Norman Kerr Memorial Lecture

ON

DRUG ADDICTION.

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BY

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DR. NORMAN KERR, in memory of whom we are assembled here to-day, devoted his life's work to the study of inebriety, and it may be truly said of him as of other good and great men, "Their work lives after them."

This society, of which he in 1884 was the illustrious founder, has steadily and perseveringly and with increasing influence and power followed the principles for which it was founded—"To investigate the various causes of inebriety and to educate the professional and public mind." The Society for the Study of Inebriety is of itself a fitting monument to the memory of Norman Kerr. His devotion to the subject he constantly had at heart, and his persevering efforts had a great share in the passing of the Acts for the reform of inebriates from 1879 to 1888. His leisure time was spent in compiling carefully written works on the subject dear to him, and these remain with us as examples of the humanity and scientific spirit with which the study of inebriety of all kinds should be approached at the present day.

In all his writings Norman Kerr insisted on regarding inebriety as a disease rather than a wilful vice. He pointed out that alcoholism and drunkenness were only one variety of the disease "inebriety," and to avoid confusion suggested as an alternative term for inebriety "narcomania," which is literally a torpor mania (*vápkη*, torpor), or in other words an overpowering impulse for narcotism by any intoxicating or anaesthetic substance. The disease of inebriety or narcomania he regarded as a true intoxication mania, the diseased inebriate often utterly abhorring the liquor (or drug) which he would barter his salvation to procure.

DRUG ADDICTION.

It is impossible to name with limitation the drugs which may give rise to an addiction habit, because any drug having an intoxicating action on the cerebrum may give rise to addiction, and new drugs of organic composition are being daily added to our pharmacological armamentarium, the effect of which as regards addiction is at present unknown. In this respect a word of caution is necessary. New organic compounds are being constantly discovered for which it is claimed that they do not cause addiction and that they are in every way capable of replacing those drugs, such as cocaine, morphine, and heroin, which are dreaded for their tendency to lead to the drug habit. The claim that a new drug is not likely to lead to "addiction habit" requires the most careful and extended trial both experimentally and therapeutically before it can be admitted.

To quote one well known example—novocain. This has been successfully used in certain operations as a substitute for cocaine, but it does not have the anaesthetic effect on mucous membranes characteristic of cocaine, and is used solely for infiltration of the subcutaneous tissues; for this purpose it is an admirable anaesthetic. Novocain is not known to give rise to "addiction," but has been almost exclusively used by surgeons. Prescriptions for it have not found their way into the hands of the public, so that there has not been the opportunity of testing the addiction properties as has been the case with cocaine. It is possible that the hypodermic administration of novocain might, if long continued, give rise to addiction. One must keep an open mind with regard to addiction properties of new drugs. I shall therefore restrict my remarks to drugs

which are well known to have given rise to addiction. These are:

Opium and its alkaloids, morphine and heroin. (Dionin not codein, cocaine.

Diethyl barbituric acid and other alkyl, aryl, or metallic derivatives of barbituric acid, such as veronal, medinal, propional, dial, luminal, etc.

Chloral.

Cannabis indica.

Sulphonal and its homologues, trional and tetronal.

Chloroform and ether.

Paraldehyde.

Hyoscine (very sure).

The most important of the drugs of addiction are: opium, morphine, and heroin; cocaine; the veronal group; chloral; cannabis indica.

Let us consider first drug addiction in relation to those drugs included under the Dangerous Drugs Regulations—namely, opium, morphine, heroin, cocaine, and their derivatives—since in the vast majority of cases it is these drugs which are responsible for addiction and which are a menace to the national health and well-being.

ETIOLOGICAL FACTORS: STATISTICS.

Is drug addiction common in this country? It is impossible to answer this question with mathematical accuracy, for no statistics are available. Speaking from personal experience, and a close study of toxicological medicine extending over the last twenty years, I am of opinion that drug addiction is rare in this country amongst the working and professional classes. Persons of this class, we may call them "the citizen class," become victims of the drug habit often from taking the drug in medical prescriptions and through no fault of their own. They are honest in their intentions and in their lives, and find themselves the victims of a terrible habit—or, as we would better term it, they became afflicted with "addiction disease." They conceal their plight for a time, but ultimately realize that disaster is imminent, and then they seek medical advice. They wander in their distress from one doctor to another, vainly seeking a cure, and their trouble becomes known to many. There is thus a tendency to exaggerate the number of drug victims of this type. I believe the number in this country to be very small.

There is another class of persons in whom the drug habit is very common. It includes those who devote their lives to so-called pleasure seeking and the search for new excitements and sensations. In American literature they are described as the "Underworld." They might be termed the "Vicious Group," the addiction arising either purely as a means of endeavouring to induce pleasurable sensations or as the result of evil association with addicts, leading to the corruption of good habits. Amongst the "vicious group" cocaine, morphine, and heroin are the drugs usually employed, either hypodermically or as snuff. The "vicious group" of drug addicts is to be found in London and our great cities. Fortunately it is a small group, and one whose influence is not extensive. Addiction of the "vicious" type is a canker to be stamped out, though one must admit that this form of drug addiction is not such a serious menace to the national well-being as that affecting the citizen class.

IMMEDIATE CAUSATION OF DRUG ADDICTION.

The commonest cause of drug addiction in this country, if we exclude the "vicious group," is undoubtedly the prescription of the drug for medical purposes.

The Relief of Pain.

It is common for morphine and heroin to be prescribed hypodermically for this purpose. The use of these drugs is necessary in certain cases. It may be necessary, in order to alleviate pain and promote sleep, for a hypodermic injection of morphine or heroin to be prescribed on one or two nights after an operation, particularly in abdominal cases. Too much care cannot be exercised by surgeons in this respect, and instances have occurred where harm has been done or a drug addiction developed.

Recently there has been under my care a most serious case of heroin habit in a patient who has done everything possible to overcome the addiction. This patient, seven years ago, was given

after an operation for appendicitis a dose of 1/12 grain of heroin every night for five weeks. This led to the addiction habit. At first the heroin had a stimulating effect, and as this wore off the dose was increased. The result has been that the patient has become a physical and nervous wreck and in spite of several courses of treatment it has been impossible for the patient to overcome the addiction habit.

Another case may be cited where, after an abdominal operation for gall stones, a patient was given on four successive nights 1/4 grain of morphine. Suppression of urine ensued, the condition not being recognized until too late. I have no doubt that in this case the toxic action of the morphine led to the paralysis of the renal function.

It is to be feared that after operations morphine and heroin are too often given hypodermically as a routine practice without sufficient regard to the dangers of toxic action of the drug, and to the equally disastrous risk of the development of addiction disease. It should be realized that, quite apart from the dangers of the development of drug addiction, morphine and heroin have a depressing and harmful effect on all the excretory and secretory organs, and so should be avoided as far as possible in all cases.

For Relief of Pain of Neuralgic Type.

The hypodermic use of morphine, heroin, or cocaine is to be avoided as far as possible. Other methods of treatment are usually available, such as local treatment by radiant heat, diathermy, or other electrical treatment, or by external anodyne applications. Many analgesic drugs, such as phenacetin, pyramidon, aspirin, are of use, and where a particular nerve trouble is involved alcohol injections are invaluable. The hypodermic injection of addiction drugs should be avoided, if this is possible, and should be a last resort. How easy it is to relieve the pain of these conditions by the injection of a small dose of heroin or morphine, and how quickly does the repetition of the dose become necessary!

The transition from pain due to organic causes to painful feelings of psychoneurotic type cannot be detected, and in cases of this type the use of addiction drugs is likely to lead to the paroxysmal recurrence of painful impressions and the demand for repeated doses. Neuritis of local origin, such as sciatica, brachial neuritis, etc., should never be treated by injections of addiction drugs, since their use retards the cure of the local condition and inevitably leads to the danger of addiction.

It must be admitted that cases do occur where morphine and heroin are necessary. For example, the involvement of nerve by malignant disease, or in that painful condition "causalgia" arising from the involvement of nerves in scar tissue. In the former case it may be necessary to continue the administration. In the latter surgical treatment is advisable to remove the cause of the nerve irritation.

The Hypnotic Habit.

In acute conditions it may be necessary to procure sleep at all costs, and for this purpose there is no surer method than the administration of morphine and heroin hypodermically. Repetition is to be avoided. Too often, however, the terrors of insomnia are impressed upon the patient. The selection of the hypnotic at night is as carefully considered as is the menu of the veriest epicure, and the patient regards the hypnotic drug as one of the essentials of life. This is a deplorable condition, and is bound to lead to the disaster of drug addiction of some kind, whether by morphine, heroin, or some one of the veronal group.

The continued use of drugs for insomnia is a method of treatment which is harmful for the cure of the condition, and patients should be led to take this view. The terrors of insomnia are not to be compared with those of drug addiction, and a little sleep following natural methods of treatment is of far greater benefit than the more prolonged abnormal condition of sleep produced by narcotic drugs.

Psychological Aspects.

The psychoneurotic factor looms large in drug addiction. Given an exciting cause—for example, the repeated daily administration of a narcotic drug—the danger of addiction is very much greater in patients with a neuropathic temperament. A family history of insanity, neurosis, or

of addiction to alcohol or drugs often exists amongst drug addicts, and they themselves, previous to their addiction, often present definite signs of nervous instability. The removal of any sources of irritation to the nervous system is of importance, since a neurotic condition may be induced by irritating stimuli. Thus, as has been pointed out by Ernest Clarke, eye-strain may lead to a neurosis and so pave the way for drug addiction. Mental worry and anxiety may similarly lead to a predisposing anxiety neurosis.

Often a psychological complex of a depressing type is present in patients of this group, and there is a subconscious cry for relief from mental suffering. Persons of this type are out of harmony with their environment. They constantly call for something to "drown the cares of life." This relief is temporarily obtained by the administration of a narcotic drug, and as surely as this occurs so inevitably does a still deeper stage of mental agony develop, which is only to be relieved by the further resort to the narcotic. "*Facilis descensus Averni.*" A vicious circle is established. The effects of drug addiction call out all the weak points in the patient's neuropathic inheritance. Too much care cannot be taken in the avoidance of the use of narcotic drugs in patients of this type. In them the knowledge that temporary relief from mental depression may be obtained from resort to drugs of addiction is often gained by association with addicts. Hence the importance of making access to these drugs impossible except by medical prescriptions. This is one of the main objects of the recent Dangerous Drugs Acts.

Toxaemia from Focal Sepsis.

In many cases patients, before resorting to a drug habit, are suffering from the toxaemia due to some latent focus of infection, perhaps the toxic absorption from septic teeth, or from some focus in the nasopharynx, such as septic tonsils or an infected antrum. The toxic absorption causes a sense of intense mental depression, irritability, and hypersensitiveness. In other words, a neuropathic condition is established which prepares the soil for drug addiction. In cases of this type narcotic drugs are often taken for the temporary relief of mental suffering, and a vicious circle is established.

The recent work in America showing the very important part played by focal sepsis in the causation of mental disease is an illustration of a physical toxic basis for many cases of mental disorder. Exactly the same relation occurs in many cases of drug addiction, and the neuropathic condition produced by toxic absorption is really at the bottom of the trouble. Focal sepsis should always be carefully looked for in cases of drug addiction, and one of the first elements of treatment should be the removal of septic absorption from such causes.

In the early part of this year there was under my care a case of alcohol addiction of several years' duration in a busy city man. This patient told me that he really took the alcohol as a stimulant to counteract the intense depression which overtook him in his daily work, and not for any real liking. Investigation of the mouth by x rays showed several apical dental septic foci. The removal of the septic teeth followed by rest and change resulted in a restoration to good physical health. There has been no return to alcoholic consumption of any kind, nor any desire for this form of addiction, and he has resumed his strenuous busy life without any resort to artificial stimulation.

In a case of combined morphine and alcohol addiction recently under my care there was an alternation of periods of alcohol addiction of the dipsomania type with periods of morphine addiction. The patient was an active man of middle life and obviously suffering from the effects of some toxic process in addition to his drug and alcohol addiction. An x-ray examination of the mouth disclosed a deep-seated infection which had obviously existed for years. In this case the patient stated that he had no real desire for alcohol or morphine, but took them to counteract the overpowering sense of depression and physical weakness which overtook him. The alcohol and morphine were at once completely withdrawn and nursing home treatment adopted. The oral sepsis was removed by appropriate dental treatment, and this, coupled with rest and change, resulted in a return to good physical health and cure of the morphine and alcohol addiction.

In both the above cases it was quite clear that there was a primary toxic basis for the addiction habit. Other cases might be quoted in illustration of the close relationship of the toxaemia of focal infections to drug addiction and of the importance in such cases of the removal of septic foci.

Focal sepsis and drug addiction are closely related, and though the former may by its physical effects lead to drug addiction, yet in a similar manner the drug habit, by its lowering effect on the immunity mechanisms in the body, may predispose to the development of focal infections, especially those of dental origin.

One Drug Habit Leads to Another.

This is an axiom which may be laid down for almost all cases. The taking of a particular narcotic drug leads to an unstable condition of the nervous system which is indicated by effects on the higher mental faculties. In other words, the soil is prepared for narcotic stimulation of any kind. Thus the morphine addict frequently resorts to cocaine or alcohol as alternative measures of relief for his states of mental depression; indeed, in some cases the craving for drugs of any kind available becomes almost an obsession.

In cases of drug addiction of long standing it is frequently found that a combination of drugs is used, morphine or heroin with cocaine or alcohol being the commonest combination.

Drug Addiction of Long Duration.

There can be little doubt that when a narcotic drug has been taken for a period of years organic changes result in the nervous system, and probably other changes of a biochemical nature occur which alter the metabolic processes of the body. In such cases cure is very difficult and sometimes almost impossible. The drug has become a necessary adjunct to the working of a disorganized nervous system; in other words, it has become an abnormal food.

Every physician who has studied drug addiction is acquainted with such cases where attempts at cure have repeatedly failed and where the daily allowance of a minimum amount of the drug is a necessity. In such cases the withdrawal of the drug may lead to the complete physical and mental breakdown of the individual. He cannot, without its artificial aid, perform the duties of life, and the withdrawal may lead to uncontrollable crimes of violence. Numerous examples of this kind have occurred amongst addicts engaged in artistic or literary work often of high grade.

In Eastern countries amongst the lower castes of society the taking of opium by the mouth causes marked addiction disease. In India certain individuals become so accustomed to a daily ration of opium that they cannot carry on their daily work without it. During the war in Mesopotamia several cases of opium addiction amongst Indians of low caste attached to the Labour Corps were brought to my notice. Often a very small amount—one or two grains a day—was sufficient to maintain an equilibrium and enable them to perform their duties. In a few cases complete mental breakdown and crimes of violence of an irresponsible nature occurred when from some reason the addict was unable to obtain his daily dose of opium.

In the Fen counties of England laudanum and opium addiction used to be not uncommon; possibly the habit arose from the taking of the drug to counteract the effects of malaria which was prevalent in former days, and for which it was a common remedy. The laudanum and opium habit became firmly established, and the unfortunate individuals affected became addicts who existed on a low grade of physical and mental health, for the maintenance of which the drug was obtained at all costs. The taking of laudanum and opium by the poorer classes in this country has fortunately become very rare.

Vicious Causes.

Opium and its preparations—morphine, heroin, and cocaine—are sometimes first taken by individuals who have been told that the drugs have a stimulating effect and produce brilliance in thought. In some persons small doses of these drugs at first have the effect of cutting off inhibitory impulses, and so for a transient period of minutes self-consciousness or stage fright may be forgotten, and a false sense of well-being produced.

An analogous use of the drugs is in the doping of horses, a practice which is severely condemned and punished by the authorities responsible for racing in this country. A horse

of uncertain temperament if given a dose of cocaine lividomergically may in a few minutes become more tractable, and perhaps run better in a race within half an hour. After this short period the animal becomes useless, and temperamentally worse than before. The repetition of doping completely ruins the animal, and rarely produces the effect desired.

The use of narcotic drugs in man for their stimulating properties is an extremely dangerous practice which frequently fails in its immediate object and inevitably leads to the terrible vice of addiction.

Association with Addicts.

This is one of the commonest causes. The addict desires nothing so much as the leading astray of those innocent of this terrible vice. The pleasures following the dope are painted in most glowing colours and the neophyte is besought to partake of them. The first few doses may actually produce transient pleasurable sensations, but each is followed by a sense of intense depression and misery, which calls loudly for removal by a further dose. In this manner drug addiction of the vicious type spreads rapidly amongst those associating with its votaries.

Morphine, heroin, and cocaine are deliberately taken by persons of vicious associations in the hope that the strings of new sensations may be played upon. In some cases, especially amongst women of the underworld, cocaine and heroin are taken commonly as snuff, with the idea that transitory mental brilliance and attractiveness are produced. Prostitution and sexual vice are closely associated with drug addiction. Thus cocaine may in the early stages of addiction have an erotic effect, and there is evidence that it is an important factor in the causation of unnatural sexual vice.

Morphine and its derivatives appear to have a sedative effect on sexual impulses and to lead to impotence and sterility. These drugs are taken often by those sexually vicious to stifle the calls of conscience. So great are the cravings of drug addiction that cases are known to me where victims of the female sex have not hesitated to sacrifice their honour in order that a supply of the drug may be obtained.

DRUG ADDICTION A DISEASE.

The taking of a narcotic drug of addiction for a few doses may be termed a vice, but if the administration is continued for a month or so a true disease condition becomes established, with a definite pathology and symptoms.

The drug addict, provided that he has a certain allowance of his drug, is an individual on a low plane of physical health. The complexion is sallow, he is emaciated, and there is evidence of a general lack of function of the secretory organs. The mental symptoms are shown by weakness of character and will, and lack of moral sense.

In some cases a drug addict may show even to an experienced observer few, if any, abnormal signs. The opium or morphine addict, if having his necessary allowance of the drug, may conduct himself normally from the moral and social point of view; and where the daily amount is small he may, for extensive periods, carry on his work in life. The cocaine addict undergoes a more rapid deterioration, both mentally and morally, and is apt to perform criminal acts.

The "withdrawal symptoms" of addiction disease are most characteristic. The sudden stoppage of the drug leads quickly to characteristic symptoms which are both physical, and subjective or mental. These have been well described by Dr. Harry Campbell in his recent able paper on morphine addiction read before this Society (April, 1923).

The objective symptoms—feebleness of the heart's action, tremors, vomiting, purging, and sometimes actual collapse—are unmistakable. In addition there are subjective symptoms, such as pains in the limbs and body of a distressing character. The mental symptoms experienced by the patient are those of restlessness and extreme mental suffering.

The withdrawal symptoms are at once relieved by a dose of the drug of addiction. The prevention of withdrawal symptoms in a confirmed morphine addict can be

worked out with almost mathematical accuracy. Thus in a given case a minimum amount of morphine can be determined which will, for a certain number of hours, prevent the development of withdrawal symptoms. Such symptoms are usually less marked with cocaine than with morphine and heroin, but in severe cases of cocaine addiction of long standing it is a mistake to assume that withdrawal symptoms do not occur; they may be quite marked and even serious.

Withdrawal symptoms of addiction disease are now accepted as forming a definite symptom-complex of characteristic type. They are not symptoms which are purposely assumed by the patient with the object of obtaining a further dose of the drug. The objective symptoms described are a sufficient proof of this.

The experimental production of morphine addiction disease in dogs, and the manifestation of a similar symptom-complex of withdrawal symptoms, have furnished additional evidence that drug addiction is a true diseased condition. A most interesting case or symptoms of morphine withdrawal in a newly born infant has been published by Dr. L. A. Van Kleek in America.

The mother had been a morphine addict for years, taking from 4 to 6 grains daily during her pregnancy.

The child at birth appeared normal, but on the second day cardiac failure, sweating, cyanosis, vomiting, and diarrhoea rapidly developed and the condition became alarming. The usual methods of treatment for shock were tried without success. In view of the fact that the mother was a morphine addict a small dose of opium, in the form of 3 minims of compound tincture of camphor, was given and repeated every one and a half hours for three doses. The symptoms of collapse cleared up as if by magic. On the third and fourth days the same symptoms of collapse occurred, and were relieved at once by the same methods of treatment. After the fourth day the mother was able to suckle the child, which then remained in good health.

In this case it was clear that the child suffered from withdrawal symptoms of addiction disease on the second, third, and fourth days of life. It also appeared evident that the addiction disease was transmitted from mother to child. Sufficient morphine to prevent withdrawal symptoms was present in the milk of the mother, who continued to have her usual daily allowance of morphine. The above case is strong evidence that drug addiction is a real pathological condition or disease.

PATHOLOGY OF DRUG ADDICTION DISEASE.

That the condition is caused by morphine and its allies is well known, and the symptomatology is well recognized as a definite symptom-complex. The explanation of why withdrawal symptoms occur is yet to be worked out. American observers, foremost amongst whom is Dr. E. S. Bishop, assert that the taking of morphine leads to the formation of an antidotal substance in the body, which neutralizes the large amounts taken by the addict. It is asserted that this antidotal substance is itself very toxic, and that it continues to be produced in the body if the drug is discontinued. At this stage withdrawal symptoms develop and they are only relieved by a further dose of the drug, which acts by neutralizing the toxic antidotal substance.

This theory, fascinating as it seems in the ready explanation of the production of withdrawal symptoms, has not yet received adequate experimental confirmation. Professor W. E. Dixon, in an address on the drug habit (*BRITISH MEDICAL JOURNAL*, November 19th, 1921), states that neither morphine nor any other drug causes antibody formation. On the other hand, Valenti rendered dogs tolerant to morphine and found that on suddenly stopping the drug typical withdrawal symptoms occurred. He alleged that injection of the serum from dogs showing withdrawal symptoms caused similar symptoms to develop in normal dogs.

Professor Dixon suggests as an explanation of withdrawal symptoms that nerve cells, after prolonged narcosis, become on reawakening hyperexcitable, and that a further dose of drug is necessary to allay this condition. The fact that increasing quantities of morphine and cocaine are required by addicts can be accounted for by the increased power of destroying these drugs which is developed by the tissues of the addict.

Another explanation of addiction disease which, I think, should be the subject of pathological research, is the prob-

ability that definite changes of a degenerative type occur in the nerve cells of the brain, and that this pathological change leads to the formation of abnormal channels of transmission of nerve impulses, whereby abnormal physical and mental effects are produced. It is well known that toxic substances, such as chloroform, affect the nerve cells, causing degenerative changes, demonstrable by Nissl's methods of staining, and it seems likely that similar changes may occur in drug addiction. This view of the subject offers an explanation of the incurable nature of drug addiction in patients who have taken large quantities of morphine, heroin, or cocaine for many years.

Scientific research is sorely needed on the pathology of drug addiction, and there are hopeful signs of light being thrown on the subject in the near future, since special investigations are already in progress.

The Ministry of Health has recently appointed a committee to inquire into the substitutes for cocaine and the possibility of drug addiction arising therefrom. It is hoped that valuable information may be forthcoming from this inquiry which will throw some light on the pathology of drug addiction.

TREATMENT OF DRUG ADDICTION.

Each individual case of addiction requires careful consideration as to the line of treatment to be adopted. I do not propose to discuss in detail the method of treatment, since these were fully dealt with by Dr. Harry Campbell in his recent paper. General lines of treatment only will be considered. When the addiction habit is once established it is essential that treatment should be commenced without delay.

Ambulatory treatment almost always fails and should not be attempted. As Dr. Bishop has forcibly pointed out, there is no panacea for the cure of drug addiction, and the much vaunted "cures" and "patent medicines" are usually worthless and do more harm than good. Some of those advertised as cures have been found actually to contain morphine.

The only treatment that gives a hopeful prospect of complete cure is one which recognizes that drug addiction is a disease, and as such requires the same careful attention to detail that any other disease (typhoid fever, pneumonia, etc.) would receive. Thus the general standard of health should be raised to as high a pitch as possible, any associated toxic or other predisposing factors should be dealt with, and the withdrawal effected under the most favourable conditions both physical and psychical. In this way the prospect of cure is as hopeful as is the case in other diseases.

A great drawback in the treatment of drug addiction is the feeling of hopelessness experienced not only by the patients but often, it is to be feared, by their doctors also.

Treatment in an institution or nursing home with complete supervision is essential. After the preliminary period of investigation and removal of associated predisposing factors, during which a minimal allowance of the drug may be necessary, withdrawal should be effected.

Sudden Withdrawal.

Where the general health of the patient is good and where the addiction is of short duration sudden withdrawal is advisable. I think the dangers of sudden withdrawal have been somewhat exaggerated, and in many cases the hesitation to cut off the drug without delay leads the patient to think that his cure is hopeless. It has been my experience that where the general condition of the patient is good and there is every facility for careful nursing, sudden or very rapid withdrawal may be safely effected and is the most satisfactory method.

In confirmation of this view I may quote the results of the experience of medical officers of prisons in this country which have been kindly given me by Sir Malcolm Delevingne. It is a frequent occurrence for drug addicts to be sentenced to terms of imprisonment, and the invariable rule with regard to them has been sudden withdrawal of the drug. In no case have any alarming symptoms occurred and in only a very few isolated patients has any narcotic drug been given at all. In these cases on one or two occasions a very small dose of liquor morphinae has been given by the mouth, but never has any narcotic drug been given hypodermically.

Gradual Withdrawal.

In cases of addiction of long duration, especially if the general physical condition is of low standard, gradual reduction is advisable. In cases of this type hyoscine has been advocated, a mild hyoscine delirium being produced for thirty-six to forty-eight hours by repeated small doses given hypodermically. At the end of this no morphine is given. The advantage of the hyoscine treatment is that in a long-standing case sudden withdrawal is effected. The disadvantage is that there is apt to be a more pronounced development of symptoms during the period of after-treatment. It is doubtful whether any ultimate advantage is gained from hyoscine treatment.

After-treatment.

After withdrawal has been effected the after-treatment is very important, and in this stage, in addition to general hygienic and medicinal methods, psychotherapeutic treatment is most valuable. The cultivation of the will power and of a feeling of hopefulness and certainty of recovery are most important factors for success in this phase of the treatment.

Cases of Long Standing.

In cases of drug addiction where large doses have been taken for many years, and where the nervous and physical condition of the patient is of a low standard, the prospect of cure is poor, and in some cases practically hopeless. The minimal daily allowance of the drug spaced at as long intervals as possible should be accurately determined, and adequate steps taken that the allowance is not exceeded. In this type of case it is probable that permanent organic changes of a degenerative nature have occurred in the nervous system. During the treatment of drug addiction it is important that alcohol should be avoided, as otherwise alcoholism is likely to follow on the cure. Similarly smoking is best cut off, or reduced to the smallest allowance.

MEDICO-LEGAL ASPECTS OF DRUG ADDICTION.

The world-wide appreciation of the dangers and evils of drug addiction was exemplified by the International Opium Convention which met at the Hague in December, 1911, and January, 1912. A general course of action was agreed upon to which the twelve countries co-operating gave sanction, but it was not to become effective until the other countries not participating had agreed. The final attainment of a satisfactory result was delayed by the outbreak of the European war.

The Peace Treaty of Versailles contained amongst its clauses some tending to the ratification of the Opium Convention. Under the terms of the Opium Convention the consenting nations agreed to frame Acts dealing with the dangerous drugs opium, morphine, and heroin.

In this country the Dangerous Drugs Act was passed in 1920, and under Section 7 of this Act power was given to make regulations for controlling the manufacture, sale, possession, and distribution of the drugs in question. In May, 1921, regulations were issued dealing with the carrying out of the provisions of the Dangerous Drugs Acts, and in 1922 and 1923 certain amendments were made to these regulations.

During the war and down to the passing of the Dangerous Drugs Regulations, control of the sale of narcotic drugs was obtained by the Army Council Order under the Defence of the Realm Act in May, 1916. Orders were made dealing with cocaine and opium which were similar in character to those of the Dangerous Drugs Regulations of 1921. The Defence of the Realm Act Order of May, 1916, dealt with the sale of narcotic drugs to any member of H.M. Forces, and permitted the sale of opium, morphine, cocaine, and heroin only on the prescription of a registered medical practitioner, dentist, or veterinary surgeon. The prescription had to be written out in accordance with the prescribed details, and was to be retained by the pharmacist or dispenser.

The scope of this order was wider than that of the Dangerous Drugs Regulations of 1921, for it included in addition barbitone, chloral hydrate, codeine and heroin, Indian hemp, and sulphonal and its homologues. The

restriction of the sale of these drugs to prescription by authorized persons is one which might be followed, with advantage to the public, in future amendments of the Dangerous Drugs Act.

The Dangerous Drug Regulations of May, 1921, and the subsequent amendments were very carefully considered by the Home Office authorities, and the representations of the professions of medicine, dentistry, veterinary surgery, and pharmacy were given the fullest consideration.

The Home Office authorities, amongst whom Sir Malcolm Delevingne, K.C.B., should be specially mentioned for his devoted attention to this difficult subject, did their utmost to meet the wishes of those concerned, consistent with the effective drawing up of the regulations required by the terms of the Convention. It cannot be claimed that these Regulations are at present perfect, but they have been drawn up in a spirit of justice and fairness to all concerned. As regards avoidance of harshness of operation on the professions mentioned, and what is of equal importance, on the addicts affected, the Regulations are a model to other countries.

I know also that moderation and restraint have been shown, as far as possible, by the Home Office authorities and the Ministry of Health in the carrying into effect of the principles of the Regulations. In the difficult position created by the Dangerous Drug Regulations it must be borne in mind that the object for which they were framed can only be satisfactorily attained by the loyal co-operation of the professions concerned with the State authorities.

It has been said that a coach and four can be driven through an Act of Parliament, and it would not be difficult for the letter of the law regarding dangerous drugs to be followed and its spirit evaded. For instance, dilution of dangerous drugs beyond the limits laid down in the Regulations would not prevent their possible use for addiction purposes.

Loyal co-operation will be best engendered by moderation and restraint by the authorities, when technical breaches of the Regulations occur, in which there is evidence that reasonable and proper care has been taken to avoid them. For example, a difficulty arises in the case of cleverly forged prescriptions; the onus of the discovery of these appears to rest with the pharmacist, and, in some cases, even with every reasonable precaution the discovery of such forgery would not be practically possible.

One very difficult question is the continued prescription by medical practitioners of drugs for addicts. I have mentioned instances of incurable addiction where such prescription in amounts as small as can be tolerated is imperative for the preservation of a certain degree of health. On the other hand, the treatment of curable cases by ambulatory methods is to be condemned.

There is no legal power of compulsion for institutional treatment in cases of addiction, except in the very rare cases where the drug is taken as drink, and then possibly the provisions of the Inebriates Act of 1898 might be called into action. For practical purposes this Act is quite powerless in dealing with drug addiction.

From the purely medical aspect it would, in my opinion, be desirable that legal powers should be given whereby drug addiction can be treated by compulsory institutional treatment. At a recent discussion at the Medico-Legal Society (March, 1923) on this subject the legal opinion was emphatic against the advisability, at present, of institutional treatment being made compulsory in cases of drug addiction. Moreover, the special institutions and staffs that would be required for the treatment of large numbers of cases of drug addiction do not, at present, exist in this country, and provision for them would be necessary before any legal enforcement for compulsory treatment were enacted.

Dr. H. A. BurrIDGE gave the Medico-Legal Society last March a very carefully thought out paper on "State effort to rescue victims of drug addiction." In this paper the hardships caused to drug addicts and to the medical profession in the United States by the harshness of the existing laws and regulations were forcibly dealt with.

In America the Narcotic Drugs Acts and Regulations appear to have been framed on the assumption that addiction was a vice and not a disease. The restrictions as regards medical practitioners have been such that large numbers have refused to have anything whatever to do with drug addicts. The drug addict is often prevented from getting by legitimate means any supply of drug to tide him over a period preceding the commencement of a course of treatment, with the result that the illegitimate traffic of narcotic drugs has become most extensive.

CONCLUSIONS AS TO MORPHINE, HEROIN, AND COCAINE.

To sum up the present position with regard to morphine, heroin, and cocaine addiction in this country—

(1) Further research is needed on the pathology, symptomatology, and treatment of drug addiction.

(2) The regulations in force are necessary for the control of an evil which is a menace to the public health and well-being of the State, and which, if uncontrolled, would certainly seriously increase.

(3) The regulations in force are at present adequate as regards the legal restrictions imposed, and it is advisable that they should be interpreted with moderation and breadth of view as regards the difficult and imperfectly understood problem of drug addiction.

(4) Compulsory restraint for treatment of drug addicts is desirable, on purely medical grounds, but could not be generally enforced at present, owing to the lack of adequate State provision.

(5) The most effective method of carrying out the spirit of the regulations of the Dangerous Drugs Act is by the loyal co-operation of the professions concerned with the State authorities.

OTHER DRUGS OF ADDICTION.

The Veronal Group.—Barbitone or veronal, medinal, propional, dial, and luminal, are all dangerous from the liability to addiction. Their continued use leads to the development of a definite symptom-complex, such as an abnormal mental condition, in which delusions and visual hallucinations may occur. The speech may become thick and indistinct and visual disturbances may occur. The gait often becomes ataxic. The veronal habit leads to a disorganization of the moral sense. Veronal and its allies are all toxic and not free from danger where idiosyncrasy is present. There is a great danger of the development of addiction. A common sequel of veronal addiction is suicide, and I have seen a number of such cases. Usually a large dose is taken with the intention of suicide. In one case a young woman, who was the victim of the veronal habit, drank a large quantity of lysol with fatal result. None of the drugs in this group should be obtainable except on medical prescription. At present they are included in Part I of the Poisons Schedule and can be obtained by the public on signing the Poisons Register. I regard all the members of this group as most dangerous hypnotics and strongly advise their avoidance.

Cannabis Indica (Indian hemp) is in common use in Egypt and Eastern countries as a drug of addiction. Bhang or hashish is the name given to the preparation, consisting of the leaves, small stalks, and fruits. "Charrish" is the term applied to the preparation of the plant prepared for smoking. The drug produces pleasurable sensations and is a deliriant poison. A case of its sale in this country as "Persian opium" has recently occurred. Owing to its narcotic and addiction effects it would be desirable for the drug to be added to those included in the Dangerous Drugs Act.

Sulphonal and its homologues, trional and tetronal, are common hypnotics. They may give rise to addiction, and then suicide is not unlikely. It would be desirable that they should only be obtainable on medical prescription.

Paraldehyde may give rise to addiction. The symptoms of the condition are similar to those of alcohol and the treatment the same.

Ether may give rise to addiction, but is rarely met with in this respect at the present day.

Chloral also may give rise to addiction, but its use for such purpose is much rarer than formerly.

Chloroform addiction may arise from repeated inhalations. In one case seen by me a few years ago the patient, who was a scientific man of neuropathic type, inhaled the drug, with the object of killing the germs causing a chronic nasopharyngeal catarrh from which he suffered. The drug caused hepatitis and jaundice which ultimately proved fatal.

Dionin has only feeble powers in the causation of addiction, though a few isolated cases are recorded. It has been used in the treatment of morphine addiction, and is of some value in warding off withdrawal symptoms. It is not included amongst the dangerous drugs.

Codeine is not really dangerous as an addiction drug, and has been wisely excluded from those in the Dangerous Drugs Act.

CONCLUSION.

With regard to legislation relating to drug addiction, let us have confidence in those experienced administrators who have charge of this aspect of the question. Let us be temperate in our desires for new legislation, remembering that too hasty legislation may do more harm than good. It is only by the steady method of advance, each step having been carefully thought out and considered in all its aspects, that true progress will be made.

COCAINE AND ITS SUBSTITUTES.

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PURELY as a local anaesthetic, cocaine is probably unsurpassed. Disadvantages are, however, associated with its use, especially its toxicity, the varying susceptibility of individuals to its toxic action, and its instability.

An endeavour has therefore been made to examine the evidence available from the clinical side on these points; and further, by experiment, to compare cocaine and some of its substitutes, particularly two recent introductions—*butyn* and *atoxodyne*.

The toxicity of cocaine appears to be less than is frequently asserted. The evidence as to "idiosyncrasy" is scanty; and, especially in the most interesting cases of reported death from small doses, the accounts are so meagre as to preclude any chance of criticism.

EVIDENCE OF REPORTED CASES.

The evidence of published cases was examined to discover if possible how far the alleged variable toxicity of cocaine is due to "idiosyncrasy" of the patients, and how far to varying methods of administration. Fifty fatal and very many more non-fatal accidents were investigated. The total available references in the medical libraries of Bristol University and the Royal Society of Medicine extend over a period of about forty years. In a number of cases it was found that reports have been copied from one journal to another several times, often with loss of accuracy.

Deaths Wrongly Ascribed to Cocaine.

Examination of the reports showed that of the fatal cases four seem to have been wrongly ascribed to cocaine poisoning.^{1,2} For example: (a) Dental injection, dose unknown; the patient became ill on the eighth day and died on the eleventh. Autopsy=septicaemia; coroner's verdict, "blood poisoning." No mention or evidence of poisoning by cocaine. (b) Abadie's patient, aged 71, received two-thirds of a grain subcutaneously. She was considered at the time to have died of apoplexy (second attack). Neither time nor mode of onset of symptoms, nor appearance after death, correspond with cocaine poisoning.

Dose of Cocaine Used in Fatal Cases.

The remaining cases include all those in which, though details are lacking, death was ascribed to cocaine poisoning. It is to be remembered that cocaine in the last century was used with a freedom and in a dose now uncommon. For example, one surgeon reports 1,600 operations in which injections up to 4 grains were given as a routine, with no serious accidents³; another frequently injected over 1 grain in children, but not under 3 years old⁴; a third had alarming accidents among infants between 3 and 6 months old, from spraying or swabbing the fauces with 4 per cent. solution⁵; a fourth