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## **Alcohol - Its Effects and Dangers**

Alcohol contributes to 100,000 deaths annually, making it the third leading cause of preventable mortality in the U.S., after tobacco and diet/activity patterns.

Alcohol is a nervous system depressant, which can affect virtually every organ in the body, since it goes directly into the bloodstream.

It lowers inhibitions and impairs judgment, leading to unsafe behaviours, and eventually even death.

Alcohol has many side effects including altering your perceptions, dulling your senses, hindering coordination, and blocking memory functions.

If you continue to use alcohol heavily, you could experience stomach ailments, sexual impotence, heart and central nervous system damage, loss of appetite, and blackouts.

Drinking, even at moderate levels, can put you at risk for serious health and social problems. Alcohol interacts negatively with more than 150 medications, so check with your doctor or pharmacist prior to drinking any amount of alcohol, if you are taking any over the counter or prescription medication. The more heavily you drink, the greater the strain will be on your relationships with family and friends.

The amount consumed by 11 to 15-year-olds has spiralled to over 10.4 alcohol units a week - twice the amount drunk ten years ago, and equivalent to more than five bottles of alco-pops or five pints of cider, according to the latest figures.

Recent research has also revealed that 15 and 16-year-olds in the UK were more likely to get drunk than most of their European counterparts, with 30% reporting binge-drinking three or more times in the last month.

Binge drinking is on the rise, and it has devastating effects both physically and mentally.

## THE EFFECTS OF ALCOHOL:

### ACTION OF ALCOHOL ON INTERNAL ORGANS.

#### Action on the stomach.

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The action of alcohol on the stomach is extremely dangerous that it becomes unable to produce the natural digestive fluid in sufficient quantity and also fails to absorb the food which it may imperfectly digest. A condition marked by the sense of nausea, emptiness, prostration and distention will always be faced by an alcoholic. This results in a loathing for food and is teased with a craving for more drink. Thus there is engendered a permanent disorder which is called dyspepsia. The disastrous forms of confirmed indigestion originate by this practice.

#### How the liver gets affected.

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The organic deteriorations caused by the continued use of alcohol are often of a fatal character. The organ which most frequently undergoes structural changes from alcohol, is the liver. Normally, the liver has the capacity to hold active substances in its cellular parts. In instances of poisoning by various poisonous compounds, we analyse liver as if it were the central depot of the foreign matter. It is practically the same in respect to alcohol. The liver of an alcoholic is never free from the influence of alcohol and it is too often saturated with it. The minute membranous or capsular structure of the liver gets affected, preventing proper dialysis and free secretion. The liver becomes large due to the dilatation of its vessels, the surcharge of fluid matter and the thickening of tissue. This follows contraction of membrane and shrinking of the whole organ in its cellular parts. Then the lower parts of the alcoholic becomes dropsical owing to the obstruction offered to the returning blood by the veins. The structure of the liver may be charged with fatty cells and undergo what is technically designated 'fatty liver'.

#### How the Kidneys deteriorate.

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The Kidneys also suffer due to the excessive consumption of alcohol. The vessels of Kidneys lose elasticity and power of contraction. The minute structures in them go through fatty modification. Albumin from the blood easily passes through their membranes. This results in the body losing its power as if it were being run out of blood gradually.

Congestion of the lungs.  
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Alcohol relaxes the vessels of the lungs easily as they are most exposed to the fluctuations of heat and cold. When subjected to the effects of a rapid variation in atmospheric temperature, they get readily congested. During severe winter seasons, the suddenly fatal congestions of lungs easily affects an alcoholic.

Alcohol weakens the heart.  
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Consumption of alcohol greatly affects the heart. The quality of the membranous structures which cover and line the heart changes and are thickened, become cartilaginous or calcareous. Then the valves lose their suppleness and what is termed valvular disorder becomes permanent. The structure of the coats of the great blood-vessel leading from the heart share in the same changes of structure so that the vessel loses its elasticity and its power to feed the heart by the recoil from its dissention, after the heart, by its stroke, has filled it with blood.

Again, the muscular structure of the heart fails owing to degenerative changes in its tissue. The elements of the muscular fibre are replaced by fatty cells or, if not so replaced, are themselves transferred into a modified muscular texture in which the power of contraction is greatly reduced.

Those who suffer from these organic deteriorations of the central and governing organ of the circulation of the blood learn the fact so insidiously, it hardly breaks upon them until the mischief is far advanced. They are conscious of a central failure of power from slight causes such as overexertion, trouble, broken rest or too long abstinence from food. They feel what they call a 'sinking' but they know that wine or some other stimulant will at once relieve the sensation. Thus they seek to relieve it until at last they discover that the remedy fails. The jaded, overworked, faithful heart will bear no more. it has run its course and the governor of the blood-streams broken. The current either overflows into the tissues gradually damming up the courses or under some slight shock or excess of motion ceases wholly at the centre.

**ALCOHOL HAS NO FOOD VALUE.**

Alcohol has no food value and is exceedingly limited in its action as a remedial agent. Dr. Henry Monroe says, "every kind of substance employed by man as food consists of sugar, starch, oil and glutinous matter mingled together in various proportions. These are designed for the support of the animal frame. The glutinous principles of food fibrine, albumen and casein are employed to build up the structure while the oil, starch and sugar are chiefly used to generate heat in the body".

Now it is clear that if alcohol is a food, it will be found to contain one or more of these substances. There must be in it either the nitrogenous elements found chiefly in meats, eggs, milk, vegetables and seeds, out of which animal tissue is built and waste repaired or the carbonaceous elements found in fat, starch and sugar, in the

consumption of which heat and force are evolved.

"The distinctness of these groups of foods," says Dr. Hunt, "and their relations to the tissue-producing and heat-evolving capacities of man, are so definite and so confirmed by experiments on animals and by manifold tests of scientific, physiological and clinical experience, that no attempt to discard the classification has prevailed. To draw so straight a line of demarcation as to limit the one entirely to tissue or cell production and the other to heat and force production through ordinary combustion and to deny any power of interchange ability under special demands or amid defective supply of one variety is, indeed, untenable. This does not in the least invalidate the fact that we are able to use these as ascertained landmarks".

How these substances when taken into the body, are assimilated and how they generate force, are well known to the chemist and physiologist, who is able, in the light of well-ascertained laws, to determine whether alcohol does or does not possess a food value.

For years, the ablest men in the medical profession have given this subject the most careful study, and have subjected alcohol to every known test and experiment, and the result is that it has been, by common consent, excluded from the class of tissue-building foods. "We have never," says Dr. Hunt, "seen but a single suggestion that it could so act, and this a promiscuous guess.

One writer (Hammond) thinks it possible that it may 'somehow' enter into combination with the products of decay in tissues, and 'under certain circumstances might yield their nitrogen to the construction of new tissues.' No parallel in organic chemistry, nor any evidence in animal chemistry, can be found to surround this guess with the areola of a possible hypothesis".

Dr. Richardson says: "Alcohol contains no nitrogen; it has none of the qualities of structure-building foods; it is incapable of being transformed into any of them; it is, therefore, not a food in any sense of its being a constructive agent in building up the body."

Dr. W.B. Carpenter says: "Alcohol cannot supply anything which is essential to the true nutrition of the tissues."

Dr. Liebig says: "Beer, wine, spirits, etc., furnish no element capable of entering into the composition of the blood, muscular fibre, or any part which is the seat of the principle of life."

Dr. Hammond, in his Tribune Lectures, in which he advocates the use of alcohol in certain cases, says: "It is not demonstrable that alcohol undergoes conversion into tissue." Cameron, in his Manuel of Hygiene, says: "There is nothing in alcohol with which any part of the body can be nourished."

Dr. E. Smith, F.R.S., says: "Alcohol is not a true food. It interferes with alimentionation."

Dr. T.K. Chambers says: "It is clear that we must cease to regard alcohol, as in any sense, a food".

"Not detecting in this substance," says Dr. Hunt, "any tissue-making ingredients, nor in its breaking up any combinations, such as we are able to trace in the cell foods, nor any evidence either in the experience of physiologists or the trials of alimentarians, it is not wonderful that in it we should find neither the expectancy nor the realization of constructive power."

Not finding in alcohol anything out of which the body can be built up or its waste supplied, it is next to be examined as to its heat-producing quality.

Production of heat.

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"The first usual test for a force-producing food," says Dr. Hunt, "and that to which other foods of that class respond, is the production of heat in the combination of oxygen therewith. This heat means vital force, and is, in no small degree, a measure of the comparative value of the so-called respiratory foods. If we examine the fats, the starches and the sugars, we can trace and estimate the processes by which they evolve heat and are changed into vital force, and can weigh the capacities of different foods. We find that the consumption of carbon by union with oxygen is the law, that heat is the product, and that the legitimate result is force, while the result of the union of the hydrogen of the foods with oxygen is water. If alcohol comes at all under this class of foods, we rightly expect to find some of the evidences which attach to the hydrocarbons."

What, then, is the result of experiments in this direction? They have been conducted through long periods and with the greatest care, by men of the highest attainments in chemistry and physiology, and the result is given in these few words, by Dr. H.R. Wood, Jr., in his *Material Medical*. "No one has been able to detect in the blood any of the ordinary results of its oxidation." That is, no one has been able to find that alcohol has undergone combustion, like fat, or starch, or sugar, and so given heat to the body.

Alcohol and reduction of temperature.

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instead of increasing it; and it has even been used in fevers as an anti-pyretic. So uniform has been the testimony of physicians in Europe and America as to the cooling effects of alcohol, that Dr. Wood says, in his *Material Medical*, "that it does not seem worth while to occupy space with a discussion of the subject." Liebermeister, one of the most learned contributors to *Zeimssen's Cyclopaedia of the Practice of Medicine*, 1875, says: "I long since convinced myself, by direct experiments, that alcohol, even in comparatively large doses, does not elevate the temperature of the body in either well or sick people." So well had this become known to Arctic voyagers, that, even before physiologists had demonstrated the fact that alcohol reduced, instead of

increasing, the temperature of the body, they had learned that spirits lessened their power to withstand extreme cold. "In the Northern regions," says Edward Smith, "it was proved that the entire exclusion of spirits was necessary, in order to retain heat under these unfavourable conditions."

Alcohol does not make you strong.

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If alcohol does not contain tissue-building material, nor give heat to the body, it cannot possibly add to its strength. "Every kind of power an animal can generate," says Dr. G. Budd, F.R.S., "the mechanical power of the muscles, the chemical (or digestive) power of the stomach, the intellectual power of the brain accumulates through the nutrition of the organ on which it depends." Dr. F.R. Lees, of Edinburgh, after discussing the question, and educing evidence, remarks: "From the very nature of things, it will now be seen how impossible it is that alcohol can be strengthening food of either kind. Since it cannot become a part of the body, it cannot consequently contribute to its cohesive, organic strength, or fixed power; and, since it comes out of the body just as it went in, it cannot, by its decomposition, generate heat force."

Sir Benjamin Brodie says: "Stimulants do not create nervous power; they merely enable you, as it were, to use up that which is left, and then they leave you more in need of rest than before."

Baron Liebig, so far back as 1843, in his "Animal Chemistry," pointed out the fallacy of alcohol generating power. He says: "The circulation will appear accelerated at the expense of the force available for voluntary motion, but without the production of a greater amount of mechanical force." In his later "Letters," he again says: "Wine is quite superfluous to man, it is constantly followed by the expenditure of power" whereas, the real function of food is to give power. He adds: "These drinks promote the change of matter in the body, and are, consequently, attended by an inward loss of power, which ceases to be productive, because it is not employed in overcoming outward difficulties i.e., in working." In other words, this great chemist asserts that alcohol abstracts the power of the system from doing useful work in the field or workshop, in order to cleanse the house from the defilement of alcohol itself.

The late Dr. W. Brinton, Physician to St. Thomas', in his great work on Dietetics, says: "Careful observation leaves little doubt that a moderate dose of beer or wine would, in most cases, at once diminish the maximum weight which a healthy person could lift. Mental acuteness, accuracy of perception and delicacy of the senses are all so far opposed by alcohol, as that the maximum efforts of each are incompatible with the ingestion of any moderate quantity of fermented liquid. A single glass will often suffice to take the edge off both mind and body, and to reduce their capacity to something below their perfection of work."

Dr. F.R. Lees, F.S.A., writing on the subject of alcohol as a food, makes the following quotation from an essay on "Stimulating Drinks," published by Dr. H.R. Madden, as long ago as 1847: "Alcohol is not the natural stimulus to any of our organs, and hence, functions performed in consequence of its application, tend to debilitate the organ acted upon."

Alcohol is incapable of being assimilated or converted into any organic proximate principle, and hence, cannot be considered nutritious.

The strength experienced after the use of alcohol is not new strength added to the system, but is manifested by calling into exercise the nervous energy pre-existing.

The ultimate exhausting effects of alcohol, owing to its stimulant properties, produce an unnatural susceptibility to morbid action in all the organs, and this, with the plethora super induced, becomes a fertile source of disease.

A person who habitually exerts himself to such an extent as to require the daily use of stimulants to ward off exhaustion, may be compared to a machine working under high pressure. He will become much more obnoxious to the causes of disease, and will certainly break down sooner than he would have done under more favourable circumstances.

The more frequently alcohol is had recourse to for the purpose of overcoming feelings of debility, the more it will be required, and by constant repetition a period is at length reached when it cannot be foregone, unless reaction is simultaneously brought about by a temporary total change of the habits of life.

Driven to the wall.

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Not finding that alcohol possesses any direct alimentary value, the medical advocates of its use have been driven to the assumption that it is a kind of secondary food, in that it has the power to delay the metamorphosis of tissue. "By the metamorphosis of tissue is meant," says Dr. Hunt, "that change which is constantly going on in the system which involves a constant disintegration of material; a breaking up and avoiding of that which is no longer aliment, making room for that new supply which is to sustain life." Another medical writer, in referring to this metamorphosis, says: "The importance of this process to the maintenance of life is readily shown by the injurious effects which follow upon its disturbance. If the discharge of the excrementitious substances be in any way impeded or suspended, these substances accumulate either in the blood or tissues, or both. In consequence of this retention and accumulation they become poisonous, and rapidly produce a derangement of the vital functions. Their influence is principally exerted upon the nervous system, through which they produce most frequent irritability, disturbance of the special senses, delirium, insensibility, coma, and finally, death."

"This description," remarks Dr. Hunt, "seems almost intended for alcohol." He then says: "To claim alcohol as a food because it delays the metamorphosis of tissue, is to claim that it in some way suspends the normal conduct of the laws of assimilation and nutrition, of waste and repair. A leading advocate of alcohol (Hammond) thus

illustrates it: 'Alcohol retards the destruction of the tissues. By this destruction, force is generated, muscles contract, thoughts are developed, organs secrete and excrete.' In other words, alcohol interferes with all these. No wonder the author 'is not clear' how it does this, and we are not clear how such delayed metamorphosis recuperates.

Not an originator of vital force.

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which is not known to have any of the usual power of foods, and use it on the double assumption that it delays metamorphosis of tissue, and that such delay is conservative of health, is to pass outside of the bounds of science into the land of remote possibilities, and confer the title of adjuster upon an agent whose agency is itself doubtful.

Having failed to identify alcohol as a nitrogenous or non-nitrogenous food, not having found it amenable to any of the evidences by which the food-force of aliments is generally measured, it will not do for us to talk of benefit by delay of regressive metamorphosis unless such process is accompanied with something evidential of the fact something scientifically descriptive of its mode of accomplishment in the case at hand, and unless it is shown to be practically desirable for alimentation.

There can be no doubt that alcohol does cause defects in the processes of elimination which are natural to the healthy body and which even in disease are often conservative of health.

#### EFFECT OF ALCOHOL ON THE BLOOD.

Dr. Richardson, in his lectures on alcohol, given both in England and America, speaking of the action of this substance on the blood after passing from the stomach, says:

"Suppose, then, a certain measure of alcohol be taken into the stomach, it will be absorbed there, but, previous to absorption, it will have to undergo a proper degree of dilution with water, for there is this peculiarity respecting alcohol when it is separated by an animal membrane from a watery fluid like the blood, that it will not pass through the membrane until it has become charged, to a given point of dilution, with water. It is itself, in fact, so greedy for water, it will pick it up from watery textures, and deprive them of it until, by its saturation, its power of reception is exhausted, after which it will diffuse into the current of circulating fluid."

It is this power of absorbing water from every texture with which alcoholic spirits comes in contact, that creates the burning thirst of those who freely indulge in its use. Its effect, when it reaches the circulation, is thus described by Dr. Richardson:

"As it passes through the circulation of the lungs it is exposed to the air, and some little of it, raised into vapour by the natural heat, is thrown off in expiration. If the quantity of it be large, this loss may be considerable, and the odour of the spirit may be detected in the expired breath.

If the quantity be small, the loss will be comparatively little, as the spirit will be held in solution by the water in the blood. After it has passed through the lungs, and has been driven by the left heart over the arterial circuit, it passes into what is called the minute circulation, or the structural circulation of the organism.

The arteries here extend into very small vessels, which are called arterioles, and from these infinitely small vessels spring the equally minute radicals or roots of the veins, which are ultimately to become the great rivers bearing the blood back to the heart. In its passage through this minute circulation the alcohol finds its way to every organ.

To this brain, to these muscles, to these secreting or excreting organs, nay, even into this bony structure itself, it moves with the blood. In some of these parts which are not excreting, it remains for a time diffused, and in those parts where there is a large percentage of water, it remains longer than in other parts.

From some organs which have an open tube for conveying fluids away, as the liver and kidneys, it is thrown out or eliminated, and in this way a portion of it is ultimately removed from the body. The rest passing round and round with the circulation, is probably decomposed and carried off in new forms of matter.

"When we know the course which the alcohol takes in its passage through the body, from the period of its absorption to that of its elimination, we are the better able to judge what physical changes it induces in the different organs and structures with which it comes in contact.

It first reaches the blood; but, as a rule, the quantity of it that enters is insufficient to produce any material effect on that fluid. If, however, the dose taken be poisonous or semi-poisonous, then even the blood, rich as it is in water and it contains seven hundred and ninety parts in a thousand is affected.

The alcohol is diffused through this water, and there it comes in contact with the other constituent parts, with the fibrine, that plastic substance which, when blood is drawn, clots and coagulates, and which is present in the proportion of from two to three parts in a thousand; with the albumen which exists in the proportion of seventy parts; with the salts which yield about ten parts; with the fatty matters; and lastly, with those minute, round bodies which float in myriads in the blood (which were discovered by the Dutch philosopher, Leuwenhock, as one of the first results of microscopical observation, about the middle of the seventeenth century), and which are called the blood globules or corpuscles.

These last-named bodies are, in fact, cells; their discs, when natural, have a smooth outline, they are depressed in the centre, and they are red in colour; the colour of the blood being derived from them.

We have discovered that there exist other corpuscles or cells in the blood in much smaller quantity, which are called white cells, and these different cells float in the blood-stream within the vessels. The red take the centre of the stream; the white lie externally near the sides of the vessels, moving less quickly.

Our business is mainly with the red corpuscles. They perform the most important

functions in the economy; they absorb, in great part, the oxygen which we inhale in breathing, and carry it to the extreme tissues of the body; they absorb, in great part, the carbonic acid gas which is produced in the combustion of the body in the extreme tissues, and bring that gas back to the lungs to be exchanged for oxygen there; in short, they are the vital instruments of the circulation.

"With all these parts of the blood, with the water, fibrine, albumen, salts, fatty matter and corpuscles, the alcohol comes in contact when it enters the blood, and, if it be in sufficient quantity, it produces disturbing action.

I have watched this disturbance very carefully on the blood corpuscles; for, in some animals we can see these floating along during life, and we can also observe them from men who are under the effects of alcohol, by removing a speck of blood, and examining it with the microscope.

The action of the alcohol, when it is observable, is varied. It may cause the corpuscles to run too closely together, and to adhere in rolls; it may modify their outline, making the clear-defined, smooth, outer edge irregular or crenate, or even star like; it may change the round corpuscle into the oval form, or, in very extreme cases, it may produce what I may call a truncated form of corpuscles, in which the change is so great that if we did not trace it through all its stages, we should be puzzled to know whether the object looked at were indeed a blood-cell.

All these changes are due to the action of the spirit upon the water contained in the corpuscles; upon the capacity of the spirit to extract water from them. During every stage of modification of corpuscles thus described, their function to absorb and fix gases is impaired, and when the aggregation of the cells, in masses, is great, other difficulties arise, for the cells, united together, pass less easily than they should through the minute vessels of the lungs and of the general circulation, and impede the current, by which local injury is produced.

"A further action upon the blood, instituted by alcohol in excess, is upon the fibrine or the plastic colloidal matter. On this the spirit may act in two different ways, according to the degree in which it affects the water that holds the fibrine in solution. It may fix the water with the fibrine, and thus destroy the power of coagulation; or it may extract the water so determinately as to produce coagulation."

#### EFFECT OF ALCOHOL ON THE MEMBRANES.

The parts which first suffer from alcohol are those expansions of the body which the anatomists call the membranes. "The skin is a membranous envelope.

Through the whole of the alimentary surface, from the lips downward, and through the bronchial passages to their minutest ramifications, extends the mucous membrane. The lungs, the heart, the liver, the kidneys are folded in delicate membranes, which can be stripped easily from these parts.

If you take a portion of bone, you will find it easy to strip off from it a membranous sheath or covering; if you examine a joint, you will find both the head and the socket lined with membranes. The whole of the intestines are enveloped in a fine membrane

called peritoneum . All the muscles are enveloped in membranes, and the fasciculi, or bundles and fibres of muscles, have their membranous sheathing.

The brain and spinal cord are enveloped in three membranes; one nearest to themselves, a pure vascular structure, a network of blood-vessels; another, a thin serous structure; a third, a strong fibrous structure.

The eyeball is a structure of colloidal humors and membranes, and of nothing else. To complete the description, the minute structures of the vital organs are enrolled in membranous matter."

These membranes are the filters of the body. "In their absence there could be no building of structure, no solidification of tissue, nor organic mechanism. Passive themselves, they, nevertheless, separate all structures into their respective positions and adaptations."

Membranous deteriorations.

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In order to make perfectly clear to your mind the action and use of these membranous expansions, and the way in which alcohol deteriorates them, and obstructs their work, we quote again from Dr. Richardson:

"The animal receives from the vegetable world and from the earth the food and drink it requires for its sustenance and motion. It receives colloidal food for its muscles: combustible food for its motion; water for the solution of its various parts; salt for constructive and other physical purposes.

These have all to be arranged in the body; and they are arranged by means of the membranous envelopes. Through these membranes nothing can pass that is not, for the time, in a state of aqueous solution, like water or soluble salts. Water passes freely through them, salts pass freely through them, but the constructive matter of the active parts that is colloidal does not pass; it is retained in them until it is chemically decomposed into the soluble type of matter.

When we take for our food a portion of animal flesh, it is first resolved, in digestion, into a soluble fluid before it can be absorbed; in the blood it is resolved into the fluid colloidal condition; in the solids it is laid down within the membranes into new structure, and when it has played its part, it is digested again, if I may so say, into a crystalloidal soluble substance, ready to be carried away and replaced by addition of new matter, then it is dialysed or passed through, the membranes into the blood, and is disposed of in the excretions.

"See, then, what an all-important part these membranous structures play in the animal life. Upon their integrity all the silent work of the building up of the body depends. If these membranes are rendered too porous, and let out the colloidal fluids of the blood the albumen, for example the body so circumstanced, 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 an accumulation of the fluid in a closed cavity, or contraction of the substance enclosed within the membrane, or dryness of membrane in surfaces that ought to be freely lubricated and kept apart. In old age we see the effects of modification of membrane naturally induced; we see the fixed joint, the shrunken and feeble muscle, the dimmed eye, the deaf ear, the enfeebled nervous function.

"It may possibly seem, at first sight, that I am leading immediately away from the subject of the secondary action of alcohol. It is not so. I am leading directly to it. Upon all these membranous structures alcohol exerts a direct perversion of action. It produces in them a thickening, a shrinking and an inactivity that reduces their functional power. That they may work rapidly and equally, they require to be at all times charged with water to saturation. If, into 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 properly; and, if the evil that is thus started, be allowed to continue, they contract upon their contained matter in whatever organ it may be situated, and condense it.

"In brief, under the prolonged influence of alcohol those changes which take place from it in the blood corpuscles, extend to the other organic parts, involving them in structural deteriorations, which are always dangerous, and are often ultimately fatal."

#### HOW ALCOHOL AFFECTS THE BRAIN.

I once had the unusual, though unhappy, opportunity of observing the same phenomenon in the brain structure of a man, who, in a paroxysm of alcoholic excitement, decapitated himself under the wheel of a railway carriage, and whose brain was instantaneously evolved from the skull by the crash. The brain itself, entire, was before me within three minutes after the death. It exhaled the odour of spirit most distinctly, and its membranes and minute structures were vascular in the extreme. It looked as if it had been recently injected with vermilion. The white matter of the cerebrum, studded with red points, could scarcely be distinguished, when it was incised, by its natural whiteness; and the pia-mater, or internal vascular membrane covering the brain, resembled a delicate web of coagulated red blood, so tensely were its fine vessels engorged.

I should add that this condition extended through both the larger and the smaller brain, the cerebrum and cerebellum, but was not so marked in the medulla or commencing portion of the spinal cord.

The spinal cord and nerves.

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The action of alcohol continued beyond the first stage, the function of the spinal cord is influenced. Through this part of the nervous system we are accustomed, in health, to perform automatic acts of a mechanical kind, which proceed systematically even when we are thinking or speaking on other subjects.

Thus a skilled workman will continue his mechanical work perfectly, while his mind

is bent on some other subject; and thus we all perform various acts in a purely automatic way, without calling in the aid of the higher centres, except something more than ordinary occurs to demand their service, upon which we think before we perform.

Under alcohol, as the spinal centres become influenced, these pure automatic acts cease to be correctly carried on. That the hand may reach any object, or the foot be correctly planted, the higher intellectual centre must be invoked to make the proceeding secure.

There follows quickly upon this a deficient power of co-ordination of muscular movement. The nervous control of certain of the muscles is lost, and the nervous stimulus is more or less enfeebled. The muscles of the lower lip in the human subject usually fail first of all, then the muscles of the lower limbs, and it is worthy of remark that the extensor muscles give way earlier than the flexors.

The muscles themselves, by this time, are also failing in power; they respond more feebly than is natural to the nervous stimulus; they, too, are coming under the depressing influence of the paralyzing agent, their structure is temporarily deranged, and their contractile power reduced.

This modification of the animal functions under alcohol, marks the second degree of its action. In young subjects, there is now, usually, vomiting with faintness, followed by gradual relief from the burden of the poison.

Effect on the brain centres.

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The alcoholic spirit carried yet a further degree, the cerebral or brain centres become influenced; they are reduced in power, and the controlling influences of will and of judgment are lost.

As these centres are unbalanced and thrown into chaos, the rational part of the nature of the man gives way before the emotional, passionate or organic part. The reason is now off duty, or is fooling with duty, and all the mere animal instincts and sentiments are laid atrociously bare.

The coward shows up more craven, the braggart more boastful, the cruel more merciless, the untruthful more false, the carnal more degraded. ' In vino veritas ' expresses, even, indeed, to physiological accuracy, the true condition. The reason, the emotions, the instincts, are all in a state of carnival, and in chaotic feebleness.

Finally, the action of the alcohol still extending, the superior brain centres are overpowered; the senses are beclouded, the voluntary muscular prostration is perfected, sensibility is lost, and the body lies a mere log, dead by all but one-fourth, on which alone its life hangs.

The heart still remains true to its duty, and while it just lives it feeds the breathing power. And so the circulation and the respiration, in the otherwise inert mass, keeps the mass within the bare domain of life until the poison begins to pass away and the

nervous centres to revive again. It is happy for the inebriate that, as a rule, the brain fails so long before the heart that he has neither the power nor the sense to continue his process of destruction up to the act of death of his circulation. Therefore he lives to die another day.

#### HOW ALCOHOL CAUSES MENTAL AND MORAL CHANGES.

The transforming power of alcohol is marvellous, and often appalling. It seems to open a way of entrance into the soul for all classes of foolish, insane or malignant spirits, who, so long as it remains in contact with the brain, are able to hold possession. Men of the kindest nature when sober, act often like fiends when drunk. Crimes and outrages are committed, which shock and shame the perpetrators when the excitement of inebriation has passed away. Referring to this subject, Dr. Henry Munroe says:

"It appears from the experience of Mr. Fletcher, who has paid much attention to the cases of drunkards, from the remarks of Mr. Dunn, in his 'Medical Psychology,' and from observations of my own, that there is some analogy between our physical and psychical natures; for, as the physical part of us, when its power is at a low ebb, becomes susceptible of morbid influences which, in full vigour, would pass over it without effect, so when the psychical (synonymous with the moral) part of the brain has its healthy function disturbed and deranged by the introduction of a morbid poison like alcohol, the individual so circumstanced sinks in depravity, and "becomes the helpless subject of the forces of evil, "which are powerless against a nature free from the morbid influences of alcohol."

Different persons are affected in different ways by the same poison. Indulgence in alcoholic drinks may act upon one or more of the cerebral organs; and, as its necessary consequence, the manifestations of functional disturbance will follow in such of the mental powers as these organs subserve.

If the indulgence be continued, then, either from deranged nutrition or organic lesion, manifestations formerly developed only during a fit of intoxication may become permanent, and terminate in insanity or dypso-mania. M. Flourens first pointed out the fact that certain morbid agents, when introduced into the current of the circulation, tend to act primarily and specially on one nervous centre in preference to that of another, by virtue of some special elective affinity between such morbid agents and certain ganglia. Thus, in the tottering gait of the tipsy man, we see the influence of alcohol upon the functions of the cerebellum in the impairment of its power of co-ordinating the muscles.

Certain writers on diseases of the mind make especial allusion to that form of insanity termed 'dypsomania', in which a person has an unquenchable thirst for alcoholic drinks a tendency as decidedly maniacal as that of homicidal mania; or the uncontrollable desire to burn, termed pyromania; or to steal, called kleptomania.

Homicidal mania.

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The different tendencies of homicidal mania in different individuals are often only nursed into action when the current of the blood has been poisoned with alcohol. I had a case of a person who, whenever his brain was so excited, told me that he experienced a most uncontrollable desire to kill or injure some one; so much so, that he could at times hardly restrain himself from the action, and was obliged to refrain from all stimulants, lest, in an unlucky moment, he might commit himself.

Townley, who murdered the young lady of his affections, for which he was sentenced to be imprisoned in a lunatic asylum for life, poisoned his brain with brandy and soda-water before he committed the rash act. The brandy stimulated into action certain portions of the brain, which acquired such a power as to subjugate his will, and hurry him to the performance of a frightful deed, opposed alike to his better judgment and his ordinary desires.

As to pyromania, some years ago I knew a labouring man in a country village, who, whenever he had had a few glasses of ale at the public-house, would chuckle with delight at the thought of firing certain gentlemen's stacks. Yet, when his brain was free from the poison, a quieter, better-disposed man could not be. Unfortunately, he became addicted to habits of intoxication; and, one night, under alcoholic excitement, fired some stacks belonging to his employers, for which, he was sentenced for fifteen years to a penal settlement, where his brain would never again be alcoholically excited.

Kleptomania.

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Next, I will give an example of kleptomania. I knew, many years ago, a very clever, industrious and talented young man, who told me that whenever he had been drinking, he could hardly withstand, the temptation of stealing anything that came in his way; but that these feelings never troubled him at other times.

One afternoon, after he had been indulging with his fellow-workmen in drink, his will, unfortunately, was overpowered, and he took from the mansion where he was working some articles of worth, for which he was accused, and afterwards sentenced to a term of imprisonment. When set at liberty he had the good fortune to be placed among some kind-hearted persons, vulgarly called teetotallers; and, from conscientious motives, signed the PLEDGE, now above twenty years ago. From that time to the present moment he has never experienced the overmastering desire which so often beset him in his drinking days to take that which was not his own.

Moreover, no pretext on earth could now entice him to taste of any liquor containing alcohol, feeling that, under its influence, he might again fall its victim. He holds an influential position in the town where he resides.

I have known some ladies of good position in society, who, after a dinner or supper-party, and after having taken sundry glasses of wine, could not withstand the temptation of taking home any little article not their own, when the opportunity offered; and who, in their sober moments, have returned them, as if taken by mistake. We have many instances recorded in our police reports of gentlemen of position,

under the influence of drink, committing thefts of the most paltry articles, afterwards returned to the owners by their friends, which can only be accounted for, psychologically, by the fact that the will had been for the time completely overpowered by the subtle influence of alcohol.

Loss of mental clearness.

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Alcohol, whether taken in large or small doses, immediately disturbs the natural functions of the mind and body, is now conceded by the most eminent physiologists. Dr. Brinton says: 'Mental acuteness, accuracy of conception, and delicacy of the senses, are all so far opposed by the action of alcohol, as that the maximum efforts of each are incompatible with the ingestion of any moderate quantity of fermented liquid. Indeed, there is scarcely any calling which demands skilful and exact effort of mind and body, or which requires the balanced exercise of many faculties, that does not illustrate this rule. The mathematician, the gambler, the metaphysician, the billiard-player, the author, the artist, the physician, would, if they could analyse their experience aright, generally concur in the statement, that a single glass will often suffice to take, so to speak, the edge off both mind and body, and to reduce their capacity to something below what is relatively their perfection of work.

A train was driven carelessly into one of the principal London stations, running into another train, killing, by the collision, six or seven persons, and injuring many others.

From the evidence at the inquest, it appeared that the guard was reckoned sober, only he had had two glasses of ale with a friend at a previous station.

Now, reasoning psychologically, these two glasses of ale had probably been instrumental in taking off the edge from his perceptions and prudence, and producing a carelessness or boldness of action which would not have occurred under the cooling, temperate influence of a beverage free from alcohol.

Many persons have admitted to me that they were not the same after taking even one glass of ale or wine that they were before, and could not thoroughly trust themselves after they had taken this single glass.

Impairment of memory.

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An impairment of the memory is among the early symptoms of alcoholic derangement.

"This," says Dr. Richardson, "extends even to forgetfulness of the commonest things; to names of familiar persons, to dates, to duties of daily life. Strangely, too," he adds, "this failure, like that which indicates, in the aged, the era of second childishness and mere oblivion, does not extend to the things of the past, but is confined to events that are passing. On old memories the mind retains its power; on new ones it requires constant prompting and sustainment."

In this failure of memory nature gives a solemn warning that imminent peril is at hand. Well for the habitual drinker if he heed the warning. Should he not do so, symptoms of a more serious character will, in time, develop themselves, as the brain becomes more and more diseased, ending, it may be, in permanent insanity.

Mental and moral diseases.  
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Of the mental and moral diseases which too often follow the regular drinking of alcohol, we have painful records in asylum reports, in medical testimony and in our daily observation and experience. These are so full and varied, and thrust so constantly on our attention, that the wonder is that men are not afraid to run the terrible risks involved even in what is called the moderate use of alcoholic beverages.

In 1872, a select committee of the House of Commons, appointed "to consider the best plan for the control and management of habitual drunkards," called upon some of the most eminent medical men in Great Britain to give their testimony in answer to a large number of questions, embracing every topic within the range of inquiry, from the pathology of inebriation to the practical usefulness of prohibitory laws. In this testimony much was said about the effect of alcoholic stimulation on the mental condition and moral character.

One physician, Dr. James Crichton Brown, who, in ten years' experience as superintendent of lunatic asylums, has paid special attention to the relations of habitual drunkenness to insanity, having carefully examined five hundred cases, testified that alcohol, taken in excess, produced different forms of mental disease, of which he mentioned four classes:

1. Mania a potu , or alcoholic mania.
2. The monomania of suspicion.
3. Chronic alcoholism, characterized by failure of the memory and power of judgment, with partial paralysis generally ending fatally.
4. Dysomania, or an irresistible craving for alcoholic stimulants, occurring very frequently, paroxysmally, and with constant liability to periodical exacerbations, when the craving becomes altogether uncontrollable.

Of this latter form of disease, he says: "This is invariably associated with a certain impairment of the intellect, and of the affections and the moral powers ."

Dr. Alexander Peddie, a physician of over thirty-seven years' practice in Edinburgh, gave, in his evidence, many remarkable instances of the moral perversions that followed continued drinking.

Relation between insanity and drunkenness.  
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Dr. John Nugent said that his experience of twenty-six years among lunatics, led him to believe that there is a very close relation between the results of the abuse of alcohol and insanity. The population of Ireland had decreased, he said, two millions in twenty-

five years, but there was the same amount of insanity now that there was before. He attributed this, in a great measure, to indulgence in drink.

Dr. Arthur Mitchell, Commissioner of Lunacy for Scotland, testified that the excessive use of alcohol caused a large amount of the lunacy, crime and pauperism of that country.

In some men, he said, habitual drinking leads to other diseases than insanity, because the effect is always in the direction of the proclivity, but it is certain that there are many in whom there is a clear proclivity to insanity, who would escape that dreadful consummation but for drinking; excessive drinking in many persons determining the insanity to which they are, at any rate, predisposed .

The children of drunkards, he further said, are in a larger proportion idiotic than other children, and in a larger proportion become themselves drunkards; they are also in a larger proportion liable to the ordinary forms of acquired insanity.

Dr. Winslow Forbes believed that in the habitual drunkard the whole nervous structure, and the brain especially, became poisoned by alcohol. All the mental symptoms which you see accompanying ordinary intoxication, he remarks, result from the poisonous effects of alcohol on the brain.

It is the brain which is mainly effected. In temporary drunkenness, the brain becomes in an abnormal state of alimentation, and if this habit is persisted in for years, the nervous tissue itself becomes permeated with alcohol, and organic changes take place in the nervous tissues of the brain, producing that frightful and dreadful chronic insanity which we see in lunatic asylums, traceable entirely to habits of intoxication . A large percentage of frightful mental and brain disturbances can, he declared, be traced to the drunkenness of parents.

Dr. D.G. Dodge, late of the New York State Inebriate Asylum, who, with Dr. Joseph Parrish, gave testimony before the committee of the House of Commons, said, in one of his answers: "With the excessive use of alcohol, functional disorder will invariably appear, and no organ will be more seriously affected, and possibly impaired, than the brain. This is shown in the inebriate by a weakened intellect, a general debility of the mental faculties , a partial or total loss of self-respect, and a departure of the power of self-command; all of which, acting together, place the victim at the mercy of a depraved and morbid appetite, and make him utterly powerless, by his own unaided efforts, to secure his recovery from the disease which is destroying him." And he adds: "I am of opinion that there is a "great similarity between inebriety and insanity.

"I am decidedly of opinion that the former has taken its place in the family of diseases as prominently as its twin-brother insanity; and, in my opinion, the day is not far distant when the pathology of the former will be as fully understood and as successfully treated as the latter, and even more successfully, since it is more within the reach and bounds of human control, which, wisely exercised and scientifically administered, may prevent curable inebriation from verging into possible incurable insanity."

General impairment of the faculties.  
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Dr. Richardson, speaking of the action of alcohol on the mind, gives the following sad picture of its ravages:

"An analysis of the condition of the mind induced and maintained by the free daily use of alcohol as a drink, reveals a singular order of facts. The manifestation fails altogether to reveal the exaltation of any reasoning power in a useful or satisfactory direction. I have never met with an instance in which such a claim for alcohol has been made. On the contrary, confirmed alcoholics constantly say that for this or that work, requiring thought and attention, it is necessary to forego some of the usual potations in order to have a cool head for hard work.

"On the other side, the experience is overwhelmingly in favour of the observation that the use of "alcohol sells the reasoning powers, "make weak men and women the easy prey of the wicked and strong, and leads men and women who should know better into every grade of misery and vice. If, then, alcohol enfeebles the reason, what part of the mental constitution does it exalt and excite? It excites and exalts those animal, organic, emotional centres of mind which, in the dual nature of man, so often cross and oppose that pure and abstract reasoning nature which lifts man above the lower animals, and rightly exercised, little lower than the angels.

It excites man's worst passions.  
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Exciting these animal centres, it lets loose all the passions, and gives them more or less of unlicensed dominion over the man. It excites anger, and when it does not lead to this extreme, it keeps the mind fretful, irritable, dissatisfied and captious.... And if I were to take you through all the passions, love, hate, lust, envy, avarice and pride, I should but show you that alcohol ministers to them all; that, paralysing the reason, it takes from off these passions that fine adjustment of reason, which places man above the lower animals.

From the beginning to the end of its influence it subdues reason and sets the passions free. The analogies, physical and mental, are perfect. That which loosens the tension of the vessels which feed the body with due order and precision, and, thereby, lets loose the heart to violent excess and unbridled motion, loosens, also, the reason and lets loose the passion.

In both instances, heart and head are, for a time, out of harmony; their balance broken. The man descends closer and closer to the lower animals. From the angels he glides farther and farther away.

A sad and terrible picture.  
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The destructive effects of alcohol on the human mind present, finally, the saddest

picture of its influence.

The most aesthetic artist can find no angel here.

All is animal, and animal of the worst type.

Memory irretrievably lost, words and very elements of speech forgotten or words displaced to have no meaning in them. Rage and anger persistent and mischievous, or remittent and impotent. Fear at every corner of life, distrust on every side, grief merged into blank despair, hopelessness into permanent melancholy.

Surely no Pandemonium that ever poet dreamt of could equal that which would exist if all the drunkards of the world were driven into one mortal sphere.

As I have moved among those who are physically stricken with alcohol, and have detected under the various disguises of name the fatal diseases, the pains and penalties it imposes on the body, the picture has been sufficiently cruel. But even that picture pales, as I conjure up, without any stretch of imagination, the devastations which the same agent inflicts on the mind. Forty per cent., the learned Superintendent of Conley Hatch, Dr. Sheppard, tells us, of those who were brought into that asylum in 1876, were so brought because of the direct or indirect effects of alcohol.

If the facts of all the asylums were collected with equal care, the same tale would, I fear, be told. What need we further to show the destructive action on the human mind? The Pandemonium of drunkards; the grand transformation scene of that pantomime of drink which commences with, moderation! Let it never more be forgotten by those who love their fellow-men until, through their efforts, it is closed forever."

#### HOW ALCOHOL RETARDS DIGESTION.

And here, in order to give those who are not familiar with, the process of digestion, a clear idea of that important operation, and the effect produced when alcohol is taken with food, we quote from the lecture of an English physician, Dr. Henry Monroe, on "The Physiological Action of Alcohol." He says:

"Every kind of substance employed by man as food consists of sugar, starch, oil and glutinous matters, mingled together in various proportions; these are designed for the support of the animal frame. The glutinous principles of food fibrine, albumen and casein are employed to build up the structure; while the oil, starch and sugar are chiefly used to generate heat in the body.

"The first step of the digestive process is the breaking up of the food in the mouth by means of the jaws and teeth. On this being done, the saliva, a viscid liquor, is poured into the mouth from the salivary glands, and as it mixes with the food, it performs a very important part in the operation of digestion, rendering the starch of the food soluble, and gradually changing it into a sort of sugar, after which the other principles

become more miscible with it.

Nearly a pint of saliva is furnished every twenty-four hours for the use of an adult.

When the food has been masticated and mixed with the saliva, it is then passed into the stomach, where it is acted upon by a juice secreted by the filaments of that organ, and poured into the stomach in large quantities whenever food comes in contact with its mucous coats.

It consists of a dilute acid known to the chemists as hydrochloric acid, composed of hydrogen and chlorine, united together in certain definite proportions. The gastric juice contains, also, a peculiar organic-ferment or decomposing substance, containing nitrogen something of the nature of yeast termed pepsine, which is easily soluble in the acid just named. That gastric juice acts as a simple chemical solvent, is proved by the fact that, after death, it has been known to dissolve the stomach itself."

It is an error to suppose that, after a good dinner, a glass of spirits or beer assists digestion; or that any liquor containing alcohol even bitter beer can in any way assist digestion. Mix some bread and meat with gastric juice; place them in a phial, and keep that phial in a sand-bath at the slow heat of 98 degrees, occasionally shaking briskly the contents to imitate the motion of the stomach; you will find, after six or eight hours, the whole contents blended into one pulraceous mass. If to another phial of food and gastric juice, treated in the same way, I add a glass of pale ale or a quantity of alcohol, at the end of seven or eight hours, or even some days, the food is scarcely acted upon at all.

This is a fact; and if you are led to ask why, I answer, because alcohol has the peculiar power of chemically affecting or decomposing the gastric juice by precipitating one of its principal constituents, viz., pepsine, rendering its solvent properties much less efficacious. Hence alcohol can not be considered either as food or as a solvent for food. Not as the latter certainly, for it refuses to act with the gastric juice.

"It is a remarkable fact,' says Dr. Dundas Thompson, 'that alcohol, when added to the digestive fluid, produces a white precipitate, so that the fluid is no longer capable of digesting animal or vegetable matter.' 'The use of alcoholic stimulants,' say Drs. Todd and Bowman, 'retards digestion by coagulating the pepsine, an essential element of the gastric juice, and thereby interfering with its action.

Were it not that wine and spirits are rapidly absorbed, the introduction of these into the stomach, in any quantity, would be a complete bar to the digestion of food, as the pepsine would be precipitated from the solution as quickly as it was formed by the stomach.' Spirit, in any quantity, as a dietary adjunct, is pernicious on account of its antiseptic qualities, which resist the digestion of food by the absorption of water from its particles, in direct antagonism to chemical operation."

#### MEDICAL TESTIMONY ON ALCOHOL.

Dr. Ezra M. Hunt says: "The capacity of the alcohols for impairment of functions and the initiation and promotion of organic lesions in vital parts, is unsurpassed by any

record in the whole range of medicine. The facts as to this are so indisputable, and so far granted by the profession, as to be no longer debatable. Changes in stomach and liver, in kidneys and lungs, in the blood-vessels to the minutest capillary, and in the blood to the smallest red and white blood disc disturbances of secretion, fibroid and fatty degenerations in almost every organ, impairment of muscular power, impressions so profound on both nervous systems as to be often toxic these, and such as these, are the oft manifested results. And these are not confined to those called intemperate."

Professor Youmans says: "It is evident that, so far from being the conservator of health, alcohol is an active and powerful cause of disease, interfering, as it does, with the respiration, the circulation and the nutrition; now, is any other result possible?"

Dr. F.R. Lees says: "That alcohol should contribute to the fattening process under certain conditions, and produce in drinkers fatty degeneration of the blood, follows, as a matter of course, since, on the one hand, we have an agent that retains waste matter by lowering the nutritive and excretory functions, and on the other, a direct poisoner of the vesicles of the vital stream."

Dr. Henry Monroe says: "There is no kind of tissue, whether healthy or morbid, that may not undergo fatty degeneration; and there is no organic disease so troublesome to the medical man, or so difficult of cure. If, by the aid of the microscope, we examine a very fine section of muscle taken from a person in good health, we find the muscles firm, elastic and of a bright red colour, made up of parallel fibres, with beautiful crossings or striae; but, if we similarly examine the muscle of a man who leads an idle, sedentary life, and indulges in intoxicating drinks, we detect, at once, a pale, flabby, inelastic, oily appearance. Alcoholic narcotization appears to produce this peculiar conditions of the tissues more than any other agent with which we are acquainted. 'Three-quarters of the chronic illness which the medical man has to treat,' says Dr. Chambers, 'are occasioned by this disease.' The eminent French analytical chemist, Lecanu, found as much as one hundred and seventeen parts of fat in one thousand parts of a drunkard's blood, the highest estimate of the quantity in health being eight and one-quarter parts, while the ordinary quantity is not more than two or three parts, so that the blood of the drunkard contains forty times in excess of the ordinary quantity."

Dr. Hammond, who has written, in partial defence of alcohol as containing a food power, says: "When I say that it, of all other causes, is most prolific in exciting derangements of the brain, the spinal cord and the nerves, I make a statement which my own experience shows to be correct."

Another eminent physician says of alcohol: "It substitutes suppuration for growth. It helps time to produce the effects of age; and, in a word, is the genius of degeneration."

Dr. Monroe, from whom "Alcohol, taken in small quantities, or largely diluted, as in the form of beer, causes the stomach gradually to lose its tone, and makes it dependent upon artificial stimulus. Atony, or want of tone of the stomach, gradually supervenes, and incurable disorder of health results. Should a dose of alcoholic drink be taken daily, the heart will very often become hypertrophied, or enlarged throughout. Indeed, it is painful to witness how many persons are actually labouring

under disease of the heart, owing chiefly to the use of alcoholic liquors."

Dr. T.K. Chambers, physician to the Prince of Wales, says: "Alcohol is really the most ungenerous diet there is. It impoverishes the blood, and there is no surer road to that degeneration of muscular fibre so much to be feared; and in heart disease it is more especially hurtful, by quickening the beat, causing capillary congestion and irregular circulation, and thus mechanically inducing dilatation."

Sir Henry Thompson, a distinguished surgeon, says: "Don't take your daily wine under any pretext of its doing you good. Take it frankly as a luxury one which must be paid for, by some persons very lightly, by some at a high price, but always to be paid for. And, mostly, some loss of health, or of mental power, or of calmness of temper, or of judgment, is the price."

Dr. Charles Jewett says: "The late Prof. Parks, of England, in his great work on Hygiene, has effectually disposed of the notion, long and very generally entertained, that alcohol is a valuable prophylactic where a bad climate, bad water and other conditions unfavourable to health, exist; and an unfortunate experiment with the article, in the Union army, on the banks of the Chickahominy, in the year 1863, proved conclusively that, instead of guarding the human constitution against the influence of agencies hostile to health, its use gives to them additional force. The medical history of the British army in India teaches the same lesson."

But why present farther testimony? Is not the evidence complete? To the man who values good health; who would not lay the foundation for disease and suffering in his later years, we need not offer a single additional argument in favour of entire abstinence from alcoholic drinks. He will eschew them as poisons.

MENTAL DISTURBANCES CAUSED BY ALCOHOL.

The physical disasters that follow the continued use of intoxicating beverages are sad enough, and terrible enough; but the surely attendant mental, moral and spiritual disasters are sadder and more terrible still. If you disturb the healthy condition of the brain, which is the physical organ through which the mind acts, you disturb the mind. It will not have the same clearness of perception as before; nor have the same rational control over the impulses and passions.

Heavenly order in the body.

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In order to understand a subject clearly, certain general laws, or principles, must be seen and admitted. And here we assume, as a general truth, that health in the human body is normal heavenly order on the physical plane of life, and that any disturbance of that order exposes the man to destructive influences, which are evil and infernal in their character.

Above the natural and physical plane, and resting upon it, while man lives in this world, is the mental and spiritual plane, or degree of life. This degree is in heavenly order when the reason is clear, and the appetites and passions under its wise control. But, if, through any cause, this fine equipoise is disturbed, or lost, then a way is

opened for the influx of more subtle evil influences than such as invade the body, because they have power to act upon the reason and the passions, obscuring the one and inflaming the others.

We know how surely the loss of bodily health results in mental disturbance. If the seat of disease be remote from the brain, the disturbance is usually slight; but it increases as the trouble comes nearer and nearer to that organ, and shows itself in multiform ways according to character, temperament or inherited disposition; but almost always in a predominance of what is evil instead of good. There will be fretfulness, or ill-nature, or selfish exactions, or mental obscurity, or unreasoning demands, or, it may be, vicious and cruel propensities, where, when the brain was undisturbed by disease, reason held rule with patience and loving kindness. If the disease which has attacked the brain goes on increasing, the mental disease which follows as a consequence of organic disturbance or deterioration, will have increased also, until insanity may be established in some one or more of its many sad and varied forms.

Insanity.

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It is, therefore, a very serious thing for a man to take into his body any substance which, on reaching that wonderfully delicate organ the brain, sets up therein a diseased action; for, diseased mental action is sure to follow. A fever is a fever, whether it be light or intensely burning; and so any disturbance of the mind's rational equipoise is insanity, whether it be in the simplest form of temporary obscurity, or in the midnight of a totally darkened intellect.

We are not writing in the interest of any special theory, nor in the spirit of partisanship; but with an earnest desire to make the truth appear. You must not accept anything simply because we say it, but because he sees it to be true. Now, as to this matter of insanity, let him think calmly. The word is one that gives us a shock; and, as we hear it, we almost involuntarily thank God for the good gift of a well-balanced mind. What, if from any cause this beautiful equipoise should be disturbed and the mind lose its power to think clearly, or to hold the lower passions in due control? Shall we exceed the truth if we say that the man in whom this takes place is insane just in the degree that he has lost his rational self-control; and that he is restored when he regains that control?

In this view, the question as to the hurtfulness of alcoholic drinks assumes a new and graver aspect. Do they disturb the brain when they come in contact with its substance; and deteriorate it if the contact be long continued? Fact, observation, experience and scientific investigation all emphatically say yes; and we know that if the brain be disordered the mind, will be disordered, likewise; and a disordered mind is an insane mind. Clearly, then, in the degree that a man impairs or hurts his brain temporarily or continuously in that degree his mind is unbalanced; in that degree he is not a truly rational and sane man.

We are holding your thought just here that you may have time to think, and to look at the question in the light of reason and common sense. So far as he does this, will he be able to feel the force of such evidence as we shall educe in what follows, and to

comprehend its true meaning.

Other substances besides alcohol act injuriously on the brain; but there is none that compares with this in the extent, variety and diabolical aspect of the mental aberrations which follow its use. We are not speaking thoughtlessly or wildly; but simply uttering a truth well-known to every man of observation, and which every man, and especially those who take this substance in any form, should, lay deeply to heart. Why it is that such awful and destructive forms of insanity should follow, as they do, the use of alcohol it is not for us to say. That they do follow it, we know, and we hold, up the fact in solemn warning.

Another consideration, which should have weight with every one, is this, that no man can tell what may be the character of the legacy he has received from his ancestors. He may have an inheritance of latent evil forces, transmitted through many generations, which only await some favouring opportunity to spring into life and action. So long as he maintains a rational self-control, and the healthy order of his life be not disturbed, they may continue quiescent; but if his brain loses its equipoise, or is hurt or impaired, then a diseased psychical condition may be induced and the latent evil forces be quickened into life.

This ebook should have now revealed to you're the dangers of Alcohol so next time you decide to drink some alcohol, remember the devastating effects it holds.