

cessfully treat the nervous system, especially to that extent to obviate deformities produced by or through the nervous system, to know thoroughly, not only the nervous system, but the entire human system, and everything that would hinder or augment its normal development. Unless we have such knowledge, we will still find ourselves treating apparent poliomyelitis for scorbutis, rachitis for paralysis, torticollis for cervical adenitis, trismus for an erupting wisdom tooth, and the "knee jerk" for morbus coxarius, these being deformities produced by abnormal changes in the nervous system. However, there are some "made to order" ovarian deformities, if I may be pardoned for mentioning the fact, which do not come under the scope of this paper, or any other, in many instances, and would not occur if a better knowledge of the nervous system and its influence over each component part of the human system existed. In many instances poliomyelitis or infantile paralysis in its various forms could be obviated if the functions and disorders of the nervous system were better understood. The remark once made by Prof. Jenner that more mistakes are made by "not seeing than by not knowing," is not without a lesson, and helps to confirm the fact that more mistakes are made in diagnosing than in treatment.

Next to the deformities produced by poliomyelitis or infantile paralysis, are those produced by hysteria, which the consensus of opinion of modern writers on the subject has placed among the diseases of the nervous system, which by no means is the most easily handled. I believe, the nervous system being well understood, that a line of general treatment may be used that will lessen the chances for such deformities and militate against existing ones. For this, the constitutional treatment must be looked after first, and the disease will always indicate same, after which the special treatment can be prosecuted and the drugs used indicated by the specialization of the disease. All kinds of talipes, or club foot, wrist drop, rotary lateral curvature of the spine, and, in fact, nearly all the muscular deformities known to orthopedic surgery may be produced by some nerve disease, and to undertake to correct the deformity with surgical means without first endeavoring to ascertain the real cause which produced the deformity, and treating the same medicinally, would not be in keeping with the modern medical and surgical science of the day. To more fully illustrate how easily we may be mistaken in the cause and results of deformities produced by diseases of localized nerves, or the nervous system, I will report the following case which has recently come under my observation:

December 7, 1897, Mr. B. brought his little three-year-old girl to me for examination, stating that she had a crooked back, which the doctor said was caused by the rickets. Upon a careful examination, I found that the child had a decidedly neuropathic family history, and a typic spasmodic rotary lateral curvature, which had been diagnosed and treated for rachitic curvature, and as the diagnosis was incorrect, the treatment must have been, because there had been no change for the better, but rather for the worse, after about six months' trial. The further history of the case showed that any kind of excitement or fatigue would increase the deformity, and when in a state of repose or sleep, the spasm of the muscles seemed to lessen. This convinced me that it was a case for medicinal treatment. I gave her a good general tonic,

strychnin internally, and locally used inunction and massage, and put on a crinoline jacket to support the spine and lessen the fatigue caused by the effort of the child to stand erect. Six weeks later I put her on three-drop doses of fluid extract of conium, increasing gradually to thirty drops, and hypodermic injections of atropin. These two drugs have always given good satisfaction in such cases. One month after this treatment began, a marked improvement was noticed, which continued, and soon the amount of medication was gradually diminished, and time for same increased, until a little over three months from the time treatment first began, the jacket was removed and treatment stopped, as the spasm of the muscles was a thing of the past, and she could walk erect without support.

WHAT INFLUENCE DO STIMULANTS AND NARCOTICS EXERT ON THE DEVELOPMENT OF THE CHILD?

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RAWLINS, WYOMING.

Since the earliest dawn of history, there has been inherent in the human organism a longing or craving for something to blunt the keen edge of anguish and sorrow, as well as to curb the intellect and inhibit the will, thereby giving full reign to the sentiments and passions during times of conviviality and enjoyment.

Glancing down through the ages into the dim twilight of the past we behold the Chinese using wine from grapes and beer from rice, somewhat like the present saki of Japan; the Hindus sura made from rice, barley, honey and other ingredients by the common people and soma made from the juice of certain plants, and after fermentation offered as a libation to their favorite Gods, Indra, Vishnu and others by the priesthood and rulers. "The ancient Persian writings, the Zend Avesta, dating back to the period of Zoroaster possibly 4000 to 6000 years B.C., contain, like the Rig Veda, many references to a sacred drink, homa, and a popular drink, hura."¹

The Bible contains numerous references to the use of wine, which was frequently carried beyond the point of moderation. And so down through the ages we find all peoples from the lowest savagery to the highest civilization resorting to some form of intoxication. Here on the one hand we behold the highly cultured lady imbibing her strong tea, the orator or statesman trying to conjure up the shade of Demosthenes or Cicero or the poet to arouse his slumbering muse by liberal potations of wine, brandy or whisky, while on the other hand we see the Guatemala Indians fuddling themselves with hemlock sap, the Peruvians with coca, the Tartars with fermented mare's milk and the Algerians with hasheesh.²

To the scientist and the philosopher, whose function it is to study the phenomena of nature, search out their causes, trace their effects, and co-ordinate all into a harmonious and symmetric whole, and especially to the physician, who should be a strong combination of both scientist and philosopher, this question appeals with peculiar force. What subtle but irresistible power has impelled races, nations and indi-

viduals to give themselves up to an indulgence and debauchery that have inevitably led to their ruin or extinction? What caused the Persians under the temperate Cyrus, who by their hardihood easily conquered the effeminate Medes, to fall victims to luxury and degenerate so that Xerxes, the descendant of Cyrus, the monarch of Asia Minor, with his mighty army, was ignominiously defeated by the hardy and temperate Greek? What, except gross intemperance and its twin sister, licentiousness, so degraded the stern, noble Roman character, reduced his physical power and dissipated his ambition, until from being the ruler of the world, he became an easy prey to the barbarian hordes of the north? What, in short, throughout all time and among all nations, has been the result of the use of narcotic and stimulating poisons, save effeminacy, degeneration and extinction? With these indisputable facts of history before us, does it not become our duty as physicians, whose function it is not only to cure disease but to act as the conservators of physical, mental and moral integrity, to investigate carefully the exact physiologic effects exerted by these agents on developed and developing living organisms, and to trace the results of their moderate and excessive use both on the present and future generations?

We shall first consider the most widely used and probably least injurious of these substances, viz., *tobacco*. The deleterious substances in tobacco smoke are: *carbon*, which acts mechanically as an irritant, and discolors the secretions of the bronchial tubes, *carbonic acid gas*, which tends to produce sleepiness, headache and lassitude, *carbonic oxide*, "a very active, poisonous agent producing drowsiness, unsteady movements of the muscles and vomiting,"³ and crude nicotine, which consists of nicotine proper, and a volatile empyreumatic substance containing ammonia, and a dark, bitter, resinous extract.³ The ammonia bites the tongue, makes the mouth dry and induces thirst, thereby causing the smoker to drink frequently and exciting a free salivary secretion; it also exerts a solvent influence upon the blood.³ Nicotine proper, produces tremor, palpitation of the heart and paralysis, while the volatile empyreumatic substance causes a sense of oppression, and gives an unpleasant odor to the breath.

Concerning the physiologic action of tobacco, Wood (Ther. and Materia Med., 6th Ed., p. 396) writes as follows: "Upon persons who are not habituated to its use, tobacco acts as a very powerful depressant, producing horrible nausea and vomiting, with giddiness and a feeling of intense wretchedness and weakness. If the amount taken has been large, to these symptoms are added burning pain in the stomach, purging, free urination, extreme giddiness, passing into delirium, a rapid, running and finally imperceptible pulse, cramps in the limbs, absolute loss of muscular strength, a cold, clammy skin, and finally, complete collapse, terminating in death." Nicotine is an exceedingly virulent poison; very small quantities, even 1/30 gr. have caused poisonous symptoms in the body (J. W. Sevier, M.D.), and large doses almost instant death.

Tobacco increases the fluidity of the blood, interferes with the development of and causes disintegration of the red blood corpuscles, diminishes the power of the blood to take up oxygen and give off the carbonic acid,⁴ and thereby retards the progressive cell changes upon which the development of the body depends; it produces debility and irregular action of

the heart⁵ and lowers the tone of the whole circulatory system; it weakens digestion and assimilation, and not only prevents the burning up of waste materials but retards their elimination.

On the nervous system, tobacco acts as a depressor, producing "languor, feebleness, relaxation of the muscles, trembling of the limbs, great anxiety, and a tendency to faint."⁶ It also acts as a cerebral irritant, and interferes with the vasomotor centers of the brain to such an extent that the vessels are unable to adjust themselves to the condition required for healthy and untroubled sleep.⁷ The power of fine co-ordination is likewise decidedly lowered by the drug.

Tobacco frequently causes disturbances of the special senses. Owing to the irritation of the nasal mucous membrane the olfactory sensibility is impaired, and probably owing to the irritation and congestion set up in the nose and throat, together with central nerve disturbance, the hearing is sometimes lowered; but of all the special senses the sight is most seriously affected, and tobacco amaurosis or amblyopia is a not infrequent result of the excessive use of the drug.

While it is fortunately true that these effects, which are almost entirely functional, rapidly disappear when its use is discontinued by those who have reached manhood, it is very different with adolescents, in whom the habit of smoking causes impairment of growth, premature manhood, and physical prostration.⁸ The question as to the effects of tobacco on the growing boy or youth has fortunately been removed from the sphere of sentiment and speculation, and is now settled by careful scientific investigations. "From measurements of 187 men of the class of 1891, Yale, Dr. J. W. Seaver found that the non-users of tobacco gained in weight during the college course, 10.4 per cent. more than the regular users, and 6.6 per cent. more than the occasional users of tobacco. In height the non-users increased 24 per cent. more than the regular users, and 12 per cent. more than the occasional users. In increase of chest girth the non-users had an advantage of 26.7 per cent. and 22 per cent., and an increase of lung capacity of 77.5 per cent. and 49.5 per cent. respectively. These facts in regard to the dwarfing effects of tobacco are corroborated by observations on the class of 1891, Amherst, made by Dr. Edward Hitchcock. He found that in weight non-smokers increased during their course 24 per cent. more than the smokers; in increase in height they surpassed them 37 per cent.; in gain of chest 42 per cent., and in gain of lung capacity 75 per cent. It is probable that alcohol and other poisons have similar effects."⁸

The deleterious effect of tobacco on the muscular system, and in diminishing the powers of endurance is strongly emphasized by the fact that "stop smoking" is one of the first injunctions given a young man on engaging in training for a race or game of any kind requiring strength and endurance; because every experienced trainer knows that smoking lowers the working power of the human muscle by a large percentage,⁹ and that to smoke merely invites defeat. If tobacco so seriously injures the young athlete during a short period of training, how much greater must the injury be in the preparation for the arduous duties of our exacting modern civilization. How seriously handicapped is the boy who enters the race of life with every cell and tissue of his body poisoned by nicotine.

According to the evidence of teachers and educators all over the civilized world, tobacco exerts a very pernicious effect on the student. He becomes dull, lazy and unreliable, and retrogrades in his work. Indeed, so marked were these effects that "in France the difference between the students in the polytechnic schools who smoked cigarettes and those who did not, in scholarship, as shown by their respective class standings, was so great that the Government prohibited absolutely the use of tobacco in all government schools."¹⁰ "Out of thirty principals and teachers interviewed by the *Chicago Record*, all were agreed that a low standard of scholarship characterized the boy who habitually used cigarettes."¹¹ The extended investigations of Dr. Seaver, of Yale College Physical Department, and Dr. McDonald's studies of school children at Washington, D. C., conclusively show that cigarette smokers are more feeble physically and mentally than other students.¹² This, together with the fact that a very large percentage of the prize-winners, and men who stand highest in their classes do not use tobacco, ought to convince every unprejudiced person that tobacco is at least injurious to the mind of the developing child and youth. We make this statement boldly, notwithstanding the recent symposium of St. Louis physicians, and the specious arguments and special pleading of lawyer Garrison in his paper, "A Brief for the Cigarette," read before the New York Medico-Legal Society, in which he tries to create the impression that because a large number of cigarettes examined were made of pure tobacco, and did not contain opium or other adulterants, therefore they were harmless. What sophistry! Just as though pure tobacco, which contains a substance far more poisonous than strychnin or morphin, is not in itself sufficiently dangerous! Such attempts as these which try to overthrow clearly demonstrated facts and encourage boys and young men in the formation of a habit which can do them absolutely no good, but may be the source of much injury, both to themselves and their friends, besides being a nuisance to every one not saturated with the vile poison with whom they come in contact, are certainly not based on correct ethical principles, and leave a strong impression that they are stimulated by a *quid pro quo* from the tobacco trust.

EFFECT ON THE MORAL NATURE.

The use of tobacco has a peculiarly demoralizing effect on the moral nature of the young. In addition to making boys tired, stupid and lazy, it makes them irritable, perverse and careless of the rights and feelings of others, besides, in many instances, leading to lying and even stealing. This tendency to moral degradation is exceedingly prevalent among habitués of all kinds of narcotic poisons, and especially so among those addicted to the use of opium. I have seen quite a large number of so-called "*fiends*," and have yet to find the first one on whose word I could rely in a business transaction. There may be honest ones, but if so I have never met them.

For many years I have been firmly convinced in my own mind that much of the pallor, anemia, malnutrition, and the many evidences of retarded growth and development so frequently seen—especially among the poorer classes of our people, are largely due to the tobacco-laden, poisoned atmosphere which these children are obliged to breathe. Many a time have I gone into small, poorly ventilated rooms, where at best it

was difficult to get sufficient pure air, and found a child suffering from pneumonia or some other severe disease, so enveloped in the foul fumes of stale tobacco smoke that it could scarcely breathe, and every breath it did take was a poisoned one, and have seen the father, who apparently was very solicitous about his child's welfare, puffing away complacently at an old pipe whose horrible odor ought easily to win for it the place of honor in a tannery or a white lead factory, and while doing more harm than all the science and skill of the medical profession, armed by the whole materia medica, could counteract, would probably be finding fault with his physician and blaming him for the child's slow recovery. Nor is this the most discouraging part of the matter, because in quite a number of instances when their attention was called to the evil effects of the tobacco smoke the fathers became angry and refused to believe that it had any such effect. Such cases as these show the moral obtuseness that may follow and the utter selfishness that may be engendered by the use of tobacco better than any lengthy theoretical disquisition could possibly do. Neither, according to competent authority, is the evil limited to the users themselves, but lingers to curse their descendants. "No evils are so manifestly visited upon the third and fourth generations as the evils which spring from the use of tobacco."¹³ says Sir Benj. Brodie.

Let us now consider the effects of alcohol on the human organism. Sir Benjamin Ward Richardson tells us that "from the stomach alcohol passes directly into the circulation, so in a few minutes it is swept through the entire system. If it be present in sufficient amount and strength, its eager desire for water will lead it to absorb moisture from the red-blood corpuscles causing them to shrink, change their form, harden and lose some of their ability to carry oxygen. It may even make them adhere in masses and so hinder their passage through the tiny capillaries." (*Diseases of Modern Life*.)

This attraction of alcohol for water, together with the fact that it coagulates albumen and forms a thin white film on the mucous membranes by acting on the albuminous elements of the secretions, and the peculiar ease with which it penetrates protoplasm (this substance can defend itself against most other poisons), suspends or destroys the action of all the primary organic elements.¹⁴ In short, it affects every cell and tissue of the body and as Dr. Lionel S. Beale tells us, "alcohol does not act as a food; it cuts short the life of rapidly growing cells or causes them to grow more slowly,"¹⁵ thereby preventing their proper development and exerting a particularly injurious effect upon the young, retarding their growth—both mental and physical.

EFFECTS ON DIGESTIVE AND ASSIMILATIVE ORGANS.

There is a wide divergence of opinion as to the effects of alcohol on the digestive organs. Formerly it was almost universally believed by physicians that alcohol in moderate amounts aids digestion, but the careful, accurate and painstaking investigations of recent years have demonstrated the fallacy of that opinion, and at the present time the majority of physicians who have made a careful study of this subject are convinced that alcoholic beverages not only do no good, but are positively injurious to digestion. "One tablespoonful of whiskey reduces digestive activity more than 75 per cent." say Drs. Chittenden and

Mendel.¹⁶ "Nothing more effectually hinders digestion than alcohol,"³ says Dr. Richardson. "If much alcohol is taken into the system the gastric juice is so changed by its direct action that digestion is arrested,"¹⁷ asserts Dr. Bunge. "The idea of alcohol in any form being an aid to digestion is altogether fallacious and has brought disease and ruin to innumerable multitudes,"¹⁸ is the verdict of Dr. C. H. Shepard. Dr. T. D. Crothers says, "I have never seen a case where spirits used in any form, for any length of time, did not produce derangement and disease of digestion,"⁷ and Dr. J. H. Kellogg writes as follows: "Nothing could be farther from the truth than the popular notion that alcohol, at least in the form of certain wines, is helpful to digestion." Roberts showed years ago that alcohol, even in small doses, diminishes the activity of the stomach in the digestion of proteids. Gluzinski showed ten years ago that alcohol causes an arrest in the secretion of pepsin and also its action upon food. Wolf showed that the habitual use of alcohol produces disorder of the stomach to such a degree as to render it incapable of responding to the normal excitation of food. Hugouencq found that all wines, without exception, prevent the action of pepsin on proteids; the most harmful are those which contain large quantities of alcohol, cream of tartar and coloring matter. Wines often contain coloring matters which at once completely arrest digestion, such as methylin blue and fuchsin."¹⁹ Many similar expressions from the most celebrated physicians in the world might be cited, but the above are enough to show that alcohol even when exhibited as a therapeutic agent, should be used with as much care as strychnin, opium, or any other poison, and not in the careless, indiscriminate manner in which it has been used in the past.

From impaired digestion there naturally results a deficient supply of healthy pabulum for enriching the blood and building up the tissues. All the cells and tissues of the body are surrounded by membranes, on the integrity of which the silent work of building up the body depends. "If they are rendered too porous and let out the colloidal fluids of the blood—the albumin for example—the body dies, dies as if it were slowly bled to death. If, on the contrary, they become condensed or thickened or loaded with foreign material, then they fail to allow the natural fluids to pass through them. They fail to dialyse and the result is either the accumulation of the fluid in a closed cavity, a contraction of the substances inclosed within the membrane, or a dryness of the membrane in surfaces that ought to be freely lubricated and kept apart. . . . Upon all these membranous structures alcohol exerts a direct perverting power of action. It produces in them a thickening, a shrinking and an inactivity that reduces their functional power. That they may work up rapidly and equally, the membranes require to be at all times properly charged with water. If in contact with them any agent is brought that deprives them of water then is their work interfered with; they cease to separate the saline constituents correctly and if the evil that is thus started be allowed to continue, they contract upon the contained matter, in whatever organ it may be situated, and condense it." "By its effect on these membranous envelopes and coverings, alcohol becomes one of the most extreme causes of the modification of animal function and one of the greatest sources of structural degeneration."³ "The long-

continued presence of alcohol in contact with the membranes destroys their dialysing property and produces in the end organic changes."

This effect of alcohol on the membranous structures exerts a most pernicious influence on the health and development of the body. While, as previously shown, its action on the digestive organs impairs the quality and reduces the quantity of the pabulum formed for the nourishment of the tissues, this last action not only interferes with the selective activity of the cells and tissues and the free passage of the nutritive material through their enveloping membranes but at the same time retards that retrograde metamorphosis which is always conjoined with healthy activity, and by clogging the membranes, prevents the free elimination of those retrograde products or toxins which are being constantly formed in the body. Nor is this all, for by lessening the oxygen-carrying power of the blood it prevents the burning up of these waste materials and toxins, and thereby interferes with functional activity, besides poisoning the system.

Viewed in the light of these facts, the so-called conservation of the tissues produced by alcohol, instead of being an advantage, as so generally taught, is, I believe, a matter of very serious import to many a patient. With the assimilation of the life-giving material impeded, and the elimination of death-dealing poisons retarded, the only explanation I can find for the widespread belief in the beneficial effects of alcohol is the tendency of the medical profession to conservatism. It is so easy to float with the current; it is so pleasant to advocate those doctrines transmitted by generations of ancestors and which have become so strongly ingrained in our natures as to be a part of our mental being; it is so hard to stem adverse currents and fight against the opinions and dicta of the many; it is so unpleasant to strive against inherited cravings and boldly to determine to make truth our guiding star, that the wonder is that any progress has ever been made. But while this is true, and all human progress and advancement are conditioned on the overcoming of these difficulties, the Creator of the universe has implanted in the minds of some rare spirits such a longing for the truth, such a desire to penetrate the arcana of nature, that they boldly face all difficulties, overcome all obstacles and never give up the fight until the banner of truth proudly floats over the innermost stronghold of error. I am happy to say that in the solution of this great problem our own ASSOCIATION has taken an active and commanding part, and among the gallant standard-bearers none occupies a higher position than the Nestor of our profession, the revered and beloved N. S. Davis.

EFFECT ON THE MUSCULAR SYSTEM.

For ages the almost universal impression has been that alcohol gives muscular force; that it enables man to do more work, to undergo greater hardships, to withstand greater cold and heat than he could without it. Accurate scientific investigations with the dynamometer and other instruments of precision have, however, positively demonstrated the fallacy of this impression. As Dr. Bunge has very cogently stated, "thousands of experiments upon large bodies of men have been made and have led to the result that in peace or in war, in heat, cold or rain, soldiers are better able to endure the fatigues of the most exhausting marches when they are not allowed any

alcohol. A similar result is observed in the navies and on the thousands of commercial vessels belonging to England and America, which put to sea without a drop of alcohol. Most whalers are manned by total abstainers."²⁰ Arctic explorers endure the severe cold much better when they abstain from alcohol than when they use it even in moderation. The great business interests of the country are beginning to appreciate the fact that alcohol unfits men for doing the best work. So convinced are they of this that many railroads and large manufacturing and mercantile establishments will neither employ nor retain in their employment persons addicted to the use of alcoholic beverages.

That alcohol lowers muscular force is very conclusively shown by the fact that those who engage in athletic sports must stop drinking if they expect to excel. No prize fighter, ball player, oarsman or any kind of athlete can keep up drinking habits without so injuring himself in a few years that he is relegated to the rear as "a back number." This is understood by all trainers and has impressed itself so strongly, that, even in beer-drinking Germany, the favorite national beverage is being discredited by athletes. "It is stated that three clubs of Leipsic students have abandoned the 'morning drinking bout,' and that several additional university clubs are about to take the same step. The desire to excel in all athletic sports is said to be the impelling cause of this action on their part." This practical acknowledgement that beer drinking is inimical to the best physical condition and to the highest degree of athletic success would be significant in any country, but is especially so in Germany, the great beer-drinking country of the world. Careful experiments made on a number of persons by Dr. Kellogg several years ago showed that muscular strength is diminished more than 30 per cent. by the use of alcohol, and the same author declares that nothing could be more absurd than the administration of mixtures containing alcohol when tonic effects are desired.¹⁹

The careful and elaborate experiments made on dogs by Prof. C. F. Hodge (*Pop. Science Monthly*, April, 1897) showed not only a marked diminution in muscular activity, but a greatly lessened power of endurance on the part of the dogs that received alcohol.

EFFECT ON THE SPECIAL SENSES.

Careful experimental investigations as well as everyday practical experience have demonstrated the fact that alcohol reduces the power and functional activity of the special senses, besides so perverting the action of the nerve centers and interfering with transmission to and from the periphery, that correct impressions of objective phenomena can not be obtained. The acuity of vision is lowered, the power of hearing reduced, the sense of smell blunted and the taste so obtunded that fiery and even caustic liquids can be swallowed without wincing. When carried to the stage of complete narcotism the functions of the special senses are for the time being lost and those "gateways of the soul" which are given us for protection are closed, and the man—deprived of sensation, motion and the power to see, hear, taste, smell or feel—lies before us, a mere vegetating mass, with barely enough respiration and circulation to sustain life, and if the narcotism is carried too far these stop too and he dies.

EFFECT ON THE NERVOUS SYSTEM.

But while alcohol retards digestion, impedes assimilation and excretion, reduces the oxygen-carrying power of the blood, and inhibits the nutrition of the cells and tissues of the whole body, still it is on the nervous system that its most far-reaching and malign influences are exerted. According to Dr. George Harley,²² it acts on nervous tissue in three distinctively different ways: "Firstly, through its chemic action on the blood; second, by disordering the liver's functions and causing the bile to accumulate in the circulation, thereby poisoning the brain and nerves, and thirdly, by its accelerating the heart's action and thus sending an increased supply of blood to the brain."

Dr. Norman Kerr²³ writes as follows: "Alcohol paralyzes the vasomotor nerves, and thereby relaxes control over the vessels so that these dilate and allow more arterial blood to pass to the brain. With this superabundant supply of blood there is great activity of function. This is the stage of exhilaration, excitement, brilliancy, sometimes frenzy and delirium. Owing to the loss of the contractile power of the vessels the increased blood-supply can not be returned to the veins from the brain with sufficient rapidity, and thus there is a block, causing impediment of the circulation, which ought to be free and unimpeded to allow of duly aerated, fresh arterial supplies; this is the stage of depression—of depression and collapse, when the brilliancy dies away; memory fades, speech is thickened, voluntary movement ceases, sensation is dulled and consciousness fails. This process, frequently repeated, sets up permanent tissue changes. The covering envelope is thickened and otherwise so injured that proper nutriment can not be conveyed to the brain, and thus that organ is badly nourished. The shape of the brain-cells is altered, and the physical degradation of the cerebral substances sadly impairs the intellectual and moral faculties."

Dr. B. W. Richardson says: "It has four distinct effects on the nervous system: 1, simple exhilaration or excitement, caused by paralysis of nerves controlling the supply of blood; 2, muscular weakness or lack of control of one's movements; 3, mental debility, involving the weakening of the will, judgment and reason; 4, unconsciousness, with entire prostration of the body, stupor and delirium tremens;" and Dr. N. S. Davis states that "alcohol diminishes nerve force, sensibility and the action of the nerve centers in direct proportion to the amount entering into the blood."

"The excitement of all natural stimulants is not necessarily followed by a corresponding depression, but it is the inevitable result of alcohol and all other narcotic stimulants, that they are followed by depression more than equal to the excitement produced, so that a person using narcotic stimulants is more depressed than ever, and, therefore, is more inclined to repeat and increase the dose."²⁴ And I desire to add that this tendency of alcoholic beverages and other narcotics to create a craving which only *their use* in increasingly larger doses can satisfy, is one of the great dangers connected with their use. Time will not permit me even to allude to the many pathologic changes or diseases that result from the excessive or long-continued use of alcohol in any of its many forms. Enough has been said, however, to show that it seriously interferes with the nutritive and assimilation.

lative functions, even in the adult, and how much more serious must its effects be on the growing child or youth, whose normal development is conditioned on the possession of pure, rich, properly oxygenated blood, active assimilation and unimpeded elimination? If it reduces muscular power and activity in the adult, how much more serious must its effects be on the rapidly developing muscular system of the youth! If it reduces the power of the special senses and so perverts sensation and interferes with the ability of the mind correctly to interpret the actual condition of the physical and mental powers in the adult, how great must be the injury it inflicts on the immature muscular system, and how terrible its effects on the nervous system of the growing boy!

EFFECTS ON THE MIND.

In view of the foregoing effects on the physical organization, the question naturally arises, How does alcohol affect the mind? What influence does it exert on the immortal part of man? If human experience and observation have ever incontrovertibly established any truth, I believe they have proved that alcohol dulls and perverts the perceptive powers, deranges the emotions, beclouds the intellect and inhibits and paralyzes the will. "The will is always lessened in force and activity. The ability to determine between two or more alternatives, to resolve to act when action is necessary, no longer exists in full power, and the individual becomes vacillating, uncertain, the prey to various passions and to the influence of vicious counsels."²⁵ "The more purely intellectual faculties of the mind rarely escape being involved in the general disturbance caused by alcohol. The power of application, of appreciating the bearing of facts, of drawing distinctions, of exercising judgment aright and even of comprehension, are all, more or less, impaired. The sense of right or justice, which the individual may have had, is so weakened or destroyed that he will lie or steal or commit murder or other outrages, even where there is no provocation." "The memory is among the first faculties to suffer,"²⁶ writes Dr. Wm. A. Hammond; and Dr. August Forel of Zürich, says: "The poisoning of the brain by alcohol is all pervasive. We need not descend to the drunkard. In looking at the moderate drinker we see that his sensibilities are less fine, he cares less for the strict truth, he is more negligent of the proprieties and less active mentally."²⁷ Nor is this all, for "under alcoholic influence the brain begins to think awry. It can not think straight,"²⁸ and its influence on the psychical processes is curious, for while it renders them much slower, the individual under its influence believes them to be much quicker than usual."²⁹ Indeed, experiments made in Heidelberg University show that the consumption of alcohol, whether in large or small doses, produces a tendency to paralysis of the mental faculties.³⁰ And still, many would excuse free indulgence in alcohol on the ground that it is necessary to arouse the mind, to cause thought to flow freely, to stir latent genius into brilliant activity, or awaken the slumbering muse and snatch undying fame from Parnassian heights. Stuff and nonsense! The genius that will not illuminate without alcohol, had better be left to "innocuous desuetude," to take its place with the "mute inglorious Miltons" of the past, and the muse whose celestial fire can only be stirred into an active flame by means of whisky, brandy or even champagne, is at best but a sorry jade,

and had better be allowed to slumber peacefully on. If the experience and investigations of the most eminent physiologists and thinkers are of any value, more long-continued, arduous and severe mental work can be accomplished without alcohol than when it is taken, even in small amounts. On this subject Prof. C. F. Hodge writes as follows: "Helmholtz has said in describing his methods of work that slight indulgence in alcoholic drinks dispelled instantly his best ideas." Prof. Gaule once told the writer as an experiment during the strain of his "Staats-examen" that he suddenly stopped his wine and beer and was surprised to find how much better he could work. An eminent professor of Leipsic once said that the German students could do twice the amount of work ("Konnten zwei mal so viel leisten") if they would let their beer alone. Dr. August Smith has found that "moderate, non-intoxicant doses of alcohol (forty to eighty c.c. daily) lowered psychic ability to memorize as much as 70 per cent."³¹

EFFECT ON THE MORAL NATURE.

As pointed out in the foregoing quotations, alcohol blunts the finer sensibilities and dulls the moral perceptions so that the regard for truth, justice and the rights of others is greatly lessened. Indeed, it is a matter of common observation that old habitués are entirely unreliable, and in many cases their most sacred pledges are utterly worthless. So thoroughly are they in the power of an insatiable appetite, and so absolutely are they enslaved by it, that they would violate their most solemn promises, yea, even, if such a thing were possible, would barter their immortal souls for a glass of whiskey. This, together with the fact that a large percentage of the crimes committed are directly or indirectly due to indulgence in alcoholic liquors, should lead to the most stringent measures to protect the children and youth of our land against their blighting influences. These protecting influences, stimulated by a thorough physiologic knowledge and an aroused conscience, should originate in the home, be continued and strengthened in the schools, and strongly reinforced by the legislatures and courts of our land, and finally should receive the unqualified and earnest support of every physician. When we consider the strong inherent craving for alcoholic beverages in the human race and the powerful inherited tendency (latent though it be) in such a large percentage of persons, I do not believe any physician is justified in using alcohol in the treatment of any case of disease, unless, after a careful investigation, he is convinced that no other remedy will answer just as well. If such a course were conscientiously pursued, I predict that alcohol would soon be reduced to a very limited sphere, because I believe that nearly every disease in which it is now so extensively used could be treated better without it, and the medical profession be spared the odium of producing so many drunkards. The same is true of opium and other narcotic poisons which are now so extensively, indiscriminately and unfortunately—I think needlessly—used. If we would devote more time to securing a clear conception of the great laws regulating physiologic activity; to ascertaining the causes of diseases and trying to remove them, or assist nature in overcoming their effects, instead of merely administering a narcotic dose to cover up the painful symptoms, we would do a great deal more permanent good and not lay our-

selves open to the imputation of having done much harm.

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DISCUSSION.

Dr. SLAGLE of Minneapolis—In regard to tobacco, the bad effects of it, of course, can hardly be exaggerated. The subject brought to my mind an experience I had when I started out in the practice of medicine, about 1861. Among my first cases I had a baby that was very ill. On my first visit it had turned suddenly worse. The symptoms were all bad: sweating, almost pulseless, and I at once made an unfavorable positive prognosis that the child was dying. I did not observe that a lot of old ladies had gathered in and had been smoking. The house was full of tobacco fumes. I gave the case up and was going to visit a relative some miles away. I returned in the morning and my patient was better, and recovered. Then I searched for the cause and found it was the fumes of tobacco with which the room was filled which depressed the child and came near killing it, and caused me to make the blunder in prognosis.

In regard to the use of alcoholic stimulants, I do not like to hear Dr. B. W. Richardson quoted, eminent as he was; I think that he went to extremes. The more I practice medicine the more I give alcoholic stimulants in certain diseases, and I am sure with good effect. Of course, no one can exaggerate the baneful effect of the excessive use of alcoholic stimulants. But in the practice of medicine, especially with children, I am sure it is a good therapeutic agent. I believe it is, when properly used in properly selected cases, a valuable agent. As to its injuring digestion, that is a mooted question; there are good authorities on both sides. I am sure it does not always injure digestion. I hoped the essayist would speak of opium. The more I practice medicine, and my department is diseases of children almost entirely, the more cautious I am of using opiates in any form in diseases of young children. Indeed, I use opium very little. I may state that in the earlier days of my professional experience I saw great harm from it. I am even willing to admit that I believe I killed some with it. It is a very dangerous agent to use in diseases of children, and I find we can get along without it. Those of the rising generation are less excusable, perhaps, for its use than we of forty years ago. We have now many remedies that were unknown then, that take its place.

Dr. LOUIS J. LAUTENBACH, Philadelphia—Up to the present

time the youngest age of any one who has been found the subject of tobacco blindness has been 19 years of age. This afternoon I expect to report a case I saw 13 years of age, and since then I have found a number of cases of about that age and from there on, and I find, from the influence of tobacco on the system, that these cases are very common indeed. I for one am very much in favor of the enactment of certain laws in regard to the use of tobacco. If we face honestly the two questions of alcoholism and tobacco, we will find that tobacco exerts the greater harm. It is not easy to think so, for we have been taught differently. We can use alcohol in reason and it will do good, but upon the young I have never seen any case where the use of tobacco has done any good, but I have seen numberless cases in which it has done harm. You go through the streets of our larger cities and notice the young boys smoking and you will see certain characteristics caused by the use of tobacco. I think before long we will have laws prohibiting the use of tobacco by minors. In the case I mentioned, the vision was about 1/5; the patient was a boy about 13 years of age, rather tall, and he had been following the habit about a year. His heart's action was very irregular. When the tobacco was stopped, the vision became 6/9, showing the influence of the tobacco on the vision. I do believe tobacco has not been talked about more because it is one of our pet vices. I find it far more difficult to get patients to stop the use of tobacco than to stop the use of alcohol.

Dr. JOHN RIDLON, Chicago—I simply wish to say a word in protest against the universal application of the conclusions in the paper read. Of course, the conclusions of the essayist are correct in a measure, but they are incorrect in their general application. Now, as to tobacco, I don't know what I would have been had I not commenced smoking at 13. As far as the effect of alcohol on digestion is concerned, it is true alcohol delays digestion, but it is not necessary to conclude therefrom that it is harmful to the individual. Delayed digestion often makes more perfect digestion. The patient may suffer difficulty from the digestion being completed before the digestive process has ceased. There can be no question that alcohol often is an advantage and help in digestion, not because it hastens digestion but because it delays digestion.

Dr. R. B. GILBERT, Louisville—I heartily agree with every word that has been said here about tobacco. I come from a State that boasts of its tobacco and whisky, and Kentucky probably would not thank me for saying a word against tobacco; but I have written against it, and I have not missed an opportunity to speak against it. It gave me dyspepsia and everything else until I quit it. It reduced my weight to 120 pounds. The point the gentleman makes in his paper is one we should pay considerable attention to. We should educate the public mind on the evil effect of the tobacco habit on the infants and children of our nation. I believe today, sir, that the degenerated condition of the country that is at war with us, is due as much, if not more, to their use of tobacco than to any other one vice they have. We should go back to the ancestry to find the cause of the ill effect on the children. I have found one or two children of such a family have a nervous temperament, even sometimes to such an extent that they could not follow the ordinary course of the common schools, many of them becoming epileptic. That is not all; it has a degenerating effect upon the moral character. The average tobacco user defends himself by saying it is a luxury and a pleasure. I know old farmers in my country, apparently hearty and hale, although they use whisky, but they are the exceptions. I want to say a word about the use of tobacco among doctors, especially those who practice obstetrics. I know a case in which I believe the doctor killed the child by blowing his breath into its face to resuscitate it. The doctor's breath was reeking with tobacco, and he blew his breath into the child's face to inflate the child's lungs. The child died, and on autopsy we could find nothin

to account for the death. No obstetrician knows what moment he may have to use artificial respiration.

Dr. E. STUVER, Rawlins, Wyo., in closing—I fully understand the fact that tobacco may have its proper usage; I believe, however, that the proper use of tobacco is in the exceptional case, and not in the general rule for mankind. Tobacco should not be used by the young. Of course, my discussion took up the general physiologic effects of tobacco. But the special application is that in the growing boy, tobacco retards growth not only of the muscular system and the nervous system, it not only interferes with digestion and impedes the elimination of toxic products from the system but it interferes with the whole development of the child in every particular, morally and intellectually as well as physically. If I had the time to complete my discussion of the alcoholic question, some of the reasons would have been seen for my objections to alcohol, especially for the young. We see many of the effects of alcohol in the young not due to its direct use, but due to the use of alcohol by the ancestors. While I am glad to know one of the gentlemen claims to get good results from alcohol, yet the more I practice the more I find I can get good results without alcohol. I can get better results from strychnia than from alcohol, in a case of pneumonia or any other condition of lowered vitality.

GASTRO-INTESTINAL CHOLERIFORM CATARRH.

Presented to the Section on Diseases of Children, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

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Of the various titles, as cholera infantum, infectious diarrhea, choleriform diarrhea, summer diarrhea, summer complaint, acute mycotic diarrhea, by which this disease is known, none are as expressive as gastro-intestinal choleriform catarrh, for none designate as much at the outset, of the extent and character of its manifestations or variety of its action; summer complaint and summer diarrhea especially should not be used, they being indefinite and meaningless. The tendency of giving a number of names to a single disease should be overcome; be simple and comprehensive so no misunderstanding will be possible; avoid a variety of synonyms; they are confusing to physicians in general, who have not this knowledge at their command—knowledge which is tedious and unnecessary, and often leading to serious mistakes.

Gastro-intestinal choleriform catarrh, while not of common occurrence compared to other diarrheal disorders, is relatively frequent in children under 2 years of age; is of short duration and frightful severity. Occurring as it does in children of such a tender age, weak and easily overcome, it is incumbent on us to know it thoroughly, recognize it early, that we may treat it vigorously and properly. It is now generally accepted that the exciting cause of this disorder is bacteria, the exact nature of which is undetermined; whether introduced into the system with impure food or residing in intestines, and made capable of exerting their destructive processes by being transformed into pathogenic germs or forming ptomains is a question to solve, on which our energies should be directed. Accepting that bacteria is the cause, we are certain that their action is limited to certain periods of the year, not exerting their influence during very cold

months—of twenty-six cases none occurred during December, January nor February—on the other hand, the prevalence of the disease during June, July and August would tend to the belief that during a high temperature, the bacteria are especially numerous or active, or changes in the body are such as to especially invite their inroads. Dr. L. Emmett Holt, in his splendid work, "Diarrheal Diseases," draws the inference that "it is not the bacteria directly which produce the lesions, but their ptomains, and, further, that the action of the latter is principally on the blood-vessels." Assuming Holt's inference to be correct, as from our present knowledge it appears to be, what are the causes predisposing to the formation of the ptomains?

Knowing that bacteria exist in the intestinal canal in health, without detriment to normal conditions, anything which changes the healthy tissue or otherwise forms a medium for their development or action would be a predisposing cause.

That there is a distinct connection between occurrence of this disease and condition of temperature can not be questioned; occurring only during warm periods and absent during very cold establishes beyond doubt such a relation; whether it is the life of the germ, the normal resistance of the child, or that food undergoes putrefaction to a much greater degree, or that increase of unhealthy surroundings favor the micro-organism, is yet to be decided. My observation of twenty-six cases were as follows:

April 1, May 1, June 5, July 10, August 6, September 2, October 1.

According to the age the cases occurred as follows: First six months; 2; second six months, 7; third six months, 9; fourth six months, 5; between 2 and 3 years, 3.

There are several reasons for frequency in infancy, one which is seldom emphasized being the natural tendency—from weakness of a child of such a tender age—to succumb to the inroads of any irritant or its inability to resist an irritant. But standing above all other causes excepting bacteria, is that old enemy of the infant, which seems to wax stronger as time goes on—improper feeding; it is worthy of note in this connection that the child so fortunate as to be nourished at the breast escapes this dread disorder, with rare exceptions. Reasoning from this fact, what is more probable than that food is the vehicle by which bacteria are introduced, a nidus for their development, or causes changes in the mucous membrane favorable to their action? For instance, in over-feeding, the organs of digestion are overtaxed by the increased work and their power gradually diminished; there remains in the intestines a quantity of undigested food which undergoes decomposition, irritating and causing a change in the normal state of the intestines, and a culture in which the bacteria may produce their evils. There is scarcely an infant which is bottle fed that escapes diarrhea during the first two years of its existence. Improper food of any kind, over-feeding, unhealthy source of obtaining milk, are self-evident reasons for this; meats, vegetable, fruits, are common causes and should be prohibited, because the infant is unable to digest such food. We should carefully guard against all irritating ingesta, animal or vegetable, and more so, if not strictly fresh; the ptomains may be introduced in the food and not formed in the intestines, though the latter appears to be in general the *modus operandi*. In conjunction with other results of high