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EDITED BY T. D. CROTHERS, M. D.

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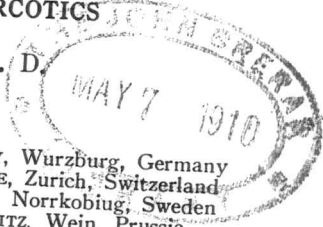
THE JOURNAL OF INEBRIETY

OFFICIAL ORGAN OF THE AMERICAN MEDICAL ASSOCIATION FOR
 THE STUDY OF INEBRIETY AND NARCOTICS

EDITED BY T. D. CROTHERS, M. D.

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SPRING, 1910

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THE JOURNAL OF INEBRIETY

SPRING, 1910

ALCOHOL IN ITS RELATION TO MENTAL AND NERVOUS DISORDERS

BY J. G. NULL, M. D., ADJUNCT PROFESSOR OF MENTAL AND
NERVOUS DISEASES, COLLEGE OF PHYSICIANS AND
SURGEONS OF SAN FRANCISCO.

THAT alcohol exerts a most baneful influence in the causation of mental and nervous diseases is an undisputed fact. That it is also a potent factor in the etiology of numerous mental and nervous derangements of doubtful pathology, but of no less direful consequences, is also true.

Its evil effects are manifested both directly and indirectly, not only on the unsuspecting imbibor, but also in his progeny where it is a most prolific source of an unstable nervous organization incapable of resisting disease and evil tendencies, thus producing thousands of mental, moral and nervous imbeciles.

It is not the purpose of the writer in the following article to delineate and discuss in detail the pathology resulting from the use and abuse of alcohol, but rather to present in a sequential and logical manner evidence of the high potentiality of alcohol for causing mental and nervous disorders.

Its manifestations of evil are so diverse and far-reaching that great liberty and wide range of latitude will be taken in this discussion to the end that we may avail ourselves of all relevant matter, though it may seem to the casual reader that we are going beyond the province of our subject.

Any substance taken into the human system must act in one of three ways: (1)—It may act as a food, maintaining vital processes and building up the tissues of the body; (2)—It may act as a poison, depressing or stopping vital processes

and injuring the tissues of the body, (medicinal doses of the poisonous drugs here excepted); (3) It may act indifferently, neither injuring nor benefiting the tissues of the body and remaining neutral to the mental, nervous and physical welfare of the individual.

Now, we may ask, in which of the foregoing classes should alcohol be enrolled? To answer this question intelligently, requires investigation, for its importance forbids hasty and unscientific conclusions. In order to appreciate clearly the inherent qualities of alcohol and gain an accurate conception of its relation to living protoplasm, its origin must be studied.

Ethyl alcohol (C_2H_5OH) is produced through the agency of a unicellular, microscopic plant when associated, under proper conditions, with a saccharine fluid. This fluid serves as a pabulum on which the plant feeds, and in addition to sugar, must contain other necessary nutritional ingredients, all in a soluble or dialyzable form.

In a general way the great plan of nutrition of plants and animals widely differs.

The plant receives its energy chiefly from the sun's rays and its food from substances in the mineral kingdom, which possess no potential energy. With these substances, CO_2 , N , and H_2O and the energy thus received from the heat and light of the sun's rays, chemical combinations are effected and potential organic bodies are formed from these otherwise inert, inorganic constituents.

Animals, on the other hand, decompose and render sensible this potential energy stored up in the organic substances prepared by the plant.

The vegetable thus furnishes food for the animal, its potential energy becoming kinetic energy in the animal, and manifested in the form of heat, nervous energy, and muscular movement.

It is thus seen that the general plan of plant growth is a synthetic process, while that of the animal is, with few exceptions an analytic, or destructive process. It is the business of the plant to utilize the simple, inert, inorganic substances in the construction of organic compounds upon which all animals, either directly or indirectly, must depend for their substance.

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This synthetic process of the plant takes place when its green parts are exposed to air and sunlight, under the influence of which it possesses the power of absorbing CO₂ from the air and returning oxygen to the air.

If the plant be examined for the carbon, it is found combined in such bodies as dextrose, levulose, starch, etc., substances known under the title of carbohydrates. The plant also receives nitrogen from the ammonia and nitrates of the soil from which it constructs nitrogenous products.

The above described process takes place only in the presence of sunlight or some artificial light, and it has been proven that the substance which makes this process possible, is the green coloring matter contained in the leaves of the plant. This coloring matter is known as chlorophyll, and will produce the same change when exhausted from the leaf with alcohol.

We may thus see that all organisms possessing chlorophyll, under the influence of sunlight, subsist on such simple, inert, inorganic compounds as CO₂, N, and H₂O, forming therefrom foods for those organisms which are destitute of chlorophyll.

Now, we are prepared to return to the subject of alcoholic fermentation and more intelligently observe the process. We have seen that the yeast plant is an essential and indispensable factor in this process.

This minute organism belongs to the lowest sub-kingdom of plant life and is classified as a fungus. It is distinguished from higher plant life by possessing neither root, stem nor leaf, and in the absence of chlorophyll. Such being the case, we must conclude at once that it is unable to subsist upon the simple, inert compounds CO₂, N, and H₂O, which are destitute of potential energy, so must, like animals, depend on organisms containing chlorophyll for its food.

We have here then, an exception to the general plan of nutrition of plant life—an organism belonging to the plant kingdom, possessing no chlorophyll, and hence, of necessity, resembling animal life in the matter of its metabolism.

Animal nutrition consists of five separate steps; namely, digestion, absorption, assimilation, catabolism and elimination, or excretion. In this process the potential energy

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of the food is liberated and rendered sensible through the agency of decomposition. The food must consist of complex, organic compounds possessing potential energy.

Kinetic energy is necessary for all growth and development and all organisms destitute of chlorophyll, must obtain this energy through a decomposition process of their food products—a process of analysis instead of synthesis.

Now, this is just what we find the yeast plant doing—taking in its food products, decomposing them into simpler compounds, utilizing the energy thus liberated, and casting out the useless, effete material.

This minute, unicellular organism does not possess the power of digestion, and consequently, this step, present in animal nutrition is absent from the metabolism of the yeast plant. As a result its life and development demand that its pabulum be in a freely soluble, or dialyzable form. In this condition it is readily absorbed through the cellular wall of the organism and at once becomes a part of the cell protoplasm.

How the cell accomplishes the building up of new material out of foodstuffs is not known. How it finally causes disintegration of portions of its own living substance is also unknown.

We do know something, however, of the processes through which the living cell-plasm extracts energy from its foodstuffs. This knowledge has been revealed through a study of the phenomena of fermentation.

The latest researches in this direction by our ablest investigators have shown conclusively that the yeast plant possesses an enzyme—zymase—which has the power of causing dextrose to break up into ethyl alcohol and carbon dioxide. This enzyme is the agent through which the living protoplasm or yeast cell liberates the energy of the sugar.

It has also been shown that the zymase is not secreted by the yeast cell, but does its work as an intracellular ferment.

If sugar be withdrawn from the pabulum of the yeast plant, its growth and development are greatly retarded, while in the presence of a saccharine fluid it grows and multiplies very rapidly. From this fact it is plainly evident

that sugar must act as a food for the yeast cell, being absorbed, assimilated, its catabolism effected through the agency of zymase, and the catabolic products eliminated from the cell.

The latest authority on fermentation, Carl Oppenheimer, tells us that among the substances which pass out of the yeast cell are CO₂, H₂O, glycerine, succinic acid, ethyl alcohol and a nitrogenous substance.

But the substances passing out of a living cell are divided into two classes: namely, secretions and excretions. The former being matter elaborated in the cell and passed out into the surrounding medium, where it performs a function advantageous to the cell or to the organism of which the cell is a part. The latter being matter which has been more or less completely catabolized, is incapable of further benefiting the cell, would injure the cell that formed it if retained in it, and is eliminated from the cell immediately after its formation.

As an example of secretions we may mention the enzymes of the digestive glands of the alimentary tract, the function of which is well known. As examples of excretions, we readily recall urea and uric acid, substances which result from the catabolism of nitrogenous matter in animal nutrition.

The substances mentioned above as leaving the yeast plant fulfill all the conditions of excretions. In no case could they be looked upon as secretions, for the yeast plant makes no use of them whatever after their elimination. They are thrown out because no further energy can be secured from them, and if retained within the cell they would poison it.

Vaughan says: "It is true, without exception, so far as we know, that the excretions of all living things, plants and animals, contain substances which are poisonous to the organisms which excrete them. These poisons originate in the metabolic changes by which the complex organic molecule is split up into simpler compounds. It is a well-known clinical fact that the retention of urea and uric acid in the human system produces serious pathological conditions.

Not only are certain excretions poisonous to the organisms

which excrete them, but it has been shown that they are also toxic to any organism of a higher rank. Thus the excreta of mammals might furnish subsistence for bacteria, but the toxic excretions of bacteria would prove disastrous to the vital processes if ingested by animals.

Now, we may ask, is ethyl alcohol (one of the excretory products of the yeast fungus) poisonous to that organism, and hence also toxic to all organisms of a higher rank? To answer this question, we again quote from Oppenheimer, who says: "The question as to how far the cleavage products affect the ferment injuriously can be answered very easily in the case of alcoholic fermentation, since in this case one of the cleavage products, namely alcohol, is, in a certain degree of concentration, a protoplasmic poison, and injures the yeast and decreases the fermentation. When the alcohol has reached a strength of 12 per cent the growth of most species of yeast is much decreased, while with 14 per cent all activity stops."

To recapitulate: Ethyl alcohol is the excretion of a fungus; it is toxic to the organism which excretes it; therefore, it must from its inherent nature, be poisonous to all animal protoplasm.

It was shown that alcohol, when ingested, from its inherent nature, acts as a protoplasmic poison.

There is a very generally conceived and accepted opinion among a certain portion of the laity who defend alcohol as a beverage, that, notwithstanding its classification as a neurotic poison, its action on the human economy is that of a tonic and a food.

This impression is shared and intensified by not a small number of practicing physicians and also by certain medical and scientific writers. The significance of this condition is apparent and requires that we give the matter more than passing notice.

Can there be such a thing as a poisonous food? Is it possible for any substance, at the same time, to act both as a food and as a poison? It is known that certain articles of diet, under certain conditions and at certain times, are poisonous, but so far as at present known, there is no substance, which, at the same time, acts both as food and as

a poison.

The claim that alcohol is a food is based chiefly on the following facts: (1)—It contains the same chemical elements, C, H, and O, as the carbonaceous foods; (2)—It is oxidized in the liver and incidental thereto liberates heat and energy.

The truthfulness of these statements we willingly concede, but we are entirely unprepared to admit that they demonstrate any food value, whatever, for alcohol, and those who use them in defense of alcohol as a food espouse a position absolutely untenable, and reached through fallacious and unscientific reasoning.

It is a well-known fact that many of the most poisonous substances with which we are familiar have the same chemical composition that many of our foodstuffs have. One has only to refer to the well-known laws of chemistry to learn that the chemical and physical properties of an organic compound depend not only upon the kind and number of atoms which the compound contains, but also upon the arrangement of those atoms in the molecule. No one would think for a moment of maintaining that strychnine is a food because it, in common with all other vegetable alkaloids, is identical in its chemical composition with many of our proteid foodstuffs.

Now, let us ascertain whether alcohol must be classified as a food because its oxidation in the liver liberates heat and energy. Food is ordinarily defined as anything which, taken into the body, nourishes or replenishes the tissues. The process through which this is brought about constitutes what we call metabolism, and is the general source of the heat and energy utilized in all cellular activities. No one will hazard the assertion that alcohol will, in any way, nourish tissue or replenish the waste thereof; so that the whole claim and defense of alcohol as a food is necessarily based on the fact that its decomposition in the liver yields heat and energy. Those who hinge their advocacy of alcohol as a food product on this argument embrace a position impregnated with danger and saturated with fallacy.

Any substance, to be scientifically classified as a food, must either nourish or replenish the tissues of the body;

in other words, it must do more than merely furnish heat and energy through its oxidation. If we admit that alcohol is a food because its oxidation yields heat and energy, we must likewise classify as foods all other substances which are oxidized when taken into the human system; for oxidation, no matter when or where, or to what extent it occurs, invariably sets free heat and energy. So, if these characteristics may constitute a criterion upon which to base our judgment of the food value of a substance, many things now looked upon as rank poisons, may be placed with perfect impunity in our list of foodstuffs.

Our most poisonous alkaloids, when ingested, are oxidized in the liver and heat and energy, although they may be inappreciable in amount, are as surely liberated incidental to this oxidation as they are when alcohol is oxidized. To champion this principle is to defend morphine, as well as the other alkaloidal poisons, as foods because of their oxidation in the liver and the subsequent liberation of heat and energy. The only difference between these drugs and alcohol, so far as the matter under discussion is concerned, lies in the respective amounts which the system is capable of tolerating before the physiologic limit is reached—this amount in the case of alcohol being much greater, a correspondingly larger amount of heat and energy are liberated. The principle involved, however, is the same, for if this physiologic limit is exceeded, the results may be as calamitous in the one case as they are in the other.

It is well known that one of the important functions of the liver is to oxidize and render harmless any toxic substance which has found its way into the circulation. In other words, it is the ever-watchful sentinel for and destroyer of invading poisons. This leads us to remark that there are two distinct classes of oxidation constantly going on in the body—the one, widely disseminated throughout the tissues of the body, a necessary step in the great process of nutrition, and the only natural source of the heat and energy utilized in life activities; the other, occurring in the liver, having no relation to the great process of nutrition, and safeguarding the system against intoxication. This latter form we may very properly term protective oxidation, and it is this kind of oxidation which alcohol undergoes

in the body.

There are many other reasons why alcohol has no significance as a food in a strict, scientific construction of the term. Chief among these reasons we enumerate the following: (1)—All of our organic foodstuffs are products of synthetic, or anabolic processes; alcohol is the result of analytic, or catabolic processes. (2)—All animal foods of an organic nature are derived either directly or indirectly from chlorophyll bearing plants; alcohol is a direct product of a non-chlorophyll bearing plant. (3)—Notwithstanding the liberation of heat through the oxidation of ingested alcohol the temperature of the body falls; heat liberated through the oxidation of foods preserves a uniform body temperature. (4)—While energy is set free through the decomposition of alcohol, the manifestations of all forms of energy are lessened. Statistics show that "soldiers, in war or peace, in all climates, in excessive heat or cold, in rain and the hardships of the severest marches, endure best when all alcoholic drinks are withheld." The energy of oxidized food is available and manifested as such in all life activities. (5)—The ingestion of a certain quantity of food is always productive of certain results; to secure the same effect from alcohol requires its ingestion in ever-increasing amounts, in this respect resembling morphine and other narcotics. (6)—Food nourishes and constructs tissues; alcohol weakens and degenerates tissues. (7)—Food is stored in the body for future use; alcohol, serving no need of the body, is quickly eliminated. (8)—Food maintains to the highest degree the functional activities of the nervous system; alcohol lessens and depresses the functional activities of the nervous system. (9)—Food, according to the great plan of nutrition, is absorbed, assimilated, catabolized, and the effete portions eliminated. The process, conserving the welfare of the body, is a slow one. Alcohol is immediately absorbed, quickly oxidized, and rapidly eliminated because it is toxic and has no part in the process of nutrition. (10)—The habitual use of foods never creates an uncontrollable desire for more in constantly increasing amounts; the habitual use of alcohol creates an insatiable appetite for more, again resembling morphine, cocaine and other narcotics.

Still other reasons might be given to negative the assertion that alcohol is a food, but in view of the evidence given in a former article showing its toxicity to living protoplasm and the many differences already pointed out between it and foods, further discussion would seem unnecessary.

Reverting again to the statement made in our premises, namely, that any substance taken into the body acts either as a poison, as a food or indifferently, it has been shown that alcohol acts primarily and specifically as a poison, and that it can in no wise be considered a food. Since its action is that of a poison, any assumption that it may act indifferently, is precluded.

With alcohol now properly classified and its inherent nature clearly placed in our minds, we are in a fair way to accord rational consideration to the part it plays in the etiology of mental and nervous disorders.

As before stated its deleterious effects on the nervous system are exerted both directly and indirectly, and with a strong probability that the injury wrought indirectly through its vicious action on other organs and tissues greatly transcends the damage attributable to its direct action. In view of this fact we would be handling our subject in a very disadvantageous and, indeed, illogical manner if we did not, in a measure, outline this indirect action.

It is well known that the tonicity of the nervous system goes hand in hand with that of the general system; that interference with the normal functional activity of other systems or organs invariably reacts adversely on the nervous mechanism; and that many of our most troublesome nervous maladies are, at least so far, without any discoverable nervous pathology, suggesting to us the bare possibility that these apparently functional abnormalities are brought about through lesions in other organs.

Alcohol, upon ingestion, in common with many other poisons, has both an immediate and a remote action; the former being due to its irritant action upon the mucous membranes and the latter the result of its absorption into the circulating blood.

In concluding our discussion of the above subject we wish to review briefly the action of alcohol on the various

tissues and organs. As mentioned in a former article this action is both immediate and remote.

The early action of alcohol when taken into the system is popularly believed to be that of a circulatory stimulant. With reference to its effects in this direction we quote from Abel who thus summarizes its action on the vascular system: (Textbook of Friedenwald and Ruhrah on *Diet in Health and Disease*," pages 139 and 140.)

"So far as present experimental evidence goes, we may say: 1. That alcohol as such—that is, when it is introduced into the circulation with avoidance of local irritation—is not a circulatory stimulant.

2.—"Alcohol in moderate quantities, say a pint of wine, has no direct action on the heart itself, either in the way of stimulating or depressing it. This statement is based on the results of laboratory experiments, extending over short periods of time only, and does not imply that it holds for steady daily use of alcohol in this quantity. Large quantities of alcohol weaken the heart.

"It has also no action either on the peripheral or central ends of the nerves which control the rate and force of the heart except probably in unusual circumstances, such as prolonged and severe intoxication.

3—"Alcohol in moderate quantities has also no direct action on the walls of the blood-vessels, either on their muscular portion or on the peripheral terminations of their vasomotor nerves. This statement also refers only to the results of single administrations. For the pathologic effects of the continued use of 'moderate' quantities the writings of pathologists must be consulted."

He next tells us that its action on the blood-pressure is in the direction of a fall and not of a rise. Quoting again his sixth observation he says: "Alcohol, by virtue of its local action on mucous membranes, and also by virtue of its cerebral action, is capable of affecting the several parts of the vascular apparatus in a number of ways, the resulting effects often being such that the term 'circulatory stimulant' is often applicable. Such indirect effects, which are shown by all the pharmacologic congeners of alcohol, are familiar in the use of alcohol in daily life and in medical practice.

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"Of these indirect effects, none is more often observed than a quickening or slowing in the pulse-rate, as is frequently seen in medical practice. These indirect influences must not be allowed to hide the true character of alcohol, which is always depressant in kind, and which easily gets the upper hand of the effects just noted. In a word, alcohol, in respect to its inherent action, when once in the blood and tissues, must be classed with anesthetics and narcotics."

It is well known that the local and immediate action of dilute solutions of alcohol when brought in contact with the mucous membranes or other tissues of the body is that of an irritant. The effect of irritation in any part of the body is the production of a hyperemic condition, its limitations depending on the amount and extent of the irritation. By hyperemia means increased circulatory activity and hence a quickening of the heart's action. Due to this fact alcohol has been erroneously classified as a cardiac stimulant when in reality it is only an indirect manifestation of its toxic properties.

If this hyperemia is maintained for an indefinite period, as in the case of the habitual imbiber, grave pathologic conditions result. There is pronounced proliferation of fibrous tissue with a consequent crowding and choking of the vascular channels, lymphatic ducts, peptic and intestinal glands and parenchymatous tissue. Digestion is seriously deranged. Mucus is secreted in super-abundance and the supply of gastric and intestinal juices is progressively decreased. The pepsin of the gastric juice is precipitated and thus rendered inert. Experiment has shown that while the flow of pancreatic juice is increased its ability to digest albumens and starches is remarkably decreased.

Inasmuch as the greater part of ingested alcohol is carried by the circulation directly to the liver this organ is early and seriously hampered in the performance of its normal functional activities. While it is putting up a noble fight in an effort to protect the general system against intoxication it is itself irreparably crippled. It is the ever watchful sentinel against the entrance of poisons into the general circulation. Alcohol, as is the case with all other poisons reaching it, is at once attacked in an effort to oxidize and

thus render it harmless to other tissues. If its physiologic capacity is exceeded, as is usually the case, the excess escapes by the liver and exerts its full toxic action on the various tissues of the body. This, at first, from mere contact with the tissues, is that of an irritant, the resulting pathology of which has already been described. When it is once actually absorbed and taken into the living protoplasm of the cell, its true and inherent nature as a narcotic is manifested. Its effect here is to deaden and slow the functional activity of the cell. This action of alcohol has been conclusively proven by experiment.

There are many who believe that alcohol taken in moderate quantities, i. e., not exceeding the physiologic limit—is harmless. Taken in such limited amounts it is fully oxidized in the liver. Without mentioning the deleterious effects it exerts in the gastro-intestinal tract, the question presents itself, can the full oxidizing capacity of the liver be expended in the oxidation of alcohol without injury resulting to the liver itself or to the system at large?

To the first part of this question we reply, that alcohol cannot be so quickly oxidized in the liver but that it exerts both an irritative and a narcotic action, such action, we admit, being proportioned to the amount of alcohol present. In answer to the latter part, we cannot do better than quote from a very exhaustive paper on this subject by Winfield S. Hall, M. D., Chicago, published in *The Journal of Inebriety*, volume 30, number 4.

He says: "It has long been known that the liver produces oxidases and that it is the site of active oxidation of mid-products of katabolism and of other toxic substances."

"Alcohol usually formed as an excretion of the yeast plant is also found as a mid-product of tissue katabolism. It belongs clearly then to the toxic substances mentioned above."

"On *a priori* grounds we should expect alcohol to be oxidized in the liver along with leucin, tyrosin, uric acid, xanthin bodies and various amido bodies." There have recently appeared two most important papers based upon extended researches, upon man and lower animals. These researches practically clear up this knotty question.

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"Dr. Reid Hunt,* in one of the Government Laboratory stations, undertook an extensive series of experiments to determine the influence of alcohol upon the defense of the system against bacterial and other toxins. Throughout this exhaustive research, Dr. Hunt found uniformly that the ingestion of even small doses of alcohol was followed by a marked decrease of the defense of the system against toxins.

"This effect was due to the disturbance of the liver function.

"The other research referred to was conducted by Dr. Beebe and published in the *American Journal of Physiology*.† The subject of the experiments was a young man in good health, of regular habits unaccustomed to the use of alcohol in any form.

"The diet was uniform throughout. Experiment I covered a sixteen-day period divided into a seven-day control, with all conditions normal. A six-day period during which alcohol was given and a four-day period during which observations were continued without alcohol.

"The amount of uric acid excreted was accurately determined. The daily average of uric acid for the control period was 0.635 gms., for the alcoholic period, 0.755 gms., and for the post period, 0.615 gms. Note that during the alcoholic period the increase of uric acid was approximately nineteen per cent—a notable increase. Subsequent experiments yielded similar results.

"The author's conclusions are so important that I will give them in full:

1.—After these experiments there is no doubt that alcohol, even in very moderate amounts, causes an increase in the excretion of uric acid.

2.—The following points indicate that the effect is due to a toxic effect on the liver, thereby interfering with the oxidation of the uric acid derived from its precursors in the food. (a)—Alcohol taken without food causes an increase. (b)—In experiment 2, the diet contained much less purin food than in experiment 1, and there was a similar increase in the uric acid excretions. (c)—The maximum

*Reid Hunt. Studies in Experimental Alcoholism, 1907. Hygienic Laboratory.—Bulletin 33.

†Beebe. The Effect of Alcoholism upon the Excretion of Uric Acid in Man. *American Journal of Physiology*. 1904-5, XII, p. 13.

increase occurs at the same time after a meal as it does when purin food but no alcohol is taken. (d)—The purin bases are affected to the same degree as the uric acid. (e)—Alcohol is rapidly absorbed and passes at once to the liver, the organ which has most to do with the metabolism of proteid cleavage products.

“The increased excretion means that a large quantity of urates has been produced and not that more of that which is already present has been excreted.

“If we accept the origin of the increased quantity of uric acid to be the impaired oxidative powers of the liver, the results of these experiments will have greater significance than can be attributed to the uric acid alone.

“For the impaired function would affect the processes which are normally accomplished by that organ, and the possibilities for entrance into the general circulation of toxic substances of intestinal putrefaction, for instance, would be increased.

“The liver performs a large number of oxidations and syntheses designed to keep toxic substances from reaching the body tissues; and if alcohol in the moderate quantity which caused the increase in uric acid excretion impairs its power in this respect, the prevalent ideas regarding harmlessness of moderate drinking need revision.”

“The value of this work and that of Reid Hunt can hardly be overestimated. In the first place the rapid oxidation of the alcohol in the liver is explained. *Alcohol itself, being one of the toxic substances which reaches the liver from the alimentary canal is at once attacked by the liver, and if the oncoming tide of alcohol is not too great it will practically all be oxidized.*

“But the hepatic oxidation of other toxic substances is impaired in the meantime so that they get past the liver to the tissues, where they may do injury. Some of these toxins are excreted unoxidized by the kidneys. There are three ways of accounting for this condition. (1)—The oxidation capacity of the liver is limited. The physiological limit of alcohol ingestion is that amount which taxes the oxidation capacity of the liver to its limit. When thus taxed all other toxic substances including uric acid and the xanthin bodies pass through the liver unoxidized

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to appear in the urine. (2)—The presence of alcohol in the blood, through its toxic action upon the liver cells, impairs the hepatic oxidation capacity and thus permits toxic substances to pass unoxidized. (3)—A combination of these conditions may represent the real situation. It is hardly conceivable that the relation of alcohol to the liver capacity is not covered in the hypotheses above formulated.”

It is thus seen that experimental investigation furnishes abundant proof that alcoholic indulgence even in ‘moderate’ quantities (physiologic amounts) is not without injurious results, while with an increase beyond the physiologic limits widespread intoxication and progressive pathologic conditions in all tissues occur.

To the end that we may not lose the trend of our discussion it would seem well at this point to summarize: It has been shown that alcohol is intrinsically a protoplasmic poison; that scientifically considered, it has no significance as a food; that it cannot, in a strict sense of the term, be classed as a stimulant; that its direct effect when brought in contact with the tissues is that of an irritant, but once absorbed into the protoplasmic cell its inherent nature as a narcotic is manifested; and finally, that widespread pathology and perverted metabolism with consequent mal-nutrition and auto-intoxication, as well as alcoholic intoxication, invariably follow its habitual ingestion.

The significance of the foregoing facts in the etiology of mental and nervous disorders should now be pointed out.

Directly, the nervous elements, through the narcotizing influence of alcohol, are inhibited to a remarkable degree in the production and transmission of all manner of nervous impulses. For the same reasons the receptive capacity of the nerve centers for external impressions is greatly impaired. Not only is inhibition a marked feature of this narcotism, but accuracy of all mental and nervous effort is equally influenced in an adverse manner.

Indirectly, through a perverted metabolism, a widespread fibrosis, an impaired circulation, and degenerative processes in other organs, the entire nervous system is made a constant sufferer from mal-nutrition and auto-intoxication.

The result of this indirect action (the most baneful, perhaps, of all the evil effects of alcoholism) is obvious to any student of neurology. Retrogressive tissue changes must inevitably follow with a consequent morbid physiology and reduced vitality which strongly predisposes the individual to all manner of mental and nervous derangements.

With this condition of affairs it is not at all surprising that medical writers give alcohol such prominent mention in the etiology of nearly all mental and nervous diseases.

Mental deterioration in the chronic alcoholic is marked and characteristic. The intellect becomes lethargic and inaccurate. The will-power, at first weakened, is finally destroyed. Self-esteem, together with a proper regard for morality, honor and patriotism are lost. Ability for concentrated mental effort or continued application is absent. An increasing tendency to excesses and intemperance of all kinds is constantly manifested. Every intellectual effort betrays the slow but sure degenerative changes which must inevitably occur. Instability of mental equilibrium progressively increases till the unfortunate individual becomes a victim of some one or more of the various psychoses.

Space forbids a discussion of the numerous nervous maladies which may be produced either directly or indirectly from periodical or habitual alcoholic indulgence. Reference to any textbook on nervous diseases will bear out the truthfulness of the statement that alcohol is a prominent predisposing factor in a large majority of all nervous affections.

In closing we wish to emphasize the fact that many of the most direful consequences of alcoholism are manifested not alone on the unconscious imbiber but also in his offspring. In no other instance do we find a more pronounced example of direct heredity. Alcoholic parents transmit to their offspring, not only a craving for alcoholic stimulants, but a neurotic constitution of extremely unstable equilibrium prone to unnatural tendencies and excesses in all direction. They are ushered into this world with a nervous mechanism absolutely unable to withstand the strain and temptations of an ordinary life. Through parental intemperance they are doomed to a life of disappointment, suffering and failure.

They are living examples of an awful negative to the oft-heard assertion that if a person wants to drink it is his or her own business. In searching for the cause of epilepsy and insanity in individuals it is found that alcoholic parentage figures most prominently in a large majority of all cases. Statistics based upon a study and close observation of thousands of school children shows that the average intellectual capacity of the children of non-alcoholic parents is much superior to that of the children whose parentage exhibits alcoholic excesses. In the realm of crime, immorality and degeneracy alcohol furnishes its most awful and vivid example of its debauching influence on the finer sensibilities of the human intellect.

INEBRIETY IN THE JURY ROOM

The question of how far a jurymen is made unfit to perform his duties by the use of alcohol has come into prominence again. In a trial extending over three weeks, five days to the week, it was claimed that 25 quart bottles of spirits were consumed by the jurors.

In some parts of the country where persons on the jury are accustomed to use spirits, it is difficult to make them abstainers during their jury duties. In a recent murder trial, the foreman of the jury was a liquor dealer, and of course supplied his brother jurors with spirits as required. The judge accepted a bottle for his own private room.

This was not considered unusual, although it was very evident that neither judge nor jury were in full possession of their senses. There can be no doubt that spirits taken in the jury room in bad air, and under conditions of more or less excitement, causes more serious mental disturbance than in other surroundings. It is also very doubtful if any drinking man is ever competent to wisely determine questions that require comparison of facts and sound judgment.

All drinking men should be excluded from the jury room and will be in the near future.

THE MEDICO-LEGAL CARE OF THE ALCOHOLIC DEFECTIVE

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THE proper care of the thousands of men, women and children who annually succumb to the overpowering influence of the alcoholic habit, which holds so many of them in its relentless grasp until death terminates the scene, is becoming a serious problem not only from the medical and legal standpoint but also from the social, civil and economic aspects of the case. The enormous sum of \$1,325,439,074 was spent during the year 1905 in the United States for liquor and a vast army of incompetents, numbering 1,500,000 men and women, were daily incapacitated for work during that same period, making a total cost of over \$3,000,000,000 for and from the direct effects of alcohol to this nation alone. England spends nearly a billion dollars annually in drink, and if we added up the total expenditures of all the nations of the earth for alcoholic liquors, with the additional cost to the nations from the effects of this stimulant, the wealth of even a modern Croesus would seem but a mere bagatelle in comparison. Yet with such statistics on record the Legislature of the great Commonwealth of New York, the Empire state of the Union, last year failed to pass a bill for the appropriation of a paltry \$15,000 for the purpose of creating a commission to study the treatment of inebriates and persons addicted to the excessive use of narcotics and their relation to the commission of crime and, furthermore, of establishing a state institution for the cure of such persons, the members of the commission to serve without salary, and the above sum to be expended only for the expenses of the said commission. This bill failed of passage on the ground that the State did not have the necessary money to devote to such a purpose.

Alcoholics requiring medico-legal care from an etiological standpoint may be divided into three general classes:

1. Cases having a defective heredity, as alcoholism, syphilis, tuberculosis, some nervous or mental disease, etc., in one or more ancestors. These are not only the least promising but the least amenable to care and treatment.

2. Cases initially healthy and with good heredity but acquiring some severe, organic or functional disease as syphilis, tuberculosis, cancer, a neurosis or psychosis and afterwards becoming addicted to the alcoholic habit. This class is of greater promise but may fail of permanent cure.

3. Cases of good heredity and free from any acquired disease but who drink to excess. These cases are most amenable to treatment and a larger percentage can be permanently cured if treated for a sufficient length of time and in a suitable environment.

In all three of these classes we may have acute, sub-acute or chronic forms of alcoholic psychosis or defective mental states, requiring medico-legal care. Statistics show that some 55 per cent of all cases of alcoholics if properly treated may be cured. If the habit results in an actual insanity, care in either a public or private hospital for the insane may be necessary during the period of complete mental alienation. This period, however, may continue only for a very brief time and, if the patient makes the demand, he must be liberated, as soon as mental alienation ceases and only too often goes forth before he is really capable of properly caring for himself with diminished resistive force to again fall victim to his alcoholic habit. When such cases reach a condition that permits them to leave the insane asylum, they—with those cases in which mental alienation is not complete but there is an inability to control the morbid desire for drink so that they may become an economic burden to their family or to the state, a violator of the law, etc.—all these cases should be legally committed for care and treatment to some colony for inebriety and there remain until such time as the superintendent and his staff (who should all be expert inebriatists) consider that the patient is cured and capable of again going forth into the world and assuming all the necessary

obligations of a useful member of the body politic. Such a colony should be situated near a great centre of population, and easily accessible. In some of the larger states, as New York, Pennsylvania and Massachusetts, several such colonies could be maintained at a great economic saving to the Commonwealth. A colony of this character could be partially self-supporting by the sale of farm and garden produce and the products of various industries, that could be maintained by the labor of the alcoholics supervised by a very small staff of paid employees. Such a colony should have a large tract of arable land with some woodland, so that various crops, vegetables, dairy products, and timber or wood might be obtained. Workshops or special factories should be erected where upholstering, wood carving, leather and metal work, basket and rug weaving, pottery and clay modeling, harness making, blacksmithing, carpentering, stenciling, printing, book-binding and various other forms of handicraft, might be carried on by the alcoholics acting as farm hands, dairy-men, artisans, messengers, orderlies, clerks, attendants and helpers of various sorts. Centrally located, should be an administration building, a hospital, an amusement hall, with stage for theatricals, billiard and pool tables, reading room and gymnasium, the latter containing a swimming pool, bowling alleys, hand and tennis courts, etc.

Suitably arranged about these central buildings and upon a detached cottage plan, groups of small dwellings should be erected, each to accommodate from ten to thirty patients; practically the entire care of these cottages could be left to the patients who occupied them. The sexes should be separated and occupy different parts of the colony with the exception of coming together for dances, entertainments and religious services. This detached cottage plan would permit of a suitable classification of the various forms of inebriety. A church for religious services and laboratories for scientific research should also be erected.

A medical superintendent with an adequate staff of physicians, all skilled inebriatists, should carefully examine every case admitted to the colony, secure a complete history of the same, and keep an accurate record of his condition during the entire period of his residence, classifying him,

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directing his treatment and selecting a suitable occupation as best adapted to the particular skill or training of the individual. All cases sent to such a colony should be under legal commitment, so that the medical staff could have the proper authority to direct the treatment of the patient along the lines best adapted to the individual need of the case and for a suitable length of time. This system of colony care of inebriates would be a much less economic burden to the state than the vast economic waste that now goes on from the lack of proper restraint of this rapidly increasing class of unfortunate defectives. As an illustration, of the 2,593 inmates of the New York City Almshouse, 90 per cent are there through drink and are a complete economic burden to the city, whereas, if placed in such a colony, many could do some work and thus partially pay for their care. That such a colony could be self-supporting is borne out by the reports of the Craig Colony for Epileptics at Sonyea, New York. In this very successful colony, consisting of over 2,000 acres of farm and woodland, there are some 1,200 epileptics, many so defective as to be unable to do anything, and yet, in 1906, the produce from their farm, garden, and numerous industries reached the total value of \$42,000 and practically most of the work was done by the patients. The maintenance of such colonies near great centres of population and conducted along the general lines above indicated would be a distinct step in advance in the care of this continually increasing class of defectives and would be of material economic saving to the nation conserving wealth, diminishing crime, and improving the general health.

THE AFTER CARE OF THE INSANE

In several recent papers on The After Care of the Insane great prominence is given to the necessity of such care among the alcoholics. One writer declares that all restoration and cure of the alcoholics depends on the after care and urges that this class demand more attention than any other. The delusional assertiveness and extraordinary confidence of inebriates after a short treatment are the best evidence of the need of after care, and of all the neurotic cases, the inebriate needs help of this kind.

COFFEE AS A BEVERAGE, ITS USE AND ABUSE

BY ROBERT AMORY, M. D., BOSTON, MASS.

IT may be interesting to learn the experience of one who has spent a long life in studying methods of preparing the beverage coffee in various ways, namely, with hot water, boiling water and cold water. The errors of making coffee should be viewed from the standpoint of its chemical constituency and physical properties. This article will begin with a description of these.

The coffee bean, the product of cultivation in many tropical countries, is gathered, dried by the sun and imported to the various market centers. As is well known it cannot be made into an agreeable beverage unless it is roasted and ground to a fine powder; it should, while roasting, be continually agitated in order to remove the loose particles of its envelope, and be heated equally throughout its interior.

The coffee bean contains, among other substances caffeine, tannin and the volatile oils; the last the aromatic flavor, which is stonger when the liquid coffee is hot. This aroma will be increased if the grinding of the bean is rapidly conducted, because the friction will set it free. These aromatic oils will be readily absorbed by cold water used in making an infusion.

The substance called caffeine is supposed to represent the active principle of coffee, and exists as a latent element in the coffee bean. When isolated it is a white powder having a slightly bitter taste and an acid reaction. At 77 degrees F. it is soluble in nine-tenths the amount of water required for its solution in hot water (175 degrees to 212 degrees F.) its solubility is increased in water containing cerium potassium, sodium salts. These salts are usually contained in spring and well water (hard water).

Pure caffeine given as a medicine, often causes headaches, and in rare instances of susceptibility, mild delirium, noises in the ears and flashes of light, showing derangements of hearing and eyesight. Caffeine, especially caffeine citrate, is used to relieve headaches, though in susceptible individuals it may increase it. Where the use of caffeine is not followed by disagreeable sensations, there often follows

increased mental action, sometimes depression or oftimes exhilaration, and in these cases insomnia. It has the peculiar action of exciting the muscles, and insusceptible people may produce irregular muscular contractions and tremors. It may also effect the heart causing irregular action and interference with the systemic circulation.

Tannin (or tannic acid) is another ingredient of the coffee bean. The Pharmacopeia (United States 1900) states that it is slightly soluble in cold water, but very soluble in boiling water, and in solution will turn blue litmus paper pink, showing its acid reaction.

In the vegetable kingdom tannin is found in the oak-gall and in many other growths; but tannin and gallic acid with iron solutions form an inky substance held in suspension in water, which is favored by heat. Tannin when swallowed produces an astringent in the mouth, throat and gullet, and a disagreeable oppressed feeling in the stomach. Pure tannic acid appears in the form of a yellow colored amorphous powder. It is used in medicine as an astringent and by constricting the smaller blood-vessels it relieves hemorrhage; by its astringent action within the alimentary canal it relieves diarrhoea.

Cushny states that "in the stomach, tannin acid combines with any proteid substance, with which it may come in contact, precipitating it; but as digestion progresses this combination is broken up, as the peptones do not combine with tannic acid in acid solution during the second stages stomachal digestion, and the astringent action is, therefore exercised in the walls of the stomach and intestines. Ordinary quantities cause the same superficial coagulation as in the mouth, but if large doses be given when the stomach and intestines are not protected by foodstuffs, a more complete coagulation of the mucous membrane takes place and the consequent irritation results in vomiting and sometimes in diarrhoea.

The local application of tannic acid causes a diminution of the secretions of glands, as has been demonstrated by Schutz. This is due to its effects upon the protoplasm of the secreting cells, which probably undergo the initial stages of coagulation."

Another local effect produced by tannic acid is seen in the cessation of the movements of the leucocytes in the tissues around the point of application and the arrest of their diapedesis.

The volatile oils, which are set free by heating the ground coffee or by its infusion in boiling water, stimulates the stomach and bowels and favor digestion by increasing peristalsis, especially in the primary stage.

Cushny also states that "coffee is not used in medicine; it contains about two-thirds of 1 per cent caffeine, and roasting does not reduce this percentage as was formally supposed and since almost all the caffeine is extracted by the ordinary hot preparation, a cup of coffee contains 0.1-0 to 0.2 gm. ($1\frac{1}{2}$ to 3 gr.) of caffeine. Along with the caffeine are extracted a number of other substances, the most important of which are volatile substances produced by the roasting, which have been called coffeon, and resemble in their action the volatile oils.

The wakefulness and the relief from fatigue produced by tea and coffee are undoubtedly due to caffeine and to central action chiefly, although the action on the muscles may also be a factor, the feeling of well being and comfort produced by coffee, after a full meal, is probably due to the local action of volatile oils in the stomach. The same result is produced by preparations of the volatile oils, and, in fact, these are often added to coffee in the form of brandy and other liquors. Apart from this local action the volatile parts of tea and coffee seem to have no effect on the economy. In experiments on the activity of the digestive ferments outside the body, it is found that caffeine increases slightly the rapidity of the process, but that coffee and tea retard it considerably. On the other hand, coffee, probably owing to the volatile oils, increases the peristaltic movements of the intestines, while caffeine has no effect on them.

It has been shown conclusively that coffee and tea increase metabolism of the body, the amount of urea and carbonic acid excreted being considerably augmented by their use. This is only to be expected from the increased activity of the nervous centers, which leads to increased movements and increased consumption.

From the above review it will be observed that the beneficial effects of coffee consists in its stimulation. In order to avoid a deleterious stimulating effect, caffeine and tannic acid should be excluded while the volatile oils should be retained. Coffee should be taken with food and not on a fasting stomach, and after a full meal or during it, it is beneficial to digestion, as may be gathered from the foregoing remarks. If brain and muscular stimulations are desired, it is better to take caffeine, the dose of which may be exact. Again it is obvious that the hot or boiling water used in preparing coffee should be avoided, and the infusion made with the cold water.

In order to make an agreeable cup of coffee the following directions should be carefully observed: Grind the coffee bean rapidly to a fine powder, as the heat from rapid friction will excite the evolution of the volatile oils. The grinding should be done immediately after preparing the extract. If the ground coffee stands in the air, the volatile oils will evaporate. Place the ground powder in the upper part of an Austrian china "biggin" (percolator) leaving off the cover and the small saucer; put in a lump of ice and pour on cold water from a water tap (not well or spring water) and let the ice-cold water drip through the ground coffee, stirring the mixture carefully and thoroughly into a paste-like mass. When the infusion has all dripped through the percolator, pour back and allow the percolation to go through the same process as before, replenishing the ice, if necessary.

Now place the lower of the "biggin" in a cool place and put on the cover. The result of this unless too much water is used in the percolation, is a very strong extract. In preparing it for the cup add sufficient boiling water to reduce it to the required strength, and the boiling water will set free the aromatic volatile oils which give the agreeable flavor.

The use of a metal "biggin" for preparing an infusion of coffee is wrong, since the vegetable matter suspended in the infusion collects in the angles of the bottom receiver and becomes the center of a decomposition, the result of which is accompanied by the development of micro-organisms which destroy the suspended particles, that

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give the agreeable taste to coffee. On the other hand clean china or glass does not favor these micro-organisms when coffee is kept in a cold place. If the readers of this article will try making coffee by the above method, the writer feels sure that they will never again make boiled coffee to drink.

GLYCERINE INEBRIETY

This is one of the new addictions, which has never been mentioned before. Dr. Schmey of Berlin reports a case in which a young man drank from 20 to 30 ounces of glycerine every day. This had been going on for many months, and began with the idea that it was of particular value as a nerve tonic.

He claimed to have received great exhilaration after using it, and compared it with alcohol, only more pleasing. A few hours afterwards the exhilarating effects turned to depression, and he had to lie down and sleep. He had become very irritable, was pale, and jaundiced. His appetite declined, and he was erratic in his work and thought.

His thirst for glycerine was very intense, and he refused to abstain and sought every means possible to procure the drug. On examination his liver was enlarged, his heart was somewhat feeble, but beyond general anemia, there was little to mark him as an addict.

He took no medicines and seemed to be functionally in a fair degree of health. This is evidently one of the anomalous cases that are likely to turn from one addiction to another from the slightest exciting causes.

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NASAL COCAINOMANIA AND ITS LOCAL ACCIDENTS

BY DR. A. HAUTANT, ASSISTANT IN THE OTOLOGICAL SERVICE OF THE SAINT-ANTOINE HOSPITAL, PARIS.

Cocaine is frequently employed in rhinology, even in considerable amounts, and rightly, for it is a reliable anæsthetic which none of its substitutes has been able to supplant. The slight disturbances which cocaine may produce are exceptional. Yet physicians should be very careful how they confide this remedy to patients, for fear of accustoming them to its use.

It may be said with truth that true cocaine habit is not engendered as the result of medical prescriptions. Cocaine, unlike morphine, does not put patients to sleep and does not produce a sensation of well-being. Patients who have recourse with sufficient frequency to the action of cocaine upon their nasal mucous membrane use it only for its local effect; in other words, to relieve them from the catarrh from which they are suffering. Cocaine, it must be remembered, almost instantly relieves the nasal obstruction, lessens the discharge, the asthmatic attacks or the violent headaches which result from a congestion of the upper part of the nasal cavities.

These patients, at most, may become cocaine fiends in a minor degree. The solutions prescribed are usually very dilute (1 per cent.) and are used in the form of sprays or are snuffed up. If we remember that the obstruction to the respiration is caused principally by an enlargement of the inferior turbinate, we will understand that snuffing a solution of cocaine will suffice to produce enough freedom for the passage of air into the nose. It is therefore exceptional to find a patient contracting the habit of using cocaine as the result of its therapeutic employment, and the symptoms of poisoning, which may result from such an employment, are always minor in character.

The true cocaine habit, or the severe form of nasal cocainomania, has quite a different origin. The patients are usually ex-morphine fiends, or more frequently persons who are still using some morphine. I am not speaking now of patients who have been treated

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by hypodermic injections of cocaine in order to cure their morphine habit; for this is a very bad method. Indeed, cocaine poisoning and the cocaine habit is even more tenacious than the morphine habit. I am speaking of patients who, of their own free will, or in a spirit of imitation, snuff cocaine as such in crystals.

This method of taking cocaine by snuffing is probably quite rare in the cases of marked cocaine habit. It is not even mentioned in these articles on cocaine habit in the classical textbooks, nor in the work of Brouardel: "Opium, Morphine and Cocaine." There are cases of this kind, however Mr. DeC., a notorious cocaine fiend who snuffed cocaine in crystals, and recently died of cocaine poisoning. Dr. Chartier was kind enough to tell me that Dr. Sollier had seen four cases of this kind. I have personally observed one case, and I know of two others.

These great cocaine fiends always use cocaine in pure crystals, snuffing it to the extent of from one to four grammes of cocaine daily. A patient of Dr. Sollier used as much as from 8 to 10 grammes; another employed a mixture of cocaine and morphine.

These patients cannot lose their cocaine habit. They require cocaine as a stimulant. While morphine puts them to sleep, they are able to remain awake much longer, in fact, several days, without sleeping or feeling the need of rest, when they are taking cocaine.

They may show all the disturbances of chronic cocaine poisoning, mental disturbances quite similar to those produced by alcohol and also disturbances of sensation. Maganan had noted these, and Sollier found them also in these cases (*Progrès Médical*, 1900). These patients have the sensation of creeping worms in their skin. They are constantly examining their hands, and open the smallest follicles with pins and pretend to find worms in the suppurating skin affections which they thus produce.

The nasal mucosa seems to accommodate itself quite well to the contact of the cocaine and to the constant absorption of the drug, for in the cases observed no local disturbances seems to have occurred, or at least none that were sufficiently marked to attract attention.

Yet it is possible that the continued action of cocaine upon the nasal mucosa may give rise to troubles in that tissue. Lubet-Barbon admits that the repeated constriction of the vessels; and local anæmia which follows the use of cocaine, may eventually produce trophic changes and a perforation of the cartilage of the

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septum. He claims to have observed two cases resulting from the immoderate use of cocaine, and does not consider these as exceptional.

It may happen, however, that more severe local accidents are produced; for example, large superficial ulcers in the vestibule of the nose, where the cocaine is introduced, or else inflammatory fibrous changes, which destroy the cartilage. In this connection I may report the following case:

Madame V., aged forty years, morphine and cocaine habituée. At present she takes one drachm of morphine daily in the form of an enema. She began by snuffing cocaine five years ago for the relief of a nasal obstruction due to a rhinitis. Since then, and especially during the last year, she snuffs about sixty drachms of cocaine per month.

She stated that the first attempts at snuffing the drug produced nosebleeds and then an abundant serous discharge. The effect at first was rather disagreeable. Then she gradually became accustomed, and the feeling of stimulation produced by the use of cocaine has led the patient to become a cocaine fiend.

About two years ago, without apparent cause, there appeared an ulceration at the left nasal orifice, through which the patient always snuffed cocaine. This ulceration rapidly grew deeper, and at its bottom there developed small fibrous tumors. These were a variety of hard polyps which obstructed the entrance to the nasal cavity and brought about a very marked obstruction, giving a nasal tone to the voice. There never had been any pain, swelling or redness at the root of the nose. The discharge had never been purulent, but always serous and abundant. She had never passed a sequestrum. The ulceration and nasal obstruction varied in intensity from time to time. At times they disappeared almost completely, always following a diminution or a suspension of the use of cocaine, but they reappeared when the cocaine was resumed.

At present the ulcer has invaded the entire internal surface of the left nasal vestibule, forming a funnel which was sunk deeply into this surface. The ulcer was slightly granular and bled a little, apparently as though the papillæ of the skin had been exposed.

At the bottom of this funnel was the tip of the lower left turbinate, the lower-most portion of which had attached to it a fibrous, hard, insensitive growth, without any mucous covering. When

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this tumor was removed a microscopical examination showed it to be composed of a skeleton of fibrous tissue which at no point was covered with epithelium. The growth presented no characters which would permit us to regard it as syphilitic or tuberculous. It seemed to be an ordinary inflammatory product.

After this fibrous tumor had been removed the interior of the nasal fossa could easily be examined. One is struck by the white, bloodless appearance of the mucosa. The covering of the turbinates was retracted and apparently closely adherent to the bones underneath, but the latter were not altered. The septum was widely perforated, so that the quadrangular cartilage had almost entirely disappeared. The bony portion of this septum was not involved, however. Exteriorly, the point of the nose was sunken, flattened.

On the right side the nostril did not present any changes. The patient had never introduced any cocaine on that side. The mucosa was also white, anæmic on that side. There were no lesions of the pharynx, of the palate or of the larynx. There was a slight swelling of the glands under the jaw on both sides.

The diagnosis was uncertain, when the course of the affection made us think of the influence of cocaine. Indeed, after we had removed the fibrous growth which had obstructed the entrance of the left nasal fossa and had removed the obstruction in the nose, the patient remained for ten days without using cocaine. As a result the ulceration improved, lost its bloody character, became covered with epidermis, and gradually grew smaller. The subsequent introduction of cocaine led to a recurrence of the ulceration and of the polypoid growth. A second operation again caused the disappearance of these growths and a temporary cessation of the use of cocaine. The ulceration again markedly improved, but the great desire for cocaine led again to its use, and the local changes in the nose again reappeared.

It is impossible to eliminate with certainty in this case the possibility of nasal syphilis. But it is more probable that the cocaine played a very important role in the origin of the lesions which the patient presented. A number of arguments may be cited in favor of this opinion: The seat of the ulceration in the nostril and only on that side where the cocaine had been introduced; the superficial character of the lesion, with a destruction of epithelium, the bloodless aspect of the rest of the mucosa, the absolute integrity of the bone of the nose; the absence of any

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history of syphilis in the nose or elsewhere; and particularly the disappearance or amelioration of the lesions whenever cocaine was temporarily suppressed.

How does cocaine produce these lesions? We should not blame the foreign substances introduced with the cocaine, for the powder employed by our patient was made by one of the leading houses. It seems that the vasoconstrictor action of cocaine is the cause of these changes, for we do not find that the prolonged action of adrenalin, which is also vasoconstrictor, easily causes ulcerations of the nasal mucosa?

To sum up, the mania for the use of cocaine in the nose is rarely of medical origin. If it does produce local lesions, they are only small perforations of the cartilage of the septum. Marked cocaine habit through the nasal route is an exception. The patients are usually chronic morphine fiends who have added cocaine to the use of morphine. In this case it is possible that the constant use of cocaine in the pure state and in large doses produces local lesions, especially ulcerations on the internal aspect of the nasal vestibule where the cocaine is introduced and on the quadrangular cartilage of the septum.

ALCOHOL IN ARTERIAL SCLEROSIS

While the use of alcohol is always followed by arterial sclerosis, it will be new to most observers to know that the effects of spirits are more pronounced and distinct in persons suffering from this disease.

A German writer calls attention to this fact, particularly where alcohol is used as a remedy in persons who had been previously abstinent, and who are suffering from arterio sclerosis. The particular symptoms mentioned are dizziness, headache, emotional crying and insomnia.

The psychic phenomena are grouped as follows. First a progressive loss of mental and physical strength. Second, variable stages of depression, some of them very severe. Third, stages of exaltation resembling progressive paralysis, frequently followed by deep melancholia. He concludes by condemning all use of alcohol in any form of arterial sclerosis, asserting that it is the most dangerous drug possible.

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EMETINE

BY WILLIAM WAUGH, M. D., CHICAGO, ILL.

A GOOD many years ago ipecacuanha was suggested as a remedy for delirium tremens. Before it had been generally tried the use of tincture of digitalis in enormous doses came in, and ipecacuanha was forgotten.

My own use of it came about by chance: I was treating a man on the verge of delirium tremens. He would not eat, could not sleep or keep still, or let anybody else have peace. Thoroughly worn out by his incessant pleadings for whiskey, I determined to divert his mind if possible, and gave him one grain of amorphous emetine. Instead of vomiting he went promptly to sleep, slept eight hours, and awoke free from mental or physical distress—the craving for alcohol gone, no headache, unrest or lassitude; he had two characteristic spinach stools, ate a good breakfast with natural appetite and was ready for business.

This highly satisfactory result has followed in similar cases whenever the emetine was retained without nausea or vomiting. To secure this result I have employed the method recommended by the physicians of India in administering dram doses of powdered ipecacuanha for dysentery:—the patient swallows the dose in a cachet or capsule, without any liquid to wash it down, and lies as absolutely motionless as possible for thirty minutes. Recently I have added to this a hypodermic of that matchless sedative, gelseminine.

The remedy emetine fills the indications—it quiets restlessness and induces healthful sleep, dissipates the craving for alcohol and eliminates: in fact its cholagog effect leaves nothing to be desired. Nevertheless it sometimes irritates the stomach and induces vomiting.

This amorphous emetine consists of the combined alkaloids of the root, and since the pharmacopoeia has authorized the use of the Carthagenia ipecac we may expect more nausea to follow our use of this drug, the Carthagenia root being richer in the acrid emetic principle cephaeline, and poorer in the cholagog emetine

I have sought to substitute the latter, but met with difficulties. It is not marketed by any American manufacturing chemist, and as far as I know is only listed by one house in England. I have, however, found that any really competent pharmacist can separate the pure alkaloid, and while rather costly, it is worth while.

Of the pure alkaloid emetine one-twelfth of a grain corresponds with a grain of the amorphous variety; and on account of its rapid solubility this should be administered in capsule or cachet, with some insoluble powder like talc or bismuth to delay solution and absorption. Now that the Council has placed a salt of emetine on its approved list we should be able to obtain it on prescription.

This paper is designed as an introduction to the subject of sedatives in general. The prevailing view has been and is, that these agents are perilous and only to be employed in sthenic fevers occurring in young, robust individuals. By careful discrimination in the selection of these sedatives and applying them so as to sedate only the function that needs sedation, in exactly the dose required to induce just enough sedation, we often secure an effect, that while yet strictly sedative, is nevertheless in its general results strictly fovant, leading to the conservation of the vital forces and lessening the influences imperiling health or even life.

The elimination of toxins from the circulation may be instanced, as well as the relaxation of vascular tension that relieves the heart by enabling it to propel the blood through the vessels with a less expenditure of force.

No conceivable danger seems to accompany the employment of emetine in acute alcoholism. The physician who administers this alkaloid in full doses may rest more easily than after pushing any hypnotic. In the treatment of chronic alcoholism emetine, while useful, has not given me as satisfactory results as podophyllin.

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AUTO TOXINS FROM BEER AND SPIRITS

BY G. H. BANTON, M. D., CHESTER, W. VA.

FROM the title page of this paper, "Auto Toxins from Beer and Spirits," one has a right to expect nothing further than a good, strong temperance lecture, applicable to the laity and such members of the medical profession as need temperance lectures.

I am necessarily then compelled to make this paper short, and will try to point out the difference in the specific poisons and their effect of not only the alcohol but the concomitant substances in the different concoctions and mixtures of malted and fermented liquors. I shall state some facts that have a practical application to the every day care of the body, either in health or disease, the general effect the corroding chemical action of alcohol, its dehydration of the tissues, its influence on suboxidation on the liver, its exciting of greater or lesser mucus excretion in the stomach in the proportion of its greater or lesser construction, its vaso-motor dilation, its toxic aspect on the texture of the arteries as well as its general toxicosis. As alcohol has been gone over by other authors and from almost every standpoint in a general way, therefore, I shall only refer to those as occasion demands to explain or in reciting the damage of the concomitant poisons in connection with the toxic influence of alcohol. There is a little repetition, however, I wish to indulge in in reference to the effect of alcohol on gastric digestion owing to some recent erroneous deductions made from experiments, not too technically carried out, by authors who are attempting to defend an old superstition of the diatetic medical values of alcohol.

The position taken and published is one in which they show that the demonstration of alcohol in dilute solutions up to ten per cent. increases the flow of acid gastric juice, which is one that we will readily admit, but one per cent. of alcohol will also increase the flow of acid gastric juice but will destroy its proteolytic activity, consequently, that there is no advantage in having an abundance of gastric juice with no proteolytic value.

The introduction of alcohol through a fistule into a dog's stomach on a cotton swab produces a flow of acid gastric juice, and also produces an excessive flow of mucus, which immediately becomes tenacious and ropy. This readily suggests the common gastric catarrh present in every case of alcoholism.

These are both purely toxic effects of alcohol diluted, but in an undiluted state, no other toxic substance being introduced with the alcohol, and to this physical disturbance as only a starting point to a large range of subsequent derangements in the process of digestion and dissimilation which lead to other anomalies, expanding their harmfulness on the integrity of the system.

Kast's experiments carried out through a gastric fistula in the patient of Bickel (*Archiv Fur Verdaungs Krankheiten*) also on dogs demonstrates much the same facts heretofore obtained by others, and while he has evidently occasioned some erroneous deductions in his conclusions in relation to the damage done by alcohol to the stomach mucosa and to gastric digestion, especially in reference to the harmful percentage strengthens, yet in the main his experiments are valuable.

His experiments show that the introduction of alcohol into the stomach diluted both excites secretion or increases secretion already established. This also holds good, he says, when alcohol is introduced into the rectum by enemata, the latter action is slighter and shorter and only suggests the result of the action of alcohol on the nervous system if the enema contains a dilution of low percentage strength. The caustic action of alcohol of the greater concentrations on mucus surfaces is well understood, and the introduction of alcohol in the stronger solutions into the rectum would produce primarily the caustic effect on the mucus surfaces with which it came in contact and a reaction of apparent stimulation of the nervous system, and, secondarily, by absorption would exert its narcotic effect generally.

Now, the low percentage of alcohol per rectum did incite some secretion in the stomach but no alcohol could be detected in the stomach contents, consequently the effect must have been produced through the nervous system. Alcohol, therefore, acts similar in that respect as does other

causes, the agreeable action of food in preparation to the hungry man excites both salivation and gastric secretions.

Kast's deductions are that alcohol in dilutions of 20% or less may increase the flow of acid gastric juice, but without increasing its peptic contents, that solutions of over 20% decrease the production of gastric both in quantity and length of time of production and arresting it altogether in concentrations of over 50%.

These facts are true and yet there is more truth of vast importance in this connection which will materially alter the result of the deductions in the fact, as Kellogg and others have proven by extensive experiment, and that is that concentration of alcohol in the form of Rye, Whiskey and Brandy of the strength of one or two per cent. absolutely destroy the protolytic activity of the gastric juice, and here again is another fact noteworthy in this connection, the higher alcohols contained in Brandy are demonstrated to be more injurious than the same percentage strengths of dilute ethyl alcohol when taken into the stomach.

Kast has made a valuable demonstration of the effect of alcohol on the stomach mucus by applying a cotton swab saturated with a 30% solution alcohol through the gastric fistula which excited the entire surface of the mucus membrane to the production of Hydrochloric acid, but only at the point of contact or its immediate surrounding was mucus secreted abundantly, demonstrating that the production of mucus is only local and a provision of nature to neutralize the caustic action of alcohol to protect the integrity of the mucus membranes.

This proves the exact cause of the ever prevalent and very annoying Gastric Catarrh of the alcohol user, and while it is pathological it is a process of defense and protection and only should more firmly legislate against the vicious toxicity of alcohol.

Kast's conclusions as stated in the Year book of '07 is that there is no reason to regard drinks which contain up to 10% of alcohol injurious to the stomach and that these limits for the amount of alcohol can be placed higher if the drink is taken on a full stomach, as in this case a rapid dilution of the alcohol occurs, and that drinks which contain more than 20% of alcohol can no longer be regarded as

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These conclusions as here stated are rather loosely conceived, Kast does not state what amount in the number of drinks of a 10% concentration of alcohol are allowable, and the effects upon which he is reporting are confined solely to the effects on the stomach of the gastric mucosa and the production of gastric juice. Now, the facts are these, one ounce of sterile water will increase the flow of acid gastric juice to the same extent as will one ounce of any alcoholic solution, $\frac{1}{2}$ of 1% of alcohol will in dilution with water or otherwise inhibit the protolytic activity of the acid gastric juice, 2% of alcohol in dilution or otherwise will entirely destroy the protolytic activity of the acid gastric juice. These percentages of alcohol in dilution are probably too small to excite in a single dose any appreciable amount of gastric catarrh, but in the taking of alcoholic drinks containing up to 10% of alcohol, especially as they are found in market adulterated with other toxic substances and coloring matters, and with no expressed limit as to the number of drinks or the frequency of repetition of these drinks one cannot rationally defend the harmlessness of such a practice even if the results were solely confined to the stomach, which it is not, the toxicity is more general if not primarily then secondarily. Alcohol is absorbable as alcohol and circulates as alcohol and the same dehydrating influences are exerted on all the tissues with which it comes in contact with the same effects.

And again in the study of the effects of alcohol on the mucosa of the stomach it is found easy to establish an acute gastric catarrh in animals by the administration of small amounts of alcohol over short periods of time, which are readily curable under diatetic treatment within a period of from three to six or eight days in the first attacks, but as to repetition of these attacks, and especially as to their frequency, if frequent they are not so readily amenable to treatment in each subsequent attack, if little time is allowed to elapse between is more persistent and shows an indisputable inclination to easy chronicity.

The acute attack is characterized by the reddening of the mucus membrane, which becomes covered with a mucopureulent secretion concomitant with an abundant

supply of gastric juice of low activity and deficient digestive power.

In the recovery from these attacks the secretions become thinner, less purulent, then less mucus is produced, the acidity of the juice is gradually increased to normal and the mucous membrane regains its natural color.

In animal experimentation, after the repetition of frequent attacks of induced gastric catarrh by alcohol toxicosis there is established a permanent injury to the stomach mucosa, characterized by the abnormal mixture of tenacious mucus with the gastric secretions, and the animal finally succumbs to the ravages of an incurable gastritis with its concomitant involvements, and especially of those of the intestine. These results are obtained from experiments conducted in the laboratories on animals to whom much less alcohol was administered than is consumed by the ordinary habitual drinker, who is not in any degree considered a drunkard, but who may consume habitually three or four drinks of the ordinary size and alcoholic strength of whiskey.

Passing from this short study of the pathological effects of pure alcohol in dilution on the stomach, let us resume the same study on that Kind of Physiological Chemists the Human Liver. M. Garnier (*Progress Medicales*, March, '07) describes six common and one rare combination of pathological entities which obtain in the alcoholic toxicosis of the liver; first, the fatty degeneration, produced solely through the toxic influence on the liver cells and tissues by alcohol, rendering them incapable of complete combustion of fats, or, in other words, suboxidation; second, Icterus, regardless of any definite absolute proof of the real pathology of Icterus whether obstructive from catarrhal accumulations produced by the action of alcohol, or whether Hemetogeneous produced similarly or otherwise, one fact still confronts us and in this case is the fact of sole importance, and that fact is that Icterus is only a symptom and dependent always upon some endogenous or exogenous auto-toxicosis in the case of alcohol; the responsibility may be divided between both, as Garnier has shown that the Icterus is secondary and not primary to Hepatic Degeneration and appears in importance of pathological sequence next succeeding Fatty Degeneration. Then, third, Garnier lists Diffuse

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Hypertrophy accompanied with Cirrhosis; fourth, the Hypertrophic Cirrhosis of Hanet and the Atrophic Cirrhosis of Laennec; sixth, Pigmentary Hypertrophic Cirrhosis, and finally, as seventh, a form of rare occurrence a combination of the latter two, which he designates Hypertrophic Cirrhosis combined with Glycosuria, and while he rejects the theory that alcohol acts on the connective tissue, he explains these different varieties as due to the different intensities of the toxic action of the alcohol on the liver cells and by the varying resistance of these cells to the action of alcohol. If, as he shows, the toxic action is overwhelming Icterus with degeneration of the cells and rapid atrophy may occur, as in the continued or excessive use of the more concentrated solutions of alcohol, whiskey, brandy, rum, gin, diluted alcohol and the like, but if the action is more moderate, as would accrue from the lesser concentrations as beer, wines of the lighter variety, or possibly even from the less frequent use and the presence of other auto-toxicosis affecting the liver cells, there may result only fatty degeneration. If, also, as is most commonly the case, the action is slower and the Hepatic resistance good, an effort toward repair is made, resulting in Hyperplasia. This, says Garnier, may be accompanied or followed by a steady disappearance of the cells and their replacement by connective tissue, giving the classical picture of the atrophic Cirrhosis of Laennec. This represents the essential gross pathology by the toxic action of alcohol of the cells, tissue and functions of the liver, limiting or destroying its activity as the supreme anti-toxic organ of the system, thus opening the flood gates to perverted metabolism of every degree, and here the damage does not necessarily stop. Alcohol as is commonly introduced into the system as common beverage, represented in the different strength of concentrations from larger beer to cognac brandy, does not expand all of its virulence in passing on the mucosa of the stomach or its gastric secretions, nor upon the liver and its functions and there stop but its pernicious toxicity is carried on to the circulation which it depresses, lowering the temperature, and finally expanding itself on the higher and subsequent centers of the nervous system. This is particularly remarkable in children, the appearance of

physiologic disturbances are first more acutely manifest in the nervous system through the administration of even very small amounts of alcohol in what has hitherto been considered permissible quantities and this fact I regard as sufficient proof of the continuance of alcohol as alcohol unchanged and at least to some extent persisting from its introduction into the system until its elimination, from which we reap only ravages which are more than less irreparable.

ALCOHOLISM AND CRIME

Dr. Albert Wilson of London, in an address on *Alcoholism and Crime*, said that over 1,000,000 persons are arrested in Great Britain yearly, and at least 70% are the result of the use of alcohol. In capital punishment for murder, four out of every five persons committed the crime while under the influence of spirits.

This terrible record is duplicated in this country. Of the half million persons arrested in this country in 1908 for all sorts of offences, 80% were due to the use of alcohol. The homicides, the criminality, insanity and pauperism which followed presents an array of statistics that are not only startling but ominous for the future of this country, unless checked.

No wonder hysterical agitations and emotional revolutions are spreading over the country. Over a million persons are gathered in societies and organizations to devise some ways and means to prevent this evil. The little group of medical men, organized into a society for the study of this subject, and the small number of physicians who are openly assisting in these temperance movements, are foremost pioneers and great leaders.

The Pharisaical sneers that such persons are cranks and extremists, come from the camp followers and those far in the rear of the evolution of the race. There is no subject that calls for higher medical skill and more exact scientific study than this problem of inebriety, its causes and prevention.

There is no fact more certain, than that American civilization will break up in ruin and disaster unless the inebriate and alcoholic problem with all its criminality, pauperism and disease is studied, prevented and stamped out.

Physicians in America are turning to this great field of preventive medicine, which has a personal practical interest to every medical man. In the near future it will be the leading topic for scientific study.

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EDITORIAL

The Reformers' Council at Washington in December, under the inspiration of Rev. Dr. Crafts, was an event of more than passing interest. Leaders of all the great reform movements were present and discussed various phases of the subject with unusual breadth and clearness.

A prominent Congressman in an admirable address on Scientific Research Concerning the Effects of Alcohol, at the beginning of the session, gave tone and direction to all the subsequent speeches.

The great reform leaders presented the very best statements and lectures on the movement, bringing out clearly the latest facts on the destructive effects of alcohol. The old time stories and dramatic portrayals of the evils with emotional appeals were not prominent, and it was evident that the whole subject and the means of prevention were discussed from a higher point of view.

A number of physicians from our society were present and were prominent in addressing lay audiences in different churches. Dr. Kellogg's address on *The Action of Alcohol*, and Miss Stoddard's stereoptican lecture attracted the greatest of interest.

No effort was made to promote any set of resolutions or principles, other than the magnitude of the subject and the need of concentrated efforts by all reform bodies. While recognizing the work done by physicians the old, old theory prevailed that alcohol was the chief and specific cause, and when this was driven out the end would be accomplished.

The narcotism sought for by drink and drug takers and the neurosis and psychosis of which this is but a symptom, is evidently not recognized, or at least made practical in the studies of the subject.

Dr. Crafts deserves the warmest praise for this effort to gather the leaders and have them concentrate efforts on correcting public opinion, and influencing Congress. The next step now will be a great World's Congress for the general discussion of this topic along the line of facts which are being accumulated from all sources.

A Semi-Annual Meeting of our Association was held in Philadelphia, Pa., April 6th and 7th. A large number of papers were given by leading men. The remarkable interest which was manifested in the Washington meeting a year ago by the publication of its proceedings as Senate Document No. 48, gave renewed interest to this gathering, and will attract the attention of scientific men everywhere.

Every reader of THE JOURNAL should write to the U. S. Senator of their State to send them Senate Document No. 48, the transactions of The American Society for the Study of Alcohol and Other Narcotics. This is a volume of 126 pages and is distributed freely to all who ask for it through their Senators.

INTERNATIONAL OPIUM COMMISSION

A gathering of prominent men met at Shanghai in February, 1909. Twelve different nations were represented by delegates. The object of the meeting was to determine what measures could be agreed upon that would diminish the opium addiction in different countries.

Delegates from China, Japan and America wished to appoint a committee to investigate the medical and scientific aspects of the question, but this was voted down by the other delegates. Hence no medical report was made. The commission was confined entirely to a study of the facts concerning the growth of opium, its distribution in different countries and the injuries which followed from it, together with measures and means that would prevent its use.

The reports and the discussions which followed covered nearly 400 cases, and while containing a great many facts, are disappointing in many ways. The commission evidently did not understand the magnitude of the subject and hence failed to bring out the larger views.

The report of the committee from Japan approaches nearer a scientific document than any others. It urges the absolute prohibition of the cultivation of the poppy, and the Government monopoly of the importation, preparation and sale, and that persons who use it for smoking should be licensed.

In Japan and Formosa there was in 1900, 160,000 smokers registered. Nine years later there was a net decrease of over 8,000, owing to government espionage and restraint. Tables

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were given of the distribution of the habit and the age and occupation, and the treatment of the chronic smokers, also the amount imported, and the average consumption.

The report of China shows a still further decrease in the cultivation of the poppy, but morphia seems to have taken its place and to have increased enormously. Of course the latter is smuggled in. The penalty is decapitation to those who persist in its use. The American report dealt largely with the use of morphia, and the Chinese smoking dens. The following statistics are interesting, and were collected from 25 cities. 5% of the prisoners in large jails use opium and 15% of the general criminal population. 21% of prostitute of doctors 2.6% used opium. Of trained nurses 1.32%, and of the general population 0.18% used morphine or opium.

In other countries of the world opium is used more largely, particularly in India. Over a million and a half farmers in India cultivate poppies for the opium product, and this must be used somewhere. Various resolutions were passed concerning the control and diminution of opium and its alkaloids, and also advising each government to pass stringent laws for this purpose.

From the amount of opium grown and morphine manufactured, it was very evident that an enormous consumption evidently increasing, was going on in all the countries of the world. This report is practically a preliminary to a much larger study. A future meeting is projected at The Hague in which it is hoped that a medical study of the subject will be made, and that the various governments of the world will have more satisfactory data from which to determine international laws and measures of suppression.

A NEW ASSOCIATION FOR THE STUDY OF ALCOHOL

Many societies have been formed in England and on the Continent to promote the cause of abstinence and the general study of inebriety. The following circular has come to us, and while there are no particular names as promoters, the outline of treatment seems very rational, and evidently an advance on many other efforts of this kind.

This new association for the treatment of alcoholism seems devoted to the rational curative treatment under medical supervision, and its objects are mentioned as follows:—

1. To treat the poor gratuitously as long as public support is forthcoming.

2. To treat persons of limited income at a cost which covers only medicinal and office expenses.

3. To educate the public to realize that Dipso and Narco Mania are definite maladies requiring therapeutic, sympathetic and individual treatment, just as in other illnesses.

4. To make every effort to reach sufferers from maladies before they reach reformatories.

5. To keep a careful and authenticated history of each case, with report of physical condition by medical men immediately before treatment, and minute reports of progress during treatment, so as to collect valuable information as to the history and causation of Dipso and Narco Mania.

6. To keep in touch as far as possible with patients when convalescent who need help, and to endeavor to obtain employment for them.

7. To energize to get therapeutic treatment carried out as far as possible in homes, reformatories and retreats, where inebriates are detained, without regard to sect and to make efforts that persons suffering from alcoholism shall not be classed with those mentally deficient. Recent statistics showed 60% mentally deficient persons in one inebriate home alone.

One of the results of recent scientific investigations into the causes of inebriety has been to establish the fact that it is a disease requiring, as do all diseases, special skilled treatment and nursing.

The result of the treatment during the nine years it has been employed in Europe, both in patients' own homes and in institutions, have been wonderfully successful, and warrant the belief that in this way alone, can sufferers from drink and drug habits be permanently cured. Then the circular goes on to say that a home is to be opened for women of the better classes, and the term of residence will be extended from four to eight weeks. The institution proposes to furnish profitable employment which will enable all persons to be treated, some of them gratuitously.

Then comes a very curious statement that the special treatment will be orthodox and in no sense a secret cure, and therefore appeal to all sorts of physicians. Finally, the circular points out the way in which individuals may become members of the society, collect money for a free home. Then the matter is philanthropic and unsectarian, and no member will receive any pecuniary benefit from it.

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All this is very interesting and we shall watch with great interest for further details.

The sale of wine in the long past, was beset with troubles and hedged about with very stringent laws. In researches at Susa, Persia, a tablet was found on which was engraved some laws enacted by Hammarabi, who was the sixth king of the First Dynasty of Babylon.

He reigned for fifty-five years, two thousand, two hundred and fifty years before Christ, and was said to be a great soldier, and pious, God-fearing king, who destroyed all his enemies and forced the nation to dwell in peace.

From this and some other tablets he evidently made very severe laws concerning the sale of wine, and prefixed them with a great curse to any who should dare break them. On this bronze fragment rescued it appears that wine selling was carried on by women, and grain was received in payment, and there was frauds perpetrated in the exchange, giving less grain or less wine, according to the regulations.

It was stipulated that where the wine seller was convicted of fraud and cheating, he or she was thrown into the water and drowned. Another regulation concerned the gathering of outlaws in the house of the wine seller. It was her duty to arrest them at once, and have them brought to the palace. Should she fail to do this, she was put to death.

Evidently the gathering of criminals in a wine shop was recognized as a very dangerous thing. If a priestess should open a wine shop, either openly or secretly, it was evidence that she had committed an unpardonable crime and death was the penalty. Another enactment sounds very modern, in inflicting the death penalty on wine sellers who sold to children and feeble minded persons, openly or secretly.

Very minute directions were given about the exchange of drink on credit at the time of the harvest, such bills to be paid in grain when the harvest was over. Men who repeatedly bought wine and became intoxicated, were made slaves, or if too old and crippled, were killed at once.

Each wine seller was to report the amount the patrons drank, if they became intoxicated, and they were to be taken to some place until the effects were worn off. In the meantime, if they violated any laws they were to be executed or be put in the galley and worked as slaves for a time, determined by their

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history and the influence of their friends.

It was the same old struggle to drink moderately, with terrible penalties if they failed.

The criticism, that our Society is only a collection of medical cranks, promoting impractical reform theories, shows that the critics are profoundly ignorant of the subject of alcohol and the movements concerning its place in the economics of the world, and the efforts of our Society.

Thirty-nine years ago this Society began and the great central purpose of its work has never been lost sight of. If the papers presented at our annual and semi-annual meetings are wholesale condemnations of alcohol, it is the voice of science, and not the theories of enthusiasts.

If these conclusions favor or support any political party or theory, it is simply because they are founded on facts which have no other application. The society has never lost sight of the one great truth, that alcohol is a poison and it produces disease, and its use is often a symptom of neurosis.

At the very beginning the theory was announced that inebriety was preventable and curable the same as other diseases, and this fact is sustained by an amount of evidence and experience that is beyond all question. Our Society now realizes that our particular province is to educate leading men, both in and out of the profession, and show the necessity for a new study on a broader basis of the great alcoholic and inebriate problem.

A summer school for the study of the alcoholic problem was opened at Rhyl in Wales, England. The purpose was to instruct teachers, clergyman and reformers concerning the latest facts and conclusions relating to the alcoholic problem.

A series of lectures and demonstrations were arranged under the following topics: Six lectures on eating, drinking, food and its uses. Six lectures on alcohol and the effects of alcoholic beverages on the body. Five lectures on the evil consequences of intemperance to the individual, the home and to the state. Six lectures on law, legislation and preventive measures, and six lectures on educational and home influences.

These lectures were delivered by eminent experts and teachers, and the object was to educate the audience to a clearer knowledge of the alcoholic problem and its various aspects. This is the first effort made to give continuous instruction on this topic,

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and no doubt will be followed by other schools in both Europe and America.

If the various Chautauqua Schools would organize and conduct special courses of lectures on the scientific and hygienic aspects of the alcoholic problem, above all political and moral points of view, a new interest would be given to the whole subject. Chautauqua temperance meetings are but the beginning of what is inevitably coming in the near future, namely the discussion of the problem as a hygienic medical one.

Some interesting statistics have lately been made of the number of opium and morphine takers in the country. One authority thinks there is one addict to every 540 inhabitants. Another estimates one to every 400 and a third, one to every 800. This would give to the first over 200,000 habitues, and for the second over 150,000. One estimate indicates that the annual mortality is about 200 to the thousand of opium addicts.

These startling figures assume greater proportion among those who use spirits, cocaine and other narcotics. Here the estimates indicate that one to every hundred man, woman and child are fatally injured by the use of spirits and narcotic drugs.

The mortality here would be double and thrifble. A correspondent who has made an exhausted study affirms that fully a million persons in the United States are drink and drug takers, and that while the average mortality of all classes is about 15 per thousand, in this class it is fully 400 per thousand.

These figures are of great significance, particularly in the possibilities of their accuracy, or at least approach to that.

Reviews

The Morphia Habit and its Voluntary Renunciat Oscar Jennings (Paris), fellow of The Royal Society Bailliere, Tindall & Cox, London. 1909. This is a of a very interesting book that attracted a good deal a few years ago. It is made up of the history of cases, of treatment, with suggestive theories and general clin

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The author has very pronounced views on the gradual reduction, and re-education of the mind, to overcome the impulse for remedies when exhausted. His reasoning is very clear, and the cases which he offers as examples of his theories are by no means different from that seen in this country, so that taken together it is a most important contribution, and should be read by every person interested in the treatment of such cases, not only for its suggestion, but for its intensely practical application of the many truths, not well known.

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Dr. Jennings has had an extensive experience, and this book gives a good record of this, and is entitled to the greatest consideration as a contribution to a subject very obscure and difficult to treat. The publishers have presented a very attractive volume, clear type and practically arranged.

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The Doctor has very happily expressed in popular and graphic language the dangers from the moderate use of spirits. It is work of this kind that produces very strong impressions on the public mind, and is most valuable in clearing away the superstitious theories which have so long prevailed.

Another leaflet by the same author entitled "Beer and Bread" points out in popular language the errors and stupid theories concerning this subject which have been condemned by all scien-

tific study. This also has an enormous circulation, and will do a great deal of good in promoting the facts which are only known in scientific circles.

The National Temperance Society will be glad to furnish copies of these little tracts to anyone for distribution.

Sir Victor Horsley's *Book on Alcoholism*. The third edition of this book has been issued in paper cover for wide distribution. No modern book on the subject of alcohol has attracted so much attention. The author's accuracy of statement and strong setting of the facts is in striking contrast with the timid explanatory statement of others who have written on this subject.

No critic has been able to show that any of the statements were extravagant, inaccurate or misleading. Recently Sir William Hartley has donated 40,000 copies of this book to the clergymen of England. Eight thousand copies to be sent to the ministers of the Anglican Church, and 20,000 to the Methodist and Baptist denominations, also a copy to every medical officer of health in the United Kingdom.

This is the widest distribution of a book of 350 pages that has ever been made, and will have the greatest impression, and be the beginning of an increased interest in the subject. If this book could be scattered in this country among the leaders in professional circles, the results would be very marked.

The publishers, MacMillan & Co. of New York City, will no doubt make very low rates to those who may wish to procure volumes for distribution.

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- Chap. IV—Penal Institutions and Hospitals for the Insane.
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- Chap. VII—Slums and Town Nuisances.
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