A British Medical Association Lecture

ON

THE DRUG HABIT.*

BY

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OUR conscious life may be regarded as a collection and perception of sensory impulses. The ever-changing conscious personality is controlled in adult life by centres which develop only after the age of 10. These later developed centres, such as those of control, judgement, attention, and choice, govern the lower centres, such as those of emotion, so that natural emotions are rarely expressed in adult civilized and cultured life. The repression of sexual emotion is an example, and it is an everyday experience that with age our memory for proper names fails, not because of any loss of function of nerve tissue, but by a repression caused by the exaggerated activity of the higher centres. The subject is bound up with what we have come to term psychotherapy.

But repression, like other higher faculties of mind, is very different in different individuals. Some are so highly reflex, so easily responsive to external impressions, that the associations set loose by any ordinary stimulus cause such a complexity of cerebration that the ordinary affairs of life become a burden. Such people are not phlegmatic and uninteresting, but are rather those possessed of quick perception, acute sensibility, and other higher attributes of mind which go to make up high breeding and culture.

But such a complexity of cerebration cannot continue long; soon it gives place to fatigue, depression, and mental distress. Such people we term neurotics, and they form a class peculiarly prone to succumb to narcotics.

Increased nervous sensibility appears to be a product of civilization and wealth, of indoor life, luxury, and perhaps excessive indulgence in the satisfaction of desires. It is difficult to form an estimate of this factor, but attempts have been made to gauge relative sensibility in different nations by estimating the number of women who employed anodynes during normal parturition. The figures obtained were—for the United States 70 per cent., Great Britain 50 per cent., and for Spain and Russia 5 per cent. The figures are interesting in view of the prevalence of drug addiction in the States.

A tendency has shown itself in recent years to classify patients into two groups—those exhibiting an excess of vagotonia, like dogs, and those exhibiting an excess of sympathicotonia, like cats. These two types of people, if they receive the same stimulus, respond differently. The members of the one group may grow pale and their pulse slow, while members of the other may flush and their pulse race. Dogs die in the early stage of chloroform narcosis by vagal inhibition and cats by ventricular fibrillation, probably induced by sympathetic stimulation.

These neurotics always belong to the sympathetic group; they easily weary of the strain and anxiety involved in the fight for existence, and anything that gives them relief from their cares and anxieties is seized with avidity. Now it is these higher faculties of mind which are most responsive to narcotic poisons; they are influenced long before those concerned with movement and ordinary sensation. So that such abnormal people, under the influence of narcotics, lose the exaggerated effect of their normal sensations, and become more like normal people; the everyday trifles and inconveniences of life are no longer exaggerated out of all proportion to their significance, and life, instead of being oppressive and anxious, becomes pleasant and free from worry. Sometimes the very acuity of their intellect is their undoing. Perhaps in a few special instances persons possessed of such vivid sensations may benefit by a narcotic which limits these conflicting impulses by allowing a freer play of the higher mental faculties; certainly the records of De Quincey and Coleridge suggest such a possibility.

I have no doubt that the drug addict is a psychopath before ever he becomes addicted, that the ordinary normal man or woman is as unlikely, even with every facility at hand, to become an addict of morphine or cocaine as he is to become a

drunkard. A lady who for a short period worked in my laboratory injected herself daily with morphine until 2 grains were reached for each injection. She gave it up without difficulty, and with no inconvenience after the first day. It is, I suppose, a recognized fact that the drunkard takes to excess of alcohol just as he does everything else that is foolish and wrong—in other words, that drunkenness is one symptom of an abnormal mind.

No one had a more extensive experience as an inspector under the Inebriates Act than Dr. Braithwaite: he is doubtful whether habitual inebriety is ever acquired, and thinks that these people start life handicapped by an abnormal brain. Sir Frederick Mott, at the Glasgow meeting of the Association, expressed similar views. The drug addict is a product of modern civilization, and addiction is a symptom of a diseased mind. For many hundreds of years Christian nations regarded the insane as people possessed of the devil; they were tortured, burned, and subjected to every indignity, and yet insanity continued. Almost the same condition is coming about now with drug addicts. I read that in July, 1921, the New York City Board of Health permitted the incarceration of drug addicts. The police imprisoned several, and the sudden withdrawal of the drug caused the death of one and collapse of several others.

I propose now to mention the substances more commonly used for addiction. Opium or one of its derivatives is the commonest addiction drug; it may be eaten, smoked, or injected. Eating opium or drinking laudanum is rare amongst Europeans, possibly on account of the constipation, the delayed absorption, and the difficulty in obtaining the large supplies necessary. It is, however, not uncommon in India, and its general use led to the Commission of 1895, which reported that moderate indulgence led to no injurious effect and did not shorten life, but that, on the contrary, it tended to ward off sickness and lessened the discomfort consequent on poor food and on malaria and other diseases. Opium is still taken in the fen district of England as a remedy to ward off the ague, a disease which has long ceased to be endemic. In India the opium habit appears to be comparable rather with our smoking than with the morphinist; it is a habit of middle life and advancing years, whilst modern statistics show that 70 per cent. of the European and American morphinists are under 30.

Opium smoking is also mainly an Eastern habit, although it obtained a distinct vogue in the United States of America until it was superseded by the infinitely more objectionable method of injection. The amount of alkaloid absorbed in the smoke is very small, both because the amount of opium used in the pipe is small, and because most of the alkaloid in the opium is destroyed. Absorption is rapid and an immediate effect is produced. Whether this is really due to the morphine I am not prepared to say, since even by smoking all day it would be difficult, if not impossible, to absorb half a grain. The morphine in ten pipes only contains about half a grain, and 99 per cent. of this is destroyed in combustion. After the first few whiffs there is a feeling of elation, followed in the habitué by delightfully languid ease, an exalted sense of superiority, and later by dreamy sleep. The smoker becomes a slave to the habit, and the evil is enhanced—at all events in the West—because the devotee must indulge in his vice in the worst possible surroundings. Opium smoking is the least objectionable form of the vice, because the amount of alkaloid taken is so small, because a strong craving is not formed, and because "cure" is relatively easy, since here we are dealing with a group indulgence, not a secret vice like that practised by the true morphinist. Withdrawal symptoms are never observed.

In Europe and America the alkaloid is usually injected: this is the most pernicious form of taking the drug, and to obtain the requisite relief the devotee must be continually increasing the dose. The amount of morphine injected daily varies greatly; 15 grains is an ordinary quantity for a morphinist to use in the twenty-four hours, though he will double this in the case of any trifling trouble.

Heroin has been used as a substitute for morphine and as an addiction drug since about 1913. This proprietary remedy was easily obtained and was even exported to the East as a cure for opium smoking. The addict often prefers heroin to morphine, since it is less constipating. The average morphine addict has perhaps one or two stools weekly, whereas the bowels of the heroin addict act almost normally. Heroin has no advantages over codeine or morphine, and its use might be forbidden without harming a single genuine patient.

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EXTENT OF DRUG HABIT.

Reliable statistics are almost impossible to obtain, and such information as we have comes principally from America. Thus the report of the Special Commission of Investigation appointed by the Secretary of the Treasury in the United States in 1918 gives the following consumption per head per annum in 1910:

Austria	...	...	...	about	$\frac{1}{2}$
Germany	...	...	...	...	$\frac{2}{3}$
France	...	...	...	...	3
United States of America	...	...	...	...	36

Ninety per cent. of this American traffic is probably used for other than medical purposes. The Commission of the Treasury, U.S.A., in 1921 estimated that the country contained at least one million addicts. From all parts of America we find the same tale. In December, 1914, the Harrison Narcotic Law came into existence; it had the support both of the public and the medical profession. In effect this law dictates the manner of practising medicine, and involves many irksome details and much clerical work for the doctor. It includes an army of officials—Federal, State, county, and city—and every grain of narcotic must be accounted for. It has now been actively enforced for seven years, and it is the universal opinion of those best able to judge that it has signally failed in its purpose. The number of addicts and the amount of narcotic consumed is as great or greater than in 1915. I believe the main reason for this is to be found in the fact that the law takes no account of the causes of addiction: the druggist is regarded as a criminal just as were the insane in mediaeval times. Everything can be obtained if the price offered is appropriate to the risk, with the result that smuggling is rampant on the Pacific and Atlantic coasts, from Canada and from Mexico. Distribution is organized by underground channels by means of the so-called dope pedlars. In other words, the law has not altered the supply, but only the distribution of the supply.

Our own less stringent law came into force in September, 1921, and it is too early yet to appreciate its effects. But such drastic laws should make us extremely anxious; they may easily increase the very vice they aim at arresting, for they put a high premium on smuggling, and once the illicit drug dealer obtains a hold on the community an evil is produced infinitely greater than before, when the drugs could be obtained at a fair price through recognized channels.

Much of the increase in drug addiction has without doubt been started in ignorance; opium smoking was regarded as a harmless pastime to be relinquished as desired; the employment of the "white snuff" cocaine served as a stimulant and pick-me-up; and heroin was used as a substitute for morphine with the idea that it was not an opium derivative. There is much evidence that the difficulty in getting alcohol leads people to try any substance which may have a "stimulant effect." But such people are neurotics, their mentality compelling them to search for any remedy to relieve their mental distress. To the normal man opium smoking or cocaine sniffing started in ignorance or in the spirit of adventure or bravado produces little or no pleasurable effect; and although from time to time the process may be repeated I do not believe true addiction ever occurs. The addict always finds it to his advantage to co-operate with the distributor of his drug, and almost never will he give information leading to disclosure of the source of supply.

The chief characteristics of the drug addict are plausibility and disorderliness; they are essentially creatures of impulse. They have little regard for time; appointments are not kept; rules of ethics are scarcely regarded and the conventions are allowed to lapse. When under the influence of their drug the attention can be concentrated for a time and they can write and work, though in a slovenly fashion. The fresh injection gives them a feeling of energy and well-being.

WITHDRAWAL.

Addicts are held in addiction largely through fear. Prolonged indulgence often fails to give them pleasurable sensations; still they must go on in order to avert the crisis of withdrawal. Their horror of pain, both mental and physical, is an obsession, and contact with the responsibilities of the world they feel is not to be borne.

The symptoms of withdrawal correspond almost exactly with stimulation of those tissues which morphine in medicinal doses depresses. The yawning, sneezing, nausea, vomiting, and mucous secretion result from stimulation of the medulla; the abdominal pains and diarrhoea from stimulation of Auer-

bach's plexus; the twitchings, cramps, circulatory troubles (rapid pulse, arrhythmia), and sometimes even convulsions, and collapse hardly distinguishable from surgical shock, are due to excessive stimulation of the cortical cells. Perhaps one of the first and most characteristic effects of withdrawal is a rise in blood pressure from excessive activity of the medulla; this is followed later, at all events in severe cases, by a marked fall in the pressure associated with the collapse. A patient seen with these symptoms, even when in a state of collapse, on receiving an injection of his drug exhibits a transformation almost miraculous; he becomes in a few minutes a relatively normal person. Nitrites in cases of early withdrawal produce much the same effect as morphine on the blood pressure, but do not relieve the mental condition.

Sudden cessation of alcoholic beverages in those who have imbibed too freely for a long period may also lead to withdrawal symptoms, which we term delirium tremens.

The explanation I suggest to account for these withdrawal symptoms is that nerve cells, after prolonged narcosis, on reawakening become hyperexcitable. The contrary effect is an everyday axiom, that stimulation is followed by depression. Another explanation has been suggested by the fact that morphine and cocaine maniacs must be continually increasing the dose to get the necessary effect. This acquired tolerance is at least partly explained by the enhanced power of the tissues to destroy the alkaloid. On this we have decisive evidence. But it is also suggested that this acquired tolerance, this inability of cocaine, morphine, and other drugs to produce their normal action on the brain, is due to some substance which neutralizes the effects of the poison.

Valenti rendered dogs tolerant to morphine, and found that on suddenly stopping the drug the animal showed typical withdrawal symptoms. He alleges that injection of the serum from these dogs into normal dogs caused similar symptoms. This view is now completely disproved. No antibody formation ever occurs in animal or man from the injection of such relatively simple substances as the alkaloids.

COCAINE.

It has long been known that the Indians in the west of South America, especially in Bolivia and Peru, used coca leaves to chew as a stimulant and narcotic. The Indian uses coca as we use tea and coffee as a stimulant in mental and physical fatigue. Travellers assert that by chewing this leaf they are able to perform long and rapid journeys with less fatigue and without feeling the pangs of hunger and thirst. Experiments in the laboratory, using the ergograph, suggest that these effects are due to cocaine, but experiments by Europeans in the Alps have not been very successful.

Cocaine as an addiction drug is taken either as snuff by the mouth or by injection, and absorption by the nose is as rapid as by injection. Cocaine powerfully excites the central nervous system, inducing a feeling of energy and restlessness. The flagging nerve cells are whipped into activity, and lassitude and fatigue pass; but this is accompanied by clouding of associations and some depression of the central nervous system always succeeds the stage of excitement. Cocaine fascinates by the rapidity with which it relieves exhaustion and dispels gloom and by a delightful sense of mental and physical vigour. Morphine acts not by stimulating, but by depressing sensory nerve cells in the brain, so that fatigue and mental and physical pains are assuaged.

The pure cocaine habit is not very common. The many cases reported in the newspapers were rather cases of users of the drug for specific purposes than cases of addiction. Our men on short furlough during the war were necessarily in an emotional state; anything which helped forgetfulness was seized, and cocaine, used by snuffing, fulfilled the condition. The debauch ended, on the following day there was no desire to repeat the experiment and no craving. Cocaine was used as a rapid and exhilarating intoxicant. Used regularly it might in some instances have led to addiction, but for the most part it did not.

Tolerance can be acquired to cocaine like morphine, but it is less definite and slower in formation; still there are several cases on record in which 100 grains were taken daily. The prognosis in such addicts is better than with morphine, the abstinence symptoms are less severe, and the cocaine can be cut off at once. Cocaine compared with morphine is relatively unimportant in Europe, and there are few cases of cocaine addiction compared with opium. The discomforts caused by cocaine are readily controlled by morphine, and when the

patient learns this the addiction becomes confirmed and of the most serious character.

The other cocaine-like substances which might lead to habit are stovaine, tropacocaine, and perhaps holocaine, though cases of addiction to these are unknown to me.

To some extent fashion or opportunity determines the type of drug used. In New York heroin is used almost entirely, in Chicago morphine is the common narcotic, and in cities with a large coloured population cocaine is in vogue.

TREATMENT.

The first and principal fact to remember in treatment is that the addict is not a mentally normal man, and the problem is not so much whether we can temporarily stop the addiction as whether we can educate his mind so that temptation can be withstood—in other words, to alter his character. Simply to control conduct so that choice cannot be exerted is to court disaster.

The following examples will show the effect of custodial care alone.

The Department of Health of the City of New York publishes statistics and details by medical experts of nearly 8,000 cases of drug addicts during ten months; 1,580 received at the clinic were willing to accept treatment and withdrawal of the drug. Those treated were kept six weeks and discharged in good physical condition "cured." In three months a large proportion had already relapsed, in spite of all efforts made to assist them.

Dr. Doane, speaking in November, 1920, stated that there had been treated in the Philadelphia Hospital 3,500 cases of drug addiction, four-fifths of which were heroin and cocaine. These patients were mostly from the lower strata of society. Dr. Doane thought that 3,400 or 3,500 had relapsed. In Los Angeles the Board of Health, with the assistance of the municipal authorities, started a narcotic clinic where addicts got their supply at a nominal price without criminal risk. This system had several advantages: the victims were able to work again; illicit peddling was reduced to a minimum; the addicts became known; but the system was much abused and cures were not effected.

It is generally recognized that of all addicts those that contract the habit as a result of disease are easiest to cure. All addicts desire to be cured but fear the withdrawal symptoms. An addict may beg to give up the habit of his own free will and submit to restraint, but as soon as his wishes are acceded to he will endeavour to render restraint unavailing, and he is so well versed in the literature of the subject that he finds a ready reason for anything he does. He is quite unable to resist an opportunity to cheat if the occasion offers. To ensure even a temporary cure restraint and custodial care are therefore essential.

The chief reason against restraint is that our object is not so much the temporary suppression of the morphine as the cure of the desire for it, and the best way of effecting this is by the re-education of the dormant will.

Under restraint the drug can be gradually reduced, and generally ten days will suffice to bring it down to *nil*. Some authorities substitute rectal administration for the injections, and some codeine for morphine. Many of these neurotics would do anything rather than diminish their injections; they take a morbid pleasure in injecting something under the skin. During the cure intensive purgation should be carried out. Morphine is the only alkaloid excreted by the alimentary canal, and it is well to get rid of it and prevent reabsorption.

The drug which is perhaps most useful in the treatment of addictions of all kinds is atropine, or, better, hyoscine. Hunger and to a smaller degree thirst are caused by conditions of the stomach, and atropine and hyoscine control the motor nerves to the stomach and intestine. It is more than likely that morphine craving has some association with the stomach. Many other drugs are, however, employed: nitrites and sparteine to lower blood pressure during the withdrawal symptoms, alkalis to combat the dyspepsia, and such drugs as valerian or asafoetida to produce a profound psychical impression. De Quincey found much benefit from valerian. To effect a cure the patient must be made to live a methodical life, to partake of temperate meals, and to observe orderliness in everything, all of which are loathed by the neurotic and morphinist.

In conclusion I desire most strongly to protest against the modern tendency to regard these people as criminals; they are and should be regarded and treated as mental cases,

addiction being the prevalent symptom at the time. The Harrison Narcotic Law has proved a failure in America, yet our own authorities have legislated on parallel lines, and time only will show whether the cure is not worse than the disease.

Since this lecture was delivered an amending bill to the Dangerous Drugs Act of 1920 has been read a second time in the House of Commons and referred to a Standing Committee. It proposes that these narcotic drugs shall be purchased only by registered medical practitioners in actual practice, whatever that may mean. I suppose all registered medical men are in actual practice, though many of us are not in practice for profit. Very large quantities of morphine and cocaine are used by the various chemical and pharmacological laboratories throughout the kingdom. Medical students may be required to detect morphine in solution and to investigate its properties on isolated mammalian tissues. Alkaloidal chemistry without morphine and cocaine is indeed unthinkable.

The second objectionable provision is that the practitioner may not prescribe for himself; horrible penalties are attached to infringement of both these provisions. Almost one is tempted to ask, Can legislators be so foolish as to attempt to pass laws directly concerning medical men which are against the whole feeling of the profession and which are calculated to cause intense resentment? If the drug traffic is to be exterminated then all our hope should be centred on the registered practitioners in this country, and to make bad law by legislating for a hard case or two will do infinitely more harm by alienating the majority of the profession than the mite of good.

Hunterian Lectures

ON

MAN'S POSTURE: ITS EVOLUTION AND DISORDERS.

GIVEN AT THE ROYAL COLLEGE OF SURGEONS OF ENGLAND

BY

PROFESSOR SIR ARTHUR KEITH, F.R.C.S., F.R.S.,
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[Abstracts.]

LECTURE III.—THE POSTURAL ADAPTATIONS OF THE SHOULDERS AND THORAX.

At the end of a long day's tramp most of us have become aware of a vague aching pain in the region of the shoulders. Nor need we feel surprise when we remember the heavy burden we have had suspended from our neck throughout the day—the load represented by the upper extremities. In a man of average weight the shoulders and arms represent a burden of about 20 lb. They are suspended from the cervical and upper dorsal regions of the spine—chiefly by the trapezius muscles and particularly by the fibres inserted in the neighbourhood of the tip of the shoulder. Then there is another composite sheet of muscle, made up of rhomboid and serrate parts, which is also concerned in maintaining the shoulders in position. By the rhomboid muscles the vertebral base of the scapula is supported from the lower cervical and upper dorsal spines; by the serratus magnus the base of the scapula is steadied on the side of the thorax because that muscle springs from the eight upper ribs. We may look on the rhomboids and serratus magnus as forming a continuous muscular sheet passing from spines to ribs; within it the base of the scapula is embedded and steadied. The levator of the angle of the scapula, originally part of the serratus sheet, is also concerned in balancing and supporting the shoulder from the neck. Now and again, once in a hundred subjects, we see another muscle helping in the support—the levator claviculae. It is strange that man is the only one of the higher primates in which this muscle has become vestigial; it is also noteworthy that in the chimpanzee this muscle is small and tends to disappear. The sterno-mastoid and pectoral muscles also play a subsidiary part in supporting and balancing the shoulder.

SUSPENSORY MECHANISM OF THE SHOULDERS.

When we stand or sit a postural reflex mechanism is brought into action which keeps the shoulder muscles constantly at work until we lie down again. How complex this