the subjects sometimes became sensitive and seemed to dread the recurrence of the laughing spell. With large doses the feeling of intoxication expressed itself in an agonizing fear of death.

The inclination to motor activity was much increased. "It felt as if all joints of the body were freshly lubricated." The subjects mimicked common movements such as riding or dancing. The capacities of critical perception were dulled. There was a marked over-estimation of the passage of time. Impressions of light and sound seemed extraordinarily exaggerated. The light from a table lamp blinded the eyes and ordinary noises, such as the ticking of a clock, resounded loudly. An inconclusive but suggestive experiment indicated that the actual threshold of sound stimuli was lowered; steps in an adjoining room, which were imperceptible to other people, were heard and counted correctly.

Illusionary misconceptions developed. "I see now that you have become much more square. Now you have a very sharp-pointed chin." The flow of imagination at the height of the experiment was slowed. "I have the feeling that ideas can come very rapidly, however, they do not come at all."

There were crawling sensations in the legs, which seemed to become alternately light and heavy. Sensations of heat coursed in waves from the feet to the head or seemed to locate in specific organs. These sensations along with a slight feeling of numbness were the first subjective symptoms of drug action. These elementary phenomena, which are purely body sensations, produce a much more complex effect when they become multiplied. These body sensations constitute the primary basis of the experience.

Taste sensations were experienced by only one of the subjects and then only with the larger nine-gram dose. Sweet, salty and metallic tastes were experienced. Visual phenomena were also experienced. In some cases the subject became suspicious, irritable and easily provoked to a dangerous degree of aggressiveness. One of the subjects attacked his colleague with a knife and had to be locked up for a time.

Straub, in describing the typical hashish effects, used one

of the experiments by this group as an example. In this case, the experimenter had taken a dose corresponding to six grams of the crude drug. The first effects were felt in forty-five minutes. The eyes became moist, the lids heavy and there was an uncomfortable sort of fatigue. He broke out in spells of uncontrollable laughter. The extremities seemed to have no weight and to be of exaggerated length. Corresponding to the increasing euphoria, the personality seemed to divide into individuals, one critically rational and the other of a fantastic spiritual character. The senses seemed more acute. Scientific problems seemed to be solved instantly in front of his eyes. Visions in bright, harmonious colors moved before him. This rapturous state seemed to last for many hours. In spite of this condition, there also existed, at times, an almost normal degree of rational consciousness. After four hours there was marked hunger and food was taken. During the remainder of the day there was some mental confusion. The following day there was not the slightest after-effect.

Kant subsequently extended his observations with these preparations to nine manic-depressives and ten schizophrenic women. The drug produced tachycardia, dryness of the mouth, heaviness of the limbs, a feeling of warmth and paresthesias. The effects only varied in degree from those he had observed in himself.

Meggendorfer about the same time also contributed a discussion of cannabis psychoses.

The series of studies from the Utrecht and Munich clinics were followed shortly afterward by a similar series from the Heidelberg clinic. The dosages in this latter series were considered much higher and, correspondingly, the degree of narcosis and psychopathological phenomena were more intense. "Cannabinol," prepared by a commercial firm, was used in oral doses of one hundred mg. in about thirty "selbstversuchen." This dose, according to Marx, contained forty of the "corneal units" defined by Gayer. According to this comparison, the dose of one hundred mg. of "Cannabinol" represented forty times as much activity as that which gives a human subject clearly recognizable effects, and this would clearly be a tremendous dose. The possibility of such an extraordinarily large dose actually acting on the nervous system, is opposed by various other considerations. For instance, the highly purified preparation may possibly under-

go more destruction in the alimentary canal than an equally active crude preparation; there is no very convincing evidence that the "Cannabinol" made by commercial houses at this date was to be considered so much more potent than the "Cannabinol" of Wood, Spivey and Easterfield. Marshall working with this latter preparation, found that twenty mg. was the minimal oral dose producing recognizable effects in man. Accordingly, the doses of the Heidelberg group may be considered as large doses but possibly not so large as the comparative figures would imply. Relatively severe effects were obtained, such as pronounced states of apprehension, somnolence and collapse. Metabolic studies made at the same time indicated "fundamental functional disturbances" which were considered to be a new observation in this type of study.

Disturbances of thought caused by the drug were classified by **Beringer** according to three general types: (1) a disturbance within the higher complex processes which are responsible for integrated conception as a whole; (2) a disturbance of the ability to retain memories; (3) a disturbance of the flow of thought, or disconnection of thought ("**Gedanken-abreissen**"). The hashish phenomena were compared with various psychotic states and with **mescaline** intoxication.

V. Bayer proposed and explained a schematic division of the motor phenomena. Three main types were recognizable in these experiments : (1) movements similar to normal expressive movements, representing elation, ecstasy or apprehension, frequently with excessive exaggeration; (2) movements which originate in a primary change of the motor apparatus, that is, an impulse excess or an inhibition of the motor apparatus-and they are only later filled with meaning and expression; (3) movements which were actuated at more peripheral points and were not associated with the higher center of consciousness. Typical of this group, are myoclonic movements which take place in special sets of muscles, choreiform restlessness, and also, the pseudo-cataleptic effects in the limbs. This latter uncomfortable condition was produced in three of the thirty hashish experiments.

Marx made numerous observations of body changes. One group of symptoms, suggesting a febrile syndrome, included a rise in body temperature and pulse frequency. Circulation velocity and venous pressures were frequently increased.

Dryness of the mouth and throat simulated an-opine effects. The eyes were characteristically glazed as in febrile patients and there was a marked injection of the conjunctival vessels. This latter is referred to as a recognized symptom in the Orient. The hands and feet were cold and moist. Blood concentration took place, hemoglobin values sometimes rising as high as 50 percent. The fact that this often accompanied a marked diuresis was considered very unusual. Hydrogen-ion concentration and carbon dioxide combining power of the plasma did not show any remarkable variations. Significant hypoglycemic changes were described.

Stringaris, also of the Heidelberg clinic, had occasion to study a large number of persons in Greece who were addicted to the smoking of hashish. Skliar and Iwanow, at the Psychiatric Clinic in Astrachan, Russia, have similarly studied cases of "Anascha" smoking in Russia.

Stringaris reported that the acute intoxication is characterized by euphoria, increased motor activity, excitability, talkativeness, laughter and appetite. Hallucinatory and delusional experiences were frequent. Occasionally, especially in persons who suffer from chronic addiction, depression instead of euphoria occurred. A considerable number of the addicts declared that the drug is a sexual stimulant. Libido is increased both during the action of the drug and during the intervals between doses.

Skliar and Iwanow carefully studied the intoxication phenomena after administering the drug to fifty-two cases, most of whom were chronic "Anaschisten." The number of individuals showing the individual typical symptoms has been recorded. For instance, fifteen noticed a lightness in the head at the beginning; six noticed tinnitus and nausea; four, clouding of vision; four, thirst; two, heaviness in the legs and arms; five, palpitation; seventeen, increased appetite; thirty-four, a calm and pleasant euphoria; thirty-two, laughed; seven, a depressed, anxious condition; six, moderate motor phenomena; twenty-two, inclination to reveries; four, disturbance of personality-consciousness, etc. True hallucinations of the special senses, such as vision, hearing taste and smell were not common. There was macropsy in twelve cases, micropsy in two cases. Functions of the sense organs in several cases were intensified and in other cases diminished.

In eight cases, there was excitement which passed over into sleep. This is more usual with the neophytes than with chronic users. Other distinctions between the neophyte and the experienced user were noted. The neophyte usually is ecstatically euphoric, laughs loudly and has an increased appetite and thirst. A subject, who has taken it for, say two years, is much more repressed in his laughter and general boisterousness.

Objective symptoms were glazed eyes, red eyelids, hyperemic conjunctivae, tremors of the tongue and extended fingers, increased patellar reflexes, marked palpitation, and accelerated pulse. These observations were considered to resemble in general the classic descriptions of Baudelaire, Gautier, Moreau de Tours, Joel and Fraenkel, Schroff and Freusberg, but certain differences were pointed out. The hashish effects are considered more pronounced than those with anascha. With hashish the laughter is more violent and unrestrained. Consciousness is much more affected with hashish and the fantastic illusions and pseudo-hallucinations are more frequent and vivid. Also with hashish there are true hallucinations of sight and hearing, which are lacking altogether with anascha. The disturbance of time sense is considerably greater with hashish. Particularly distinctive with hashish is the disintegration of personality and the resolving of the individual into the environment and all nature at large, which phenomena are infrequent or very slight with anascha.

These distinctions are considered only quantitative rather than qualitative. Anascha is obviously a mild form of hashish (and smoking is a means of ingestion permitting smaller systemic dosage). Also, the mentality and character of these subjects varied considerably from that of the writers and scientists who were the subjects for the classic descriptions. Further, the age range of these subjects was low, seven to twenty-five years! When larger doses of anascha were given the effects resembled in intensity the hashish effects.

Dontas and Zis also made careful observations of the immediate effects of hashish smoking. The hashish they used evidently corresponded to the resinous exudate rather than the crude plant. Their studies were primarily concerned with the physiologic changes and included good comparisons of the effects on normal individuals and on those habituated to the use of the drug. Medical students in the University of

Athens were used as normal subjects. After several minutes they experienced a dryness of the mouth and pharynx and were seized with a violent cough which at times became spasmodic. The face became red and there was a feeling of warmth. Very often there was a bitter taste and the saliva became thick. The respiratory movements became irregular, the pulse was accelerated and increased ten to fifty pulsations per minute. Blood pressure was usually diminished. Often there was vertigo, nausea, and vomiting. The subjects always felt a general weakness and numbness in the extremities. Sometimes there was a general or partial muscular trembling with a rapid rhythm which was periodically accelerated; at other times the trembling was myoclonic. Almost always there was a marked increase of the tendinous reflexes. Throughout the experience, the intelligence remained clear. If the person continued to smoke, psychic phenomena appeared. Frequently there were cataleptic phenomena. In the beginning, the smokers experienced a muscular relaxation and a pleasant torpor. They avoided all movement, fixed their eyes, had the air of thinking profoundly and experienced hallucinations which for the most part were agreeable and which rendered them happy and gay. Later if the subject continued to smoke, the psychic phenomena were accentuated, the hallucinations and paresthesias took on a general character. One of the students thought that he was flying in space, another thought his feet had become very large while at the same time his pipe had become microscopic. Another thought that the wall of a nearby house was a lake surrounded with trees. Suddenly thinking he was being mocked he attacked the assistants. Such symptoms were always very transitory. Several minutes after the subject had ceased to smoke, the psychic phenomena disappeared, the other symptoms disappeared later and in the course of several hours they were no longer recognizable.

When smoking a stronger preparation from Serbia, one student, among other usual symptoms, was seized with a general muscular trembling followed by a tonic contraction of the extensor muscles of the fingers of both hands. His fingers remained in extension for five minutes.

Another series of experiments was made on subjects who had smoked hashish for one to four years. All of them showed an augmentation of reflexes, pallor, fixity of expres-

sion, nervousness and variability of moods. Deprived of hashish they became nervous and despondent and their attitude belligerent. After smoking, they became gay and talkative. These individuals smoked hashish almost every day, sometimes by cigarettes but most frequently by narghile. *

When studying such cases in the laboratory and comparing them with subjects unaccustomed to hashish, it was noted that the nervous phenomena were less marked although there was a distinct augmentation of reflexes.

Dreury recently described an instance of marihuana psychosis with sexual stimulation and marked schizophrenic coloring.

Marihuana smoking as a social problem and as a subject for psychiatric analysis has been similarly studied by Bromberg, a psychiatrist at Bellevue Hospital. According to him, the chief effect of smoking is an intoxication of transitory nature and relatively uniform symptomatology. A period of anxiety is developed in ten to thirty minutes and is associated with restlessness and hyperactivity. A few minutes of this and the subject begins to feel more calm, develops a definite euphoria, becomes talkative, exhilarated and filled with a vivid sense of happiness.

Walking becomes effortless. The paresthesias and changes in bodily sensations help to give an astounding feeling of lightness to the limbs and body. Elation continues: he laughs uncontrollably and explosively for brief periods of time without at times the slightest provocation: if there is a reason it quickly fades, the point of the joke is lost immediately. Speech is rapid, flighty, the subject has the impression that his conversation is witty, brilliant; ideas flow quickly. Conclusions to questions seem to appear ready-formed and surprising in their clarity. The feeling of clarity is, of course, spurious: it is merely a subjective feeling. When the user wishes to explain what he has thought, there is only confusion. The rapid flow of ideas gives the impression of brilliance of thought and observation. The flighty ideas are not deep enough to form an engram that can be recollected-hence the confusion on trying to remem-

* waterpipe

ber what was thought. The smoker is seized with the desire to impart his experiences to others; he wishes in some way to transmit the glory and the thrill. Activities speed up tremendously and time is slow in passing: there is a feeling of changed reality. Sex excitement consists in the fact that the sexual objects in his environment become extraordinarily desirable. At the stage (about twenty to thirty minutes after starting) he may begin to have visual hallucinations which may start as misinterpretations and illusions. Characteristically there are at first flashes of light of amorphous forms of vivid color which evolve and develop into geometric figures, shapes, human faces, and pictures of great complexity. The depth of the color and its unusually arresting tone strike the subject. After a longer or shorter time, lasting up to two hours, the smoker becomes drowsy, falls into a dreamless sleep and awakens with no physiologic after-effects and with a clear memory of what had happened during the intoxication.

Bromberg himself smoked two marihuana cigarettes within forty minutes and experienced a pronounced lightness in the head immediately after the second. In general, the sensations experienced were typical.

New thoughts seem to come from the background with a startling clarity and speed. The imagery I have is so luminously clear it stands out in the background like sharply cut figures in a frieze.

The uniform symptomatology of cannabis links up the psychotic states, the experimental findings and the effects obtained by the casual user. From a clinical view point the importance of this symptomatology is that when it occurs in a mental picture (such as a schizophrenia with toxic features) it can be recognized as such because of its almost specific distortion of the clinical picture. The relationship of the personality reaction to the physiological changes due to the drug in the resulting clinical picture becomes obvious in studying mental reactions where marihuana is a factor.

The cases of intoxication are considered to fall into three clinical categories as follows: (1) Intoxications illustrating any or all of the characteristic symptoms; (2) reactive states to these features of the intoxication; (3) toxic psychoses which seem usually to be the admixture of the toxic effects of the drug to a basic cyclothymic (manic-depressive) or schizophrenic reaction.

Eleven illustrative cases are given in considerable detail. The first group consisted of three negroes who had been smoking "reefers." Two of them had appealed to the police when they became alarmed at their peculiar sensations; the third had been taken in custody by police after he was seen following women in the park. Excitement, disorientation, visual hallucinations and sexual excitement characterized these cases. All were discharged in one to several days with no evidence of psychosis. A second group of two cases illustrated mental reactions to the changed somatic sensations which the patient experienced. Suicidal impulses and homosexual tendencies characterized both cases. The third group comprised cases of psychotic conditions in which marihuana intoxication provided a characteristic coloring to the mental picture.

Fraenkel studied the hashish intoxication according to a scheme of psychiatric analysis based on the Rorschach test. This test involves the interpretation of ink spots and is considered to show the particular direction of the variations of emotion. For instance, in some cases sexual emotivity is manifested, in other cases the maternal instincts. Subjects under the influence of hashish, in interpreting images, attribute an abnormally significant importance to details. The detail tends to break its boundaries, it tends to emancipation. Accordingly, it ceases to be a detail. Interpretations of detail are collectively reduced and, in turn, changed in character. It no longer simply stimulates affectivity, it becomes epic in character.
