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The Menace of Morphine Heroin and Cocaine

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INTRODUCTION

This pamphlet is intended for the non-professional reader, but we trust that those interested in medicine and drugs may read it with profit. Its subject matter has been derived from many sources and is put down with little claim to originality. Its brevity prevents the consideration of the details and exceptions which a full treatment of the subject would embrace, but the principles and general statements contained herein have been scientifically demonstrated, and the pamphlet as a whole may be accepted as correct and dependable. Although there are many other drugs that develop types of addiction, our discussion in this pamphlet will deal only with the more dangerous poisons, morphine, heroin, and cocaine, which at present are making such inroads in our civilization.

Our purpose is to begin, in and out of our schools and colleges, the *systematic education* of our youth against the use of narcotics, an education now almost totally lacking. For State and National laws may be made and amended, International Conventions may be signed, but their observance and enforcement depends upon individual opinion grounded in a full knowledge of fact.

We hope this pamphlet will broadcast enough information to inspire this general education, to place every reader on guard, and to bring about a kindlier state of public opinion towards the millions of unfortunates who, knowingly or unknowingly, have become the tragic victims of what is called the "drug habit."

A SPREADING DISEASE

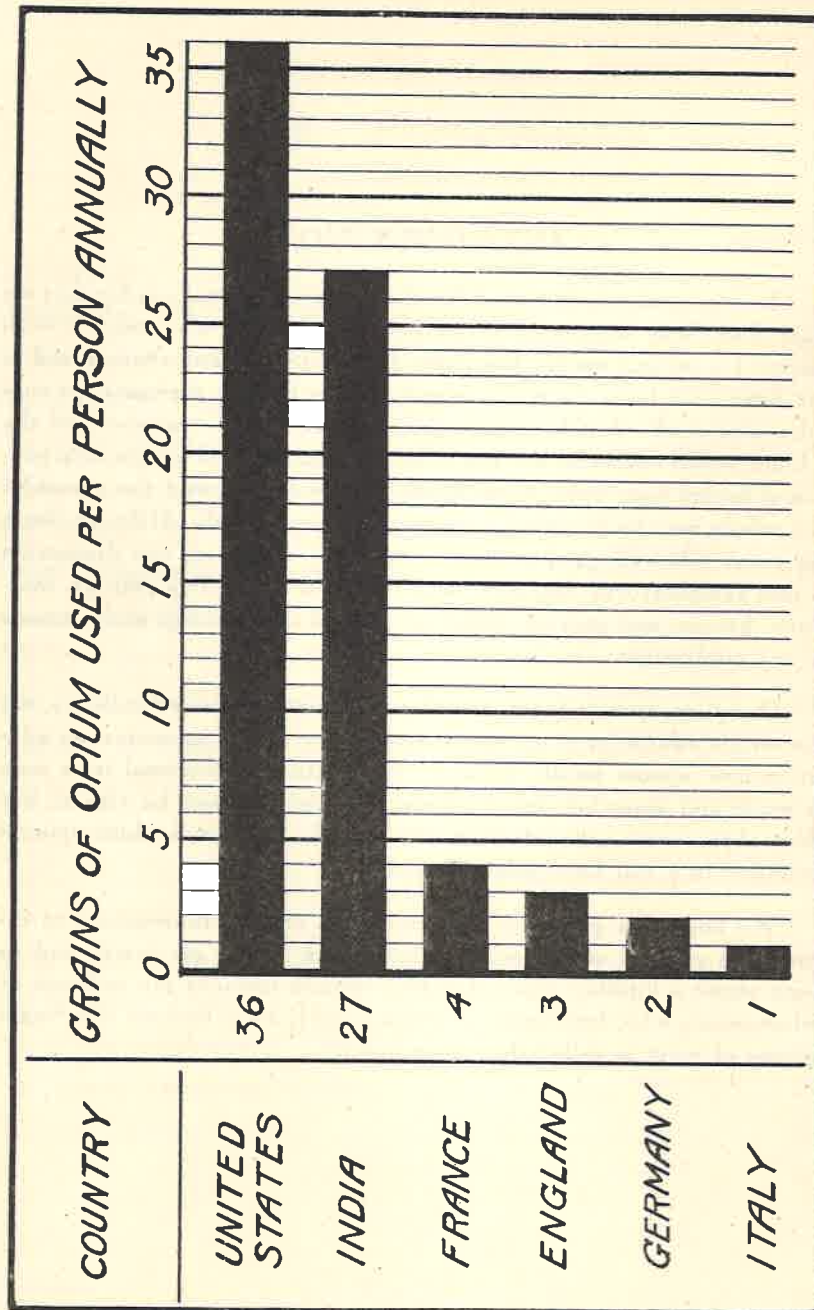


FIG. 1—The per capita consumption of opium (1910 to 1915)

"The United States uses more opium per person than any other nation in the world." These are the words of Tarini Prasad Sinha of Benares, India, spoken recently at the International Convention held at Toronto. His complete statement is, "The annual consumption of opium per person in Italy is one grain; in Germany, two grains; in England, three grains; in France, four grains; in India, twenty-seven grains; and in the United States, thirty-six grains." This statement is evidently based upon the figures presented in a special report of the Treasury Department, entitled "Traffic in Narcotic Drugs," which show that from 1910 to 1915 the average annual importation of opium into the United States for home consumption was 471,043 avoirdupois pounds, or an equivalent of thirty-six grains per person. These figures represent conditions prior to the passage of the Harrison Narcotic Act, and probably are too small to portray correctly the present situation, if the amount smuggled into this country were known.

An idea of what this average annual consumption of opium means may be gained from the following calculation: If the morphine which is derived from these thirty-six grains of opium were dispensed in the usual doses of one-eighth of a grain each, it would be sufficient to keep every person in the whole United States more or less under the influence of an opiate for twenty-nine days each year, or about a month. Our total consumption of opium at the present time is sufficient to supply a million addicts, even if there are no more¹, with a grain of morphine every day, which is eight times as much as is usually administered at one dose by a physician to a normal person.

It is to these addicts who must have their opiate every day that the enormous consumption of opium in this country is largely chargeable, because physicians today less frequently prescribe it than they did formerly when fewer pain-killing drugs were known. In India it is estimated that these addicts number four millions; in the United States the number is probably no smaller. An unofficial estimate places the number of drug addicts in New York State alone at half a million. A recent news item, emanating from the Treasury Department, says that one person in every seventy-three in the United States is known to be an addict.

The Nature of Existing Laws.—The Harrison Narcotic Act of 1914 is intended to control the manufacture, sale, and use of narcotic drugs and to suppress smuggling; that it has resulted in a decrease in the legitimate trade is indicated clearly by corresponding figures for 1916 to 1921, during which period the annual importation of opium dropped to 178,255 pounds or about 12.5 grains per person. This average of 12.5 grains per person does not include the derivatives of opium

¹The report of a special committee appointed by the Secretary of the Treasury, dated April 15, 1919, says, "The committee is of the opinion that the total number of addicts in this country probably exceeds 1,000,000 at the present time," but that was four years ago.

smuggled into the United States by the "dope" peddlers since the passage of the Harrison Narcotic Act.

There is reason for believing that some of the opium legally imported eventually reaches illicit trade channels, but the exact amount cannot be determined; it is known that thirty-five per cent of the narcotics confiscated by the Internal Revenue Department under this act is manufactured in the United States; and there is good reason, also, for believing that the decrease in the legitimate trade has been more than offset by the increase in the illicit trade. The investigation conducted by the Treasury Department in 1918 showed in general that there had been a decrease in narcotic drug consumption in the smaller places, but that there had been an increase in twenty of the larger cities, notably New York, Chicago, Philadelphia, San Francisco, Detroit, Toledo, Wilmington (Del.), and Kansas City (Mo.).

The Jones-Miller law, passed by Congress in 1922, limits the importation of opium and coca leaves to the amount actually needed for scientific and medicinal purposes, and authorizes a Federal Narcotics Control Board, composed of the Secretary of State, the Secretary of the Treasury, and the Secretary of Commerce, to determine the amount of these crude products needed annually and to limit importation to that amount. Under this law, morphine, heroin, and cocaine, as such, cannot be imported, but only gum opium and coca leaves. The same law also prohibits the exportation of opium and its derivatives and also of cocaine from the United States, unless there is an actual medical need for these drugs in foreign countries. It aims to prevent manufacturers from selling these drugs to purchasers in Mexico, Canada, and Japan, and other countries, possibly to be smuggled again into this country. In 1920 over one-third of the opium imported was exported, principally to Japan, but that year was exceptional.

In 1920 the Federal Government made a ruling to the effect that no opium shall be imported that does not contain at least 9 per cent of morphine, thereby virtually excluding from our legitimate markets all opium grown in India, which averages only 8½ per cent of morphine. As a consequence, the Indian opiates reaching this country must come through illicit channels and must have been manufactured elsewhere. Despite the laws which have already been enacted and the regulations which have been made to enforce them, the "underground" traffic in narcotic drugs has increased and the Nation is no better off in this respect than it was before it attempted to regulate and control this narcotic problem.

The traffic in "dope" has become so widespread in this country that Federal authorities are unable to curb it under existing legislation and appropriations. Joseph Burke, United States District Attorney for Southern California, is credited with saying that 60 per cent of the time of the two Federal grand juries at Fresno and Los Angeles is taken up with cases of violation of the Harrison Narcotic Act, that the present force of sixteen narcotic agents for the whole Pacific coast is insufficient to control the menace, and that the National force of 163 agents and the Federal appropriation of \$750,000 are not large enough to cope successfully with the problem.

So much for the consumption of opium. How much cocaine do we use? National figures on the consumption of cocaine show that from 1910 to 1915 the United States imported 1,048,250 pounds of coca leaves annually, or an amount sufficient to supply each person in the population with two-thirds of a grain of cocaine. This annual allowance, if uniformly distributed and administered in doses of one-fourth of a grain, would keep the Nation more or less under its influence for about three days. These figures are undoubtedly too small since they evidently do not include the cocaine smuggled into this country by the stealthy "dope" peddler. Furthermore, they do not include the manufactured cocaine and related chemicals legally imported, which averaged 2,916 ounces for the six-year period beginning in 1910.

From the foregoing figures on drug consumption, it is apparent that we are now using annually 36 grains of opium (which yields 3.6 grains of morphine), and about 1 grain of cocaine per person in the entire population; therefore, it is evident that the "opiate" invasion is at present more menacing and threatening to our civilization than the impending dangers of cocaine addiction.

ADDICTION AMONG SCHOOL CHILDREN

This so-called "dope" evil is spreading so rapidly even among our children, that high school students and even pupils in the elementary grades are falling prey to it through the agency of the illicit "dope" peddler. We have new official proof of this fact. A recent report of the Federal Grand Jury at El Paso, Texas, states: "It has come to our observation that boys between the ages of 12 and 15 years are being taught the use of narcotic drugs, that these boys once in the grip of this vice, sell the clothes that their parents provide for them, steal and indulge in other petty crimes for the purpose of obtaining funds to satisfy their cravings engineered by the drug habit. We find that one boy has stated to officers of the law that he has about twenty companions of his own age who are drug users. Another boy disclosed that there are forty of his child companions using narcotics. Peddlers of drugs are giving it away to some children to create narcotic addiction, thus enlarging the demand for their illicit traffic." A government official stated, "if you had seen the child witnesses called before the Grand Jury during the investigation, you would have realized that it applied to Americans and Mexicans alike."

The report (April 15, 1919) of the special committee, appointed by the Secretary of the Treasury to investigate the secrecy of the drug traffic, states, "The range of ages of addicts was reported as 12 to 75 years. . . . Most of the heroin addicts are comparatively young, a portion of them being boys and girls under the age of 20. This is also true of cocaine addicts."

Nearly all American children go through our schools without obtaining adequate information about these habit-forming narcotics and their effects on the human system. Ignorant of the exact nature of

opiates and cocaine and of the fact that indulgence is inevitably followed by addiction disease, they accept the suggestions of those who are themselves secretly addicted, or who are engaged in the illegal sale of the drugs, to secure relief from any temporary ache or pain that may annoy them, and thus unwittingly acquire the disease of opiate addiction.

We cannot expect our school children to learn what is not found in their text-books, or concerning those things about which little or no instruction is given. To show that our text-books are woefully lacking in the subject matter bearing on narcotics, a few results of an investigation are presented. This Association has just made a survey of almost 100 text-books on physiology and hygiene used in the public schools throughout the United States. Out of the 18 text-books widely used in high schools, 5 contain nothing whatever about opiates. In the other 13 text-books, less than two pages on an average is devoted to a consideration of the subject. If all the material in all the 13 books were brought together in a single volume, one would get a fair conception of the effects of opiates and cocaine on the system, but when taken separately, as they must be in class-room instruction, they fail to give the treatment which so serious a subject requires.

For instance, only 8 authors state that opium is a narcotic drug; only 9, that its continued use results in an almost unbreakable habit; only 6, that certain "patent medicines" contain opium; only 4, that laudanum is opium dissolved in alcohol; and only 4, that paregoric is a dilute solution of opium. Only 5 authors say that opium makes physical wrecks; only 4, that it affects the mind; only 4, that it destroys morality; and only 1, that its use calls for increasing doses. Although heroin is now probably the leading and the most dangerous drug of addiction, only one author ventures to mention it.

Even such treatment as is given to the subject of habit-forming drugs in these text-books pertains more to their use as medicines or as drugs which may cause acute poisoning, than to their abuse as habit-forming narcotics which wreck the physical and mental life of all who become knowingly or unknowingly addicted to their influence.

But all high school students do not get even this meagre instruction, because in a majority of secondary schools a course in physiology and hygiene is not offered and even when the subject is taught, it is not often required of all students. Few universities and colleges today will give entrance credit for work done in this subject in high school—a fact which discourages schools from offering it and students from taking it when it is offered.

That our schools are not functioning properly in this branch of instruction is clearly indicated by Dr. Dana S. Hubbard when he states that "80 per cent of the addicts visiting the New York Department of Health Clinic are young men and women just out of their teens." This proportion does not indicate that 80 per cent of all the addicts in New York City are young men and women, but that four-fifths of those who applied to the clinic were just out of their teens.

Therefore, since the average citizen of the United States has not received a high school education, we may fairly assume that the average adult in our population is not well informed about the evils of drug addiction. For, despite the material current in the daily press as news, there is very little specific knowledge as to the causes and cure of narcotic addiction, and very little appreciation on the part of fathers and mothers and of boys and girls of the perils that lie in the use of the principal narcotics, morphine, heroin, and cocaine. It is the purpose of this pamphlet to supply this information and to rally the forces of public opinion to the eradication of the evil.

Dr. Amos O. Squire of Sing Sing says that most addicts acquire the habit in the early twenties. Mrs. Ellen La Motte says that 20 per cent of addicts begin to use narcotic drugs before they are 20 years of age, and that 35 per cent acquire the habit under 25 years of age.

THE NATURE OF HABIT-FORMING DRUGS

Before discussing the general question of drug addiction, it is desirable to learn something about the history, appearance, and nature of these narcotics and how the body reacts to their presence. This information will enable the reader to detect them the more readily and assist him in forestalling any attempt on the part of designing "dope" peddlers to inveigle him unknowingly into the use of these drugs.

First, let us find out where these drugs come from. Both opium and cocaine come from the vegetable world, one from the flower and the other from the leaf of a plant. Opium is the dried juice of a poppy plant grown extensively in Southern Asia, but chiefly in India. It is secured from the plant by making cuts in the partially ripened poppy heads and by scraping off the gummy substance which oozes from the incisions. The crude opium is a reddish brown sticky substance with a peculiar odor and a very bitter taste. Cocaine comes from a shrub called the coca plant which is grown chiefly in South America. The drug is obtained from the dried leaves of this plant. Like opium, it has a very bitter taste. Cocaine forms only about one-fifth of one per cent of the green coca leaves but about one per cent of the dried coca leaves, such as are shipped to the United States.

Opium is the "mother" of a whole family of poisonous narcotics. There are twenty "children" in this family, and they all have names ending in "ine," but only two of them concern us here, *morphine* and *codeine*. We frequently refer to these children as *opiates*, meaning that they are somewhat like the mother drug, opium. Morphine, which constitutes about one-tenth of crude opium, is the most poisonous reptile in this family. Morphine seldom appears outside of chemical laboratories unless it is "married" to some other drug, but it is always the "boss" in the new household and never surrenders its poisonous nature. When it is combined with a form of sulphur, it goes under the name of *morphine sulphate*. Codeine is seldom married when it appears in the public market place. It is a very valuable drug in medi-

cine and, though habit-forming like its brother morphine, it is not often used as a drug of addiction.

Morphine, like opium, also has a family of children, all of which have names ending in "in," and all of which are poisonous. Two of these off-spring, *heroin*¹ and *dionin*, are of special interest to us—the former because it is the most poisonous opiate known, the latter—because it is used for curing those who become addicted to morphine and heroin. Heroin is the most heroic child in this family, being from two to four times as strong as its father, morphine. Both the father and the son are habit-forming poisons and produce a disease called *addiction*, in the people who are unfortunate enough to use them.



FIG. 2—The Opium-Producing Poppy

The picture at the left shows the poppy in bloom. When the petals fall off the flower head develops into the capsule shown at the right. The vertical lines on the capsule represent the incisions through which the sticky opium exudes.

It kills and lets live—*Dr. John A. Riley*

¹Heroin is a compound made artificially from morphine and is technically known as diacetylmorphine hydrochloride.

Cocaine, like morphine, usually appears in public places only when married to some other drug, such as chlorine; but, unlike morphine, it has no children or brothers or sisters of any importance. The wedded name of cocaine is *cocaine hydrochloride*. Both forms of cocaine are exceedingly poisonous when taken into the human system, and are habit-forming.

The reader asks why some of these deadly drugs seldom appear on the market. The answer is simple. Practicing physicians need drugs that are soluble in water, so that they may be readily injected into the bodies of their patients by means of a hypodermic needle. For the same reason addicts have no use for narcotics that have to be dissolved in alcohol before they can use them. Since the crude opium and the pure morphine and cocaine (although soluble in alcohol) are not soluble in water, there is little commercial demand for them.

Thus it is seen that only three of the narcotic drugs considered meet all the requirements of physicians and addicts, viz, morphine sulphate, heroin, and cocaine hydrochloride. In the vernacular of the layman the terms, morphine, heroin, and cocaine, generally refer to these respective chemical compounds. In conformity with this custom the more popular phraseology will be employed throughout this pamphlet in referring to them.

How may these deadly compounds be recognized outside of chemical laboratories by those who have had no experience with them? The answer is complex. In some respects they are all alike:

First, they are all white or colorless crystalline powders (unless put up in tablet form), not unlike pulverized sugar.

Second, they are all as odorless as a piece of steel.

Third, they all have a bitter taste, the morphine and heroin being very bitter.

Fourth, they are all soluble in water.

Fifth, they are all habit-forming and if used for a sufficiently long time, they will create a desire to continue their use.

In certain other outstanding respects these narcotic drugs are very different. When taken into the mouth cocaine is the only one that numbs or paralyzes the nerves of taste and produces a tingling sensation. While under its effects, the tongue could be amputated with very little, if any, pain. When they are sniffed into the nose, cocaine is the only one that destroys the sense of smell. If the drugs are injected beneath the skin with a hypodermic needle, cocaine paralyzes the flesh around the point of administration, whereas morphine and heroin do not deaden the flesh at the point of injection but produce sleep and kill pain in any part of the body. When they are taken into the body in any manner cocaine causes the pupil of the eye to dilate, but morphine or heroin causes it to contract to pin-point dimensions. Cocaine excites and stimulates the user, but morphine and heroin depress mental activity.

These characteristics of these drugs should enable the average person to formulate a well-founded opinion about them. The chemist alone can detect and distinguish them with absolute certainty.

All of these narcotic drugs are so powerful that very small quantities have profound effects on the human body. For instance, one-eighth to one-quarter of a grain of morphine is sufficient to relieve pain and induce sleep, but only one-twenty-fifth to one-eighth of a grain of heroin is used for this purpose. In fact, one-eighth of a grain of heroin has such a pronounced effect that this amount is seldom administered. The usual dose of cocaine is one-fourth of a grain, but it is administered in very dilute solutions.

The three drugs under discussion are all related in a chemical way, but their formulas are too complex to be considered in an elementary treatise of this type. Suffice it to say that each contains carbon, hydrogen, nitrogen, and oxygen, and that the composition of pure cocaine differs from that of pure morphine only to the extent of two added molecules of water.

THE ACTION OF OPIATES ON NORMAL PEOPLE

The action of morphine on a person who has not become addicted to its use has been carefully described by many and is summarized somewhat as follows by Cushny, a well-known medical authority: Small quantities of morphine kill pain and produce sleep and drowsiness, but the sleep produced is lighter than normal sleep; the reasoning faculties are depressed and self-control and judgment are lessened; the sense of the logical sequence of things is lost, and the patient often has no idea of the passage of time or the extent of space. The sleep is a kind of dream state in which the attention wanders. The imagination is not so depressed as the reasoning abilities—a fact which often makes the patient feel that his intellectual powers have been stimulated.

Larger doses of morphine produce a dreamless sleep from which, however, the patient may be easily aroused but only for a short time. As the dose increases, this sleep becomes a torpor from which the patient can be aroused only with great difficulty and eventually all efforts to arouse the patient fail and coma, that is, profound insensibility, follows.

In this state the respiration is very slow, the pulse is regular, full and of moderate speed, but pupils of the eye become contracted to small points; the mouth is dry; the face becomes purple and congested; the skin feels warm but the temperature is often low and the breathing becomes slower and even periodic. Just before death the pupils open and the heart continues to beat freely for a short time after breathing ceases. Death results from a paralysis of the nerve centers which control respiration.

Heroin is said to have about the same effects on normal people as morphine. It is a much more powerful and poisonous drug than mor-

phine, however, and its effects on the nervous system when taken in equivalent doses, are more pronounced than those produced by the milder drug.

To relieve a patient suffering from acute morphine poisoning, keep the stomach and intestinal tract as nearly empty as possible, since the drug, according to Cushny, is excreted largely by the alimentary canal and much of it may be reabsorbed. Osborne, another well-known author of medical text-books, says that morphine is excreted largely by the kidneys, and that the urine should be evacuated regularly, by artificial means if necessary. Caffeine, the drug found in coffee, is perhaps the best antidote for morphine poisoning; atropine has antidotal properties also, but must be administered hypodermically in very small doses of one-one-hundredth of a grain. The patient should be kept awake if possible, but his energies should not be exhausted by this kind of treatment. Often it becomes necessary to carry out the well-known processes of artificial respiration to prevent the breathing from ceasing altogether. A small injection of strychnine may be given if the heart exhibits signs of failure. In treating cases of heroin poisoning the same procedure, as that described above, is followed, except in one particular—it is imperative to secure regular evacuation of the urine, since the drug is excreted largely by the kidneys.

THE ACTION OF COCAINE ON NORMAL PEOPLE

Cocaine has a more stimulating effect on normal people than morphine and in small quantities usually produces excitement. Cushny says that the person usually becomes restless, talkative, and somewhat anxious and confused, the pulse becomes faster, the temperature generally rises, and the breathing is quick and deep. The blood pressure rises at first, because the blood vessels are much contracted, but it subsequently falls. The pupils are usually dilated and headache and a dryness of the throat often follow. In some cases convulsions may seize the patient and rapid breathing sets in. In other cases fainting and collapse occur; the skin becomes cold; the heart may be depressed; and the breathing slow and weak; and death results from a cessation of respiration. During the periods of convulsion small quantities of chloroform or ether may be used to relieve the patient and morphine may be used to quiet the delirium. Cocaine relieves the feeling of hunger only because it benumbs the nerves of the stomach. Cocaine is a general protoplasmic poison. The spermatozoa are completely paralyzed in a dilute solution of it, the white blood cells lose their power to move about, and all cell life is more or less impaired and destroyed by it. The cocaine which is not burned or oxidized in the body is excreted in the urine.

Small quantities of cocaine undoubtedly relieve fatigue and may serve as a stimulant to mental work, but large amounts depress the higher centres of consciousness. The natives of Peru and Bolivia have used cocaine for hundreds of years to increase the endurance of

fatigue. The bearers of the Andes chew the coca leaves and are capable of great endurance. They are said to chew from 2 to 3 ounces of coca leaves daily, but this quantity of fresh leaves contains only 2 or 3 grains of cocaine. Since they do not use the pure cocaine of commerce, they probably do not experience all the reactions outlined above, and can continue to use it without apparent harm for many years.

Although cocaine is technically a stimulant, it must not be inferred that it is a safe drug to use. Stimulants are often as deadly and dangerous as narcotics. For instance, strychnine is a stimulant to the heart, yet it is a violent poison. Nearly all stimulants also have a reactionary effect which often makes them unsafe even to be used as temporary expedients in medicine.

HOW ADDICTS ARE MADE

The element of time alone determines whether the user of morphine, heroin, and cocaine will develop addiction to these drugs. The user has no choice in the matter, and the time required to establish addiction is indeed brief. A recent report of the Treasury Department shows that in certain unstable and susceptible people the use of morphine, heroin, or cocaine for a period of 10 days, and even in the strongest and most vigorous individuals the use of these drugs for 30 days, is sufficient to place the person in grave danger of becoming an addict. It does not matter whether the person uses the drugs upon the advice or prescription of a physician, or does so to gratify his own desires, the results are the same—if used long enough addiction disease will inevitably follow.

CLASSIFICATION OF ADDICTS IN PUBLIC AND PRIVATE INSTITUTIONS FOR THE THREE-YEAR PERIOD 1916, 1917, AND 1918, ACCORDING TO THE MANNER IN WHICH ADDICTION WAS ACQUIRED. (Report of the Treasury Department).

MANNER	Addicts in penal institutions	Addicts in public almshouses, insane asylums and hospitals	Addicts in private hospitals and sanatoria	Total Addicts	
				Number	Per Cent
Direct administration by physicians	87	280	133	500	10.7
Physicians' prescriptions	240	364	93	697	15.0
Self-medication (proprietary remedies)	18	206	117	341	7.3
Association with other addicts	974	1,275	205	2,454	52.7
Other ways, including white-slave traffic	42	355	270	667	14.3
TOTAL	1,361	2,480	818	4,659	100.0

No more valuable information could be furnished the reader of this pamphlet than that relating to the first steps leading to addiction. Our boys and girls in particular should be familiar with the primary

causes of drug addiction, because the habit is often acquired in the early years of youth.

There are six principal ways in which people get started on the road to drug addiction: first, through the use of "patent medicines"; second, by taking narcotic drugs prescribed by physicians; third, by inheriting addiction; fourth, through gratifying the craving for alcohol by substituting addiction drugs; fifth, through idle curiosity; and sixth, by taking drugs to tide them over strenuous physical and mental periods. Those who establish addiction through the first four methods often do so unknowingly and are to be pitied, but those who bring on their own misery by the last two methods do so knowingly and deserve accordingly less human sympathy. The former class constitutes the *involuntary* addicts, and the latter group the *voluntary* addicts in our civilization. But no matter how opiate addiction is established, a diseased condition results which society should attempt to alleviate and cure if possible.

Let us examine more carefully the way in which the different types of addiction arise, not for the purpose of assisting those who have already acquired the habit, but to teach our young folks how to avoid the disease which invariably follows the continued use of morphine, heroin, and cocaine.

Among the involuntary addicts are many who were started on their road to addiction through the use of such "patent medicines" as cough cures, cathartics, headache powders and soothing syrups. If the reader of this pamphlet is using a "patent medicine," he should examine the label carefully to find out whether it contains morphine, heroin, cocaine, laudenum, or paregoric. The law requires that the dangerous contents of these "patent medicines" be made public for the protection of innocent people, but unfortunately many people do not give sufficient attention to the information published. If the reader is using a "patent medicine" containing any of these drugs, he is started on the sure road to addiction for thousands upon thousands have gone this way before.

Despite the fact that many of these "remedies" contain opiates, they are often given to children by well-meaning parents who are totally ignorant of the results to which their use leads. Children are especially sensitive to opiate drugs; they more readily acquire cravings for opiates than do older people. Cushny cites the case of a child under one year of age that was killed by a single drop of laudanum. Many an addict is made in the cradle while he is sleeping under the influence of a soothing syrup, a few drops of laudanum, or a dose of paregoric.

Many persons do not know that laudanum contains about one per cent of morphine, and that paregoric, although a somewhat milder drug, contains about one-twentieth of one per cent of morphine. Four teaspoons of paregoric contain about a grain of opium, an amount sufficient to put an adult well under the influence of the drug. Intelligent parents who have learned something about the after effects of opiates refuse to give them to their children even as a temporary expedient.

They are fully aware that such compounds as paregoric and laudanum produce indigestion and leave the child in a worse physical condition than it was before the drug was administered.

Of the involuntary addicts, the greatest number perhaps contract the disease through using medicines which contain morphine, heroin, and cocaine, as prescribed to them by a physician during a serious illness when they lie helplessly under his care. It is estimated that prior to the enactment of the Federal Narcotic Law about 50 per cent of the addicts were made in this way. They were then able to have a prescription for narcotics filled repeatedly.

With physicians morphine especially plays an important role in the treatment of diseases, and cannot be entirely dispensed with, as the following typical conditions indicate. When a patient is suffering continually from some painful chronic disease, such as cancer, morphine affords relief and is often prescribed. Some one has said, "Morphine is a sheet anchor in the later stages of cancer and other painful diseases, rendering the life of the patient one of comparative comfort." It is used also to quiet a patient who has passed well into the last stages of tuberculosis, and whose violent coughing is likely to cause or revive a hemorrhage. The drug is a boon to those suffering from gall stones, for it causes the muscle gripping the stone to relax and permits it to pass on without causing pain or damage. Morphine is used to relieve the pains of those who are suffering from accidents or wounds of various kinds. It also has the effect of slowing down or stopping the peristalsis of the intestine, and is often used to stop intestinal hemorrhages in order to give the bleeding intestine an opportunity to heal. Under such circumstances, the use of the drug if continued long enough will result in cases of firmly established addiction.

The practising physician must be ever on his guard against establishing or reviving addiction. He can scarcely justify the use of morphine in the treatment of chronic afflictions unless the disease is one that will shortly and inevitably prove fatal. So long as the use of morphine is not continued to the danger point of producing addiction, it may be judiciously prescribed in the practice of medicine. The physician must use great care in administering morphine and heroin to neurotic patients, or to those who have been cured of addiction habits, because a very few doses are sufficient to establish or revive the disease with all its fearful agony. Furthermore, the sensitized nervous system of a child of an addicted mother or of one who has been nurtured on "patent medicines," often readily responds and becomes addicted under a very few doses of morphine or heroin, administered by a well-meaning physician.

One of the most secret and insidious agencies for creating involuntary addiction is the practising physician who is himself an addict. Since he cannot secure a sufficient amount of the drug of addiction through legitimate channels, he often resorts to fraud to obtain it. He may possess a large clientele to whom he can prescribe opiates on the slightest pretext, taking a chance of being able to procure from his

patients in devious ways a part of the opiate prescribed. Although this type of physician is primarily interested in obtaining the drug for himself, and does not mean to harm his patients, nevertheless, the frequency with which he issues opiate prescriptions establishes in them a craving for the drug. This exposure of unprofessional conduct is made in the interest of the general good and should cause people to look with suspicion on any physician who prescribes opiates with unnecessary frequency.

Perhaps the most unfortunate of all the involuntary addicts are the soldiers of the World War who acquired a craving for opiates through the administration of such drugs during the treatment of their wounds received on the battle fields of France. No statistics are available as to the number of such addicts, but they are undoubtedly many. They deserve pity, protection, and the most scientific treatment at the expense of the government if necessary, instead of the censure and reproach generally accorded the drug addicts of the underworld. These heroes are twice victims. They suffered for their country on the battle fields and are doomed to go through life with that horrible disease known as opiate addiction. Let no censure or reproach fall upon them.

It is often asserted that the prohibition of the sale of alcohol in this country has caused many drunkards and inebriates to seek indulgence in the use of opiates instead. Many inebriates have become addicts; but the cause of addiction may be due more to a certain inherent weakness of character, than to a craving of the system for some narcotic developed originally by the use of alcoholic liquors.

Every man, woman, and child should be familiar with the "first steps" of voluntarily becoming a drug addict. Undoubtedly the great majority of the voluntary addicts receive their first "shot" out of idle curiosity. Many of them, of course, were ignorant of the dreadful results in store for them and their bitter experience leaves them almost invariably with the desire to shake off their shackles, but with insufficient will power to accomplish their desires. This group constitutes the weak-willed addicts who are cured with the greatest difficulty and who almost invariably revert to addiction even after the most careful and prolonged hospital treatment. It is to this type of individual that the allurements and enticements of the "dope" peddler make the most successful appeal. They constitute that neurotic class in whom a few injections of opiates readily set up an intense craving for the drug. Since they are the weaker links in society, they should not be criticized severely but should receive the same consideration that is accorded the feeble-minded and the insane.

CLASSIFICATION OF ADDICTS IN PUBLIC AND PRIVATE INSTITUTIONS FOR THE THREE-YEAR PERIOD, 1916, 1917, AND 1918, ACCORDING TO THE PREDISPOSING CAUSE OF ADDICTION. (Report of the Treasury Department).

PREDISPOSING CAUSE	Addicts in penal institutions	Addicts in public almshouses, insane asylums and hospitals	Addicts in private hospitals and sanatoria	Total Addicts	
				Number	Per Cent
Low mentality or arrested development.....	198	924	102	1,224	32.3
Nervous diseases.....	55	266	195	516	13.6
Chronic or painful illness.....	49	590	180	819	21.6
Surgical operations.....		160	154	314	8.3
Other causes.....	125	595	200	920	24.2
TOTAL	427	2,535	831	3,793	100.0

Many of these voluntary addicts have unstable nerve forces and general physical instability, which make them easy victims to drug habits, and yet many addicts come from the highest walks of life and not a few possess superior mental ability. Sometimes even attorneys and physicians standing high in their profession resort to morphine, heroin, or cocaine to tide them over some particular period of stress and strain. If these periods are of sufficient recurrence drug addiction will inevitably result. They have fallen a prey to a self-inflicted disease.

In the making of these voluntary addicts, the illicit "dope" peddler is the greatest malefactor. A report based on returns from 388 cities, or about 32 per cent of the total number, indicates that there are 1,800 "dope" peddlers. We are informed that about 75 per cent of these peddlers are foreigners who have no regard for the welfare of the American people. He stands on the street corner or prowls about in obscure places and entices boys and girls to take their first "shot." This wiley "dope" peddler often induces young folks to indulge in drugs by assuring them that the "dope" will relieve toothache, headache, or any other pain, and that it will enable them to be brilliant in their studies or prize winners in athletics. He has even invaded society of the higher class and "drug-parties" often honor his trade.

When he finds he has the victim firmly in his grasp he will encourage this unfortunate to seduce others, frequently furnishing the "dope" without cost. He is entirely devoid of conscience, for when the addict reaches the state when he feels that the drug is as necessary to his life as food and air, the peddler practices methods of extortion by raising the price of the drug and encouraging his victim to indulge in crime to secure money with which to purchase it. He is the arch fiend of our civilization, deliberately turning the innocent into victims whom he tortures and kills by a medieval process of prolonged pain.

OPIATE ADDICTION AS A DISEASE

Opiate addiction is a disease. This fact is now thoroughly established and is generally recognized by the medical profession. It is high time indeed that it be so accepted by the public and by those charged with making the laws governing the sale of opiates and regulating the management and care of addicts. This affliction, known as "opiate addiction disease," follows with absolute certainty the continued use of opium and its derivatives, morphine and heroin. It is the popular belief that morphine and heroin users take these drugs to produce highly pleasurable sensations. This is a mistake. Hundreds of addicts bear testimony that they do not take these drugs for the agreeable feelings resulting, for they experience none, but solely for the purpose of keeping themselves in a condition of well-being.

The sudden withdrawal of the drug from an opiate addict is followed by a train of alarming symptoms. One writer on this subject says, "As the time approaches for the usual dose there is a marked restlessness, followed by excitement and later by chills, pallor, nausea with perhaps vomiting, and diarrhea. Horrible mental depression and melancholia are present and there may be hallucinations of vision and hearing, passing into violent delirium. At this stage collapse may set in; the patient becomes faint, the limbs twitch, and radical impulse becomes imperceptible, and unconsciousness supervenes."

Bishop in an article on Narcotic Addiction, published in Journal of the American Medical Association in 1913 has so well described the "withdrawal" symptoms of opiate addiction that his observations are worth quoting, "in a general way they [physical reactions] may be said to begin with a vague uneasiness and restlessness and a sense of depression; followed by yawning, sneezing, excessive mucous secretion, sweating, nausea, uncontrolled vomiting and purging, twitching and jerking, intense cramps and pains, abdominal distress, marked circulatory and cardiac insufficiency and irregularity, pulse going from extremes of slowness to extremes of rapidity with loss of tone, facies drawn and haggard, pallor deepening to greyness, exhaustion, collapse, and in some cases death."

Osborne, in his text-book on therapeutics, says, "The symptoms from withdrawal are nervousness; sleeplessness; lack of mental concentration; more or less lachrymation; increased secretion of mucous membranes; sometimes sneezing, muscle twitchings, perhaps cramps, bowel cramps and more or less diarrhea; generally a rapid pulse and low pressure; and widely dilated pupils."

These statements of physicians who have had wide experience in observing and treating addicts ought to convince the most skeptical that opiate addiction is a disease and that the withdrawal of the drug is accompanied by certain physical reactions and manifestations.

Experienced physicians state that this period of violent torture continues for not less than 36 hours and seldom longer than 120 hours. During this time the patient suffers all the agony that it is possible

for a human being to bear. But the symptoms do not end here, for stabbing pains continue to remind the patient of his drug privation. The "thrusts" are so severe that the addict finds comfort and peace only by resorting again to the use of the opiate which produced his misery.

Many people are under the misapprehension that the opiate addict can refrain from using drugs without suffering anything but mental agony and distress. This, too, is a mistake. If the body reacted in its normal way after the withdrawal of the drug, this popular conception of opiate addiction would be correct and the mere confinement of the patient would cure his addiction in a due course of time. No amount of so-called will power is sufficient to stay and counteract these intense cravings and no type of mental treatment yet devised has ever met with any measure of success in relieving this distress and effecting a cure of which we have record. It is quite true that the mind suffers with the rest of the body, when the drug of addiction is withheld, as indicated by the testimony quoted above, but no change of view-point or mental resolve is sufficient to off-set the physical agony and torture resulting.

It would seem from the descriptions outlined above that a case of established addiction would be readily detected even by one who has had no medical training. Yet we are told that the addict who is neither under-dosed nor over-dosed with his drug almost defies detection. The stigma placed upon addicts forces them to use every means to conceal their habits. If an addict's condition becomes known he is sure to lose his prestige in the business world and he may thereafter be unable to support his family in a legitimate way. So great is the reproach accorded an addict that even his own family and his closest friends may turn away from him in utter disgust, when his true status is revealed. Furthermore, the methods by which the addict secures his drug makes him a criminal in the eyes of the law and prompts him to use every means in his power to conceal his secret.

Therefore, the drug addict may pursue his downward course for many years undetected even by his nearest associates. We are told that physicians are often unable to detect cases of drug addiction unless they subject the addict to clinical tests. When this is done the habits of the person under suspicion are laid bare. Five simple methods are usually employed in diagnosing cases of addiction: first, if an examination of the stool or the urine shows traces of the drug, addiction is surely indicated; second, if a secret injection of morphine or heroin fails to produce drowsiness and relieve pain, the patient is unquestionably an addict; third, if the patient is isolated or kept in confinement, and deprived of all drugs, the "withdrawal" symptoms described above invariably appear in a very short time; fourth, the "pin-point" pupil of the eye usually furnishes a clue; and fifth, small needle marks or tiny abscesses on the front of the body usually indicate opiate addiction.

So far we have described only the symptoms of the disease as they appear when the drug of addiction is withheld. These are by no means all of the usual characteristics of addiction as they are manifested in those who are consuming the customary doses of the opiate. One writer on morphine addiction says, "The early stages of morphinism are marked by moral degeneration; the patient seems to lose all sense of right and wrong, and will lie most plausibly and even thieve to obtain the drug; personal disorderliness, disregard of time, neglect of business, and decline of family affection soon become evident. Physical symptoms soon appear; the face assumes an earthy color, the body wastes, constipation is usually present to an extreme degree, the secretions become arrested, loss of appetite and indigestion follow, and the mouth is parched. The nails become brittle and the skin is dry; sterility shows itself in women and sexual impotence in men." Osborne adds that the blood pressure is likely to be low and that the thyroid and suprarenal glands are generally very much disturbed.

No matter how addiction begins, there are very few addicts who do not wish to be freed from the shackles which bind them. Often too late they realize that they have fallen into the clutches of a vice which grips them body and soul. If they once experienced pleasure in such indulgence, this reaction has long since passed away and they find that the drug of addiction is as necessary to their existence as water and air, as bread and meat. They are sick and the stimulating opiate is now required to keep them in a state of well-being. Their mental, moral, and physical natures are wrecked. They are generally in destitute circumstances and are often unable to buy the food necessary to sustain life. This condition awaits the man or woman, the boy or girl, who idly partakes of these narcotics, who resorts to "patent medicines" containing opiates or who alleviates every ache and pain with an injection of morphine or heroin.

COCAINE ADDICTION

While cocaine probably stimulates mental activity, produces more or less pleasurable sensations, and undoubtedly increases the endurance of fatigue, it should not be inferred that it has no harmful effects whatever on those addicted to its use. Osborne says, "The cocaine habit is more deplorable than the morphine habit, as the demoralization and systemic injuries that cocaine causes are greater than those caused by morphine. No patient can take cocaine for any great length of time without being seriously injured." Although cocaine relieves hunger it is not a food, for the addict gradually wastes away and becomes somewhat emaciated, exhibiting all the physical characteristics of starvation. The allayed feeling is due entirely to the paralyzing effect of the drug on the nerves of the stomach. As a result the cocaine addict usually suffers digestive disturbances, loses his appetite, and is unable to sleep soundly.

Cocaine is a general protoplasmic poison but it works its greatest havoc on the central nervous system, causing the brain tissues to de-

generate. Its continued use, Cushman states, causes "tremors and occasionally convulsions, hallucinations, insanity, and delirium." Cocaine addicts frequently experience dreadful delusions, not unlike delirium tremens in the inebriate, known in the vernacular of the addict as "bull horrors." When these delusions are present the addict fancies that he is being pursued and watched and is afraid to venture out of the house or to appear in public places lest some dreadful calamity may befall him.

It is generally much more difficult to detect cases of cocaineism than morphinism. Infection frequently follows hypodermic injections of cocaine and abscesses often result: these furnish the clinician a clue to detect the habitue who administers the drug hypodermically. An analysis of the urine may show only slight traces of cocaine, since most of the drug is oxidized in the body and only a small part of it is excreted by the kidneys. Unlike morphine, it is not excreted by the intestine. Cocaine addiction is probably present if the patient under suspicion is stimulated to excitability and talkativeness when the drug is used, and suffers very great depression and melancholia when it is withheld. The dilated pupils of the cocaine addict when he is under the influence of the drug also furnish a clue in the diagnosis. If, however, the cocaine addict also uses morphine or heroin, this behavior of the pupil does not result, because these opiates cause the pupil to contract to pin-point dimensions and tend to off-set the usual ocular response to the presence of cocaine.

In cases of cocaine addiction the nasal septum is frequently perforated, the drug actually destroying the "partition" between the nasal passages. The same effect is sometimes noticed in cases of heroin addiction also, if the drug has been "sniffed."

It should be clearly comprehended at this point that no physical "withdrawal" symptoms of any consequence occur when the cocaine addict is deprived of his drug. The diagnostician, therefore, can not depend upon the appearance of disturbed bodily reactions to furnish a clue to the existence of cocaineism in his patient. Such addicts experience only mental and nervous disturbances when the drug of addiction is withheld, but those may be intense, as Cushman has pointed out. Cocaine, unlike morphine, is usually taken, therefore, not for the purpose of avoiding physical agony, but to relieve depression and to produce pleasurable stimulation and excitement.

THE CAUSE OF ACUTE SUFFERING IN OPIATE ADDICTION

The intense "withdrawal" symptoms of opiate addiction have already been described but so far no attempt has been made to explain them. Several theories have been advanced by the medical world, but none more satisfactory than the antitoxin or antibody theory. What is this theory? Many disease-producing germs or bacteria which enter our bodies, throw off waste products more or less poisonous to us. These waste products or solutions are called toxins. The human body

is capable of producing solutions to neutralize these toxins or poisons produced by various disease germs. These counter solutions are called antibodies or antitoxins.

For instance, when the vaccine for small-pox enters the body the system starts at once to make a solution to neutralize the virus or toxin produced by the germs in the vaccine. The body responds vigorously by producing the antibodies in amounts sufficient not only to off-set the influence of the vaccine, but also to fortify the body against future attacks of small-pox for many years. The person who is recovering from vaccination has in his blood a new substance, the antibody for small-pox, which thereafter prevents the small-pox germ from gaining a foothold in his system. Fortunately, this antibody produces no discomfort in the patient and he does not become "addicted" to vaccine because of the presence of the new solution in his blood.

In such a dangerous disease as diphtheria, the body is often unable to manufacture at once the antibody or antitoxin fast enough or in sufficient amounts to neutralize the increasing poisonous toxin produced by the diphtheria bacteria. In such a case additional antitoxin, made outside the patient's body, is injected into the patient to reinforce his own. This antitoxin, used in the treatment of diphtheria, is produced in the following way: the toxin of the diphtheria bacteria is injected from time to time into the blood of a robust horse. Stimulated by the presence of this new poison in his blood the powerful animal produces this antitoxin in greater quantities than are needed to neutralize the toxin. Some of the blood of the horse thus enriched with antitoxin is taken and is chemically prepared, its strength is tested, and the solution is injected into the diphtheria patient. The antitoxin which the horse has manufactured destroys the diphtheria toxin produced in the human body and the patient recovers. In convalescing the patient continues to produce antitoxin just the same as the horse did in counteracting the injected toxin. But fortunately again, this antitoxin does not produce discomfort and does not create a craving for toxin. The presence of these antibodies in the blood upon recovering from vaccination or from diphtheria guarantees a certain immunity from future ailments of this nature.

An opiate in the blood acts as a toxin and the body of the addict is thought to respond to its presence by producing an antitoxin or antibody to neutralize it or favor the oxidation of the morphine or heroin present. The body is thought to produce these opiate antitoxins in excess of the amount needed to counteract the effects of the opiates administered. But, the existence of these opiate antibodies in the blood produces great discomfort unless they are neutralized by a further dose of the drug. For this reason, the body calls for ever increasing amounts of morphine and heroin and the addict continues to enlarge his dose to neutralize the increasing antitoxin. It is the presence of this poisonous antitoxin in the body of the addict that causes the "withdrawal" symptoms described. Some of the antitoxins produced by the body are known to be more poisonous than the venom of the cobra or the rattlesnake; and the one for opiates is probably no less virulent.

This theory of addiction disease explains practically all the phenomena of opiate indulgence, and is quite generally accepted by the medical profession. That some poisonous substance is present is evidenced by the following phenomena. For instance, anything which dilutes the blood, and, therefore the antibody contained in it, relieves the painful symptoms of withdrawal. The loss of "water" from the blood, when purging is resorted to during treatment, also relieves the symptoms. Excessive perspiration also tends to dilute the antibody and to make conditions more endurable. Dr. John A. Riley, Medical Superintendent of the Southern California State Hospital, says that on recovering from the disease, after hospital treatment, the patient can not stand his customary dose of the drug of addiction. Reversion must be gradual, because of the absence of the usual amount of the anti-toxin, or the addict will die of acute opiate poisoning.

The fact that as tolerance increases smaller proportions of opiates are excreted supports the theory that the drugs are destroyed in the blood current either by direct neutralization or by facilitated oxidation due to the presence of the antibody. Furthermore, the addicted person is not affected to the extent that a normal person is by the administration of an opiate as long as he is not overdosed—a condition indicating that the opiate is destroyed or neutralized in the blood current.

The exact chemical nature of this neutralizing solution is not known and the drug of addiction seems to be the only chemical so far discovered that has the absolute power to destroy it. Atropine and caffeine are the only drugs which seem to have any antidotal properties whatever towards the antibody, and Osborne says that all successful treatments for opiate addiction are based upon the use of some form of the former drug. Strange as it may seem, atropine also has a tendency to destroy the morphine itself as well as the antibody.

Little credence is given to the theory that the cells of the body become progressively less responsive as increasing doses of opiates are administered. The experiments of Cloeta, who was able to isolate large quantities of morphine from the tissues of animals, do not prove that the body cells of man acquire tolerance from the poisonous action of the drug. All the phenomena cited above can not be explained on this hypothesis.

HOW "DOPE" IS ADMINISTERED

There are three methods commonly used in taking habit-forming drugs into the system; first, the drugs may be injected beneath the skin with a hypodermic needle; second, they may be taken orally, that is they may be swallowed or may be held in the mouth until they are absorbed; third, they may be sniffed into the nose, where they are absorbed by the mucous membrane. Opium smoking, so prevalent in China, has not gained a foothold in this country, and this method of administration will not be discussed in this pamphlet. Since cocaine is a local anaesthetic, producing insensibility in a large area surrounding the point of administration, it is seldom injected hypodermically,

except in surgical cases, but is sniffed into the nose. The cocaine addicts usually refer to this process of administering this white crystalline powder as a "sniff of snow." Cocaine is frequently used in the manufacture of catarrhal remedies since it has the effect of affording relief by numbing the nerves in the affected area.

Heroin is usually sniffed into the nose, but it may also be administered hypodermically.

On the other hand, morphine is generally injected hypodermically, since no local anaesthesia or numbing of the flesh results. A hypodermic needle may be used for this purpose, but ordinarily the addict injects it through a hollow needle attached to the end of an ordinary medicine dropper. The apparatus used in this novel method of injection is very inexpensive—a very potent factor with the usual addict, who needs all his money to purchase the drug which his system craves.

The oral method of administration is seldom used by addicts since it takes a larger amount of the drugs to produce the desired effect and since there is a considerable delay in getting the usual results; due to the slow process of absorption.

Clinicians tell us that addicts become almost as much addicted to the needle as to the drug itself, and that for psychological effects some substitute for morphine or heroin should be injected regularly during treatment for some time after the drug of addiction has been entirely displaced. It is almost invariably found that addicts reluctantly change from the hypodermic to the oral method of administration. Since the use of the hypodermic needle sometimes causes small abscesses at the point of injection, especially if cocaine is administered in this manner, it is desirable to have such addicts transfer to the oral method as soon as possible when undergoing hospital treatment.

Addicts usually carry clear, colorless solutions of morphine in little vials or bottles ready for use. Frequently a wisp of cotton is kept in the solution chiefly for the purpose of preserving as much of the liquid as possible in case the vial is accidentally broken. Furthermore, these wads of cotton are often dried and preserved for use in cases of emergency, because the addict well knows that he can dissolve out of the dried bits enough morphine or heroin to tide him over the "rainy days" when no money is available to purchase the opiate of addiction or when the drug itself can not be procured even through "underground" channels.

TOLERANCE TO DRUGS

The body can develop the ability to receive toxins and poisons without apparent harm or with less than normal injury; this power of resistance to drugs is called tolerance. 'Tis said of Alexander the Great that he deliberately practiced taking increasing doses of various poisons known at that time, until he had developed a tolerance for

most poisons, which might be used to destroy him. Many inebriates develop a great tolerance for alcohol, so that they can consume without apparent effects enough alcohol to intoxicate several normal persons. In like manner, the body can acquire a high degree of tolerance to opiates.

The physical explanation of tolerance to opiates on the basis of the antitoxin theory has already been made; but the extent to which the body can acquire it needs further elucidation. In a normal person an eighth to a quarter of a grain of morphine will relieve pain and induce sleep, but many addicts have acquired such a high degree of tolerance for the drug that they even require as many as 10 to 15 grains of morphine daily to keep them in a condition of well-being. Occasionally addicts are found who consume from 60 to 70 grains of opiates daily. DeQuincy says, in his "Confessions of an Opium Eater," that 320 grains of opium, or an equivalent of 32 grains of morphine is sometimes required to allay the physical suffering produced by temporary abstinence. Recently Dr. Alexander Lambert reported the case of a man who used 180 grains of morphine daily, and Dr. Amos O. Squire of Sing Sing prison says that he knew a prisoner who used 80 grains of heroin per day, but that the usual daily dose of this drug varies from 15 to 25 grains.

A few addicts of the stronger mental type have succeeded in so regulating their doses that the body seems to function normally on a regular and constant amount of the drug, but such cases constitute exceptions to the general rule. If the theory outlined above is true, and if the antitoxin is produced in excess of the amount actually needed to neutralize the drug of addiction, it is highly probable that opiates create an ever increasing physical demand for their use. The fact that addicts do increase their tolerance to opiates and have a desire to take progressively larger "shots" supports the antitoxin theory.

Most confirmed addicts do not experience the usual effects which morphine has on normal people, and it is highly probable that the greater part of each "shot" is used in neutralizing the antitoxin described. It is well known that the addict who is neither over-dosed nor under-dosed appears to be a normal individual.

The person who acquires a tolerance to opiates also acquires a high degree of tolerance to almost all other drugs. For instance, it takes heroic doses of chloroform and ether to put an addict under their hypnotic influence. Doses of strychnine sufficient to have serious results in a normal person scarcely affect a person of established addiction. The fact that strychnine has properties antagonistic to those of morphine may partly account for this condition. Physicians who have had wide experience in treating hospital cases of addiction tell us that there is little danger of over-dosing an addict with any of the drugs commonly used in the practice of medicine.

Tolerance is explained, therefore, on the theory that the body produces in increasingly larger amounts certain solutions to neutralize the invading poisons. Morphine and heroin do not so poison the cells that they do not respond to the presence of the opiate by producing an

antitoxin. Not so, however, with the general protoplasmic poison cocaine. The cells seem to be utterly unable to produce any solution having a power to neutralize or counteract cocaine. It is claimed by some investigators that addicts do acquire a certain degree of tolerance for cocaine, but this has been disputed. The effects of cocaine are somewhat transient and the addict may repeat his dose in a short time, without necessarily increasing his tolerance. Cushny says that "Tolerance is said to be attained in man when cocaine is taken habitually, but this is not satisfactorily established." In the case of cocaineized animals it has been found that they even become more susceptible to the effects of cocaine as the habit is continued.

THE TREATMENT OF OPIATE ADDICTION

It is not the purpose of this pamphlet to undertake a thorough discussion of the methods employed in the treatment of this disease, but merely to enumerate some of the outstanding factors. First of all, the addict must approach his treatment voluntarily. This is, indeed, a very difficult step for him to take. He, above all others, is appreciative of the fact that *very few are ever redeemed*, and of the truthfulness of the insinuation, "Once an addict, always an addict." He has already learned from his associates that many so-called "cures" are unsuccessful and even fraudulent and he regards with considerable suspicion any physician who professes to cure addiction. If the Preliminary Report of the Whitney Committee of the New York Legislature is correct in the statement that not a single sanitarium in that state, either public or private, was offering a type of treatment which would result in a permanent cure of addiction, it would seem that drug habitues have a well-grounded reason for not seeking hospital treatment voluntarily. Many are deterred from submitting to treatment because the expenses are often exorbitant, the methods used have uncertain results and the "punishment" inflicted is almost unendurable.

One of the saddest things about opiate addiction is that few afflicted persons apply for hospital treatment until the habit has been thoroughly established by years of indulgence, and until their own efforts to cure themselves have utterly failed. The addict's body has become a physical wreck and his moral sense has become more or less blunted, degraded and depraved. He is often quite emaciated, has grown somewhat despondent, and has very little hope of regaining his normal status. In this condition he rather reluctantly withdraws from his employment and submits to constrained and regulated treatment. If he is to be cured, his whole attitude must be changed and he must voluntarily and willingly submit and cooperate.

Practically all experienced physicians now agree that it is useless to attempt a cure unless the patient is withdrawn from his customary environment and placed in a hospital or sanitarium. "Office treatment," as it is termed, is almost invariably unsuccessful. The ambulatory addict has too great an opportunity to secure the drug of addiction to guarantee successful treatment under such conditions.

Few physicians today, however, advocate confining the addict under lock and key, depriving him wholly of his drug, and compelling him to endure the horrible "withdrawal" symptoms, which may result in death. This method has been tried repeatedly, but without success, in the case of addicts who have been imprisoned for crime. In such instances, the addicted prisoner anxiously awaits his liberty, contemplating all the while a return to his old habits as soon as he is released.

Likewise, the method of suddenly withdrawing the drug, as practiced by some sanitariums, is equally as unsuccessful in effecting a cure. A few cures are brought about by such a method in cases of individuals who possess strong wills and dominating desires to be cured and who are willing to endure temporary torture to secure permanent relief, but such cases are exceptions.

Perhaps the most successful method of handling cases of addiction consists in a "gradual withdrawal" of the drug of indulgence. Before such treatment is begun, however, physicians attempt to restore physical vigor and to secure bodily reactions as nearly normal as possible. This method is based on three fundamental assumptions: first, that the antitoxins formed in the body of the addict need to be neutralized from time to time to prevent the appearance of the violent "withdrawal" symptoms, so characteristic of opiate addiction; second, if the opiate of addiction is gradually withdrawn, the body will slowly reduce the amount of poisonous antitoxins manufactured to counteract it until none are produced; and third, that the "withdrawal" symptoms are mitigated to the extent that the liquids in the blood are diluted.

The essential factors in the "gradual withdrawal" treatment are about as follows: Opiates diminish most bodily secretions and interfere with the proper excretion of waste through the kidneys, intestine, and sweat glands. Anything which increases watery excretions tends to dilute and renew the blood stream. Consequently, in treating drug addiction disease by this method, physicians aim to stimulate glandular activity, to keep the bowels and kidneys in good working condition, and to promote excretions through the skin. To give relief, they substitute various drugs for the opiate of addiction, chief among which are codeine and dionin of the opiate series. Heroin is sometimes used in case the patient is addicted to morphine, but there is great danger that heroin addiction may also result. Of these three substitutes, dionin is undoubtedly the best. In treating habitues by this method the drug of addiction is gradually reduced and other drugs are substituted for it in such a way that the same amount of the combination is administered at each dose. Usually the injections are given at regular intervals, but as far apart as the condition of the patient will permit. Thus, if the addict has been accustomed to taking his opiate six times a day, he is now given it only three or four times a day.

Experimentation has shown that the customary daily dose of the opiate can be very materially reduced at the beginning of the treatment, but that the final withdrawal of the drug must be exceedingly

gradual. Dr. T. F. Joyce, the physician in charge of the Riverside Hospital (North Brothers Island, N. Y.), says that after the patient has been in the hospital for six days it is possible to reduce the daily consumption of morphine or heroin from 20 to 60 grains to only 2 or 3 grains without causing the patient to suffer signs of drug privation. Osborne says, that the final withdrawal of the last one-one-hundredth of a grain of the opiate may precipitate the "withdrawal" symptoms.

Bishop advocates giving the patient as much of the opiate as he is accustomed to taking, but doing so at longer intervals and in larger doses. This method of administration is continued until the general bodily tone is improved and until it is safe to undertake the gradual withdrawal of the drug of addiction.

Osborne believes that all successful methods of treatment are based upon free elimination by purging and upon the use of atropine. He comments favorably upon Scelesh's method of treatment, which includes among other things the use of dionin, an atropine antidote, and the nitrate of strychnine. The dionin is a substitute for the drug of addiction, the atropine compound acts as an antidote to the poisonous antitoxin, and the strychnine has an antagonistic effect to that produced by the drug of addiction. This author also insists that there must be no possibility for the addict to obtain more of the drug of addiction than is administered to him in the course of the treatment because the extra amount may completely nullify the progress already made.

Perhaps the most difficult factor to deal with in depriving an addict of his opiate is that of sleeplessness or insomnia. If the patient can get the necessary amount of sleep, he is usually able to endure the treatment without great discomfort during his waking hours. It is very imperative, therefore, that the physician give some mild non-opiate hypnotic, such as chloral, or sulphonal, or veronal, to induce sleep in his patients.

It is quite apparent from the literature on the subject and personal investigations made, that it is possible, under proper treatment, to effect the complete withdrawal of opiates without causing the patient to experience the usual "withdrawal" symptoms. It is even possible to discontinue the use of the drug of addiction without the patient's becoming aware of the fact. When he is informed that he is no longer taking the drug, he imagines he is completely cured, but he is only a fit subject to revert to his old habits when a favorable opportunity is presented. His nervous system is sensitized, so to speak, and the administration of an opiate, even a small amount, readily offsets the treatment he has received. Experience has shown that his body remains sensitized for many years, and that the habit may easily be renewed by taking a "patent medicine" containing an opiate or by receiving an injection of morphine or heroin at the hands of a physician.

To prevent reversion, all the physical ailments of the addict must be cured before he is permitted to leave the hospital, since these may have been the original cause of the addiction or may stimulate, or

even necessitate, reversion. The "cured" addict must, therefore, be ever on his guard against the dangers which inevitably await him. His sensitized nervous system falls an easy prey to the wily "dope dispenser" and a return to the same environment in which addiction began is generally a passport to assured re-addiction. A complete change of conditions and associates is usually the only guarantee that the "cured" addict will not revert.

CLASSIFICATION OF ADDICTS IN 683 INSTITUTIONS FOR THE THREE-YEAR PERIOD, 1916, 1917, AND 1918, ACCORDING TO THE DRUG OF ADDICTION. (Report of the Treasury Department).

DRUG OF ADDICTION	Addicts in 126 penal institutions	Addicts in 330 public almshouses, insane asylums, and hospitals	Addicts in 227 private hospitals and sanatoria	Total Addicts	
				Number	Per Cent
Gum opium.....	87	111	27	225	2.1
Smoking opium.....	260	157	21	438	4.2
Morphine.....	1,705	3,072	1,056	5,833	55.7
Heroin.....	1,925	900	297	3,122	29.8
Codeine.....	15	30	28	73	.7
Laudanum.....	16	75	17	108	1.0
Paregoric.....	20	123	55	198	1.9
Cocaine.....	377	24	28	429	4.1
Cannabis or hashish..	49			49	.5
Total.....	4,454	4,492	1,529	10,475	100.0

The only national figures available show that the morphine habit is more prevalent in the United States than heroin or cocaine addiction but that the use of heroin and cocaine is increasing, especially among youthful addicts. The report of the Treasury Department in 1919 says that the large majority of addicts of all ages are addicted to the use of morphine or opium and its preparations but that most of the heroin and cocaine addicts are boys and girls under 20 years of age. It is the general opinion of those who have had a wide experience in treating cases of addiction that the use of heroin and cocaine is increasing much more rapidly than the use of morphine. If it were possible to obtain up-to-date figures as to the prevalence of the different types of addiction throughout this country, they would probably substantiate the more recent data for the Riverside Hospital in New York. Dr. Joyce says, "Four-fifths of the 2,300 patients treated at the Riverside Hospital were addicted to heroin while about one-fifth were addicted to morphine or other forms of opium. About one-eighth of the heroin addicts also used cocaine."

THE TREATMENT OF COCAINE ADDICTION

From what has already been said about cocaine addiction, it is quite evident that cocainism demands a different type of treatment from that prescribed for morphinism. Practically all experienced physicians agree that the cocaine addict should be immediately deprived of his drug. They are unanimous in agreeing that the treatment given should be symptomatic, that is to say, if the breathing is depressed, give some other drug to stimulate the respiratory center; if the heart beats too rapidly or too slowly, give some stimulant or depressant to counteract these extremes; if constipation is present, administer some drug to relieve it; or if the patient is unable to sleep, give some hypnotic, such as chloral, sulphonal, or veronal to induce it. The treatment must be continued until the desire to return to the drug has been stamped out and until the general physical condition of the patient has been improved.

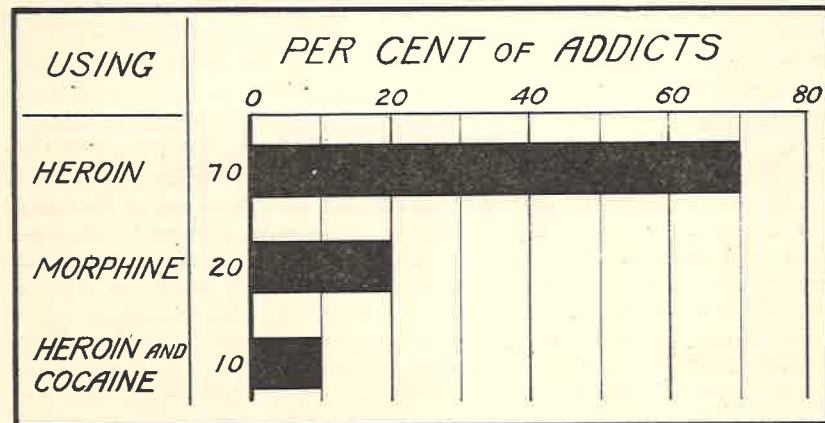


FIG. 3—How 2,300 addicted patients in the Riverside Hospital, New York, are distributed.

THE USE OF HABIT-FORMING DRUGS AS MEDICINES

Should the medical profession be allowed to use these narcotic drugs which so frequently lead to addiction? The use of morphine relieves pain and it is almost indispensable in the treatment of chronic diseases of a painful nature and in giving relief to those who have been wounded in battle or who have met with serious accidents. No other drug yet discovered has such potent analgesic, or pain-killing, properties as morphine, and it would perhaps be the last drug to be surrendered willingly by the medical profession. It would indeed be a great mistake to prohibit reputable physicians from using morphine in cases specifically calling for it, and to inflict on suffering humanity the added torture of pain.

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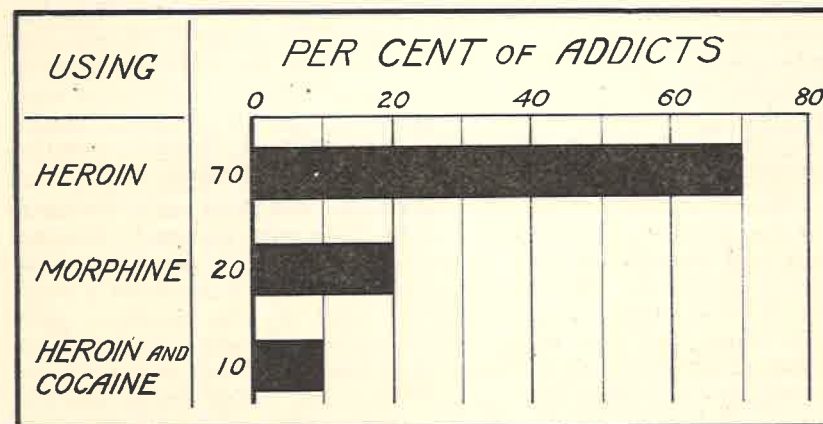


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Not so, however, with heroin. Witness the testimony. Osborne in his *Principles of Therapeutics* says, "Heroin is very subtle in its ability to cause a habit, and it has no activities whatsoever of any advantage over codeine. It is absolutely not needed therapeutically, should never be prescribed, and should be abolished from the *Pharmacopœia*." Cushny in his text-book on the *Action of Drugs* states, ". . . . the advantages claimed for heroin by its advocates have not been confirmed by impartial investigation." With this evidence before us there is little defense for a physician who persists in the use of heroin, unless he is prescribing it in the "gradual reduction" treatment of heroin addiction.

In cases of continued pain and suffering physicians are often duty bound to administer morphine even past the danger point of establishing addiction. If the disease is one that will shortly prove fatal, no great harm has been done, but if the affliction is curable, the physician has cultivated a new diseased condition which needs also to be removed before the patient is released from treatment. The physician who creates in this manner a craving for drugs is morally and professionally responsible for the treatment of the addiction disease contracted under his care. If this ethical principle were practiced consistently by the medical profession, fewer cases of addiction would result and the public would not look with so much distrust upon the necessary use of morphine in alleviating human suffering.

Heroin should not be used at all and morphine must be used with the greatest care. What shall be done with cocaine? Cocaine has a well established place in medicine. Its chief use is found in surgical operations. When injected into the body it produces a large area of local insensibility around the point of administration upon which minor, and even major, operations may be performed without causing pain. The state of insensibility begins in 5 to 7 minutes after the injection and lasts from 20 to 30 minutes, giving ample time for many operations to be performed without additional administrations. The drug is used very largely at present by specialists in performing operations upon the eye, nose, and throat. When applied to the mucous membrane it is readily absorbed, causing insensibility and rendering the operation painless. Osborne says that "there is no good excuse for using cocaine internally or hypodermatically for any purpose except to produce local anesthesia, and that it should not be used in sprays or ointments for the nose, or in sprays or gargles for the throat."

Cocaine not only produces local insensibility, but it has another effect which commends its use in surgery, namely, it temporarily constricts the blood vessels around the paralyzed area and prevents excessive bleeding. On the other hand, there is a well grounded suspicion among physicians that infection frequently follows the use of cocaine. The drug lowers the bodily powers of resistance around the point of incision, through its general power to destroy all protoplasmic and cell life.

The best physicians of today, realizing the ever impending dangers of creating addiction, are beginning to substitute other drugs for

morphine, heroin, and cocaine, as fast as new discoveries will permit. For instance, codeine, which is seldom habit-forming, has almost entirely replaced heroin and is often used instead of morphine unless the pain is severe; chloral, sulphonal and veronal have displaced morphine as a sleep producer, unless the insomnia is caused by pain; novocaine and nitrous oxide, or "laughing gas," have largely taken the place of the once-favored cocaine in dental surgery; and the eye specialist finds atropine a better pupil dilator than cocaine, because a cocainized pupil closes up to some extent when exposed to a bright light. A cup of hot coffee is said to have a greater stimulating effect on the mental powers than cocaine, but it does not relieve physical fatigue to the same extent as cocaine.

Almost any druggist will testify that the amount of morphine and cocaine prescribed in the legitimate practice of medicine has been decreasing rapidly since the passage of the Federal law regulating its sale. Hubbard says that about 90 per cent of the opium and cocaine imported is used for other than medicinal purposes. As a general rule the medical profession is not yet ready to abandon entirely the use of morphine and cocaine, but it is doing so as fast as satisfactory substitutes are discovered. The expanding consumption of opium and cocaine in the United States, therefore, is not due to their increased use in medicine, but to the wide-spreading menace of "dope" addiction. The druggist dispenses a smaller amount of these narcotics than ever before, but the illicit "dope" peddler, by his secret and insidious practice, is selling more than enough to offset the decrease in the legitimate trade.

THE COST OF "DOPE"

It is not generally known that the habit-forming drugs under consideration are rather inexpensive when purchased through legitimate channels. The wholesale list price of 100 quarter-grain tablets of morphine sulphate is \$1.70; of 100 sixth-grain heroin tablets, \$4.00; and of 100 quarter-grain cocaine hydrochloride tablets, \$3.00. At these rates the list price of an ounce of morphine would be \$32.64; of heroin, \$115.20; and of cocaine, \$57.60, when the drugs are put up in tablet form. If, however, they are purchased in the powdered or crystalline form, in which they are generally used by addicts, the cost is much reduced. For instance, the wholesale list price of an ounce of powdered morphine is only \$9.05; of powdered heroin, only \$13.60; and of powdered cocaine, only \$10.60. Of course, the druggist usually purchases these narcotics for about 30 per cent less than the wholesale list prices quoted above and usually dispenses them through legitimate channels at an equal or higher rate.

The close system of accounting kept by the Federal government on the receipts and sales of the druggist, and on the prescriptions issued by physicians, makes it almost, if not wholly, impossible for the addict to secure even a small part of his drug of addiction from legalized sources. As a result, he must patronize the illicit "dope" peddler

regardless of the price asked. The "dope dealer" adjusts the price of his commodity largely to the financial means of his addicts, but it has recently come to light that the usual price received by this fiend for powdered morphine is one dollar per grain, or at the rate of \$480 per ounce. This extortionate price is over 53 times as much as the wholesale list price of this drug in a legitimate market. Joseph Burke, United States District Attorney for Southern California, is credited with saying recently that "narcotics selling for \$19 and \$20 an ounce in Mexico are retailed for \$437 an ounce in California." If any credence can be placed in current newspaper reports on the profits made in this illicit business, it is not an uncommon thing for the retail peddler to receive at least \$200 to \$300 an ounce for "dope" which he can procure in outside markets for \$30 to \$65 an ounce. If these figures are only approximately correct, it is clearly evident that the underground dispensing organization is the greatest profiteering group of vultures on earth.

Such enormous profits draw many people of high standing into this illegal business, despite the fact that a penitentiary sentence may await them if they are "caught." The dean of a narcotic squad is quoted as saying that "one attorney, apparently respectable, has made \$500,000 on dope in the last two years, and a doctor has made close to \$1,000,000. These men and their ilk can match every dollar of enforcement funds with \$1,000 to be used in evading detection and capture."

Dr. Edward H. Williams, a prominent Los Angeles physician and student of dope addiction, is quoted as saying that "the ease with which the deadly powder is carried and concealed is another phase of the problem that makes it difficult of solution. One airplane, flying over the Mexican border, can bring into this country a quantity of morphine sufficient to supply the entire Western United States for several months, and so small a place is required to conceal it that a dealer may be able to make a good living from the amount it is possible for him to carry in his vest pocket or even in his ear."

"DOPE" AND CRIME

Many addicts must spend from \$10 to \$15 a day to secure the required amount of opiates from illicit peddlers. Such addicts probably use from 10 to 15 grains of opiates daily. The cost of this amount of morphine at the commercial wholesale rates would vary from about 19 to 29 cents a day, if purchased by the ounce, and would not be prohibitive even for addicts of ordinary means. It is quite apparent from these approximate figures that the addict of today needs a large income to meet the needs of his addiction habits, whereas the addict, prior to the enactment of the Harrison Narcotic Act, could secure his daily dose for only a few cents. No one would contend that this law should be annulled solely for the purpose of giving the addict an opportunity to purchase his drug through legitimate circles at a much reduced price, but the figures do indicate that something should be done to help these unfortunates who are victimized financially and physically. Any

physician who has had much experience in treating opiate addiction will testify that certain physical reactions are set up in the opiate addict which makes it almost, if not entirely, impossible for him to do without the drug of addiction. When the addict is deprived of his drug, he suffers physical torture so insistent that even the strongest-willed person can not endure it. Under present conditions, if the financial standing of the addict is so limited that he can not purchase his drug, at these extortionate prices, he is actually forced to resort to deception, dishonesty, and even crime to secure it.

One of William Traegar's (Sheriff of Los Angeles County, Calif.) veteran investigators is quoted as saying that "Dope is responsible for 90 per cent of the crime in Los Angeles, and crimes due to drug addiction are rapidly shifting from denizens of dives to the upper classes." The Warden of the California State Penitentiary at San Quentin not long ago stated that 90 per cent of the serious crimes committed by those confined in that penal institution were caused by "dope" addiction. These statements from men who know something about the practical aspects of criminology should cause us to pause and consider more effective means of controlling this menacing evil of narcotic addiction. But the facts need analysis.

It has often been asserted, but has never been proved, that the addict is disposed to commit crime because of the influence of morphine on his nervous system. When an addict is well supplied with his drug, he is generally a very peaceable citizen. It is highly probable that crime is an indirect result of the use of morphine and that the addict is driven to secure the drug which he must have and which is as necessary to him as food and air. Clinicians will tell you that the withdrawal of the drug sets in motion determined tendencies to secure it at any cost. The torture to which the deprived addict is subjected frequently incites him to steal, to rob, and even to commit murder to secure the accustomed drug. The fact that crimes are committed not during periods of drug privation, but while the addict is under the influence of the drug, leads the casual observer to attribute the cause of the crime to drug addiction. They become criminals not from choice, but from forced necessity. Of course, many denizens of the "underworld" were criminals or possessed criminal tendencies before they became addicts. In such cases, the use of the drugs unquestionably stimulates such inclinations.

Some investigators contend that heroin stimulates the user to crime. The fact that there are more heroin than morphine addicts confined in penal institutions lends support to this contention. On the other hand, heroin may be used more generally than morphine by the criminal or "under-world" classes and, if so, the preponderance of heroin convicts in such institutions may be no indication that heroin is more potent than morphine in arousing criminal activities.

Cocaine addicts frequently pass through a period known as "bull horrors" in which they fancy they are being pursued and watched; during such periods they are afraid to venture out of the house or to appear in public places; in such states the addict exhibits none of the

tendencies of a daring criminal, but quite the contrary. On the other hand, during periods of excitement and stimulation by cocaine the addict may exhibit boldly the inherent criminal tendencies.

The report of the Treasury Department says in this connection, "The users of opium and morphine are seldom seen in courts for brutal crimes. . . . They are frequently aiders and abettors of crimes, but less commonly the leading actors in criminal conduct. In cases where addicts have committed violent crimes, it is reported that they were users of cocaine or heroin."

It would be wise for legislators to consider these addicts as diseased persons who need medical treatment rather than to regard them as criminals. These addicts have a disease more serious than tuberculosis or typhoid fever; their bodies are filled with a poisonous substance which forever drives them on to sink further into the clutches of the vice. Society looks with sympathy upon the kleptomaniac and those afflicted with other types of insanity, but it does not fully appreciate the fact that those addicted to the use of drugs are diseased and need treatment at public expense, if necessary. The morphinomanic is with us and the world would do well to look upon his removal largely as a problem for the medical profession to solve. Law enforcement organizations should be charged with suppressing the illicit traffic in "dope," but the hope that jails and penitentiaries will effect cures and reform addicted individuals has long since been abandoned.

THE UNSOLVED PROBLEM

It is admitted by all that the legitimate sale and consumption of habit-forming narcotics in the United States has decreased within the past nine years; but there must be something fundamentally wrong with a law which has been enforced so stringently as the Harrison Narcotic Act since 1914, and which has resulted in an ever-increasing total consumption of habit-forming drugs. Under it the old addicts are no longer able to secure the necessary supply of drugs through legitimate channels and must resort to other means to obtain them. Unlike the inebriate who exhibits no abnormal craving for alcohol when he is no longer able to get it, the opiate addict is absolutely unable to do without the drug to which he is addicted. When the drug of addiction is withdrawn great physical and mental suffering ensues and the addict will resort to any measure to relieve his misery. In response to this insistent physical demand an "underground" illicit traffic in "dope" has developed, a traffic so secret, so well organized, and so far-reaching that Federal and State authorities are unable to cope successfully with it. The tentacles of this illegal organization are so extensive that the very foundation of our civilization is seriously threatened unless some effective method is found to suppress it.

The unsolved legal problem is four fold; first, some means must be found to limit the world's supply of opium and coca leaves; second, some method must be adopted to control the manufacture of morphine,

heroin, and cocaine; third, reputable physicians must be given a sufficient allowance of opiate derivatives to use in the treatment of addicts who apply to them for relief; fourth, an attempt must be made, at public expense, if necessary, to redeem those who have fallen into the grip of this menacing vice.

International Agreement to Limit Production—Until the nations of the earth can get together in some sort of an international understanding, the first aspect of the problem will not be solved and the "dope" peddler will continue to ply his trade and wreck certain types of humanity.

The first favorable step towards solving this international problem has already been taken by Congress. The Porter Resolution, which has passed both Houses, authorizes the President to enter into negotiations with foreign powers for the purpose of limiting the world's production of the opium poppy and coca leaves. Henry Cabot Lodge, who sponsored the resolution in the Senate, in urging its immediate adoption, said that only 100 tons of opium were needed for scientific and medical purposes, but that 1,500 tons of this drug were produced annually in Asiatic countries. This statement shows that the world is now producing 15 times as much opium as it needs, and that the addicts of the world are consuming 14 times as much as is used in experimental work and by the medical profession in alleviating human ills. These figures, according to Hon. Stephen G. Porter, the author of the resolution, do not include the 700 to 900 tons of opium used by the native addicts of India, Turkey, and Persia, but only the amount actually exported by these countries.

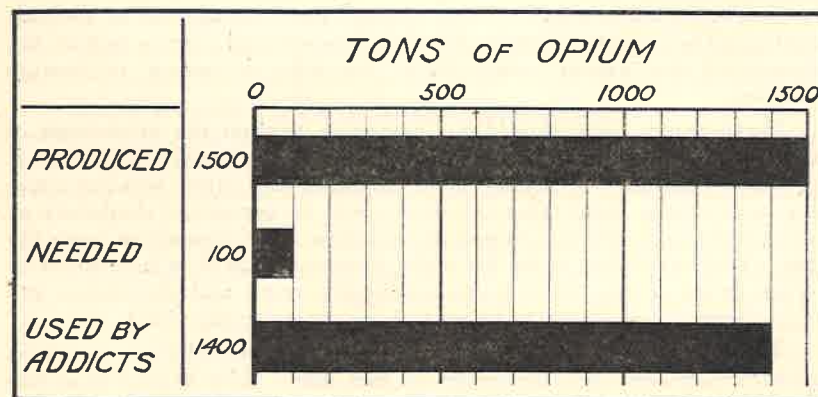


FIG. 4—The world's supply of opium.

It will be more difficult to effect this international agreement than it is to bring about a League of Nations or the total disarmament of the powers to guarantee peace, for the Nations have absolute control over the machinery of war, but so far they have very little administrative authority over the production of poppy or coca leaves. Let us look the problem of limiting the world's supply squarely in the face. Mr.

F. R. Eldredge of the Department of Commerce says, "that most of the opium used in this country originates from Asia Minor." The Porter Resolution authorizes the President to confer with Turkey, Persia and the British Government in India for the purpose of reducing the production of opium in these countries. These two facts indicate that the solution of this problem so far as our protection is concerned will depend upon the President's success in persuading Turkey and Persia to reduce their poppy crop. To what extent will Turkey cooperate in a campaign of this sort? Cooperation means that many poppy growers must go out of business, and that the Nation's revenue will be decreased thereby. The World War has left Turkey bankrupt and in dire need of money. At present this nation is not even on political "speaking terms" with Turkey. Little chance to secure cooperation under such circumstances!

To what extent will India reduce its production and exportation of opium at the request of the United States? Its hostility towards a movement of this kind has already been expressed. When the League of Nations attempted to limit the production of opium in 1921 to "strictly medicinal and scientific" purposes India objected and the phraseology eventually incorporated in the covenant has proved as ineffective as if it had not been inserted. Both England and India are interested in the continued production of opium on a large scale; England furnishes money *without interest* to promote poppy growing in India; and a goodly portion of the revenue of the British Government in India comes from this source. Furthermore, the financial welfare of millions of people in India depends upon the extent of the poppy field.

In Persia the problem is less complicated but almost as difficult to solve. The income of many Persian farmers and even a part of the revenue of the nation comes from the sale of opium to foreign countries.

Furthermore, why should our campaign against the production of opium be directed wholly against these three countries? Some of it is grown in Egypt, and a great deal in China and other smaller countries in Southern Asia. Our intentions will be construed doubtless as unjust and unfair and our campaign will meet with opposition from the start. The movement is in the right direction, but it is not inclusive enough in its scope. It will precipitate argument and discussion and the problem is not likely to be solved for many, many years.

There is a less tangible, but no less real, reason why some nations will not cooperate in a campaign of this sort. The World War has left many nations with hostile and bitter feelings towards each other. Anger and hate are only smouldering. Why should a nation seek to protect its enemy against an opiate invasion? The reader can easily point to nations that would gladly destroy other nations, not by open warfare alone, but by any insidious method which will accomplish the same result. The will to destroy by gunpowder and gas still lives.

A similar situation prevails with reference to limiting the supply of coca leaves in Peru, Bolivia, and Java. The industry is profitable

and the grower of coca trees will as reluctantly cut down his source of income as an orange grower will deliberately destroy his orange trees, should the nation discover that orange juice has a harmful effect on the human system. The suggestion of limiting the supply of cocaine will be opposed at once by all who grow the coca plant.

The cocaine problem will not have been solved when the nations now growing the coca plant agree to limit the production, for it has been discovered recently that cocaine can be made chemically from coal-tar. In time the production of cocaine in this manner may even prove more advantageous and economical than the present technical and expensive process of distilling it from coca leaves.

These statements are made to show that the fight has just begun and that it will take many years to educate the public to the point where it will be willing to abandon and suppress an industry which at present has all the aspects of a legitimate and useful business. The medical necessity for these drugs in relieving human ailments constitutes an almost impregnable bulwark of defense against any argument to limit the production.

Control of Manufacture and Trade—Some have suggested that measures should be taken to control the manufacture and distribution of these narcotic drugs. When the world's supply of opium and cocaine is limited to its purely scientific and medicinal needs there will be no necessity to control the manufacture of these drugs, but it will require the strictest international supervision to guarantee that each nation receives its pro rata share. Without control the "dope" peddler will out-bid competitors and rob suffering humanity. The manufacturers should then account for every pound of the crude products received and for every ounce of the drugs sold and their sales will have to be limited to the legitimate market. This will require the strictest international supervision and is a sequel to agreements limiting the supply.

Under present conditions foreign manufacturers are scarcely controlled. They are free to sell their products to illicit dealers and smugglers, who have a trade even in our own country. To bring about effective international agreements to control the manufacture and distribution of these narcotics will be more difficult than to limit the supply. The poppy and the coca plant can not be grown in secret, but a chemical laboratory can be installed in a cellar or on a desert island and almost, if not wholly, defy detection. It would be as difficult to discover as a "moonshine" still. It is quite true that only the expert chemist is able to separate the drugs from the crude product, but the services of many of them can be procured by the wealthy "dope" barons. An international attempt to control the manufacture of these narcotics will result in the installation of chemical laboratories in the remotest corners of the earth, where drug production will be carried on with impunity. Under the Volstead Act the Nation now controls the legitimate manufacture of alcohol, but the "moonshiner" still flourishes. In the same way the "dope" peddler will survive any legal restrictions placed on the manufacture and distribution of drugs. This method of controlling the manufacture and distribution of opium and

coca leaves through international administration does not seem to hold much promise in solving the problem.

The Redemption of Addicts—The first two aspects of this unsolved problem relate to limiting and controlling the supply of opium and cocaine, whereas the last two deal wholly with the redemption of addicts. These addicts should be cured, if possible, for two reasons; first, it is our duty to aid them in the same way as we assist others who are sick; second, in their present condition they have a bad influence on those who are associated with them, especially on the boys and girls just out of their teens. So far, they have not generally submitted to hospital treatment because the cost is often prohibitive and the results are uncertain. Most of them would willingly undergo treatment at the hands of their own physician, but many physicians avoid such patients because of the rigid enforcement of the law. Not a few honorable physicians with good intentions in mind have been fined severely for aiding addicts. Frequently physicians complain about the limitations placed upon them and many state that they can not secure in a legitimate way a sufficient amount of the opiate of addiction to use in the "gradual withdrawal" treatment. The Harrison Narcotic Act could easily be modified so as to protect the medical profession and give honorable physicians permission to use a sufficient amount of morphine and heroin to effect a "cure" in their patients. This is the easiest factor of the problem to solve and yet one of the most essential.

To take the last step in the solution of the difficulty will not be such an easy task. It involves an additional expenditure of money on the part of the Federal Government, not for the purpose of inflicting punishment but for the purpose of curing these unfortunates. So far, few clinics have been established at public expense solely for the purpose of affording addicts relief. State and National legislation should establish clinics where the unfortunate addicts in our population could receive treatment at a reasonable expense. The cooperative clinics established recently in Los Angeles and San Diego, although highly successful, were nevertheless discontinued because of the sinister influence brought to bear upon their promoters. At the present time the Medical Association of Chicago contemplates opening a clinic for drug addicts where treatment will be accorded secretly to rich and poor alike.

Some have suggested that the administration of existing and future legislation of this nature should be placed under the control of the United States Public Health Service so that trained physicians would be available to investigate existing methods of treating addiction, to devise new methods, and to conduct government clinics for the purpose of giving treatment in the light of the latest established scientific discoveries. It is well known, especially by addicts who have taken "cures," that the various sanitariums now in existence use widely different methods of treatment and that very few of them ever succeed in effecting a permanent cure. Since the present methods of treatment are more or less experimental, there is urgent need for gov-

ernment to undertake the discovery of that scientific method of handling cases of addiction which will give the best results.

As soon as the Nation learns that opiate addiction is a disease, not very different from certain types of insanity, it will look more humanely and tolerantly upon the ills of the addicts and punish with greater severity the illicit "dope" peddler who smuggles the drugs into the United States, sells them at an enormous profit, and inoculates new victims as fast as his ingenuity will serve him. This human fiend is largely responsible for the enormous increase in our consumption of opium since the passage of the Federal Narcotic Law. He is the one to whom the law should show no mercy and give no quarter. He is as great a conveyor of disease as the rat and mosquito ever were, and his existence should be regarded as more menacing.

THE ULTIMATE SOLUTION

What shall be the ultimate solution of this narcotic problem? National legislation seeking to control the sale of these drugs, although very rigidly enforced, has not met with success. Under it physicians have been denied the free use of these narcotics and humanity has suffered accordingly; under it a new crop of addicts has been born and this country is now consuming more opium than any other nation on the globe; our courts have been flooded with cases of violations of the Narcotic Act; our prisons have been filled with addicts, but no attempt has been made to cure them; the addict, in securing the drug which is necessary to his existence, has been literally robbed by the "dope" peddler; our high school boys and girls are falling a prey to this invading menace; in truth the very foundations of our civilization are threatened and national law has brought no relief. In all sincerity the question has often been asked, "Hasn't the law done more harm than good?"

Does international law hold forth any promise of protection? The development of such laws requires decades upon decades and then they may be lightly thrown aside as a "scrap of paper." It is a fairly easy matter to secure State and National legislation, because the composing units of civil government are organized, but the nations of the earth are not organized, and any proposition that is aimed at particular nations is opposed at the outset. An international reduction in armaments affects all the leading nations alike and none can take offense, but any attempt to limit the agricultural products of a few nations will meet with the keenest opposition from many quarters. Thus, the present movement to limit the world's supply of opium and cocaine only precipitates a new subject for disagreement.

Can the addict be persuaded to leave off his loathsome habit and thereby destroy the market for narcotic drugs in this country? We have shown above that very few addicts are ever cured and that those who take medical treatment nearly always revert. To rely on addicts for the removal of this menace would be like expecting a man to refrain from eating. To them life and addiction are one.

Can the "dope" peddlers be induced to quit their nefarious business? If they could be, a new "ring" would soon organize to take their places, for the business is profitable.

It is quite evident that the illicit "dope" traffic can be controlled neither by premature law nor by sentimental persuasion. Either method of attack meets with opposition from those who are personally interested in the continued production and consumption of opium and cocaine. How then can the "dope" evil be eradicated? Permanent reform comes from conviction, from new ideas, from conversion—in short, from education. A famous foreign diplomat once said that you must put into the schools what you would have in the life of the Nation a generation later. Truer words have seldom been spoken. Public opinion must precede legislation and education must precede public opinion.

This fundamental law was never more fully demonstrated than in the movement which has just resulted in National prohibition in this country. In the eighties nearly every State adopted a law requiring the effects of alcohol on the human system to be taught to all children in the public schools. It was thirty years before the movement bore fruit in the form of an amendment to the Federal Constitution. When the children in our schools became the controlling factor in the National electorate, alcohol met its fate. It took almost a half century for the spirit of *La Dernière Classe* to generate a patriotism fervent enough to say, "They shall not pass." No great movement begins with law—it commences with education. Woodrow Wilson once said, "Forces do not threaten, they operate." Education is a force, law is only a threat; it operates successfully only when backed by public opinion, and public opinion is the fruitage of education. The philosophy of the ages teaches us that there is only one way in which any national issue can be solved without resorting to war, and that way is education.

The final solution of the narcotic problem lies in educating all the children of all the nations as to the evil effects of opium and cocaine on the human system. When these children control the world the "dope" problem will have been solved, and not before. Those living in drug producing countries will not want to poison those living in other countries, and those living in "drugless" nations will have no use for narcotic poisons produced elsewhere. The "drug" business will then fail for want of patronage. Desire will die—both the desire to kill and the desire to be killed.

Someone asks, "Will not education stimulate a desire to indulge in habit-forming drugs, instead of creating abhorrence for them?" Do you believe that any school boy or girl, any sane person, would desire to play with a rattlesnake or a cobra or let these reptiles take a "shot" at him after he has learned something about their poisonous fangs? The existence of the human race is built upon fear—sane, reasonable fear. Witness the avoidance of the poison ivy, the water hemlock, the hila monster, and the tarantula. Witness also the simpler fear manifested towards the ugly caterpillars, earthworms, beetles, centipedes,

and even mice. Only those survive who exhibit the most sensible fears—this is the fundamental law of the survival of the fittest. Education fortifies the mind against destructive forces and saves humanity from ruin. Narcotics are comparatively new factors in our civilization and the race has not yet learned to fear them. They are harmless looking; so, why fear them? The Indian did not fear whisky, because the Red Race had had no experience with it. There is no instinctive abhorrence for these newcomers in our civilization, so education is necessary to take its place. When a child has been properly taught the evil effects of harmful things, he recoils from them with the instinct of self-preservation.

Our school have been negligent in teaching boys and girls about the evil effects of narcotic drugs on the human system. They have been taught something about the disastrous effects of "booze" and it has been banished, but sufficient instruction about the narcotic poisons, morphine, heroin, and cocaine, has not been given. If there is any place where the effects of these narcotics should be taught it is in the schools of the nation.

The schools have not functioned in this regard because of the inadequacy of State laws in this connection. At the present time Arizona, Delaware, Tennessee, and West Virginia have no laws requiring the effects of any narcotics to be taught in the public schools. Twenty-seven other States have such indefinite laws that it is not at all certain whether any instruction is required about any other narcotic than alcohol. Thus, in 31 States it would be possible for teachers to omit all instruction about the nature and effects of morphine, heroin, and cocaine without violating the technicality of the law. The temperance laws on the statute books today pertain chiefly to giving instruction about the use of alcohol and tobacco, and refer to the habit-forming narcotics only in an incidental way. This phase of our national education has been shamefully neglected; both text-books and laws being decidedly inadequate to counteract the invading menace. The people of the United States have not been sufficiently informed about the dangers lurking in the use of the hypodermic needle; or we would not now be the most gluttonous opium-eating nation on the globe.

The Nation needs a Mary Hannah Hunt to carry the message of this menace to the very doors of every legislature in the land and to write upon the statute books of every State laws that will fortify our school children against the tricks of the drug traffic. Teachers and text-book makers must enlist in this international campaign against narcotics if the enemy is to be defeated.

To solve this educational problem will require the force of many agencies. We shall need to preach the gospel of narcotic abstinence from the pulpit, to flash it on the screen, to enact it on the stage, to proclaim it from the public platform, to depict it in the press, and, above all, to teach it in our schools. All other agencies will help in fighting this drug menace, but the school is the only place where immunity will be developed in the very fibre of the people; it is the only institution that reaches every child in the United States and it is the

only place where the child lives for five hours each day, for five days each week, and for 32 weeks each year. Here alone is it possible for the child to acquire the fundamental principles of science underlying the nature and effects of these narcotics; here alone can he ask questions about the things he does not understand; and here alone will his knowledge of narcotics be interwoven with that acquired in other subjects. The warp and woof of human life is made in the schools; ideals are born there.

THE PORTER RESOLUTION

Whereas the unlawful use in the United States of America of opium (the coagulated juice of *Papaver somniferum*) and its derivatives (morphia, codeine, heroin), and cocaine (obtained from coca leaves—*Erythroxylum coca*) and other preparations made from these plants or their by-products, with attendant irreparable injury to health and morality and resultant death from continued use, is increasing and spreading; and

Whereas the special committee of investigation of traffic in narcotic drugs appointed by the Secretary of the Treasury, in its report dated April 15, 1919, having considered the secrecy connected with the unlawful sale and use of these drugs, and other difficulties in obtaining information which would give the exact number of addicts in the United States, says: "The committee is of the opinion that the total number of addicts in this country probably exceeds 1,000,000 at the present time," and further says that "the range of ages of addicts was reported as 12 to 75 years. The large majority of addicts of all ages was reported as using morphine or opium or its preparations. . . . Most of the heroin addicts are comparatively young, a portion of them being boys and girls under the age of 20. This is also true of cocaine addicts," and as this report is in harmony with the opinion of many who have carefully investigated the subject; and

Whereas the annual production of opium is approximately 1,500 tons, of which approximately 100 tons, according to the best available information, is sufficient for the world's medical and scientific needs, and the growth of coca leaves is likewise greatly in excess of what is required for the same needs, and thus vast quantities of each are available for the manufacture of habit-forming narcotic drugs for illicit sale and consumption; and

Whereas opium is obtained in paying quantities from poppies cultivated in small areas of India, Persia, and Turkey, where the soil and climate are peculiarly adapted to the production of poppies containing opium rich in morphia, codeine, and other narcotic derivatives; and

Whereas in Persia and Turkey the growth of the poppy and the production of opium therefrom, resulting in large revenues to those respective governments, is controllable by virtue of their sovereign power to limit the exportation thereof and to restrict production to the quantity actually required for strictly medicinal and scientific purposes; and

Whereas the British Government in India, which derives large revenues from the growth of the poppy and the production of opium therefrom, has full power to limit production to the amount actually required for strictly medicinal and scientific purposes; and

Whereas the production of coca leaves (*Erythroxylum coca*) is limited to certain areas of Peru and Bolivia and the Netherlands possession of Java, and their production is controllable by virtue of the sovereign power of those Governments to limit the exportation thereof and to restrict production to the quantities actually required for strictly medicinal and scientific purposes; and

Whereas the antinarcotic laws of a majority of the larger nations of the world provide severe penalties for dispensing habit-forming narcotic drugs without a record of the amount thereof dispensed, thus providing reliable data from which a reasonably accurate calculation can be made of the amount of these drugs needed for strictly medicinal and scientific purposes; and

Whereas on January 23, 1912, as the result of the meeting of the International Opium Commission at Shanghai, China, in 1909, and the conference at The Hague

in 1912, a treaty was made between the United States of America and other powers which was intended to suppress the illicit traffic in habit-forming narcotic drugs, and notwithstanding that upward of seven years have passed since its ratification, the treaty and the laws in pursuance thereof subsequently adopted by the contracting powers have utterly failed to suppress such illicit traffic, by reason of the fact the treaty attempted to regulate the transportation and sale of these drugs without adequate restriction upon production, the source or root of the evil; and

Whereas failure of such treaty and the laws adopted in pursuance thereof to provide adequate restrictions upon production has resulted in extensive and flagrant violations of the laws by reason of the fact that the great commercial value of these drugs, the large financial gains derived from handling them, and the smallness of their bulk, which renders detection in transportation and sale exceedingly difficult, have induced and encouraged the unscrupulous to divert enormous quantities into the channels of illicit international traffic, thereby rendering partially, if not wholly, ineffective the treaty and the laws adopted in pursuance thereof; and

Whereas in June, 1921, the opium advisory committee of the council of the League of Nations adopted a resolution urging the restriction of the cultivation of the poppy and the production of opium therefrom to "strictly medicinal and scientific" purposes, which resolution was approved by the council of the league, but when said resolution was presented for final approval to the assembly of the league, which is composed of a representative from each nation which is a member thereof, it was amended by striking out the words "strictly medicinal and scientific" and substituting the word "legitimate" in lieu thereof; and

Whereas, the substitution of the general word "legitimate" for the specific words "medicinal and scientific" permits the continuance of the sale of enormous quantities of opium and its derivatives in many sections of the Orient by the opium producers of India, Turkey, and Persia, where it is "legitimate" to sell and transport these drugs in unrestricted quantities regardless of their ultimate use by the purchaser; and

Whereas, the continuance of the sale and transportation of such drugs, without restriction on their use, results in the diversion of large quantities thereof into the channels of illegal international traffic and in the unlawful importation into the United States, and the sale here for unlawful purposes, of preparations made therefrom such as morphia, heroin, and cocaine; and

Whereas, the United States of America, in dealing with the traffic in habit-forming narcotic drugs within its own territory and possessions, notably in the Philippine Islands, and in cooperating sympathetically with the efforts of the Government of China in dealing with its opium problem, has always been committed, without regard to revenue, to a program for the complete suppression and prohibition of the production of and traffic in them, except for strictly medicinal and scientific purposes; Therefore, be it

Resolved by the Senate, etc., That it is the imperative duty of the United States Government to safeguard its people from the persistent ravages of habit-forming narcotic drugs.

Sec. 2. That the effective control of these drugs can be obtained only by limiting the production thereof to the quantity required for strictly medicinal and scientific purposes, thus eradicating the source or root of the present conditions, which are solely due to production many times greater than is necessary for such purposes.

Sec. 3. That in the hope of accomplishing this end, the President be, and he hereby is, requested to urge upon the Governments of Great Britain, Persia, and Turkey the immediate necessity of limiting the growth of the poppy (*Papaver somniferum*) and the production of opium and its derivatives exclusively to the amount actually required for strictly medicinal and scientific purposes.

Sec. 4. That the President be, and he hereby is, requested to urge upon the Governments of Peru, Bolivia, and the Netherlands the immediate necessity of limiting the production of coca leaves (*Erythroxylum coca*) and their derivatives to the quantity exclusively required for strictly medicinal and scientific purposes.

Sec. 5. That the President be, and he hereby is, requested to report to Congress on the first Monday in December, 1923, the result of his action.

Passed by the Senate on March 1, 1923.

TECHNICAL WORDS DEFINED

- Addict** (ad'-ikt). The name applied to a person who has used narcotic drugs so long that he is no longer able to do without them.
- Addiction** (ad-ik'-shun). The state of being given over to some habit, such as a drug habit.
- Analgesic** (an-al-jes'-ik). Relieving pain; a remedy for pains.
- Anaesthesia** (an-es-the'-ze-ah). Loss of feeling or sensation.
- Antibody** (an'-te-bod-e). A substance in the blood produced by the body to counteract or neutralize the substance which stimulated the body to produce it. Thus in vaccination against small-pox, the body produces an antibody or solution which is proof against the toxins produced by the small-pox germ should the person ever become exposed to the disease. There are several kinds of antibodies, such as, antitoxins, cytotoxins, and opsonins.
- Antidote** (an'te-dote). A remedy for counteracting a poison. The name applied to a drug which has the power to destroy another drug or its effects on the human body.
- Antitoxin** (an-te-tok'-sin). Any defensive substance either existing normally or developed in the body as a result of the implantation of a poison, and acting as a neutralizer of the poison. The three principal antitoxins are used for diphtheria, tetanus (lockjaw), and hydrophobia. The diphtheria antitoxin which is injected into the body of the patient, is derived from the blood of a horse which has been inoculated with diphtheria toxin.
- Atropine** (at'-ro-pin). A poisonous crystalline drug derived from belladonna. It increases the pulse rate, stimulates respiration, and dilates the pupil of the eye.
- Chloral** (klo'-ral). A colorless oil liquid of a pungent odor and harsh taste, obtained by the action of chlorine on alcohol. The chloral hydrate, which is a white crystalline substance obtained by treating chloral with water, is used to induce sleep.
- Clinic** (klin'-ik). The word means pertaining to a bed. A clinical lecture; examination of patients before a class of students; instruction at the bedside.
- Clinician** (klin-ish'-an). An expert clinical physician and teacher.
- Codeine** (ko-de'-in). A white crystalline drug derived from opium or prepared from morphine. It is not so strong as morphine and is not known to be habit-forming.
- Degenerate** (de-jen'-er-at). One who has changed from a higher to a lower form. A person of low grade mental or physical constitution.
- Delirium** (de-lir'-e-um). A mental disturbance marked by senseless speech, illusions, hallucinations, delusion, excitement, restlessness, and incoherence, having a comparatively short course, and usually resulting from fever or some other disease, from intoxication, or from injury.
- Derivative** (de-riv'-a-tiv). Morphine and codeine are obtained from crude opium and are said to be derivatives of opium, that is, they are derived from opium.
- Diagnosis** (di-ag-no'-sis). The art of distinguishing one disease from another. The determination of the nature of a case of disease.
- Diagnostician** (di'-ag-nos-tish'an). An expert in diagnosis.
- Dionin** (di'-o-nin). A white, bitter, crystalline compound made from morphine. Its scientific name is ethylmorphine hydrochloride.
- Facies** (fa'-she-eh). The expression or appearance of the face.
- Habitue** (ha-bit'-u-a). A habitual frequenter of any place, especially one of amusement, recreation, and vice. Drug addicts are often referred to as habitues.
- Hallucination** (hal-u-sin-a'-shun). Mind wandering; mental error or morbid delusion. A sense-perception not founded on an objective reality.

- Hydrochloride** (hi-dro-klo'-ride). Any salt of hydrochloric acid. It always contains chlorine.
- Hypodermic** (hi-po-der'-mik). Applied or administered beneath the skin.
- Impotence**. (im'-po-tense). Lack of power; chiefly of reproductive power or virility.
- Kleptomaniac** (klep-to-ma'-ne-ak). A person having an insane impulse to steal. He steals without purpose or necessity for it.
- Lachrymation** (lak-rim-a'-shun). The secretion and discharge of tears.
- Melancholia** (mel-an-ko'-le-ah). A form of insanity marked by a depressed and painful emotional state with abnormal suppression of mental and bodily activity.
- Narcotic** (nar-kot'-ik). Any drug that produces sleep or stupor and at the same time relieves pain.
- Opiate** (o'-pe-ate). Any drug or chemical derived from opium. Morphine and heroin are opiates; cocaine is not.
- Oxidation** (oks-id-a'-shun). The act of burning. It takes place when some substance combines with oxygen.
- Pharmacopoeia** (far'-mak-o-pe'-ah). An authoritative treatise on drugs and their preparations.
- Protoplasm** (pro'-to-plasm). The essential constituent of the living cell. Under the microscope it is seen to consist of a fine network of protein matter containing fluids in the meshes.
- Protoplasmic poison**. Any drug which destroys or has a tendency to destroy protoplasm or cell life.
- Radicle impulse**. The pulse beat or throb.
- Spermatozoa** (sper'-ma-to-zo'-a). The male reproductive cells found in the semen. They can move about and serve to impregnate the ovum of the female.
- Sterility** (ster-il'-it-e). Barrenness; inability to produce young.
- Sulphate** (sul'-fate). Any salt of sulphuric acid. A sulphate contains sulphur and oxygen and some other element, such as sodium, lead, iron, etc.
- Sulphonal** (sul'-fo-nal). A colorless or white crystalline powder used to produce sleep.
- Suprarenal** (su-prah-re'-nal) *glands*. Flat triangular organs situated on the upper side of the kidneys. Their secretion is thrown into the blood stream.
- Symptomatical** (simp-to-mat'-ik-al). A symptom is any evidence of disease or of a patient's condition. In treating a disease symptomatically, the physician gives drugs which tend to restore the depressed or over-stimulated organ to its normal state; that is, counteracting medicines are given.
- Therapeutics** (ther-ap-u'-tik). The science and art of healing. Also a scientific account of the treatment of disease.
- Tolerance** (tol'-er-ans). Ability to endure the continued use of the drug in increasingly larger doses.
- Toxin** (toks'-in). Any poisonous substance produced by bacterial action. A toxin is the waste product excreted by disease-producing bacteria. Its presence in the body may cause the patient discomfort, often producing abnormal temperature and sometimes causing death. The toxin of the tuberculosis bacillus is mild, the damage being done by the germs themselves, and not by their poisons. The diphtheria toxin is very poisonous, and relief is given by injections of anti-toxin produced in the horse.
- Veronal** (ver'-o-nal). A white crystalline substance used to produce sleep.