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# THE JOURNAL OF INEBRIETY

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

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### SUMMER, 1911.

#### ORIGINAL ARTICLES

<b>The Biological and Physiological Relation of Alcohol to Life</b> . . . . .	41
By W. S. HALL, PH. D., CHICAGO	
<b>The Treatment of Drink, Drug and Tobacco Habits by Hypnotic Suggestion</b> . . . . .	48
By JOHN D. QUACKENBOS, M. D., NEW YORK	
<b>The Use of Narcotics as Related to the Declining Birth Rate and Race Suicide</b> . . . . .	62
By D. H. KRESS, M. D., WASHINGTON, D. C.	
<b>The Physiological Actions of Radiant Energy and the Static Current and Their Indication in the Treatment of Inebriety and Drug Narcosis</b> . . . . .	72
By W. B. SNOW, M. D., NEW YORK	
<b>Prize Essay Announcement</b> . . . . .	78
<b>EDITORIALS</b>	
<b>Alcoholic Neuritis Resembling Muscular Paralysis</b> . . . . .	79
<b>Inebriates on Moving Trains</b> . . . . .	80
<b>Treatment of Inebriates in London</b> . . . . .	81
<b>Inebriety and Alcohol in Scotland</b> . . . . .	82

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Volume 33, Number 3

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### ORIGINAL ARTICLES

Some Obscure Pathological

By C. C. HERSMAN,

Parental Alcoholism as a

By ALFRED GORDON

Spirit and Drug Taking

By WILLIAM FRANCIS

A Few Suggestions Toward

By G. H. HEALD, M. D.

The Social Glass, a Menace

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### EDITORIALS

Two Great Conventions—

Progress—Inebriety in B

Insanity and Alcoholism

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# The Quarterly Journal of Inebriety

SUMMER, 1911

## THE BIOLOGICAL AND PHYSIOLOGICAL RELATION OF ALCOHOL TO LIFE

BY WINFIELD S. HALL, PH.D., M.D., PROFESSOR OF PHYSIOLOGY, NORTHWESTERN UNIVERSITY MEDICAL SCHOOL, LECTURER ON DIETETICS AT MERCY HOSPITAL AND AT WESLEY HOSPITAL, CHICAGO. PRESIDENT OF THE AMERICAN MEDICAL SOCIETY FOR THE STUDY OF ALCOHOL AND OTHER NARCOTICS. PRESIDENT OF THE HEALTH LEAGUE OF CHICAGO.

**E**THYL alcohol is one of the normal products of the life activity of the yeast plant, though most species of white mold form alcohol under certain abnormal conditions. The conditions which lead to a formation of alcohol by the white mold lead also to a marked increase in the formation of alcohol by yeast.

The yeast plant is a fungus. The method of reproduction used by this order of plants, when all conditions are favorable to vegetative growth, is a germination or budding.

Reess (1) grouped all of the alcohol-forming yeast plants into one genus which he called *Saccharomyces*. He further divided the genus into several species, which are gradually increasing in number as new researches are made. *Saccharomyces cerevisiae* (8-9 micron) is the beer yeast. This species has been subdivided by Hansen (2) into a great number of races or varieties.

*S. Ellipsoideus* (6 microns), *S. Apiculatus* (6-8 microns), are the principal wine yeasts, though many other species have been described.

The fungi belong to the lowest subkingdom of plants and are distinguished morphologically by absence of root, stem and leaf, and physiologically by the absence of chlorophyll,

the green coloring matter of leaves and stems.

According to the plan of nature, only those organisms which possess chlorophyll are able to build up complex food substances from simple inorganic compounds. Thus we find the green-leaved cereal grasses building up cellulose, starch, sugar, oil, and proteins from such inert compounds as  $\text{CO}_2$ ,  $\text{H}_2\text{O}$ , and the mineral salts of the soil. The energy which is made latent in this wonderful constructive process, *Photosynthesis* is derived from the sunlight by the chlorophyll.

Organisms not possessing chlorophyll are unable to utilize the inert inorganic materials of their environment. They are dependent upon the chlorophyll-bearing plants for their food. Animals live upon the cellulose, starch, sugar, oil, and protein elaborated by green plants for their own use. Fungi subsist in a similar, though perhaps somewhat humbler way: the toadstool and mushroom, appropriating the decaying vegetable matter of field and forest; the yeast plant, consuming the sugar of decaying fruits; while molds and bacteria are found wherever vegetable or animal matter is in the process of degenerative change. In fact, it is the presence of these non-chlorophyll bearing organisms which leads to decay.

From the above we see that the fungus possesses many points in common with animals. Its life energies are liberated from the highly organized foods which it first consumes, then decomposes.

The food of the yeast plant must contain nitrogenous matter, otherwise there will be a wasting away of the cell substance as shown by Pasteur (3). Mayer (4) has shown that this nitrogenous matter may be in the form of such soluble and diffusible proteins as peptone, proteoses, syntonin or yeast extract. A portion of the nitrogenous matter may also be in the form of ammonium nitrate, tartrate, or oxalate.

Besides the nitrogenous food there must be carbonaceous food, which is represented by sugar. Then there must be water and salts; the latter must represent iron, potassium, and magnesium in phosphates, and in some sulphur combination. (Not sulphate—Mayer.)

As these foods are all soluble, they may be directly absorbed by the yeast cells without the intervention of any

digestive process. They are absorbed through the cellulose wall of the yeast cells and become a part of the cell protoplasm. In this connection we must remember that not all of the substance included under the term cell protoplasm possesses that property which we call *life*, and assimilation has not taken its highest step when a substance enters the cell.

The cytoplasm of the cell is now generally accepted as representing a reticulum (spongioplasm) whose meshes are filled with a fluid (cytolymph). Food substances are absorbed into the cytolymph, where they are supposed to be held temporarily in store for the use of the active and more highly organized spongioplasm. The spongioplasm is active, while the cytolymph is passive; the spongioplasm has the power to replenish its own substance from the foodstuffs of the cytolymph. *The spongioplasm alone possesses the peculiar property which we call life.*

In the manifestation of its life the spongioplasm may build up more spongioplasm from the various foodstuffs or it may cause an oxidation of foodstuffs within the cytolymph without these foodstuffs having been built up into spongioplasm. How the cell accomplishes the building up of the new living material out of food-stuffs is not known. How it finally causes disintegration of portions of its own living substance is also unknown.

Something is known, however, of the processes by which the living cell plasma extracts energy from the foodstuffs of the cytolymph. A study of the phenomena of fermentation through half a century by hundreds of investigators has revealed the existence of soluble ferments, or enzymes which are the catabolic agents of the living substance; i. e., they are the instruments through which the living substance breaks down food substances and liberates the latent energy of these foods.

Enzymes may be either secreted by the cell or retained within the cell; in the first case they perform an extracellular fermentation; in the latter case an intracellular fermentation (5).

Buchner (6) has shown that the yeast plant possesses an enzyme—*zymase*—which has the power, when extracted from the cell, of causing dextrose or grape sugar to break up into ethyl alcohol and carbondioxide. No one has ex-

pressed a doubt that this enzyme is the agent through which the living protoplasm of the yeast cell liberates the energy of the sugar. The zymase is not secreted by the yeast cell, but does its work as an intra-cellular fermentation.

Very early in the study of alcoholic fermentation it was discovered that when the yeast cell has an ample supply of oxygen there is a rapid growth and reproduction of the cells with a much decreased production of alcohol and a quantity of carbon dioxide out of proportion to the amount of alcohol (7). On the other hand, with a deficiency of free oxygen there is great decrease in cell proliferation, while the energy for the life processes of the cell is liberated from the sugar through the action of the enzyme; the reaction being something as follows:  $C_6H_{12}O_6$  (plus latent energy) equals  $2 CO_2$  plus  $2 C_2H_5OH$  (plus kinetic energy), which was first suggested by Gay-Lussac (8), but now accepted for practical purposes by Oppenheimer (9).

Kassowitz (10) suggests the following preliminary step in the formula:

$C_6H_{12}O_6$  equals 6 (H-C-H) plus 3  $O_2$  equals  $2 CO_2$  plus  $2 C_2H_5OH$ .

Every living organism absorbs certain foodstuffs, assimilates these, and either directly or indirectly causes their catabolism or breaking down. The catabolism of complex substances results in the formation of a number of substances of simpler composition which are passed out of the cell or organism.

Among the substances which leave the yeast plant are:  $CO_2$ ,  $H_2O$ , glycerine, a nitrogenous substance, succinic acid, and ethyl alcohol.

But the matter which passes out of living cells may be divided into two categories: (1) Matter which is elaborated within the cells and passes into the surrounding medium, where it performs a function or serves a purpose advantageous to the cell or to the organism of which the cell may be a part; (2) matter which has been more or less completely broken down and, being useless to the cell, is passed out in order that its accumulation within the cell may not clog the vital processes or otherwise injure the cell.

As examples of the first category one thinks at once of the enzymes of the digestive glands, elaborated from sub-

stances within the cell-plasma, passed out into the lumen of the alimentary canal, where they induce in the contents of the canal chemical changes which are highly advantageous to the organism as a whole. Then there is mucin, formed and passed out to lubricate and protect the delicate surface of the alimentary, respiratory, and other membranes; also oil, prepared in the sebaceous glands and thrown out upon the skin to keep it soft and non-absorbent.

As an example of the second category, one may name carbon dioxide, a product of the oxidation of the carbon of the cell-protoplasm. In the case of the higher animals, urea and uric acid, products of the oxidation of the nitrogenous matter, are good examples of the second group.

The line of division between these two classes of substances is a very clearly marked one. Johannes Muller made this subdivision and it has been generally accepted. The substances belonging to the first category are called *secretions*; and those of the second *excretions*. Such leading dictionaries as Foster's, Gould's, and Century recognize the division and define *excretion as waste matter thrown out of an organism*. The term excretion is used in this sense by physiologists generally.

In the light of the use and definition of the word "excretion" in the literature of nutrition, we can formulate the following definition, which would be acceptable to any physiologist: *An excretion is any substance; (1) which is the product of intra-cellular oxidation; (2) from which the organism has extracted the maximum energy possible for it; (3) which would injure the cells that formed it if retained in them; and (4) which is expelled by the cells immediately after its formation.*

All of the substances mentioned above as leaving the body of the yeast plant fulfill these conditions, and must, therefore, be classified as excretions. In no case could they, or any one of them, be looked upon as a secretion in the sense in which that term is generally used. No one has ever contended that the yeast plant makes any use of these substances after they are thrown out of the body. The fact is the yeast plant throws them out because it can get no further energy out of them. They are thus typical excretions.

THE BIOLOGICAL SIGNIFICANCE OF EXCRETIONS IN GENERAL,  
AND THE INFLUENCE OF EXCRETIONS UPON LIVING MATTER.

The living organism throws out excretions for two reasons: (1) It can make no further use of them and (2) if retained the substance poisons the organism. A clinical fact long known and frequently illustrated is that retained urea and uric acid cause profound disturbance of the nervous system, followed by convulsions and death. It is a biological principle universally recognized that *the decomposition products of any organism are injurious to that organism*. Vaughn (11) expresses this law in the following words: "*They (the cells of the body as well as bacteria) are injured when the products of their own activity accumulate about them.*"

The excreta of bacteria are all classed as ptomaines by Vaughn (11), and he subdivides these into two classes: (1) Toxic ptomaines, formed in the presence of little oxygen (scarcity of O); (2) non-toxic ptomaines, formed in the presence of abundant free oxygen. Quoting further from Vaughn (12); "It is true without exception, as 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."

We must now inquire whether or not alcohol is one of the constituents of the yeast plant excretion which is injurious to that organism. The latest authority on fermentation, Carl Oppenheimer (13) 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 twelve per cent. the growth of most species of Saccharomycetes is much decreased, while with fourteen per cent. all activity stops."

Mucor (white mold) in general and some of the Saccharomycetes are much more sensitive to alcohol, one per cent.



to four per cent. being sufficient to stop completely all further growth as well as fermentation.

Not only will the excretion of any living organism poison the organism which produces it, but it will have a toxic action upon any organism of a higher rank. Thus the excretion of a mammal might serve as food for some of the lower invertebrates, and certainly for fungi and bacteria; while the excreta of the yeast fungus (alcohol) serves as pabulum for the bacterium of acetic acid fermentation. The excretion of the bacteria (ptomaines) are, however, poisonous to the bacteria and to the yeast fungus; alcohol is toxic to the yeast and to all animals and higher plants.

The biology of ethyl alcohol may be thus summed up: (1) *Ethyl alcohol is the excretion of a fungus; (2) excretions which are toxic to the organism which excretes them are also toxic to all higher organisms; (3) alcohol is toxic to the yeast plant; and, from its inherent nature it is therefore toxic to all animal protoplasm.*

(1) Reess: "Untersuchungen ueber die Alcoholgahrungspilze." Leipsiz, 1870.

(2) Hansen: "Untersuchungen aus d. Praxis d. Gahrungsindustrie." 1895.

(3) Pasteur, cited by Schurtzenberger in "Fermentation." New York, 1893.

(4) Mayer, cited by Oppenheimer, "Die Fermente u. ihre Wirkungen." Leipsiz, 1900.

(5) Green: "The Soluble Ferments and Fermentation." Cambridge, Eng., 1900, p. 13.

(6) Buchner: "Alcoholische Gahrung ohne Hefezellen," Ber. d. d. Ch. Ges. Berlin, —'97—'98—'99.

(7) Buchner u. Rapp: Zeitsch. f. Biol., No. 37, 3. 82, 1899.

(8) Gay-Lussac: Ann. de Chimie, No. 95, p. 311, 1815.

(9) Oppenheimer: "Die Fermente u. ihre Wirkungen," Leipsiz, 1900.

(10) Kassowitz: "Aufbau u. Zerfall d. Protopl." Allgemeine Biologie, Vienna, 1899.

(11) Vaughn. "Ptomaines, Leucomaines, Toxines, and Antitoxines," 1896, p. 549.

(12) Vaughn, l. c., p. 550. Refer also to Aitken, "Animal Alkaloids," 1889, p. 14 et seq.

(13) Oppenheimer, "Die Ferment u. ihre Wirkungen," Leipsig, 1900, s. 276.

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## THE TREATMENT OF DRINK, DRUG AND TOBACCO HABITS BY HYPNOTIC SUGGESTION

BY JOHN D. QUACKENBOS, A.M., M.D., EMERITUS PROFESSOR  
IN COLUMBIA UNIVERSITY.

**I**T gives me great pleasure to appear before you this evening, in response to an invitation from the President of the American Society for the study of Alcohol and Narcotics, to relate my experience in the treatment of drink and drug addiction by hypnotic suggestion. In what follows, I shall have reference especially to the technic employed, the class of cases that have been found amenable, time limits of treatment with general results, and permanency of cure.

Justification for the existence of a society with the design of awakening public concern regarding the dangers that lurk in the use of alcohol and narcotics, coal tars, cocaine and caffeine tinctured temperance drinks—is to be found in the increasing consumption of these stimulants and habit-forming drugs. More than one and a quarter billion dollars are spent annually in the United States for drinks containing alcohol and about a hundred million more for disguised intoxicants that masquerade in proprietary preparations. Moreover, the rapid accumulation of wealth by the manufacturers of patent medicines is one of the world's threadbare proverbs. The inference is unescapable. Who would venture to compute the quantity of dangerous drugs annually swallowed by the people of this country, in the form of soothing syrups, sleeping potions, medicated soft drinks, catarrh, consumption, cough and cold remedies, headache powders and wafers and the more notorious drug addiction cures?

The drink habit is growing, especially among our women, from shop maid and *nymph du pave* to the pampered dames of upper society. The punch bowl figures at all functions, and proud-pied women dip freely therein, ten drinking today where one drank a dozen years ago. School misses and college girls are conspicuous among the throng. Debutantes, not necessarily of the fast set, unblushingly assert a right to drink wine and smoke cigarettes at luncheons

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*Treatment of Drink, Drug and Tobacco Habits* -- 49

and levees, to say nothing of private indulgence, and not a few of this class, as well as young married women, have been brought to my office in a state of intoxication. Such has become the vogue; and, worse than this, girls in their teens see no impropriety in drinking publicly with men companions. Flushed with alcohol, they are likely to forget the restraints of modesty. Root passions spring into expression, the conversation tends to subjects which should not be named in decent society, profanity is tolerated, and when the constraints of self-respect break down with the moral elements of the brain cells, gross indiscretions are a natural consequence. The abstinent, unobtrusive young woman of the past generation is giving place to a coarse and boisterous bon-vivant, controlled by unworthy impulses and wholly unfit to fulfill her function in society as an inspirer to meritorious action, or her function in the home as a character-former, a wife and a mother.

Our very school-children are becoming beer and even wine drinkers, especially those of foreign parentage, and the increasing prevalence of this habit is leading to a mental sluggishness, if not defect, among the pupils of the public schools that is attracting the attention of educators and philanthropists. In few, the prevalent wholesale addiction to the use of alcoholic stimulants—with its accompanying degeneration of organs; its pernicious influence in the causation of pulmonary disease; its marked action in increasing the mortality rate in the case of all diseases, about 15 per cent. of all deaths being due to such action, directly or indirectly; the part it plays in the induction of insanity, one-third of all mental affections being caused by its abuse; and its tendency to transmit to offspring not only epilepsy and mental defect, but marked degeneracy and criminal propensity—is assuming proportions so appalling that it may justly be regarded as perhaps the greatest existing menace to the stability of American institutions.

And what is it that the mass of our people are drinking? Anything and everything but *pure* whiskey, *pure* wine, *pure* beer. It is a poison far deadlier and more rapid in its action than the genuine articles. This fact is ignored by the temperance reformer and often by the physician.

The beer-drinker has to run the gauntlet of various preservatives, especially formalin, with its destructive action on all the organs; and of artificial bitters like strychnia and aloes. Even arsenic in poisonous quantities has recently been found in beer, much of which is made from refuse treated with acids and colored with noxious dyes, malt substitutes that destroy digestion and degenerate the arteries, conveying slow poison to the cerebral centers and so wrecking intelligence, will power and moral soundness. Von Moltke was not far from right when he said that beer was a more dangerous enemy to Germany than all the armies of France.

Intoxicating liquors are as liable to adulteration. Properly matured ethyl alcohol or unadulterated whiskey, itself a degenerator of the protoplasm of the brain and nerve cell, is hardly obtainable in an American bar-room. Of every hundred drinks sold in the United States as whiskey to-day, only one is really whiskey; but so clever is the counterfeit that connoisseurs fail to detect it. Amylic ether, or the common whiskey of trade, is the "death's river" setting in resistless current toward murder, robbery, misuse of women, paresis and the asylum. Whatever moral, social, or legislative measures may eventually be adopted looking to the suppression of the drink habit, we are in urgent need of power to restrain in appropriate institutions the habitual drinker of methylated spirits, who is, under the present conditions, a danger to himself, a curse to his family, and a nuisance to the state.

For a dozen years, I have applied the principles of psychological therapeutics to the treatment of alcoholism, more than a thousand cases having come under my care, the record of cures being from 75 to 80 per cent. These cures are effected by appeal to what has been called soul-power, or supernormal faculty—reserved force, that is now recognized by psychologists as inherent in every human personality. The object of suggestion is to awaken the action of this psychic force and place it in control of the craze for drink. In other words, there is in every man, something more powerful than the man we see and know—that is not God. Appeal is made to this something. So in the language of Helena in "All's Well:"

“Our remedies oft in ourselves do lie,  
“Which we ascribe to Heaven.”

It happens to be a fact of mind that psychic control can best be instituted in a state of natural sleep. The technic adopted by me involves:

(1) The establishment of objective rapport by a preliminary conversation in which is awakened the subject's confidence in my desire and ability to serve him through a straight-forward explanation of the procedure and an assurance of the probability of cure, this assurance being based upon the results obtained in my practice by psycho-therapeutic methods.

(2) The administration, where necessary, of some simple sedative adapted to the individual under treatment, who is usually nervous or agitated. By this expedient, cerebral vigilance is removed, relaxation supervenes, and a state of indolent unconcern is induced which rapidly develops into reverie and sleep under the influence of my monotonous voice tones and mental concentration. The object is to secure a more or less complete severance of the normal relations existing between brain plus sense organs and the immaterial part of the man. A moderate depth of slumber has proved in my experience more favorable than profound sleep on the one hand, or sub-hypnotic or hypnoidal states on the other.

(3) Pertinent dynamic suggestions then follow. A consciousness of his own adequacy having been aroused in the patient, his mind is impressed with the certainty of the result. He is assured that, in accordance with his own desire and decree, he has lost all craving for beer, wine, whiskey; that alcohol in any form will disgust him, and, as a safeguard, that he cannot swallow it, cannot carry the containing glass to his lips. The society of low companions is tabooed; the pleasures associated with drink and the glamour of the bar-room are pictured as meretricious and placed in vivid antithesis to the chaste delights of home life. The physical, mental, moral and economic bankruptcy that accompanies dipsomania is held up before the view of the sleeper, and he is forced to the conviction that begotten of this apprehension has come into his soul an abhorrence for drink and all that it stands for. He realizes the presence

of efficiency within him adequate to the enforcement of radical abstinence as the controlling principle of his life; and he is rendered insensible, for the future, to any such combination of passion and allurements as has usually constituted temptation. So he is led instantaneously to scorn recourse to alcoholic stimulants, or to extrinsic exaltation of any kind, either for convivial reasons, or in time of depression, misfortune or sorrow; and to depend exclusively, under any mental or physical strain, on the units of energy legitimately manufactured out of nutritious food, non-intoxicating drinks, air, exercise and sleep. The subpersonal mind is then directed to the vocation or the avocations, or both, as circumstances suggest; the idea that better work can be done under the influence of alcohol is dispelled, and a career of wholesome activities and satisfactory success is imaged as the legitimate result of the abandonment of the compromising habit. The patient is left asleep for an hour or longer in the atmosphere of these convictions.

It will thus be seen that hypno-suggestion is of the nature of inspiration. It is a summoning into control of the true man; an accentuation of insight into life and its procedures; a revealing—in all its beauty and strength and significance—of absolute, universal and necessary truth, and a portraiture of happiness as the assured outcome of living in consonance with this truth. It is not a mere pulling up of weeds by the roots, as Horace Fletcher describes it in "Menticulture"; but it is a sudden overshadowing and starving of character defects and mental weaknesses by a tropical growth of ethical energy which seeks immediate outlet in the activities of a moral life. The patient freely expresses his best self post-hypnotically, without effort, from a plane above that of the will—the plane of apprehension and spontaneous self-command along lines of thought and action that are worthy and wholesome. Thus is effected a perfect agreement between the law of right and the intelligent creature, with which neither the will of the operator nor the will of the subject has aught to do. The popular idea that supposes subjection to the will of another is a mistaken one.

Inspiration, to be efficacious, cannot be mere lip-work or rote lesson. It implies a belief in the suggestions offered, an eloquent and incisive manner born of the courage of

conviction; in short, it is a transfusion of personality. Perfunctory speeches are of no avail, for the mind of the subject is endowed with supra-normal insight, at once detects the disingenuous and rejects the counsel of an uncandid or lukewarm guide. In practical hypnotics, to quote Walt Whitman, "When I give, I give myself."

A *sine qua non* of success is the consent of the patient, an honest desire on his part to reform. Habitual drinkers, booze-hards, those who "soak" as Goldsmith described it, do not, as a rule, wish to be cured. They enjoy indulgences in alcoholic beverages and the false pleasures that attend it; and about ninety per cent. of them, women as well as men, resent the approaches of those who desire to save them. Sometimes, when no other form of appeal is effective, they may be frightened into a realization of the fact that constant use of alcoholic stimulants will result in organic changes in the liver, kidneys and brain, or by lowering the general powers of resistance and at the same time irritating the bronchial tubes and the lungs, through which the alcohol is in part eliminated, markedly predispose to pneumonia and tubercular consumption. In fact, immoderate drinkers may, in sober intervals, be made to realize, not only that they are physically depraved, but intellectually degenerated as to the faculties of memory, attention, concentration, judgment and that they are deficient in business tact and in the general address essential to success. Once apprised of their enervated mental condition, they honestly desire to correct the habit, but cannot of themselves, the craving simulates a mania. Under these circumstances it is comparatively easy to persuade a patient to accept treatment, and a rescue may be effected in a week's time.

But the treatment must be persisted in for a much longer period.

My policy at present has in view three treatments, given at once, covering a period of ten days. After that I insist on seeing my patient once a month for a year at least, renewing the suggestions as I deem necessary and looking carefully to his physical welfare.

It is not claimed that the tendency to relapse is absolutely obliterated by suggestion. The cure may or may not be permanent, as is the case with rheumatism, quinsy, bron-

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chitis, intermittent fever with its distinct germ and distinct specific. No physician is asked to guarantee a patient against a recurrence of tonsillitis, especially when the patient deliberately exposes himself to the appropriate condition for a relapse. More cannot be expected of the physician suggestionist, who is not a miracle-monger. The utmost he can do in a prophylactic line is to reject all compromises in his treatment, suggest total abstinence, forbid exposure to temptation, and render insensible to the psychology of the saloon.

The physical side must not be lost sight of, the serious nutritional disorder threatening degeneration of the neurones. While hypnotic suggestion may regulate a disturbed metabolism in the nerve organs or check atrophic changes in cell protoplasm, it cannot be expected to repair lesions in the blood-vessel sheaths or suddenly atone for the results of an exaggerated destructive metamorphosis in the nerve cell bodies. Fortunately, the damage to the cells is measurably reparable by discontinuance of the poison, and judicious administration of nourishment, general and specific. Therefore, in my treatment, alcohol is immediately withdrawn; stimulating liquid food is given for a day or two; the phosphoglycerates of lime and soda are administered for several months, with a view to improving the quality of the lecithin; also; for a brief period, a tablet containing strychnia, nitroglycerin, atropin and digitalis, and a valerianate to control temporarily undue nervous expression. As there is no disease or condition that is purely mental or purely physical, successful treatment can rarely be given exclusively from the psychic standpoint. It would be immoral to suggest to a patient what the brain and nerve organs are incapable of doing. It would be equally immoral to withhold the drugs that make them capable.

In the insanity of extravagant drinking, coupled with chronic nicotin poisoning, suggestive treatment may sometimes be delayed with advantage until after the compulsory reduction or withdrawal of the artificial stimulant. Patients who, to rid themselves temporarily of the importunity of relatives, accept an institutional life, with mental reservation as to their habits at the termination of the period of treatment, are proper subjects for suggestion while *in sanatorio*.



"The tongue has taken the oath, but the mind is unsworn." Under such circumstances, with the craving in lull, the subliminal self may be impressed.

The success of the treatment bears a distinct relation to the amount of injury already inflicted upon the brain cells and the accompanying mental deterioration. Its advantage consists in the rapidity of restoration to self-control without the necessity for effort of will, without the physical discomfort or suffering that usually attends abandonment of the habit, and, most conspicuously, without the breaking of family ties and the enforced absence from professional or business duties that are implied in sanatorium treatment. Moreover it effects the continuous expression of moral force in the subject, who not only abandons the use of alcohol but otherwise plays the man in all his domestic, social and business relations.

In passing, let me insist on this fact, viz.: The failure of a given suggestionist to effect the cure of an alcoholic or drug addict, does not imply that such a subject is incurable through psycho-dynamic influence. Especially is this to be considered in Emmanuelism failures, where cures are attempted by unqualified clergymen, who are ignorant of the mental states in which receptivity is at its height, and apply extremely crude methods with faith in their efficacy. There are limitations even to the therapeutics of faith.

The mania for drink may have for its object a potable other than the ordinary alcoholic beverages. The sipping of absinthe, known as the green vice, is on the increase in this country. Absinthe frappes and cocktails dashed with absinthe are served at City clubs and saloons, and are now obtainable at many railroad stations and country bars. The first effect of absinthe is a strange exaltation, accompanied with brilliancy of thought. But to him who persists in its use, it means, as Marie Corelli depicts it, "More than death; it means crime of the most revolting character, brutality, cruelty, apathy, sensuality, frenzy." The common symptoms of absinthism are muscular tremor, loss of strength, emaciation, impairment of brain power with vertigo and hallucinations, epileptiform convulsions terminating in paralysis.

The few absinthe drinkers whom I have treated have been beginners, whose habit was nipped in the blossom through appropriate suggestion.

Physicians who have had much to do with alcoholic inebriates realize that there is a direct relationship between alcohol addiction and the abuse of tobacco. Twenty per cent. more money is expended in America for tobacco than for bread. The first effect of tobacco smoking is stimulating, with a rise of blood pressure; a sedative effect follows, with a fall of blood pressure; and if the smoking be continued, the nerve cells are depressed. The depression is cumulative in the system of the smoker, and after a varying interval (of days, weeks or months), it creates an instinctive demand for the antidote to tobacco poisoning—and that is alcohol. The intemperate use of tobacco thus explains 75 per cent. of all drink habit cases. The alcoholic thirst is engendered and inflamed by smoke.

The real danger in smoking consists largely in the habit of inhalation, whereby the volatilized poisons are brought into immediate contact with many hundred square feet of vascular air-sac walls in the lungs, and are thus promptly and fully absorbed to be diffused into the blood and carried on their fatal errand to the several organs of the body. Young subjects immediately learn to inhale. They are, moreover, markedly susceptible to the influence of these poisons, which include, besides the chief active constituent, nicotin-ammoniacal vapors that dry the throat and liquefy the blood, carbon monoxid or illuminating gas that induces a drowsy, dizzy condition and disturbed heart action, carbon dioxid, prussic acid in combination, sulphuretted hydrogen, and coal tar derivatives—all virulent nerve poisons, capable in their concentrated conjoint action of paralyzing the muscles of respiration and so causing death. Schoolboys who become addicted to cigarette smoking exhibit in a brief time its demoralizing effects. They are listless, forgetful, backward in study, and conspicuously lacking in power of attention and application. As the habit is pushed, they become excessively nervous, suffer from shortness of breath due to action on the medulla oblongata and the respiratory muscles, rapid and irregular heart, nausea, giddiness, tremor, insomnia, irritable throat ("cigarette cough") impaired

digestion, and often from dimness of vision which has been known to culminate in blindness (tobacco amaurosis). Gravest of all the resulting evils is the lessening or complete loss of moral sensibility, with a conspicuous tendency to falsehood and theft. The moral propensities are eventually destroyed because of the destruction of those elements of the brain through which moral force is expressed. The victim degenerates into an unmanly, unprincipled, irresponsible doddy-poll, in splendid fettle for the penitentiary or the madhouse. Such is the influence on character of the cigarette habit, which has developed into a form of moral insanity.

Alcoholism cannot be cured until the inhalation habit is disposed of.

In dealing with this vice, much more difficult of remedy than the habit of drink, hypnotic suggestion has proved in my practice of conspicuous value. Many who drink and smoke to excess are willing to abandon alcohol, but come to treatment with mental reservation as regards the use of tobacco. If they objectively consent to the obliteration of tobacco craving, and are sincere in their desire for its eradication, they can be cured through hypnosis. The method pursued with cigarette smokers—many of whom go to bed smoking, and get up smoking, and spend the day smoking, inhaling the fumes of from 50 to 100 cigarettes in 24 hours—has been to deprive them gradually of the deleterious gas. Suggestions are first given to smoke fewer cigarettes each day; secondly, to loathe tobacco, to be nauseated by its reek, and to drop the practice of inhaling without the nervous discomfort usually attendant on discontinuance.

Cigarette smoking has become the curse of the age. Its association with moral degeneracy and failure of mental faculty has led nine of our states to prohibit the manufacture and sale of cigarettes (Tenn., Wis., Minn., S. Dak., Nebraska, Kan., Ark., Oklahoma, Washington); and bills having the same object in view are now pending in the legislatures of eleven others (Ill., Mich., Ohio, N. Dak., Cal., Colorado, Utah, Nev., Tex., W. Va., No. Carolina).

It is estimated by those conversant with the situation (Dr. Kepler), that there are from three to four million drug habitues in the United States. Applicants for cure represent

a beggarly fraction of this number—the great mass of drug slaves purpose remaining habitues.

So many habit-forming drugs are now accessible to the seeker after extrinsic stimulation, that public attention would appear to be diverted from opium and its alkaloids. While it is true that anti-narcotic legislation has done not a little to curtail the use of these derivatives from the poppy, yet morphia, which represents the physiologic activity of opium, continues to be the lord paramount of habit narcotics.

All the great suggestionists have successfully treated morphinomania by inducing hypnosis and implanting an idee fixe against the use of the drug in question either by hypodermic syringe or mouth.

Morphine-hunger, as may readily be inferred, often originates in the sense of relief attending the administration of morphia for the purpose of alleviating pain or the exhaustion due to over-work. The drug soon becomes indispensable, and a necessity arises for a gradual increase of the dose to produce the required effect. Chronic morphine poisoning is the result, with its irresistible craving for the alkaloid; its loss of appetite, sleep and physical vigor; its mental irritability and instability with outbreaks of rage; its brain degeneration with the accompanying moral palsies, pseudomania, mania for deception, will paralysis.

Morphine cannot be suddenly cut off from the patient, as there is danger of collapse in such heroic treatment; it must be gradually withdrawn. Hypnotic suggestion renders such reduction absolutely painless to the subject. It further inhibits the nervous restlessness, mental excitement, physical pains and profound depression that ordinarily characterizes discontinuance of the habit. In three weeks' time the patient is independent of morphia, without any realization of the fact—for if he be in the hands of an incorruptible attendant (and there is no use in treating him without such) he obeys the suggestion to trust that attendant implicitly, to attempt no deception, to question nothing that he is directed to do, and to suppress all curiosity as to the amount of morphine allowed him daily. After he has discontinued the use of the drug, there are two dangers that must be reckoned with; first, that he will relapse; secondly, that he will have recourse to another stimulant. In the morphino-

maniac the suggestions come in conflict with a more than ordinary massive impulse to resort to the dangerous spur.

Moreover, his sincerity lacks staying power, his faith is equally unstable, he becomes discouraged on the slightest pretext, and is prone even to abandon treatment before he has given it a fair trial. For these reasons good results never follow self-treatment. The speaker uniformly declines to treat morphine habitues unless they submit unconditionally to his terms during demorphinisation, and surrender themselves without reserve to his attendants or nurses.

Of all drug habits cocainomania—in the subtleness of its inception, the arduousness of its cure, and the direful nervous and moral wrecks it makes of its victims—is *facile princeps*. And the habit is not confined to the well-to-do. As is absinthe to the working-man of France, so is cocaine becoming to the American laboring class even to the newsboy and shop-girl—a cheap and easily obtainable pick-me-up. The habit has spread with such alarming rapidity that thousands of our youth, as well as of mature men and women, are in its frightful clutch. The negroes of the South have learned the mystery of its power, and double their strength for hard work with generous allowances of the popular stimulant. The lepers of high life, the women of the demi monde, in common with the over-worked physician, clergyman and man of affairs, find in cocaine an attractive brace for exhausted nerves and fagged brain. 150,000 ounces of this alkaloid are annually consumed in the United States.

Many first learn of its effects from its administration by medical attendants in the form of collyrium or nasal spray; and continue to use it after the condition for which it was prescribed has been relieved. None of the victims so insidiously created seem ever to forecast the inevitable brain wreck that waits upon the use of the drug. The irresponsible fancy-monger of to-day develops into a delusion-ridden madman to-morrow. The man whom a single snuff at first impels to merely vulgar bluster, rapidly degenerates in nervous and mental efficiency; loses the power of sustained attention and expression of will, becomes dead to all moral restraint and ends his career in an institution.

Cocaine habitues require the strictest supervision during hypnotic treatment until the dangerous hallucinations are put to flight, and in order that the insane determination to elude vigilance in efforts to obtain the drug may be properly guarded. The stimulant must be withdrawn with the greatest circumspection. Even under suggestion, fainting or collapse is likely to occur if the daily dose is too rapidly diminished.

In addition to the drugs enumerated, large quantities of acetanilid, antipyrin, phenacetin, caffeine (a dangerous cerebro-spinal stimulant—in a hundred soft drinks and preparations that are favorites with women and children), chloral (in Bromidia and Somnos), heroin (in a miscellany of cough mixtures), trional and veronal—are sold without restriction under names that do not indicate their presence.

I have successfully treated many habits of these poisons by suggestion—the most conspicuous case of the trional habit being that of a lady whose regular retiring dose was 70 grains, and of the veronal habit, that of a gentleman who took 100 grains of the drug on a journey between Buffalo and New York. Greater caution should be exercised by physicians in prescribing drugs under proprietary names. The patient learns through this channel of the preparation, and levies on the druggist ad infinitum for Somnos (chloral), Neuronidia (veronal), etc.

One of the later addictions is the Bromo seltzer habit, extremely rife on the higher levels of society, and most demoralizing in its action on heart and blood vessels, digestion, nervous poise and moral expression. Hardly a week passes in which some patient is not weaned in my office from this inviting preparation, now on sale at every soda water fountain. I have recently discharged, cured, a lady who was taking a half dollar bottle daily for headaches and a general exhilaration effect. According to the representations on the label, each ounce of this dangerous salt contains 20 grains of acetanilid. The contents of a 50-cent bottle weigh 2 3-4 ounces; so this patient was consuming 55 grains of acetanilid *per diem*, at a cost of 50 cents, in order to enjoy the stimulating effect of a penny's worth of caffeine and a common soda powder, blanketed by a coal tar notorious as

a heart depressant, and a thinner of the myocardium and arterial muscular coats.

The time will surely come, as civilization refines and knowledge advances, when the occurrence of a contagious disease in family or school will be regarded as a crime. So may we hope that in the fullness of the same time, the unscrupulous vender who deals out death to his victims on the installment plan, either through the medium of attractive nostrum, or cocaine-bearing temperance drink, shall be adjudged as incontestably a murderer as the poisoner who takes the life of his fellow with a single dose of arsenic or the foot-pad who kills with one stiletto thrust.

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## THE USE OF NARCOTICS AS RELATED TO THE DECLINING BIRTH RATE AND RACE SUICIDE\*

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**A** NATION, to maintain herself, must be able to fill the vacancies made by death. The number of her births must at least equal the number of her deaths. During the past century there has been a marked decline in the birth rate in all civilized countries.

France has felt some alarm for years because the number of her deaths exceeded the number of births. In the year 1889 the French government, in aiming to remedy this condition, encouraged the increase of population of births by offering inducements to couples of the poorer class. Fathers of seven children were exempted from the payment of personal tax. This experiment proved a failure for between the years 1900 and 1907 there was a farther decrease of about one hundred thousand births. The year 1907 showed a decrease of over 30,000. France lost in that one year by excess of deaths over births, nearly twenty thousand persons, while the death rate since then has been diminished somewhat. The decline in births still continues.

M. Clementel, former minister for the Colonies, in his report on the war office estimates of France, points out that the diminution of the birth rate is becoming a serious matter to the army. He predicts that in ten years' time there will be thirty-two thousand fewer recruits to replenish the forces than there are at present, while in twenty years the available recruits will have fallen fifty-eight thousand.

It has recently been seriously proposed in the Senate that "the rule of three" children be imposed on every government employee, and that those who are not rearing children be excluded from the government pay-roll, and, further, that the payment of one hundred dollars be granted for the maintenance of the youngest child in every family of three, and the same sum be granted for every child born additionally.

At present out of every ten million eight hundred and twenty-four thousand families, only two million thirty-two

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thousand have three children or more. The remaining seven million two hundred and eighty thousand have only seven million eight hundred and seventy-two thousand children, or an average of one child to the family. Calculations made by some statisticians show that if the present decline continues, a definite time may be fixed for the extinction of the French race.

Thirty years ago, in Great Britain 35.4 births were registered for every thousand of the population. The average between 1907 and 1910 was only 26.6. The year 1910 shows the lowest birth rate on record in London, it being only 24.8 per thousand. The decline in the city of London during the past thirty-five years is over twenty-seven per cent.

In Prussia the number of births per thousand women capable of child-bearing between the ages of fifteen and forty-five, has declined in about the same ratio. In the cities this decline is especially striking. In Berlin between the years 1897 and 1905 there was a decline in the birth rate of more than forty per cent.

In no country is the decline in births more marked than in the United States. The real situation is concealed from the superficial observer by the rapid influx of immigrants. Among the first settlers in this country large families were the rule, and small ones the exception. There was an average of over eight children to the family. At present fifty-eight and seven-tenths per cent. of white women of native parentage, after from ten to twenty years of married life, have not more than two children, and only nine and two-tenths per cent have more than five children. One out of every six of these women is childless. This estimate has been based on the tabulated statistics of Rhode Island. Had the earlier birth rate been kept up, the United States would, no doubt, have a native-born population of fully one hundred million people, whereas, including immigrants and their offspring, numbering over thirty-five millions, we have a population of only ninety-three millions. This represents a loss of more than thirty millions in the native-born population.

During the census of 1910, Baltimore, being relegated from the sixth to the seventh place in the list of the largest American cities, upon investigation discovered that in the

year 1875 she had 8,375 births and a population of less than three hundred thousand, while in the year 1909, with double the population, the births numbered only 8,796. Had the birth rate of 1875, when she had but few foreigners, been continued, she claims she would have a population of about one million. In the eleventh ward, where *native-born* preponderate to the extent of ninety-seven per cent, there were only one hundred and fifty-one births from January to September. In the third ward, where chiefly *foreigners* reside, the number of births during the same period was five hundred and sixty-one.

That a tremendous difference exists between the wealthy and the extreme poor, was shown by results of an investigation made in the city of New York by the New York Milk Committee in the year 1907. Although this was not the special object of their investigation, the purpose of the committee being to ascertain what percentage of the 16,000 annual deaths were found respectively among the rich, the middle class, and the poor. Three sections of the city were taken. The estimated population of these areas was approximately the same. In the area occupied by the very poor, there were 434 births. In the area populated with the middle class (containing more Americans) there were 160 births. In the area made up of the wealthy, only 37 births were recorded. Eleven times as many infants were born among the very poor (chiefly foreigners) as were born in the fashionable uptown area.

We find, from all these investigations, that foreign women have more children than American women; that the first generation of foreign women have more children than the second; those living in rural districts have a greater number of children than city dwellers; those living in the poorer parts of the city have more than the well-to-do; and that the well-to-do have more than the wealthy.

Prof. Albert Bushnell Hart, of the Department of History and Government at Harvard College, in referring to the rapid decline of the birth rate among the Harvard graduates, says: "The class of 1671 contained eleven men, ten of whom married and had seventy-one children." This class, he claims, fairly represented that period. Of his own class, which graduated in 1880, he says: "One hundred and

seventy men received the degree of A. B. Now, up to the present day (representing a period of thirty years) there are not as many as one hundred and seventy sons of those one hundred and seventy graduates."

Prof. Walter F. Wilcox, of Cornell University, who has been gathering statistics, recently announced at a meeting of the Statistical Association, held at St. Louis, that the only hope of seeing children five years of age in the United States by the year 2020, if the present decline continued, would be by importing them from France. He claims that the decline in the birth rate is more marked in the United States than in France.

It is possible that the earlier birth rate in the United States was too high. I do not advocate larger families than can be cared for properly, neither do I consider a decline in the quantity of children a serious matter. It would be of benefit to the race if the quality was thereby improved. But we find that there is a depreciation in quality as well as in quantity. It is estimated that there are in the United States today fully twelve million children of school age who are defectives. So long as the quality continues to depreciate, the fewer the children born the better.

This degeneracy in children is due partially to degeneracy in the parents. It is manifested in the mother by her inability to suckle her offspring, a condition which exists in all civilized lands. Doctor Bunge says: "In the towns of Germany and Switzerland (where we would least expect it) more than half of the women are already attacked by this inability." This disability is always associated with a declining birth rate and is one of the premonitory symptoms of advancing sterility.

There are numerous causes for the decline in the number of births. The intense and unnatural suffering experienced by the modern woman at childbirth has created a dread of having children, and has, naturally, led to the employment of preventive measures. The prevalence of specific diseases is, without doubt, another causative factor. High living, overfeeding, and lack of exercise also act as contributing causes.

The women that have engaged in out-of-door work, and who have been content with simple foods, are the ones upon

whom the perpetuity of the race has in the past depended, and upon these it will in the future depend. Inactivity and over nutrition results in degeneracy and sterility.

The influence of outdoor employment on the fecundity of a race was demonstrated years ago when a handful of people went to Egypt. While the Egyptians inhabited the cities, these people lived in the country, and tilled the soil. So rapidly did they multiply under these conditions, that the Egyptians feared they would soon outnumber them, and, in case of war, fight against them. Believing that harder work would bring about degeneracy, and decline in the number of their births, they said, "Let us deal wisely with them." They appointed over them taskmasters, and afflicted them with hard labor. They were disappointed in the results, however, for the record says, "The more they afflicted them, the more they multiplied and grew." The command was then given to the midwives to destroy the male children at birth; but the midwives said to Pharaoh, "The Hebrew women are not as the Egyptian women, for they are lively, and are delivered ere the midwives come in unto them." It is evident that by them very little suffering was experienced at this period.

In every nation the peasants, whose habits are simple, have in the past been the backbone of civilized nations. Sterility has always been most marked in cities, and among the wealthy or those of luxurious and intemperate habits, in these cities.

Arterio-Sclerosis is always associated with degeneracy of the glands of the body. Degeneracy of these glands and a declining birth rate are associated. A degenerate tree will bring forth degenerate fruit, and ultimately *no* fruit.

Anything that tends to bring about arterio-sclerosis will make less pliable and less elastic all the muscles and naturally will result in an increase in labor pains and thus will be apt to lead to the employment of preventive measures on the part of women. Any habit or practise that favors arterio-sclerosis will bring about degenerative changes in the mammary glands, and the germinal glands, as well as of the liver, kidney, and other glands, and will result in decline in the number of births.

Alcohol, when taken into the stomach, can be demonstrated in the testicle or ovary within a few minutes. Being a narcotic and an irritant, its presence is injurious to the germ elements therein contained, and its elimination through the mammary glands will bring about structural changes in these glands.

Professor Bunge, in his investigations into the causes of the disability on the part of mothers to nurse their young, discovered that "in families where mothers and daughters can suckle their children, drunkenness is rare." The hereditary influence was shown by the fact that "in seventy-eight per cent., where the mother is capable of nursing her children, and the daughter is not, the father of the daughter was an immoderate drinker."

Professor Bertholet, of the Pathologic Institute of Louisiana, in making post-mortem examinations on seventy-five men, of whom thirty-nine were known to be victims of chronic alcoholism, discovered some degree of atrophy in the germinal glands of all but two cases. Complete atrophy was found in only the alcoholics. In the experimental evidence furnished by the reproductive history of Professor Hodges' alcoholized dogs, it was found that to the pair of tipplers there were born in four litters only *twenty-three* pups, and of these nine were born dead, eight were deformed, and *only four were normal*; while the pair of normal dogs produced *forty-eight whelps* (or twice as many), of which *forty-one*, or nearly all, were normal.

The tendency at present is to ascribe all the evils found in social life to the use of alcohol, but alcohol is not the only narcotic that has aided in bringing about the decline in the birth rate. Probably no narcotic drug is more freely used in the civilized world than caffeine. It is served to young and old at our tables, and is dispensed freely at soda fountains. Over one hundred soft drinks are sold in the United States alone containing caffeine. Medical science recognizes that caffeine increases blood pressure, and will in time bring about arterio-sclerosis, and, consequently, degeneracy of the glands of reproduction. In France coffee is used freely by women, and caffeine poisoning is of common occurrence. The coffee inebriate is considered a more hopeless degenerate than the alcoholic inebriate.

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Trousseau declared that there is not a more potent aphrodisiac known than coffee. Boussingault held the same opinion. Bouchard cites the case of a young man of twenty years of age who for three or four years had been drinking coffee in large amounts and had atrophied testicles and was impotent. Guelliot reported several analagous cases.

The inspectors of national schools, in their investigation as to the cause of the marked degeneracy among the poor in Ireland, in a report say: "Of the many abuses that require correction, one in particular must be vigorously combated, if the race is to be preserved from deterioration. The use of tea is now carried to such dangerous excess that it ranks before alcohol as an enemy of the public health."

In no country is this drug consumed more freely than in the United States. One-half of the world's entire coffee crop finds its way to this country. This offers another partial explanation of the rapidly declining American birth rate.

Breisacher has shown that the over-use of meat causes degeneracy of the thyroid glands, the liver, the kidneys, and the *sexual glands*: first producing excitation, and subsequently degeneration. It has also been shown in experiments upon rats and fowls, conducted by Chalmers Watson and others, that a meat diet causes degeneracy of the sexual glands, and in time produces sterility. This is partially due to the presence in meat of uric acid and body wastes, and to the auto-toxicosis resulting from its free use.

It is well established that nicotine is another narcotic that produces arterio-sclerosis, and also glandular degeneracy. Offsprings of excessive users of tobacco are usually degenerate. This degeneracy becomes more marked in succeeding generations, if the habit is continued.

In the present existing degeneracy in our youth, and the decline in the number of births, we are reaping the accumulated results of the use of these narcotics by ourselves, our fathers, and our forefathers.

From the use of tobacco, most of our young men are physical degenerates. A few years ago, England was startled by the announcement that out of twelve thousand men that appeared for examination at Manchester, nine thousand

had to be rejected as physically unfit for army service. "They come to us with their fingers stained with nicotine," the examiners said. A few years later, when the call was made for young physicians to enter the United States army, eighty per cent. were rejected as unfit, owing to what was pronounced "tobacco heart." These represented the choicest young men these countries could produce. If three-fourths of the young men are unfit for army service, they are certainly unfit to assume the responsibility as propagators of a fit race. When these facts were brought out, they created alarm, and for a time were commented upon by the pulpit and the press. But all was soon forgotten, and since then the consumption of tobacco has been rapidly increasing. Last year 160,000,000 more cigars, and one billion more cigarettes, were smoked than the year before.

The results of the use of narcotics have been more fully demonstrated among some of the savage races where the women use tobacco and strong drink as well as the men. One hundred and fifty years ago, Captain Cook estimated the population of the Hawaiian Islands as being about four hundred thousand. In 1872 a local census gave the population as 49,994. In 1890 it was reduced to 34,436. And, according to the census of 1900, the population was less than thirty thousand, and the statistics approximated only one birth to every four women. This race is rapidly nearing extinction.

The natives of New Zeland, pronounced by Captain Cook the finest race with which civilization had been brought into contact, during the same period have been reduced from one hundred and twenty thousand to less than forty thousand. Although no new preventative measures were employed by them, there is a rapid decrease in the number of births, and those that are born are degenerate.

In civilized lands we frown upon the use of cigarettes by women, and discourage the use of tobacco by boys. Among these innocent natives tobacco and whiskey are used not merely by the women, but by the boys and girls, the same as by the men. In the United States woman has in this respect no doubt been a redeeming factor in race degeneracy. Just to the extent that tobacco is used more

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freely among them, will degeneracy and the decline in births become more marked.

Four hundred years ago, when the pangs of child-birth were not severe, and women looked forward with pride and pleasure to the time when they should become mothers; when large families were the rule, and when mothers were able to suckle their own infants, tobacco was unheard of in civilized lands, and nothing was known of coffee or tea as a beverage. The habits of the people were at that time simple. They depended chiefly on the products of the soil for food, and very little meat was consumed by them. The use of these narcotics is undoubtedly responsible, in part, for hardening of the muscular tissue, which deprives it of its elasticity, and, consequently, for the extreme pains associated with child-birth, which leads to the employment of preventive measures. It is responsible also, in part, for glandular degeneracy and the consequent inability to suckle the infants, and for the degeneracy of the germinal glands, and the consequent decline in the birth rate, and sterility.

The United States is noted for its fertile fields of wheat. The amounts paid out last year by her people for caffeine served in the various beverages, is a sum which equals the value of the wheat crop for the same year.

Considerable alarm has been expressed because of the immense expenditure for automobiles. Some have even predicted a financial crisis if this continues. And yet three hundred millions more dollars than the *entire* investments in automobiles thus far, were paid out for tobacco during last year alone.

The Panama canal is being built at an immense cost to our nation. Three such canals could be built each year with the tobacco money alone.

The production of coal is considered to be one of the greatest industries in the United States; but the value of all the coal produced during the year 1910 fell short by over two hundred million dollars of paying the tobacco bill for the same year.

The total amount paid out by the people of the United States for *tobacco, caffeine, and alcohol* last year equals the total amount of money in circulation—including gold and silver coins, certificates, United States and National Bank



notes. Four hundred years ago, tobacco, tea, coffee, and many other narcotic poisons were unknown in civilized lands. Today their use is universal.

This wholesale poisoning of civilized and semi-civilized races, if continued, will ultimately result in their extermination.

Appearances are not reliable. The beer drinker with his florid face, may have the appearance of health, but his earthly career is short. He is a degenerate *physically*. A country or nation made up of such subjects may have the appearance of strength and stability, but she is degenerate and cannot long continue. Babylon of old boasted of her greatness. She said, "I sit a queen, and shall see no sorrow." At the very time when she felt so secure, her foundations were crumbling and tottering, and were about to collapse. The handwriting appeared on the wall of the palace, where they were feasting and drinking wine—"Thou art weighed in the balances, and found wanting," and Babylon, the beauty of the Chaldeans, fell, no more to rise. Since then, nation after nation has fallen because of the same intemperance on the part of the people.

A nation's greatness can only be truly measured by the temperate habits of the people composing it. Nature has never perpetuated a nation whose people are given to gluttony and intemperance and she never will. So long as this wholesale use of narcotics continues to increase we shall experience increased degeneracy, and a consequent declining birth rate, which will ultimately result in the extinction of these races.

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# THE PHYSIOLOGICAL ACTIONS OF RADIANT ENERGY AND THE STATIC CURRENT AND THEIR INDICATION IN THE TREATMENT OF INEBRIETY AND DRUG NARCOSIS

BY WILLIAM BENHAM SNOW, M.D., NEW YORK.

**T**HE province of my subject includes the physical but not the psychic conditions of inebriety and narcotism. It is important, however, to recognize the intimate relation that exists between the ego and its habitat.

The mental state as well as the nervous mechanism requires a healthy condition of the body functions, particularly of those related to metabolism, in order that an equilibrium may be maintained or restored—*mens sana in corpore sana*. To consider, therefore, either of the correlated sides of this important problem without recognizing the intimate relationship existing between them, is to fall short of the adequate consideration of the subject.

Environment and immoral influences may lead the normal youth into indulgences which gradually pervert both the mental and physical characteristics of the man; or other habits and excesses may lower the body resistance and vitality, after which the victim more readily falls a prey to further vicious habits.

Pain is probably the most common cause which leads the individual to become a victim to narcotism, which may speedily lead him into subjection to a habit which perverts his moral as well as his physical status. Both the cause and effect are to be considered in the treatment if these unfortunates are to be redeemed. Whenever an individual becomes a slave to the alcohol or opium habit, the physician who undertakes to cure him must investigate the personal equation, consider everything that has led up to the condition present and be prepared to meet each phase of the case. The clinician will recognize a symptom complex, which in various cases presents different problems if a normal mental and physical poise are to be restored.

\*Read before the American Society for the Study of Alcohol and Other Narcotics, at the Hotel Belvedere, Baltimore, Md., April 20, 1911.

*The prognosis* as in all abnormal conditions, generally bears a well marked relation to the chronicity or time during which the process has been active, and also to the extent of disturbance that has been produced in the important functions of the organism.

*The alcoholic* usually suffers from gastritis and intestinal derangements associated with auto-intoxication, and exhibits a series of symptoms pointing in many cases to hypertension and arteriosclerosis. In some instances cirrhosis of the liver will complicate the ailmentary derangements. In all cases the secretions will be inactive, with a generally disturbed and impaired metabolism, and systemic poisoning due not only to interference with nutrition and auto-intoxication arising from impaired digestion, but also a systemic vitiated condition arising from the slow poisoning process of chronic alcoholism.

*In narcotism* likewise derangements of the alimentary canal are present, which arise from interference with the activity of all the body functions due to inhibition of peristalsis and secretion.

It can be readily appreciated, and is generally recognized, that drug medication plays a very unsatisfactory part in relieving conditions of perverted and impaired metabolism. While exercise and healthy environment constitute very important agencies in the restoration of metabolism, they are quite inadequate to meet the extremes of conditions as they exist in advanced cases of inebriety and narcotism.

The measures which I am requested to consider as useful in the management of these cases probably play fully as important if not the most important roles when employed for the indicated reestablishment of active metabolism. The types of energy which comprise emanations from sources of radiant light and heat, and also static currents possess valuable properties; each operating in its own way to awaken the tissues to their normal activities.

That these valuable agencies have been seriously neglected in therapeutics the modern text books bear testimony. That they deserve most earnest study and prompt recognition is patent to all who are at all familiar with their *modus operandi* when intelligently employed.

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In considering the physiological phenomena we must look upon radiant energy as including both the effects of light and the effects of heat. Emanating from luminous sources, such as the sun, the incandescent lamp or the arc lamp, light and heat are manifestly ether vibrations, and bodies which resist their passage to the extent of converting light vibrations into heat units, are evidently acted upon by their complex influences.

Radiant energy from these sources penetrates the human body, except of the dark skinned races, to a distance of approximately six inches, as estimated or demonstrated by Kellogg; and probably the infra-red or heat rays penetrate deeper. Even the presence of bony structure does not prevent these vibrations from reaching and affecting every organ in the body, as is readily shown by illuminating the antrum with a small lamp in the mouth. The penetration of radiant energy increases directly as the wave length and inversely as the frequency of the vibration—the higher the frequency the shorter the wave length. The greater the wave length, the greater the penetration; and as the wave length diminishes from the infra-red to the ultra-violet, the greater heat production in the tissues is derived from the lower frequencies of the spectrum. It must be understood furthermore, that with the increased penetration and transformation into heat in any tissue there is an increased influx of blood and cell activity because of the automatic effort, through vaso-motor influences, to maintain an equalization of temperature throughout the organism.

The primary results realized from the heat effects of radiant energy, are (1) *local hyperemia* in the parts treated; and (2) *consequent increase of nutrition, metabolism and phagocytosis* of the parts so stimulated.

That hyperemia is confined to the skin when convective heat, or heat applied from other than radiant sources is employed, was demonstrated by Gilman Thompson in his experiments upon an anesthetized cat. Hence radiant light and heat affect tissue metabolism to a greater depth than the Turkish or steam bath.

With the penetration and transformation of heat throughout the organism, there is a marked increase of elimination both at the periphery and through the glandular structures

which are so stimulated; as well as of all glands through which a heated blood stream flows.

The application of radiant light and heat over the abdominal cavity arouses to activity the dormant functions of the intestinal structures and other interior organs to a greater degree than the application of any other agent known to therapeutics, excepting possibly the static current; and this without harmful effects.

With the induction of perspiration which in the light bath is very profuse, there is through the increased activity of the sweat glands, a coincident elimination of the products of vicious metabolism and other irritants present in the blood. Radiant light acting upon the blood in the skin rendered hyperemic by the administration, acts also to increase the oxidizing function and hemoglobin of the blood; dispensing thereby a double influence throughout the organism, as is demonstrated clinically in the treatment of all conditions of impaired metabolism. When used with sufficient intelligence to insure the employment of the proper degree of energy, no other agent is so active in restoring the functions of metabolism, as systematically applied radiant light and heat.

Probably no other useful therapeutic agent has been more maligned and misunderstood by the profession than the electro-static current. Those who have not kept pace with the development of electrotherapeutics have expected from electric energy some mysterious unexplainable effect akin to the mystic. Consideration of the static current from this point of view is today both irrational and unscientific. When a proper investigation is made by skeptics, recognition of a great truth will certainly follow a comprehension of the authenticated effects of this important agent. A change is always promptly observed in the personal attitude of the originally incredulous physician, who, with open and inquiring mind, studies the static current.

An erroneous view that static electricity only acts upon the surface of the body, has been dominant in the minds of those unfamiliar with that current since that misconception was unwittingly promulgated by an eminent neurologist. It can be excused only on the score of unfamiliarity with the physics of the subject; for no other agent can be made to

arouse to such energetic activity the remote recesses of the human body as can the static current. Its action is not necessarily electrolytic, but mechanical; and as a mechanical force it is intelligently employed.

Of the various methods for its application, the static wave current and static sparks are the most valuable for arousing to activity conditions of sluggish metabolism. Applied to an indurated tissue with a metal electrode, employing a proper degree of energy as determined by experience in arranging the condenser conditions and by the length of the spark-gap, this current is capable of softening throughout their substance, and bringing to their normal proportions parts of the organism that have not undergone structural change, such as the development of hyperplasia. When applied to a hypertrophied cirrhotic liver or an enlarged spleen extending into the abdominal cavity, the organ is made to retreat toward or even to its normal dimensions, as will a congested prostate gland, a sprained ankle, or a knee joint when the seat of synovitis. Another result of the use of this current is its effect upon general metabolism, due to its passage to and fro through the tissues, with each alternating charge and discharge.

*Electricity* can no longer be looked upon as other than a material substance. The experiments and demonstrations of Silvanus P. Thompson demonstrated this truth when an atom of hydrogen was resolved into upwards of eight hundred electrons. These minute particles surging throughout the economy, arouse to activity the remote recesses of the body, increasing metabolism, and thereby promoting the elimination of effete accumulations from within the tissues.

But of all the effects of this current the most important is a local pulsatory activity induced in the tissues (graphically described as molecular gymnastics) by forcible alternating contraction and release which, regulated by properly controlled generator speed and length of spark-gap, are caused to succeed each other rapidly throughout the entire abdominal cavity; draining indurated tissue and expressing the infiltrate from the tissues. At the same time muscular spasm is relieved wherever present beneath an electrode.

Let me not fail to impress, as strongly as I may, the fact that no agents, singly or in combination, are so energetic

in relieving the symptoms complex present in all cases of impaired metabolism as are radiant light and heat and the static currents. They are also peculiarly energetic in the relief of local inflammation and the consequent pain so often the incentive to narcotism; also occasionally of alcoholism. The static current, by acting upon indurated tissue and muscular spasm as present in the non-infected types of inflammation, (relieves induration and pressure; and this relief is followed by the prompt disappearance of pain. This applies not only to the treatment of external conditions, such as neuritis, but also to internal pelvic congestions or local inflammation wherever it may be found.

*The treatment of narcotism* should be anticipated by the employment of measures which relieve the pain which may have led up to the habit; and no agent is more effective than the static current in effecting such relief in the class of cases referred to.

Where the inflammation is caused by *infection*, hyperemia as induced by radiant light and heat and the d'Arsonval current (agents which produce heat and thereby induce hyperemia in the involved tissues), is capable of increasing local tissue resistance and phagocytosis, thereby often relieving early cases of infectious inflammation, and is valuable in all cases.

You will pardon the assurance with which I make these statements. They are based upon an intelligent use of these agencies by the writer for more than a decade. If I am to judge from the general concensus of medical opinion, probably few of you, my hearers, are familiar with the results here briefly outlined, which experience has demonstrated to be valuable. Dr. Crothers, through whose courtesy I present this paper, is himself well aware of the phenomena which attend the employment of these potent and often maligned agents, the use of which has become convenient and universally accessible through the recent development of the more powerful influence machines for generating static currents, and through the development of electric lamps of high candle power.

In closing, I appeal to your intelligence and to your fair-mindedness and earnestly urge that a more liberal and

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general attention be given to the well attested effects of these important therapeutic measures.

#### PRIZE ESSAY.

Under the auspicious of The American Society for the Study of Alcohol and Other Narcotics.

Dr. L. D. Mason, of Brooklyn, N. Y., Vice-President of the Society, offers a prize of \$150.00 for the best essay on the following topic:

“THE BIOLOGICAL AND PHYSIOLOGICAL RELATIONS OF ALCOHOL TO LIFE.”

The essay must be the result of original research which shall confirm or disprove the present theories of the inherited effects of alcoholic degeneration and indicate how far the defects of the parents are transmitted to the children.

Such work may be carried on in man or animal, and the results may be illustrated by drawings or photographs, and must be typewritten and sent to the office of the Secretary before July 1st, 1913.

This offer is open to students in all countries, and each essay should be accompanied by a motto and a sealed envelope containing the same, with the author's name and address.

A committee of award of which Dr. W. S. Hall, Prof. of Physiology in the Northwestern University, Chicago, Ill., is the chairman.

All inquiries should be addressed to Dr. T. D. Crothers, Hartford, Conn., Secretary.

This essay will be published in THE JOURNAL OF INEBRIETY.



## EDITORIALS

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### ALCOHOLIC NEURITIS RESEMBLING MUSCULAR PARALYSIS.

A very interesting case is reported in the British Medical Journal translated from The German, of a boy eight years old, who had all the symptoms of muscular paralysis. His father was an inebriate and committed suicide. His mother died of tuberculosis.

He was brought up by foster parents who were very poor. For some time they had noticed that he was unable to walk and was mentally dull and complained of headache. The symptoms of paralysis were very pronounced and were noticed by the local doctors, but there were no explanations of his particular condition.

He was finally taken to the hospital. Neuritis was ascertained, atrophy of the legs, contraction of the muscles and very marked symptoms of general paralysis. At times he could walk better than at others. It was ascertained that he used every opportunity to secure alcohol from the lamps in the room, or from spirit jars in which specimens were kept, or from alcohol that was used to wash the windows. He admitted that he had an uncontrollable longing for spirits, and that his foster parents had given him freely schanpps and beer at any time, not thinking that it was anything more than a tonic.

The case progressed well and finally in the course of a year he was discharged as cured. The chief points in the case are, first the extreme rarity of alcoholic neuritis in early life.

Second the diagnosis and the exaggerated patellar reflexes. Third the absence of pain, tenderness and paraesthesia in the paralyzed parts.

This was the first case noted in the Medical Clinic at Zurich of child life. The majority of cases occur between thirty and forty years of age. It was also unusual that the reflexes should be preserved, and not show changes.

It was thought that the term pseudo-hypertrophic paralysis would best describe this condition. In this case the deposit of fat in the calf muscles and cutaneous tissues of the legs was remarkable.

The twitchings in this case were also unusual as they spread over a number of muscles. While they are common to alcoholic neuritis they are usually localized and are not seen as in this case.

The recovery was very satisfactory, and when the diagnosis was fairly determined, the treatment was by baths, massage and the iodides.

#### INEBRIATES ON MOVING TRAINS.

Shall railroads be held responsible for injuries and violent acts of inebriates who are riding on the trains? Shall passengers and others hold the companies responsible for the injuries and insults that shall come from persons under the influence of spirits? These are questions that are not well settled yet.

The violent inebriate riding on the train, who insults passengers or assaults them is usually put off by the train hands. The unwritten law is that the company must protect the passengers en route and they can appeal and demand help in such cases.

A case occurred in which a number of passengers were injured and greatly distressed by the violent acts of the inebriate. They sued the company who set up a defence that the injuries and violence were provoked by the indiscretion of the passengers and that the inebriate would not have committed overt acts had he been left alone.

This case was decided in favor of the company and was carried up to the higher courts. The final decisions were that the company was responsible for the protection of the passengers from annoyances and injuries and that it was their duty to refuse to carry persons, who through the influence of spirits, made themselves obnoxious, also that the company had a perfect right to stop the train and put off anyone whose misconduct annoyed or periled other passengers.

This point was tested where a person partially intoxicated was put off the train at a way station and soon after run over by a passing train. The jury gave damages against the company for negligence of not taking this passenger to a distant station and placing him under proper authorities. This was appealed and the final decision was that the company had a right to eject the man at any place, who was drunk and disorderly.

## TREATMENT OF INEBRIATES IN LONDON.

The London County Council, which has charge of the paupers and those dependent on the city, has petitioned the Home Secretary for new legislation and powers of control for the inebriate.

The present system should be replaced by indeterminate sentence. In this way the inebriate can be kept for life, or for a long period, under control. The results of treatment for drinking women at Farmfield, covering 600 cases after a period of ten years, was as follows:

19.1 were doing well; 27 per cent did well for a considerable period; 45 per cent relapsed; 15 per cent could not be traced; 7.7 per cent transferred as unmanageable; 3.2 per cent insane; 2.7 per cent dead; 1.5 per cent still at the hospital.

From these results, it was evident that more legal measures were required, particularly for persons who appeared to be developing into habitual drunkards. Such persons to be taken to the reformatory hospital at the earliest possible moment. Second, for the prolonged detention of inebriates with criminal symptoms who showed no disposition to reform, and who could not be trusted alone. For them the indeterminate sentence was invaluable.

A third class should be restrained for short periods, and then permitted to go out on parol. If this was not sufficient, they were kept continually under control. It was impractical to simply restore people and send them out again with a certainty that they would relapse. It was impractical to send out persons restored, who would return at once to their old surroundings and scenes of temptation, and certainly relapse.

They urged that provision should be made for the care and control of the feeble minded, whose drinking was only a symptom of their mental weakness and should be recognized as such.

The application for license to sell spirits in a supposed aristocratic club located in Boston, is one of the startling events of the day. In the supposed cultivated circles of the great literary center of America, that a club of women should request legal permission to serve spirits in their club home, is one of the saddest reflections of the ignorance of the present.

It implies either want of knowledge of the great hygienic and laboratory studies of the day and utter failure to understand the

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every-day life and currents of public opinion, or it assumes a superior knowledge, that ignores all exact work and research, which every newspaper reader is familiar with.

On the other hand, it is possible that leaders of this club may be wives and daughters of the distiller, the brewer or the spirit dealer. To such persons, spirit drinking may seem to be practical, financially as well as a protest against the science teachings of modern civilization.

The latter conclusion would seem to be more in accordance with the facts and the possibility that a company of women might be so impressed as to ask to be accorded the same privileges that their husbands and fathers have. The license was granted, and with it a light that will reveal the exact conditions and give permanent setting to one of the deplorable facts in the great literary center of America.

#### INEBRIETY AND ALCOHOL IN SCOTLAND.

The Lunacy Commissioners in their annual report of the mental diseases and inmates of insane asylums, bring out the fact more clearly than ever before, that alcohol occupies a place of increasing prominence as a cause of insanity. From 12 to 14 per cent. of mentally afflicted persons are directly traceable to alcohol.

Dr. Clouston places the number at 30 or 40 per cent, including those that are indirectly due to the use of spirits. Other authorities find from 12 to 14 per cent of mental cases due directly to alcohol and are called alcoholic insane.

It is a curious fact that the number of women is very much less, averaging from 7 to 9 per cent. Some other authorities assert with great positiveness that no other single factor is responsible for so much of the insanity, idiocy and epilepsy of Scotland, and these statements are not disputed, although not yet studied with the same accuracy that other causes are.

It is evident that in Scotland, as well as in other parts of Europe, alcohol is found to be a very prominent factor in degenerations of all kinds. Every new study of causes gives it greater prominence.