

*Cocaine in the Treatment of Mental Disorders.* By Dr. C. HEIMANN, of Charlottenburg, Berlin.

*Paper read at the 59th meeting of the Association of German Scientists and Physicians in the section of Psychiatry and Neurology.*

Certain therapeutic effects upon the human organism ascribed to cocaine,\* occasioned me to make use of the drug in suitable cases of psychosis and psycho-neurosis. Stimulant action and exhilaration (Euphoria) on the one hand, and on the other depression of undue sensitiveness, these were the effects I looked for from the alkaloid. Unfortunately, I am able to record scarcely a single case of certain and permanent cure following the use of the drug.

In melancholia, without hallucinations, cocaine was ordered in doses of 0.01 gramme thrice daily; the dose was increased up to 0.06 gramme (in English weights gr.  $\frac{1}{7}$ —gr.  $\frac{2}{7}$ ). At the end of a fortnight the treatment was obliged to be abandoned on account of failure of health, due to anorexia; the drug had been quite without effect on the psychosis. No secondary effects were witnessed with the exception of acceleration of pulse and dilatation of pupil, both of which lasted some 3-4 minutes. The small doses were chosen in order to avoid the production of hallucinations.

In melancholia with hallucinations cocaine was given in doses of 0.2 grms. (3 grains) about thrice daily, again without success. One of these latter patients suffering from hypochondriacal delusions, stated that for a very short time after taking the drug (1-2 minutes) he felt easier. After 14 days, when no advance had been made, but on the contrary, complete anorexia had supervened, the drug was stopped. Another, a young man, who during three months that he had been in the asylum had not spoken a word, and had had to be fed, though without resistance, and in general was completely apathetic, the same in the third week of treatment became suddenly the subject of strongly-marked delusions, began to speak to his fellow-patients, and developed a much livelier manner. The improvement continued from that day, and this in spite of discontinuance of the drug; the patient was in a short time discharged cured. Possibly in this case the improvement was accelerated by cocaine.

\* Wallé, "Aphoristic Contributions to the subject of Opium Antidotes;" Aschenbrandt, "Physiological Action of Cocaine;" Hepburn, of New York, "A Few Observations on Cocaine Action;" Obersteiner, "Concerning the Internal Use of Cocaine;" also Marselli, Buccola, and others.

To a young woman, who for a period of eight months had suffered from melancholia, and had made the most serious attempts at suicide, and resisted being fed with all her energy, so that the continuous use of the stomach or nasal tube was necessitated, supplemented or replaced by nutrient enemata, all other likely methods of treatment having failed, cocaine was administered subcutaneously in doses of 0.02 grms. ( $\frac{2}{7}$  grain). The patient expressed herself as feeling better, "so light in the head." Five minutes from the injection an acceleration of pulse amounting to 30-40 beats in the minute occurred, and the patient became very maniacal. This condition of excitement was taken advantage of to administer food in the natural way; this was done successfully. The excitement lasted for about  $\frac{1}{2}$  to 1 hour, after which the patient relapsed into her former state. The repetition of the experiment gave the same result on the second and third days, but after that it failed even with increasing dose. In the sequence, the patient had to be watched in order to prevent suicidal attempts, and forced nutrition was required, but about fourteen days after the drug had been suspended improvement set in, and proceeded ultimately to a complete cure; but, as is clear, this was spontaneous, and in no way related to the use of the drug.

To test the vaunted influence of cocaine on the motor centres, the drug was administered subcutaneously in doses of 0.2 grms. (3 grains) per diem, to two patients suffering from katatonia; the drug was continued for several weeks without the slightest effect.

Finally, even in cases of hypochondriasis, neurasthenia, and hysteria in which I looked for great success, having regard to the exhilarant effects described, even here there was complete absence of any obvious or permanent improvement. The hypochondriacal patient, who hails with gladness every new remedy, was soon obliged to complain, and with justice, of anorexia. The subject of neurasthenia complained more and more of weakness, being unable to take sufficient nutriment. In hysterical patients besides anorexia, which, by-the-bye, is not to be disregarded, owing to the frequent coexistence of anæmia, there occurred attacks of vertigo, which soon lessened their faith in the medicine. From these, my observations, I am constrained to deny to cocaine a place in the therapy of mental disease.

Concerning the use of cocaine in the treatment of the opium habit, I am able only in part to corroborate the

experience of Erlenmeyer.\* On the other hand, my experience does not quite accord with that of Smidt.† The subjects of the combined morphia-cocaine habit received morphia in rapidly diminishing quantities, whilst the cocaine was increased till the morphia craving had disappeared. Then the cocaine was diminished down to zero. Symptoms due to the withdrawal of the morphia were, on this plan, observed only during the first few days, and were only very slight, *e.g.*, chilliness, sneezing, insignificant attacks of diarrhoea, which disappeared of themselves. On the withdrawal of the cocaine, there was no immediate appearance of any new symptoms, but a few days later an insatiable hunger. As to relapse, my experience was that the morphia-cocaine habit, or the morphia habit simply, was resumed. I must add that hitherto I have been unable to determine a permanent advantage from this mode of treatment; on the contrary, the use of cocaine during the withdrawal of morphia soon manifested its deleterious effects on the mental state.‡

These deleterious effects are of the following nature:— After the protracted use of cocaine in larger or smaller doses, subcutaneously or by the mouth, also after the use of coca leaves, the first symptoms to arise were, according to the statement of the patients, who, for the most part, were colleagues, an increased secretion of the sweat and sebaceous glands, also desquamation. A constant accumulation of dirt under the nails, probably in consequence of the above, was observed, and this in spite of frequent cleansing. Complaint was also made of an itching of the skin, suggesting the presence of vermin; failing to discover such, the patients soon become persuaded (hallucinations making their appearance) that the itching is produced either by an external invisible power or by organisms which go in and out of the skin. Larger and smaller insects of variable colour would then become visible, and in two cases (both colleagues) these were actually seen under the microscope (microscopic visual hallucinations!). A third, also a colleague, was unable to make this observation since the people at his lodgings had damaged his microscope of a purpose!

\* "On Cocaine Craving."

† "On Cocaine Craving and Further Observations on the use of Cocaine in Morphia Habit."

‡ Geissler, "Instances of Poisoning from Cocaine;" Comanos Bey, Cairo, "The Effects of Large Doses of Cocaine on the central Nervous System;" Hense and others.

In fact, the microscope was unusable, owing to extreme dirtiness, such as characterizes the belongings of cocaine eaters in common with other demoralized beings. Hallucinations of hearing would now, as a rule, appear, the patients hearing remarks made about the creatures infesting them. The perverted sensations, as also the hallucinations of sight and hearing, become more and more marked. The patients seek continually for new explanations of their symptoms, and arrive at the most absurd conclusions. They think they see holes in the walls and ceilings, they see wires in the air, which are drawn by invisible power in all directions, and again these disappear; they are conscious of electric and hypnotic effects, &c. Hallucinations of taste and smell do not arise constantly. On the basis of these illusions of the senses, there gradually arise fixed ideas of insanity which are in process of time built up into a system. These delusions appear at first sight to be of the nature of persecution, but on a more close examination they are found to differ essentially from the current ideas of persecution. The patients think they are being followed, it is true, but they do not think that this is with a view to harm them, but on the contrary that it is for their own advantage or for that of the world at large. Thus one patient was under the impression that he was being constrained to undergo treatment for his morphia habit. As, however, he objected to interference with his own freedom on any grounds whatever, he sought to withdraw himself. To throw dust in the eyes of his pursuers, he even presented himself at our asylum and arranged about his reception. Thereupon, in the dusk, he left the asylum, did not return home, but passed the night in an hotel. Since, however, his symptoms did not diminish in the new abode, he fetched his personal effects from his dwelling, went to the station and took a ticket. Then, having seen his effects off to their destination, he drove to another station, and took train in an opposite direction. Another patient thought he was being forced into making a grand discovery. He had already detected the cocaine insects, and having also seen them on the hands of those with whom he had come in contact, he had thus discovered the contagious nature of the disease. Patients thus infected, and himself also, he treated by subcutaneous injections of weak salt solution, which effectually disposed of the insects. A third thought himself pursued by Indians, who wished to make him marry a rich Bolivian lady. I have already spoken of the microscope which was out of order

and had been purposely damaged by the people of the house in order that the patient might not distress himself by a clearer vision of the supposed insects. The same patient travelled from place to place, thinking himself pursued by the authorities, who were endeavouring to put him in ward so that his property, which was being drained by the large expenditure for cocaine, might be preserved for his children. Patient was touched by this thoughtfulness on the part of authorities, but could not bring himself absolutely to sacrifice his own personal freedom. Another patient discovered that the people around him broke, bent, and blocked the needles of his Pravaz syringe, that he might thus be prevented from administering the drug to himself. It is true they knew well how much good the injections did him, how much they strengthened him mentally, how, by virtue of them, he was enabled to work miraculous cures, but the police had called upon them to prevent the injection of the drug. Many patients of his had given him hints by looks and words. He had also cast out the same, it not being necessary, thank God, for him to practice. In the end he took down his professional plate from the door. Asked why the police were pursuing him, he answered: "If nowadays a man do not practice and prescribe exactly according to the rules of the art, the authorities are of opinion that they must protect the public." That he might give no ground for offence to the authorities, he removed his doorplate and gave up his practice.

To be brief, the patients, in the sequence, become more and more excited, they finally resort to weapons to protect themselves and to frighten their persecutors, and their condition may develop into acute mania. The patients are dangerous to the public, and they are mostly sent by the authorities to a *closed* asylum.

The appearance of the cocainists is as follows: The tint earthy, the pupils widely dilated, the eyes deep-set and showing circles around them. In their deportment they manifest increased self-importance, they overrate their own powers, and furnish frequently excellent examples of the well-known punning spirit of maniacs, *e.g.*, a colleague, who, on account of his violence, had to be isolated, asked if it was intended that he should thus study a new cellular pathology?!

On discontinuing the cocaine, the patients become quieter, fresh delusions cease to appear, but the older ones only disappear very gradually. The patients believe in the reality of their hallucinations longer than is apparent, since they

soon learn to conceal them. The insane fixed ideas fade in like manner only gradually.

When these morbid symptoms have quite ceased the patients do not show any special defect in the spheres of thought and judgment, and no gaps are apparent in their memory. In like manner their discursiveness in speech and writing disappears almost completely.

Nevertheless, especially in cases of prolonged use of the poison, the cure may have to be regarded as relative only, as a cure with so-called defects. In the spheres of sensation and of volition considerable damage has been sustained, the patients lie when they open their mouths, they steal on the first opportunity, and they desire to do that which they are unable to perform. They are irresolute in their action, and, should they have begun anything, their activity is of the shortest duration. In their being they become apathetic, indifferent to everything, untidy in their belongings, unclean in their person, in short, they are demoralized.

I have said the cure appears to be one with defect, but indeed the disease is of too recent a date to permit of a definitive prognosis. It is possible that the last named qualities, which are the expression of a diseased mind, should gradually become effaced. On the other hand, these very qualities lead the patients again and again to recur to the poison, for which there is a very decided craving.

Accordingly, we can only say that from our experience the disease is curable, so long as no permanent psychic defect has been established. This, again, appears to be dependent on the size of the doses habitually taken, and still more on the length of time during which the drug has been persisted in.

The treatment consists in the gradual or sudden withdrawal of the drug. I should recommend the former in the case of morphia-cocainists. I have never observed any symptoms due to abstinence follow the sudden withdrawal of the drug.

Now, although the patients, by their demand for cocaine, reveal at once that they have been taking it, and although the whole course of the disease, as well as the sum total of the symptoms above described, is sufficiently characteristic to strike the difference between it and any other psychosis, *e.g.*, paranoia hallucinatoria, mania, delirium, and even from the abstinence-symptoms of the morphia habit, yet, with the assistance of my friend Dr. Kleimann, of the Royal Polytechnic at Charlottenburg, Berlin, I have tested the urine of these patients.

With regard to the chemical analysis of the urine in these cases, it was necessary, in the absence of any literature on the subject, to first determine whether it was possible to detect the alkaloid. To solve this, 0.23 grms. of hydrochlorate of cocaine were added to one litre of normal urine. The acid urine was then rendered faintly alkaline by the cautious addition of bicarbonate of soda, and then digested with ether. In view of the free solubility of the base in ether it was to be expected that a single extraction with ether would yield a sufficient quantity of the alkaloid for the purposes of testing. In point of fact there remained on evaporation of the ether a not inconsiderable syrupy residue, which, placed on the tongue, gave a characteristic effect, and, further, when heated with concentrated sulphuric acid, yielded the characteristic smell of benzoic acid. Repeated shaking up of the urine with ether did not increase the amount of extract, and although in this way the quantity of cocaine obtained was but a fraction of that used in the first place, yet the proof was obtained that in the above way small quantities of cocaine, such as would certainly be present in the urine of an organism habitually taking cocaine, were capable of detection, provided, of course, that the cocaine were excreted as such. The urines of cocainists were now examined. They were first rendered faintly alkaline, then shaken up with ether. In this way an emulsion was formed, which only on prolonged standing separated into an upper, ethereal layer, and a lower, watery, stratum. The ethereal extract was evaporated in a watch glass, at the temperature of the atmosphere (in order to prevent any decomposition), and gave a slight residue which was bitter to the taste, and caused numbing of the corresponding portion of the tongue. The bitter taste is not sufficient evidence, but solely the numbing of the part, for normal urine treated in the above fashion yields to the ether small quantities of a bitter principle.

From numerous experiments made, as above, the conclusion seems justified that of the total quantity of cocaine consumed, only very small quantities appear in the urine, for the quantity extracted by the ether sufficed only for the testing by the tongue, and was always far too small to permit of chemical tests (formation of benzoic acid by treatment with concentrated sulphuric acid). On the other hand, the quantities were always large enough to allow of the performance of an exact physiological test, *e.g.*, the ethereal residue was treated with hydrochloric acid, and then, again,

evaporated. In this way the hydrochlorate of cocaine was formed, a salt readily soluble in water. The aqueous solution dropped into the eye of a rabbit caused complete anæsthesia of the same, so that for 10-15 min. the cornea could be rather roughly handled without causing the slightest blinking, whilst the non-anæsthetized eye blinked even at the approach of an object. This experiment was checked by using normal urine, and applying its ethereal extract, treated as above, to the eye.

In conclusion, I must accentuate the following points concerning cocaine :—

1. That cocaine acts similarly whether taken internally or injected beneath the skin ;
2. That the coca leaves exert almost the same effect as the alkaloid.

This statement is based, firstly, on historical data. Coca played a prominent part in both the social and religious life of the ancient Peruvians, it being said of the plant that it stayed hunger, gave new vigour to the fatigued and exhausted, and caused the unhappy to forget their troubles. These are the same properties with which we have become acquainted in the alkaloid itself. We say of cocaine, that it renders us insensible to hunger and thirst, causes anorexia, it excites, it exhilarates, &c. Similarly the evil effects of the use of coca leaves were well known to the inhabitants of South America, and they stated that the plant was of idolatry and witchcraft, and only appeared to give strength by the deception of the Evil One ; that it did not possess any real virtues, and that it spoiled the lives of numbers of Indians, who, at the best, only escaped with mind and body unhinged. In like manner we also record of cocaine that it produces, amongst others, symptoms, not without danger, of a paranoia hallucinatoria. It seems that the coqueros, like our own cocainists, are recognizable by their uncertain manner, the loose skin of earthy tint, the hollow lack-lustre eyes, surrounded by violet-brown circles, the tremor of the lips, the style of speech, the suspicious, hesitating, false, crafty character. Similarly to our cocainists, they are insensible to hunger and thirst, are often under the influence of delusions, and, mentally, they not infrequently are degraded to complete imbecility (an experience which truly darkens considerably our above-stated prognosis). A case, however, occurring in my own practice, of the establishment of the above psychosis by the use of coca leaves, corroborates my statement. Apart from the actual resemblance of the effects



of coca leaves and of cocaine, the other substances present in the leaves, which might be held to be effective, are in too small quantities to be really credited with observable effect. Moreover, the method adopted by the Indian in chewing the leaves proves that it is the alkaloid alone that he seeks; he uses, viz., the ashes of plants—caustic lime, in a word—basic substances whose action will be to set free the alkaloid.

The third and last point concerns the question whether the described psychoses result from the use of cocaine alone, or only when it is conjoined with morphia. I am quite willing to admit that morphia may beget a certain predisposition to our psychosis, but, after all that has been said, in particular after the last-mentioned proof of the similarity of effect of coca leaves alone with those of cocaine, there can be no reason to assume that only the conjunction of the two poisons will be effectual.

I am unable to conclude without again insisting on the, at least, doubtful advantages which cocaine offers to us as a medicine in mental affections. On the other hand, I must draw attention to the disadvantages which not infrequently attend the use of the poison.

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#### CLINICAL NOTES AND CASES.

*Cases of Masturbation (Masturbatic Insanity).* By E. C. SPITZKA, M.D., of New York.

(Continued from p. 73.)

There are exceptions to the rule that all male masturbators are shy with regard to the female sex, and at all times. It is true that the majority are so in the earlier periods of their vice, and as long as definitive mental disease has not set in. In some cases where such disease has become established, a sudden transformation from bashfulness to brazen effrontery, and from timidity to bold, insulting and lascivious demeanour, is noticed. These patients exaggerate the characteristic, so happily drawn by Oliver Goldsmith in "She Stoops to Conquer," of a certain class of men who are heroes before barmaids and cowards before refined females. In exceptional instances, the masturbatic lunatic is as brutally indecent to those of a higher as to those of a lower station. Godding relates a case of this kind in graphic language in his "Two Hard Cases."