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# Alcohol as a Causative Factor in Diseases of the Central Nervous System.

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*Compliments of*  
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ALCOHOL AS A CAUSATIVE FACTOR IN  
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Next to syphilis, alcohol is the most frequent cause of diseases of the brain. In many instances it is more virulent, rapid and pronounced in its effects and is now fully recognized as a poison of the narcotic class.

Its general action on the system is seen in irritation, deranged functional activities, diminished force and narcosis. Some instances show marked narcosis from the beginning. The first effect of alcohol is to produce functional disturbance, and such poisons are called narcotic and neurotic, because their most conspicuous action is on the nervous system. Apparently this effect is transient, and the injury is supposed to be indicated by the repetition of the functional disturbances. A fatal dose acts like other tissue poisons, producing narcosis and necrosis. Alcohol while being carried to all parts of the body acts, like other poisons, on those parts which it reaches with the least amount of dilution, particularly the stomach and liver. Unlike other poisons, it seems to have a special affinity for the brain and nervous system. The vascular disturbance and consequent nutritional derangement are most prominent. The effects of alcohol in what are called chronic states, may vary widely in persons who are termed steady drinkers, and others who are not supposed to be injured by alcohol, up to those who are notoriously degenerated from its use, may be grouped as follows :



1. General temporary exaltation of the brain and emotional activities, followed by depression and feebleness, loss of memory and change of character and conduct.

2. General diminished power of attention and volition, particularly in the sensorial and kinesthetic centers and their connections.

3. Diminished energy and adaptability of conduct to the conditions of life.

4. Diminished muscular power and demand for help or stimuli to do the ordinary work of the system.

5. From the first a marked blunting and deepening obscurity of the moral and ethical sense.

6. Insomnia, diminished power of sleep and recuperation, with a nutritive break down of the stomach and brain.

7. The relations of the *ego* to the external world become disturbed followed by melancholy, suspicion, delusions, hallucinations and changed emotional states all merging into various chronic insanities.

These groups of symptoms are seen in all cases, not in a continuous order, but varying widely. Sometimes one is much more prominent than the other, but in all cases the psychical disturbances are present. The diminished sensory functions and the lowering and obscuring of the higher ethical sense of duty and the relation to the surroundings indicate a profound nutritive and dynamic failure of the nerve elements of the brain. While these are the well-marked symptoms of all cases who use alcohol excessively they are by no means absent in those who are supposed to use it in moderation. There are no dividing lines on one side of which the poisonous action of alcohol can be seen, while on the other it is absent. The fact is that alcohol, like other poisons, varies in its effects on different persons, producing in certain organs more prominent effects than in others; in certain cases concealed for a long time, then bursting out, revealing a degree of degeneration unsuspected; concentrating on the liver, stomach, kidneys or heart, or suddenly

developing into serious lesions of the higher brain centers.

To understand more clearly the influence of alcohol in the causation of disease of the central nervous system, a study of some central facts of the dynamics of brain energy and force will be useful. All nerve force and brain activity is physical energy in motion. This energy is gathered and released and is technically only a variety of motion the same as is electricity. It is transmitted motion, but not electricity, although the latter is transmitted in the same way. It comes from nutrition, from chemic and molecular changes and is stored up and released by certain activities. It may be quickened, retarded, changed, increased or withdrawn.

It is the transmission of this energy along the nerve tracts to all parts of the body that constitutes life, and with all its attractions and repulsions and the continual readjustments of the delicate equilibrium necessary to sustain the work of life this is carried on with exact and absolute precision. Nothing in the range of human knowledge can compare with the perfection and minuteness of these dynamic processes going on in the neurons and protoplasm of the brain. The force displayed in muscular activity, the contraction and expansion of the molecules as energy is liberated and transmitted along the fibers, well illustrates the marvelous mechanism of the brain.

This energy can be changed by foods, by drugs, by environments, all of these being new sources of energy, which may add to or pervert and exhaust the present sources, or more commonly may change the direction and power of this energy or depress it below normal levels. This is clear from a change of function and normal activity of the body. What we call disease is a change of the chemic conditions of the body and consequent alterations of nerve force and energy.

This is noted first in deranged functions and disturbed energies, which seem to act out of harmony with the surroundings. Functional disturbance may reach a point where it becomes convulsive and displays



a flow of energy along new paths of discharge. What is called nerve-storms is the unrestrained convulsive concentration of nerve force and the repetition of this, in epilepsy, is disease. Drugs which change this release of energy may be dangerous, in not only destroying the equilibrium of forces, but the power of adding new energies and increasing or diminishing the direction and rapidity of the energy. This gives some conception of the mechanism of what is called inhibition and resistance. In early life the energies of the body may be easily augmented and perverted. The functional changes may register these states. In later life defective nutrition and chemic changes break up the normal flow of energy. This breaking up of nerve energy and irregularity of the movement of nerve force is most strikingly seen in epilepsy and convulsive irregular discharges of nerve and muscular power. This energy is renewed during a period of building up; then it is released in a convulsive discharge of force. These are some of the facts which bring us to a point of view where the action of alcohol can be seen more clearly. The fact that alcohol, even in small doses, produces functional disturbances in the brain and nervous system is very significant of derangement of nerve energy and motion.

Another fact admitted beyond all controversy is that alcohol has a special affinity and positive action over the brain and nervous system. Its effects are seen here more than any other part of the body. The increased heart action points to a release of energy, and the blurring of the senses show that energy has been diverted and changed from its normal channel.

In many cases alcohol is used up to the toxic limit of full narcotism. Then a period of abstinence follows. After a time these cases become periodic, and the drink-storm occurs with regular or irregular intervals. The exciting causes of the return of the paroxysm are complex and uncertain. Each paroxysm is longer, more intense and followed by greater prostration. The first glass of spirits seems to

both liberate and concentrate nerve energy in a convulsive demand for more spirits until narcotism comes, and even then the demand continues long after the capacity to retain it has passed away. This convulsive discharge of nerve energy as in epilepsy becomes a disease of the central nerve centers. Like epilepsy, it may continue for years before ending in death.

Alcohol may act as an exciting cause, exploding and concentrating unstable elements of nerve force, rousing up latent predispositions and precipitating degenerations. Periodic convulsive drinking belongs to the family of epilepsies, and has many symptoms in common. They are both central nerve diseases and follow a uniform course to the same end.

General paralysis is another disease which dates from the use of alcohol. In nearly all cases alcohol is used to excess at some time in the progress of the case. It is a symptom as well as a cause, and it is often difficult to separate one from the other. Pneumonia, nephritis, cirrhosis and other acute organic diseases follow the use of alcohol, and are the natural sequel of acute degenerations.

It is not possible at present to specify any particular diseases which are caused by the action of alcohol alone. Like the poison of syphilis, alcohol seems capable of producing the most complex degenerations in every organ and tissue of the body. It not only brings new abnormal force to the brain centers, but deranges and perverts that which exists. Pathologically the injury seems widespread and general, affecting cell and tissue alike, both retarding nutritive cell growth and waste elimination; physiologically deranging the functions of the organs and then the structure, diminishing their normal activity and capacity. Psychologically it effects the higher brain centers, with a literal general paralysis going on down to the lower centers and functions following a graded line of dissolution. Structural injuries of the peripheral nerves, which comes directly from alcohol, are common. In chronic cases these injuries are well recog-

nized, but in moderate and periodic drinkers they are overlooked. They are called rheumatism and neuralgia in cases where the cause of alcohol is not prominent. I have found these lesions in persons who have abandoned the use of alcohol or have long free intervals of sobriety. The injury from alcohol, which begins as interstitial inflammation, becomes a parenchymatous degeneration, and is confined to the sensory nerves first, and the brain later.

Ataxia and loss of muscular power comes on in the later stages.

Alcohol seems to have a special toxic action over the peripheral nerves. Arsenic and other minerals have a like power, and we are able to differentiate a number of different forms of neuritis.

Alcohol as a factor in diseases has two very pronounced actions. One on the dynamics of nerve force and the other on the nutrition and source of supply and energy. The nerves are over-excited and depressed and then activity is perverted, and the power of restoration from nutrition destroyed. The two central processes of life, waste and repair, are affected, one increased and the other diminished. These facts seem to be sustained by a great variety of evidence which admits of no other interpretation.

In clinical studies of cases the inebriate, or the person who uses alcohol in so-called moderation, may not exhibit symptoms of well marked disease, or of diseases which are described and classified in the textbooks, and yet the evidence of exhaustion, degeneration and general derangement is always present. There is present in these cases a profound lowering of nerve energy and vigor, associated with a prodigality of waste and delusions of strength that is not apparent to superficial observation.

The apparent recovery from the narcotism of single drunk paroxysm is never real. The convulsive discharge of nerve energy through the actions of alcohol permanently derange the dynamic equilibrium of the nerve centers. Its repetition fixes this condition, and

the power of resistance to disease becomes less. Local inflammation from infectious agents, from injuries, strains and drains, can not be overcome and death follows. Alcohol has been the factor which made these conditions possible, and destroyed the *vis medica natura*.

In this general outline of the facts concerning the power of alcohol as a factor in central nerve disease, the following facts may be restated:

1. Alcohol is a poison of the narcotic class, with a special tendency to act on the brain and nervous system.

2. In a general way the effects of alcohol are the same. Disturbing the functional processes and diminishing the sensory activities, ending in general muscular depression and mental enfeeblement.

3. A general psychical paralysis beginning with the *ego* and extending to all parts of the body, varying in some slight degree, but marked in all cases.

4. In dynamics of the brain there is a continuous gathering and discharge of nerve energy. This is increased, retarded and perverted by drugs, foods and environments.

5. The change of this nerve energy is seen in the functional disturbances of the body. In early and late life it is very prominent.

6. Alcohol produces marked functional derangements. It both releases and concentrates nerve energy. The increased and diminished vascular actions, with diminished sensory power, point to profound disturbances of the dynamic forces of the brain.

7. Periodic drinking is a convulsive disease like epilepsy, and is of the same family group. General paralysis is another similar disease, associated with exhaustion.

8. Alcohol acts on the body psychologically, physiologically and pathologically, and is a literal paralysis and dissolution.



9. No other substance known in common use has such a profound destructive action on waste and repair of the body.

10. This opens the door for many diseases by destroying the power of resistance and enfeebling all the powers of life.

