JOHN HARVEY KELLOGG (1852-1943)

Lectures, Speeches, Notes, and Articles, ca. 1890-ca. 1943
(undated by topic)

Alcohol
A review of the effects of local option in Calhoun County and especially the City of Battle Creek is most gratifying to its advocates and defenders. The evidence of the available public and private records leaves no room for doubt or argument as to the desirability of its continuance from an industrial, business, economic and moral standpoint. Following is a brief resume of facts shown by written record:

BANKS.

April 28, 1909, two days before the saloons left Battle Creek our banks had total deposits of $7,584,673.33. Nov. 10, 1910, after a little more than 18 months of local prohibition their total deposits were $8,640,555.28, an increase of $1,055,781.95. Bank officials report that numbers of new depositors are largely recruited from the mechanics, shopmen and others who have never before had a bank account.

VACANT BUILDINGS.

The passing of the saloon left 45 vacant buildings in Battle Creek's business district. A district slightly larger than the former saloon district and including it in which 14 new stores were completed since the town became "dry" contained only six vacant stores January 1, 1911, and only three of those were desirable for any decent business.

NEW BUILDINGS.

In 1908, the last "wet" year 223 new buildings were constructed at a total cost, as estimated by the city engineers office, of $382,100. During the first "dry" year the same number of buildings were constructed but at a total estimated cost of $865,700. In the year just past about the same number have been constructed, not including additions to some of our leading manufacturing plants. No
expressed at people for people of the people. The people, the people, the people. The people, the people, the people.

If the people have been active, they will use their influence to protect the people. The people, the people, the people. The people, the people, the people.

Since then, the City Police have been active. The people have been active, the people, the people. The people, the people, the people.

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during the "wet" 20 months they arrested only 5. Same ordinance, same City, same police force,—different mayor,—that's all.

TAXES.

The Battle Creek City tax rate has not increased, but is precisely the same as for several years past. While the rate has not changed the city treasury on January 1, 1909, contained only $1,233.36 and various funds were overdrawn $40,102.07 Jan. 1, 1911, after the business desolations of nearly two years of prohibition the City treasury contained $102,935.06 and no fund is overdrawn.

The total County, State and School taxes on each thousand of assessed valuation since 1906 are as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate</th>
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<tr>
<td>1907</td>
<td>$12.40</td>
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Such comparison shows the taxes for saloon prosperity in 1907 exceeds the taxes of 1910 by 75 cents on the $1,000 of taxable property.

MORAL CONDITIONS.

On Tuesday evening Dec. 6, 1910, the police commission called before it every member of our metropolitan police force and went into executive session "Upon the Morals of Our Town." Every patrolman declared the town better morally than ever before. We can do no better than to quote these officers.

"Local option has eliminated an undesirable element that formerly infested Battle Creek," said Chief Farrington when called upon for a statement. "It has cleaned out the city until there is not a better place morally in the state."

"Drinking has rapidly decreased since local option took effect," said Patrolman Ely. "Bottle drunkards are becoming scarce."

"You used to see more drunks in the Bad Lands in one night, when the saloons were here than you see now in a whole year in the entire city," said Patrolman Godsmark.
"There were ten drunks then to where there is one now," said Patrolman Strickland. "The reason our records fail to show this is that the men who formerly sent home or ignored are now brought to the station and locked up."

"I walked the Bad Lands beat for nearly a week before I finally saw a drunk," said Patrolman Lawler. "Most of our drunks come from outside the county." "A half of them are taken off the interurban."

Taxpayers do not want Saloons.

The question will be voted on again next spring but not because the home owning taxpayer desires it as the records disclose that all those who signed the "wet" petitions in Battle Creek paid only 8.53% of the taxes of the City in 1910 and several prominent men and heavy taxpayers who were willing to have the question resubmitted and who signed such petitions have expressed themselves as satisfied with present conditions and against the return of the saloon.

Louis E. Stewart.
Manhood, not scholarship, is the first aim of education.

--Ernest Thompson-Seton.

So we're going to make a plan.

Understand that everything is not just random.

Work

After breakfast, resume work.

Work

Next, make a plan.

Work
Write Mrs. Wagner.
The greatest single step forward movement ever made by a civilized country.

Production increased 25 to 30 per cent in ten years. Double the normal.

The loss of 15% in production puts the country on its back.

This great economic success in spite of the fact that the farmers have suffered, half the coal mines idle, the textile industry in a bad way.

The national income has increased from $66,000,000,000 in 1919 to $89,000,000,000 in 1928.

Prosperity chiefly due to the diversion of money expenditure from drink to goods, homes, etc.

Working men are riding in automobiles; their wives and children are well dressed.

Poverty has almost disappeared.

Universities and institutions of learning overflowing with students.

Saloons gone.

Drunkenness on streets and public places seldom seen.

Consumption of liquor enormously reduced.

Working men spending money on their families.

A manager of a large industry states that before Prohibition, the morning after pay-day always found 50 to 100 women in the office asking for advances because their husbands had spent all their wages the night before for drink, before coming home. Since Prohibition, he had never found more than two.
In one city, a supervisor estimated the saving by working men, due to Prohibition, as over $200,000 a week.

The testimony of 250 college presidents recently, gathered by the W. C. T. U., showed that drinking among students is diminishing.

The wild conduct of young people which followed the war, appears to be lessening.

The failure of enforcement probably not more than 60 to 70% successful, and may never reach more than 80 or 90%. As good as can be expected.

Other laws are even less successfully enforced.

The argument of wets that non-enforcement produces scoff-laws and encourages crime, not sound.

Many laws on the statute books are not enforced at all, such as blue laws.

Trenton blue laws on Sunday observance prohibit music and any kind of amusement on Sunday; forbid a man to kiss his wife.

(Read article prepared for G.H. on "The Medical Use of Alcohol").

Alcohol formerly regarded as a stimulant, a supporting agent, and needed in all cases of shock, fever and pneumonia.
Long before prohibitions this was found to be false. Alcohol is a narcotic, not a food, never a stimulant. Its use has been largely abandoned by medical men on this account.

Formerly the largest item in the budget of London hospitals. Now an insignificant item.

In this country the use of alcohol has been entirely abandoned in many leading hospitals such as Crile's hospital, Cleveland, the hospitals of New Jersey, Wisconsin, Iowa, Michigan, Kentucky and also many of the leading hospitals of London, Paris and other European cities.

In Paris hospitals the use of alcoholics of all sorts, including wine, has fallen off within 40 years to a minute fraction of its former proportions. The present average is only 10 drops per day per patient.

Doctors have largely abandoned the use of alcohol for any purpose.

In states which have no laws against the medicinal use of alcohol only 43 per cent of the doctors prescribe it.

There are only 15 states in the United States where alcohol can be prescribed for medicinal purposes.

Some doctors protested against these laws restricting their use of alcohol, but the Supreme Court, after hearing the testimony on both sides, sustained the law.

A referendum by the Journal of the American Medical Association showed about an equal number of doctors on each side.

Those who voted in favor of alcohol being necessary believed it essential in the treatment of pneumonia, influenza and other infectious diseases and as a supporting agent
in old age, general debility, diabetes, heart failure, shock and convalescence.

These are evidently doctors who are not up to date and are not aware of the fact that for all these uses science has shown alcohol to be not only useless but harmful, and its use for such purposes has been abandoned by progressive up-to-date physicians long before prohibition.

A resolution against its use was passed by the American Medical Association in 1917, two years before prohibition.
Christian effects of the alcohol. No doctor could think of giving alcohol in any form suffering.

As a man with insanity.

The Yuma Indians, who reside live in Arizona and New Mexico, where the weather is sometimes so hot that much hotter than we ever know it here.
Bruce, and Hart, Livingstone, Stanley, and all great African travellers, condemn its use in that hot country as well as elsewhere.
have made a law of their own against the use of liquor. By which me of the tribe became drunk, he is severely punished. This they have made an atonement because of the evil effects of the use of liquor which they do not think that they saw among the Indians to do? Thus we see that alcohol
will not warm a man when he is cold, nor cool him when he is too warm.

In other words, it cannot in any sense replace do you not think it is a very much better & leave alcohol alone altogether?

Effects of alcohol upon the brain and nerves.

Here are two interesting
Experiments which you teacher or parents can make by you.

Experiment 1. Place a piece of tender beefsteak in a saucepan and cover it with alcohol. Allow it to stand overnight. In the morning the beefsteak will be found to be all shriveled up and almost as tough as a piece of
Dole leathers. This shows the effect of alcohol upon the tissues, which are essentially like those of lower animals.

Experiment 2. 

Break an egg into a half glassful of alcohol. Stir it a few minutes. Pretty soon you will see that
the egg begins to harden and to look just as though it had been boiled.

An egg represents in itself all the effects of the effect of strong alcohol, weak alcohol, metrazum, and spirit. The alcohol of alcoholic drinks has water and other things.
mixed with it, so that it does not act quite so quickly nor so severely as liquor alcohol, but the effect is essentially the same. It is in this way that the brain and nerves of drinking men and women become greatly diseased.
To my mind the best way to educate a boy to shun intemperance, is not through efforts to give him a mental conception of its evils but to educate the whole of his three-fold nature to operate in harmony with the Divine laws of his being, particularly his will and his appetite. If I were the boy’s mother I would aim to educate him to make appetite his servant rather than his master by providing him a simple unstimulating diet, knowing that it takes seed sown to produce a harvest, and that unrestricted pleasuring of the sense of taste may establish a dominance of appetite which indulged in one direction will be hard to restrain in others. If I were the boy’s father, I would teach him from earliest childhood to respect his body as the image of the Divine Creator lent to him for his temporary use, to be returned pure and undefiled to his Maker, and that he has no right to in any way cripple or abbreviate its usefulness.

If I were the boy’s father, mother, or teacher I would instruct him concerning the marvelous structure of his body, showing him by picture, chart, model, and experiment as plainly as possible how “fearfully and wonderfully it is made,” and then portray in the most vivid manner possible the extent of injury done to this masterpiece of Divine workmanship through the use of alcoholics, tobacco, opium, and other narcotics.

If the boy has inherited a nature morbidly susceptible to temptation, ready to fall at the slightest provocation, then with special care and watchfulness it should be the aim to build up the wall within at the points where it is weakest, and so surround the boy with and accustom him to such an atmosphere of temperance in all things that he can not breathe freely in any other.

The training must be positive as well as negative. The positive side in diet will mean to teach the boy, first, the duty of thorough
mastication, to chew his food at least four or five times as long as food is ordinarily chewed. Second, to make a selection of such foods as will make pure blood and a strong healthy body. This will exclude flesh foods of all kinds, irritating condiments such as mustard, pepper, peppersauce, horse radish, hot sauces of every description, such indigestibles as pickled green olives and every other sort of pickles, preserves, fried food, rich pastry, confectionary, and other dietetic abominations which are antagonistic to good digestion and hence to good morals. The cultivation of an appetite for abnormal foods results in a perversion of the natural instinct, arousing morbid and pernicious desires and cravings. This is one of the strongest of all the leading strings to intemperance.

Alcohol exercises a double spell over its victims. It is first a nerve tickler, creating felicitous sensations; later on its consequent effect appears it becomes a comforter, puts to sleep all the body sentinels, pains, hunger, and every sort of bodily distress. Even the upbraidings of conscience are stifled by the anesthetic spell which this competent drug casts over its unfortunate victims. The only safe place for the boy, girl, man or woman is that of harmony with nature, which means to be in harmony with God's laws. Into this refuge the victim of intemperance may run and be safe; and every boy is proof against the allurements of the intoxicating cup so long as he remains in the stronghold of simplicity and naturalness.

The physical education of the boy must, however, include something more than naturalness in diet. The muscles must be trained by vigorous out-of-door life. Agriculture is a powerful antidote for the wiles of the poison habit. Agricultural laborers are, as a class, temperate. The idleness and sedentary life of the city have a strong
tendency to intemperance. Cities are strongholds of King Alcohol.
If the city vote could be eliminated from politics, the strongest sort of prohibitory legislation could be secured at once. Gymnastics, swimming, bicycle riding, and especially manual training and sloyd are highly valuable as preventive means.

The mental and moral training must include, first of all the inculcation of Bible and Christian ideals from earliest infancy. The principles of the Book of books must be xxxxxxxxxx so interwoven with the boy's intellectual development that they shall become his standards of judgment, and his rule of conduct in all his relations in life. Care must be taken that his associations are right. Even in early boyhood this is important. No boy should be allowed to choose his own associations either on the street or in school, or otherwise.

A love for books should be cultivated, and the best books should be placed in his hands. Here are a few books, which will be found particularly helpful.

The thought should be constantly held before the boy that he is responsible to God, the one who has created him in his own image, and has made him to be a witness for him in the world, and that the greatest possible comfort, happiness and satisfaction can be attained only by a life tuned in harmony with the infinite One, with every faculty devoted to the glory of God and the betterment of men.
A patent-medicine man is generally the patentee of a device for selling whiskey under a new name.

Every night labors to undo the physiological mischief of the preceding day—at what expense, gluttons may compute if they compare the golden dreams of their childhood with the leaden torpor-slumbers of their pork and lager-beer years.

A healthy man needs no artificial excitants; the vital principle in its normal vigor is an all-sufficient stimulus; the inspiration bought at the rum-shop is but a poor substitute for the spontaneous exultations of a healthy mind in a healthy body.

—Felix Oswald.
R. Takii (of Japan).


The author details a number of original experiments to establish the effect of camphor, caffeine + alcohol respectively upon the heart. He utilizes the Williams apparatus for frogs' heart, having made certain modifications of his own.

From 12 experiments made with frogs' heart, it appears, that the blood pressure rise within five to six minutes after introduction of the camphor. Camphor sinking again a few minutes later. These rises and falls were repeated several times, but did not last long. It was characteristic of all cases, that the blood pressure sank a few minutes after the application of camphor under the normal
and then under strong pulsation of the heart, none again immediately; the greater the amount of camphor exhibited, the greater the sinking out succeeding rise.

Moreover in 3 q. the experiment, the pulse rate declined considerably, while the heart made great pulsation. With small dose this decrease in pulse rate is not seen.

Author further made experiment as to blood pressure in man. Animals were deeply chloralized to exclude the effect of camphor upon vascular system.

From five experiment (2 cat, 3 rabbit,) in which animals were subjected to tracheotomy & prepared for streptococcus, it was found that considerable lasting rise of pressure occurred in those treated with elixir as well as curara, from injection of camphor in stomach & veins.

The rise of pressure is, however, sometimes inconsiderable as when 1 gm. is injected into stomach then occur fluctuation and often convulsion. Nevertheless it is shown that
When the animal is previously well chloralized and 0.5 – 1.0 gm. of camphor is introduced into stomach, the blood pressure exhibits a steady rise.

Since camphor increases pressure in chloralized animal, when vasomotor center is paralyzed, it may be concluded that the rise in pressure is due to direct excitant effect of camphor.

**Caffeine**

For the purpose of investigating the direct action of caffeine, the author instituted a series of experiments upon separated heart of frog by means of Williams apparatus and also upon cats and rabbits treated with chloroform and curare.

From 12 experiments on frogs hearts it appeared that caffeine produced only very slight and short lasting increase of blood pressure, and often none at all.

Five experiments on cats and rabbits gave in general the same results. Only in one case there was a gradual decline of blood.
pressure ending in death.

Caffeine then exerted less slight influence upon heart itself—never having the same action on diaphoresis (although apparently so when used therapeutically)

Alcohol

To establish the effect of alcohol on the heart, the author made 14 experiments, 10 on frogs heart, 4 on cat's heart. In the former, made with Williams apparatus, it was found that when with large amount of alcohol (10%) were mixed with the blood, then occurred a gradual fall of pressure, while the heart exhibited large slow pulsations, and often short time fluid escaped through cardiac wall.

Small amount of alcohol caused on the other hand a slight rise of blood pressure and the contraction of the heart were more energetic as the heart accelerated.
The author has recorded two sets of experiments. 

1. To determine the frequency of the pulse after introduction of alcohol into the animal economy and to study the effect of alcohol upon the arterial blood-pressure.

In cats, dogs and men, the introduction of alcohol of relatively slight concentration produced no change in frequency of pulse. The frequency of respiration remained likewise generally regular.

In frogs, after the abolition of the reflexes, the frequency of the heart contraction was sometimes considerably reduced. In rabbits, injection of alcohol into the stomach produced on the other hand a decided and prolonged increase of heart-beats, while the frequency of respiration gradually lessened. A like same result was gotten in rabbits from injection of distilled water.
One experiment on a dog, i.e., to effect on temperature showed a decrease reaching only to 0.5° after administration of 120 c.c. of 40% alcohol (At least there was no rise)

Group II - Experiments as to blood-pressure.

These experiments (eleven in number) were all made on cats & the alcohol of varying amount & concentration injected into the stomach or into veins (10 to 60 c.c.) in some a pronounced sinking of blood-pressure followed several minutes after the alcohol had thoroughly passed through the period of the operation of the alcohol. In one experiment #1 took only 15% of the pressure before injecting alcohol into the stomach. When the alcohol was injected into veins it first fell suddenly and then gradually rose but not to point of pressure before injecting — due probably to the alcohol coming in greater concentration directly into the heart, operating directly upon the cardiac walls.
Then made further experiments to determine whether the weakening in the power was due to direct action upon heart muscle or to the effect upon the vagus. These were made on cats. After the introduction of the alcohol, and when the blood pressure and pulse showed considerable diminution, — the vagus was cut — which was followed each time by return again to normal or even very normal of both blood-pressure and frequency of pulse.

Therefore alcohol is evolved not as a stimulant but a depressant upon heart and this influence is to be attributed, in chief part at least, to its action upon vagus.
Schlemmerson has shown by experiment that the decrease of blood pressure from chloroform depends both upon a weakening of the heart force and upon dilatation of arterial vessels as a result of lessening of elastic vessel motor tone. Confirmed by other investigations.

It is the action of chloroform on the heart and blood vessels, which causes sudden death in man and animals. The cessation of the heart is observed in dogs which make violent movements during the chloroforming, which continue to make deep respiration after narcosis has set in, and in cases where the chloroform is rapidly pushed. It happens similarly in men. If the chloroform is injected in very concentrated doses, large quantities at a time may gain access into pulmonary circulation from there to the left heart. This has occurred many times reported in the literature.
If the heat come to a still stand, the artificial respiration alone will not overcome the asphyxia, since on account of the deficient circulation the chloroform is not carried out of the heart & the cause nucleus is not removed. A long-continued rhythmically executed pressure upon the chest, by which an alternate emptying and filling of the heart is accomplished, is the most effective measure. It must however be provided that the vapor injected shall be sufficiently diluted with air, that in chloroform may pass the left heart only in small quantities.

But sudden death may occur with ordinary inspiration from primary elevation of the heart, if the musculature of the latter be weakened by fat, dilatation or other conditions.
Some continued chloroformanaæmia may partly degenerate the internal organs, viz. liver and heart (Unger, Stomma, and others).

In delirious conditions and in very long continued anaesthetics during severe operative procedure, simultaneous relaxation of the vessels and weakening of the action of the heart and respiration may be so great that death will occur simply from collapse. The heart then shows sometimes at least in animals the Cheyne-Stokes respiration.

Then accidents which may occur during chloroform anaesthesia are vomiting, increased bronchial secretion due to local irritation of the mucous membrane, occasionally convulsions, even cramps; also coldness of the skin and albuminuria occur from circulatory disturbances.
The exciting and stimulating effects of alcohol, especially of the
psycho function, hand, talking, and kindliness, increase pulse frequency, sudden
ness of skin, and increase warmth, are really only results of beginning paral.
ism of certain parts of brain. Higher degree of attention, judgment and
reflection are diminished. Moderate amount of alcohol enhances
the ability to estimate differences in weight.

Increase in frequency of pulse is often seen is due to the situ-
ation. Mühle & Jaquet found that alcohol in doses of 10-100
ccm of 20% sol was without effect upon circulation.

There are contracted veins, however, of ether, which do not become excited or the alcohols act similari to amyl nitrite in causing dilatation of veses
of the face and brain.

If the action of the heart is "increased" it is uncertain in what way it is done. It may overcome vascular contraction, which offers resistance to emptying of the heart, or influence favorably the distribution of the
blood in general. In other cases it is due to perhaps to a diminution of a too great tons of
inhibitory nerves of the heart or to lessening of
irritation of motor cardiac ganglia.
Conclusively it was demonstrated that alcohol cannot be a food, that its use resulted in an actual reduction of temperature and, at the same time, a degeneration of all the tissues. "If it be really a luxury," he said, "for the heart to be lifted up by alcohol; for the blood to course more swiftly through the brain; for the thoughts to flow more vehemently; for words to come more fluently; for emotions to rise ecstatically, and for life to rush on beyond the pace set by nature, then those who enjoy the luxury must enjoy it with the consequences." Breasted, his lectures which were published, many articles and books have come from his able pen against the use of alcohol. While fully recognizing the value of his "Dialogues on Drink" and his "Temperance Lesson Book" we call special attention to a work on the "Dreams of Modern Life," in which are treated the evils flowing from the abuse of this poison. Out of this timely agitation grew the British Medical Temperance Association, which was organized in 1877. The agitator himself being called to the presidency in 1880. This office he still holds. Nor has his zeal for the cause of temperance diminished one jot during the quarter century which has passed since this reformer presented his
original view for the first time before the Medical World. Quoting from a recent speech before the Annual Gathering of the National Temperance League, I wrote this own words: “I have just discovered that it is twenty-five years since I delivered my first lecture on physiological kind, on the foundations of total abstinence. I have thought it wise to consider whether, with a mature judgment, there is anything I would like to recall, anything I would like to withdraw from the past on this subject, before I proceed further.”

In my first lecture in 1869, continue he, I had shown that alcohol, like chloroform, produced four distinct stages, a stage of simple exhilaration, a stage of excitement, a stage of rambling incoherency, and lastly a stage of unconsciousness, with entire prostration of the body, a stage so near death that, if the person were able to take more of the poisonous substance, death would be the inevitable consequence. I had observed that a general excitement in the first stages was followed by a general and long persistent coldness; that when the action of alcohol was pushed to the fullest extent, a very long time elapsed before the respiration, the circulation & the power of the involuntary muscles came back to the natural standards. I found that the
and assisting her husband in his many laborious enterprises. Two sons and one daughter have since completed the family circle.

At the School of Medicine, adjoining St. George’s Hospital, afterwards called the “Governor Place School of Medicine” Dr. Richardson was first lecturer on medical jurisprudence and public health, but later accepted a call to the Chair of Physiology.

Over thirty times has he been elected President of the St. Andrew’s Graduates’ Association.

Ful]ly occupied as was his time with weightier matters, the Doctor still found leisure to write several poems and plays, of which we may mention "A Day with Cromwell," "The Blacksmith of Antwerp" and "The Mask of James." These appeared in a weekly journal of his own establishing, but well, we believe, he published in a separate volume.

As a tribute to his ability and in appreciation of his public works, he was elected Honorary Member of the Philosophical Society of America, of the Philosophical Society of St. Andrews and of the Imperial Academy of Natural Sciences of Germany, a Fellow of the Pathological Society of Berlin and a Member of the Philosophical and Statistical Society of Milan.
For several years he lectured, as a private lecturer, on "Experimental and Practical Medicine," during which time he sent to the Royal Society a contribution on the "Possibility of Restoring Life after Certain Forms of Apparent Death." In 1867 the Royal Society of England elected him a "Fellow."

Meanwhile the mind of this remarkable man was being directed into another channel. While investigating the actions of Amyl Nitrite, which owes its recommendation to the Profession as a Therapeutic Agent to Dr. Richardson, his attention was called to substances, alcohol among the number, allied to Amyl Nitrite. After complete experimental study and investigation, he concluded that Alcohol acted, as did Amyl Nitrite, by relaxing, through the Vaso-Motor System, organic muscular fibres. By special request of the Council, Dr. Richardson delivered several lectures before the Society of Arts on "Alcohol." The eminence of the lectures and the fact that, for the first time, the value of total abstinence was being urged from the solid platform of experimental evidence, created not only a great sensation, but also much subsequent enquiry and investigation.
and a delusion, and it is based upon the ancient, but baseless
supposition that alcohol is a stimulant, whereas it is a narcotic poison and simple and
its use in cholera verticis or any other condition characterized
d by depression is folly. Dr. Hart
of London, years ago pointed out the absurdity of using
alcohol, a product of the growth of germs, in cholera, when
the system is already struggling against germ joints
and the same principle obviously applies to cholera morbus. No up-to-date physician
Alcohol in Chronic Diseases—Should Elders by Persons Discontinue the Use of Tobacco?

Mrs. A.E. new of N.C. asks: 1. Is alcohol necessary in the stage of collapse in aged persons, especially in aged or one case of a person eight-seven years old? 2. What may be used instead? 3. May a person who has chewed tobacco for seventy-five years or more discontinue its use without injury?

Ans. 1. No. Alcohol is not needed in any disease, and the older a person the more dangerous its use. The idea that alcohol is especially necessary for old persons or especially tolerated by them is wholly and entirely baseless.
3. Certainly, tobacco is a poison and never becomes an article of our diet, not even for our chickens. We believe that the body begins to develop a tolerance for it even if it does not make it in every sense useless. We believe that the use of tobacco, alcohol, nicotine, and other drugs, never are in our diet. The idea that we should abandon them after we have been indulging in them for a long time is a misconception. The best plan is to seek office. The patient should go to bed for a while, have a warm bath, and then rest.
2. In collapse, the remedy needed is a physiological stimulant, not a narcotic. Heat is a remedy of the highest value, and is almost appropriate in this case. It may be applied by any of the following means: Hero's Wine; hot water drinking and hot fomentations repeated every five minutes; foot bath; hot blanket back rest. In feverish states the hot bath followed by cold affusion that is water as cold as can be obtained (not iced water), poured over the back, shoulders, and legs, followed with vigorous massage. Hot and cold compresses to the skin in alternation is also a capital remedy.
one often crowded downward. In fact, the stomach is found in this condition in probably one half of the adult women of the country as the result of wearing the conventional dress. In smaller some cases the stomach is not more than two or three inches out of place, while in many others it falls several inches below the umbilicus, sometimes reaching a position five or ten inches below the normal position. In a smaller number of cases the whole stomach does not fall but becomes dilated, a condition even worse than prolapse. In Katti Jugu-klume and dilatation of the stomach the
Temperature 95°F to 98°F should be administered slowly and two or three times a day if necessary to relieve nervous symptoms.

30 to 40" Hg

The normal position of the stomach is such that its lower border rests at a point two inches above the umbilicus. As the result of low altitudes in sitting, crouching, kneeling, or wearing of tight bands and heavy shirts, the organs, the stomach and other abdominal
the digestive work demanded by it. It is common in cases of indigestion of the stomach, and is present in most cases of extreme dilatation.

3. An irritated condition of the sympathetic nerves, probably involving the solar plexus, possibly due to the capsule of the stomach or not to indigestion. When this is a very common symptom in hyperpyrexia, and in cases of acid dyspepsia.

4. If a prolonged stomach distension is given a chance to return to its proper place, then it must be daily replaced and held in position by a natural abdominal support or a body

in bad cases the natural
food is retained for a long time, and fermentation and decomposition result. This is the cause of biliousness, bilious headache, migraine, or nervous headache, and a vast number of most distressing symptoms, such as neuralgias, neural irritation, neurasthenia or nervous prostration, and even chronic maladies like gout, rheumatism, diabetes, anemia, and chlorosis.

2. Hypophysitis is a condition in which the stomach produces too small an amount of hydrochloric acid, so that the gastric juice is incapable of digesting...
is not well tolerated by a dilated or prolonged stomach as observed by Lister, the eminent English physician to whom we owe most of our knowledge of this subject. Meat, coarse vegetables, shellfish, cheese, pastry, and all indigestible and irritating foods must likewise be totally discarded. The stomach is disabled in such a way that foods which are not perfectly digested before entering the stomach are once more retained there for too long a time, with the inevitable consequences of fermentation and decay. In many instances one...
Body training is begun early in life, and in the meantime the muscles of the abdomen and trunk must be developed. The exercises and Swedish gymnastics are so that the viscera of the organs may be restored. These, it is

In cases of dilatation of the stomach in addition and in most cases of stomach trouble, careful regulation of diet and of the mode of life is needed to combat the disorders resulting from the displacement or dilatation. A diet, adequate dietary is needed. Fruits, grains, and meats furnish just the elements required in cases of this kind. Ordinary milk...
suitable antibiotic already such as charcoal, preferable what charcoal, is needed to prevent the action of fungi in the food while it remains in the squad.

The care of cases of this sort is by no means an easy matter and the majority of patients will be best dealt with in a properly equipped and managed sanatorium. If a stay of several months is not possible, even a few weeks will accomplish much in getting the patient started in the proper course of training, which may afterward continue at home. A few weeks by this
at the summer sanitarium or
Prohibition Park would be given
plan for a future such occasion.

Professed injuries first
of all the removal of the causes
of the condition, so far as
possible. These are largely
to be found in errors of diet,
and the conditions above referred
to. The general plan of diet as
suggested above should be followed
and, in a cause of hydroptic
and other treatment which must
be adopted to the patient's condi-
tion by the aid of a personal
examination, must be
adopted.

The pain referred is often
temporarily relieved by hot
applications.
Permanent relief is to be found only in the removal of the causes which are generally the sources in the conditions above referred to, which complete relief from backache, spine ache, and similar pains is often obtained by the adjustment of an abdominal supporter capable of actually holding the rectified organs in position. Unfortunately there are very few of the many sorts of supporters furnished by instrument dealers which do accomplish this. Most of these the majority simply confine the abdomen, contract the lumbar and hold the organs down instead of elevating them. Yet even these sometimes afford
14. reenacting the
relief by keeping the organ
quiet, from the constant dis-
justling and swaying about
of which they seemed subject
when badly involved.

2. In acidity of the
stomach, there is already
produced in the stomach
an excess of carbonic
acid gas, the constituent
of soda. "The term soda
water" is inappropriately,
as "soda water" contains
no soda. Unless you
have had made an analysis
of the stomach fluid it has been
found in the cases and has
shown the presence of hydro-
chloric, or excess of hyd-
chloric acid. In that case,
two before meals and two or three 
hours or four hours afterwards as 
best times for drinking. As a rule a person may without 
ruining drink a muffle at 
abundance of water, 2/3 to 
half a glassful is a glassful, 
at any time when thirst 
is experienced except at 
meals and in cases of the 
dilatation of the stomach. If the 
food taken at meals is dry, 
little water may be taken 
at the close of the meal unless a strictly dry diet 
dhas been prescribed. The 
question of water drinking 
is almost wholly settled by 
the liberal use of fruit. Nicely
the soda may be used, but the
glycerine is not needed. In
cases of corn stomach from
fermentation, the use of soda
is highly injurious, aggreg-
ating the disease in a most
decided manner.

We can

3. The above remarks apply
equally well to lime water
per an oyster shells or any
other source

4.

and, yes, unless the diet con-
gists of largely of fruits that
the needs of the body are fully
supplied. The equivalence of
three parts of fruits should
be taken daily. Onions or
will not agree perfectly with
other cubebearing foods. The
only exception is in the case
of strongly vegetable, such as
rotaves, with which just does
not agree, when the digestive
powers are weak as in high
fever, and in cases of dis-
casc or dilated intestines, or
chronic conditions.

(4)

Aus. Elevated regions, such as
the white mountains; and
localities which are benefited by
the air from the sea or from large bodies of water.
Such as sea islands and
certain localities in Northern
Michigan, are of great
relief to many fever sufferers.
To a person suffering from rheumatic or nervous distaste, his may make one of the daily meals wholly of fruit. A fruit breakfast is a capital preparation for clear headliness in the early brain workers. If a late meal is taken, it may with great advantage be combined to fruit. But at a fruit meal nothing but fruit should be taken. Bread and butter, a glass of milk, a piece of pie, a cake, will

find all. It must not be supposed however that fruit
well not agree perfectly with other wholemeal food. The only exception is in the case of starchy vegetables, such as potatoes, which fruit does not agree with. When the digestive processes are weak as in hypochondria, and in cases of nervous chronic or dilated stomach, many common conditions.

2

Arms, elevated regions, such as the valvate canals of mountains, and localities which are protected by land air from contact with sea or from large bodies of water, such as sea islands and certain localities in Northern Michigan are of great relief to hay fever sufferers. It
permanent relief, however, it is necessary to resort to treating the diseased condition of the nasal mucous membrane which is the real cause of the peculiar susceptibility to which the disagreeable symptoms of this disease are due. A cold-Bleed cure is possible by a proper combination of local and systematic measures.

Ans. 1. The danger is less than in the case of older children.

2. No.

3. This depends on the age of the child, and the kind of food given to it. There is, under normal conditions, no food so exactly adapted to health
infant's needs, as the food provided by its own mother, that adapts itself to circumstances and needs in a marvelous manner. Artificial feeding is at best a maiming substitute. It is as a child's life. Until the infant reaches an age at which it can properly begin to eat jammie-cereus food, it should be fed on breast milk by its own mother in the natural way. If it is as far as possible to provide for it. If it is as far as possible for it. It should be remembered that under normal conditions nursing is beneficial to the mother as well as to the infant.
It is not a proper substitute for mothers milk.

6. Cane sugar is not found to any considerable extent in and the natural foods of man. It represents the carbohydrate element in a state of inert transformation or digestion, but is not capable of being acted upon by the saliva which readily digests starch and dextrine. Muscovy melons are natural sugar and identical with the dextrin found by the digestion of starch in the body. Cane sugar is very likely to cause fermentation and flatulence of the stomach.
Memoranda for Lectures for Health and Temperance Class.

Lecture 1: "General Survey of the Body."
The noblest study of mankind is MAN, the masterpiece.

Bones.

Muscles.

Nerves.

Movements.

Sensation.

Viscera.

Nutrition—to support work.

Digestion—alimentary canal.

Circulation—heart and blood vessels.

Elimination of waste—skin, lungs, liver, kidneys, bowels.

Gaseous waste—lungs and skin.

Liquid waste—kidneys, liver, and skin.

Solid waste—bowels.

SPECIAL ORGANS:—

Glands form new substance from the blood.

Glands of the skin.

Salivary glands.

Liver.

Gastric glands.

Tear glands of the eyes.

Secretions from glands of the ear.

Glands of the intestines.

Hair follicles.
Glandular action of all the tissues.

Organs of Special senses:

Sight.
Hearing.
Smell.
Taste.
Touch.
Temperature, &c.
Lecture TWO: "Consideration of Matter."

Various theories.
Theory of mind cure.
Atomic theory.
Atoms.
Molecules.
Size of atoms.
Size of Molecules.
Molecular force.
Cohesion.
Adhesion.

Explain cohesion—the balance maintained between attractive and revulsive force.

Attractive force in property of matter.
Revulsive force due to movement.

Explain different states of matter—solid, liquid, gaseous.
Solid—attractive force dominant.
Liquid—attractive and revulsive forces balanced.
Gaseous—attractive force wholly overcome.

Illustrations:

Cohesion—1. Bend a piece of metal.
         2. Stretch a piece of rubber.
         3. Pour a stream of water or operate a siphon.

Adhesion—1. Drag a heavy weight over the floor or top of table.
         Force acquired is much greater than if the object were suspended in the air.
         2. Friction due to adhesion—
             Mark on blackboard with chalk.
             Rub oil on board—cannot mark.
             Cannot mark on oiled paper with a lead pencil for the same reason.
3. Suspend a drop of water from a slip of glass. Place the glass in water. Note that water rises on the surface of the glass.

4. Repeat experiment with mercury, showing that the mercury is depressed at the surface of the glass.

Illustrate capillary action in bringing two slips of glass together, the lower end touching the water. The water rises to the top.
Lecture 3: "Molecular and Mass Forces, --Heat, Life, Electricity, and Magnetism."

Experiments to illustrate each as follows:
Sources of heat--friction impact, &c.
Experiments to Illustrate Heat.

Fill two flasks, one with a solution of alum and the other with a solution of iodine in carbon bisulphide.

Focus rays of calcium light with alum flask in gun cotton—very bright light but does not burn.

Focus rays with iodine flask—no light but cotton explodes.

Heat and light the same—only difference rate of vibrations.

Heat an iron wire or ball in gas hydrogen light to black heat.

Show the heat by dipping in water and also by bringing near the thermopile.

Thermometer to red and white heat.

Red produced by vibrations, 400,000,000,000,000.

Yellow light produced by vibrations 500,000,000,000,000.

Violet light produced by vibrations 700,000,000,000,000.

Gun Cotton.
Experiments With Lens.

Wavelets.
Red light 1500 waves per minute. 
Yellow light 1700 waves per minute. 
Violet light 2500 waves per minute. 

Number of vibrations determined by dividing 186,000 by the length of wave.

Heat and light same relation as low tones and high tones.

Vibrations of a tuning fork 440 a second.

Sound travels 1100 feet a second.
EXPERIMENTS WITH HEAT.

Boil a flask, close it, and pour water upon the sides.
Have a thermometer passed through the cork inside and note the temperature.
Can close flask when boiling in the absence of a stop-cork by having passed through the cork a long glass tube.
Heat the tube and draw it out.
Experiment with Lenses.

✓ Candle and flask experiment.

✓ Candle on one side, flask on the other.

✓ Thermo differential calorimeter.

✓ Galvanometer.

✓ Prism.

✓ Electrical magnet.

✓ Lenses.

✓ Paper to produce a smoke.

✓ Show image in the air.

✓ Paper rendered transparent by oiling.

A piece of ground glass.

✓ Large lens with handle.

✓ Copper penny and piece of zinc the same size.

✓ Vinegar and water.

✓ Coulombmeter.

✓ Rheostat.

✓ Electrograph.

✓ Recording cylinder.

✓ Small storage battery.

✓ Magneto machine.

✓ Stick of ceiling wax.

✓ Glass rod.

✓ Bits of paper.

✓ Cotton.

✓ Wool.

✓ Gun Cotton.
EXPERIMENTS TO ILLUSTRATE LECTURE 4. To Show Chemical Action.

Mix solution of iodide of potash and mercury salt producing red and yellow solution.

Add alkali with acid solution containing color indicator phenol phthalein.

Show violet of peptone reaction.

Precipitation of lime from lime water by the addition of an acid.

Precipitation of albumen by adding an acid and heating.

Specimen of urine containing albumen--add an acid and heat.

The relation of this and the preceding experiment to the body.

Albumen in the blood--in solid form in the tissues.

Reduced to soluble form by work, and carried out of the body.

Experiment--

Add sulphuric acid to ice water and several tubes.

Pass around to class and show heat.

Shows relation of chemical action on heat.

Make a small battery consisting of a copper penny and a piece of zinc with blotting paper between moistened with vinegar.

Connect the galvanomometer with the thermostat.

Repeat the experiment with another penny and piece of zinc dipped in water only.

Show the galvanometer to the class by means of a mirror placed at the proper angle behind it.
Experiments to illustrate correlation of force.--

1. Relation of heat and motion by friction machines; fire may be produced in this way, water boiled, &c.

2. Relation of heat and light is obvious. Show Crock's Radiometer.


4. Relation of light and electricity—condensed rays from a lamp upon thermopile with a lens.

5. Relation of light and magnetism—pass current through the large magnet.
The great need of the temperance cause at the present moment is the education of old and young respecting the physical effects of alcohol. Every man, every woman, every child needs to be convinced that alcohol is a deadly poison; that so-called pure whisky is bad whisky; that the most costly and refined brandy is a deadly poison; that alcohol is not a stimulant but a narcotic; that it is not sustaining food, but a dangerous drug; that it does not strengthen a feeble man, weakened by disease or hardship, but makes him weaker; that it never helps, but always hinders the sick man in his battle against disease; that alcohol is never a friend or a helper, but always an enemy and a deceiver.

By giving exclusive attention to law enforcement and neglecting education respecting the fundamental facts about alcohol, the issue is being camouflaged and made to appear as a question of personal liberty; that is, good whisky is all right if one can only get it without being caught.

A great nation-wide and world-wide campaign of education is needed to awaken intelligent men and women everywhere to battle against the Great Destroyer of soul and body. Every school in the United States from kindergarten to college, should teach and reiterate the basic effects about alcohol. Every pulpit, every Sunday school must be enlisted in the battle against alcohol, and the movie, the greatest of all educational forces, should be made to tell the story in every city, town and village of this great country.

When the whole people know the truth about alcohol, the enforcement of the Volstead Act will become as easy as the enforcement of city ordinances against speeding and parking of automobiles, the location of factories and the disposal of garbage, because it will be backed by a public jubilee.
Opinion which will command the respect of legislators, justice officials, and even bootleggers and moonrunners.
When the art of distillation was introduced into Europe in the middle ages and aleurol was discovered and exploited by that the father of alchelans, Paracelsus, as the elixir of life, this root acquired a preeminent place among medicines and spiritous liquor because in time the chief
dependence in the treatment of all diseases in which the patient was supposed to need. A supporting treatment, alcoholic was regarded as a powerful stimulant, an agent which was capable of energizing the vital forces of the exhausted patient and aiding him in his
battle against germs and other enemies of life and health.

Fifty years ago, when I was beginning the practice of medicine, fever patients and consumption were gives relief in such cases that they were kept in a state of continual intoxication.
If they recovered, visibly got the credit, and the patient not infrequently became confirmed alcoholics.

A venerable and highly popular practitioner of the old school told me forty years ago that he often met on the streets, meeting drunkards whom he knew had been made much
Continuing, I expect & assume
some sort of payment for our
safety & presence, but I
wouldn't expect anything
in the nature of return for
our help.

I'll leave out the

declarations, duress,

laws, and

pleas. I'll

mention

nothing. I won't

waste time

on

you.
gin or plain alcohol with
the addition of something not
bitter, Richardsons. The
much advertised bitters, Rich
don's contained 50 per cent more
alcohol than Scotch whisky,
and so called "temperate
bitters" was convicted of
being an intoxicating as
been in home.

What specifically research
has changed all this.
Alcohol is no longer regarded as a healthful art.
It is known to be a narcotic.
and is so described in all
realises on drugs.
The
most of the so-called
times I have disappeared
from the drug stores
and the advertising columns
of the met. daily newspapers
and the religious weeklies.

"The popular monthly Maga-
gives long ago ceases to publish these meretricious advertisements. The modern, up-to-date doctor does not believe.
I.

J. L. Sullivan, aged 28 years; unmarried; has a fair education; has been drinking for the last ten years; drinks from 12 to 15 glasses per day; American by birth.

II.

J. J. Feran, aged 36 years; Canadian; and orphan at 16; his brother is a Roman Catholic priest in Philadelphia—died from the effects of drink. Mr. Feran was picked up in the street; has been drinking hard for the last 19 years; drinks from 30 to 40 glasses per day,—the vilest of drinks—5 cents a glass; has used tobacco 20 years. Uses it constantly; could not remain in meeting long enough to hear the sermon; has a fair education; reads both French and English; contracted syphilis while on shipboard some 6 or 8 years ago. Has eruptions on legs and different parts of the body; patient suffering from delirium tremens four weeks ago; came to the dispensary and received help; has not been drinking for the last four weeks. Reformed fellow.

III.

Mrs. Eter, aged 35 years; weight 100 pounds; lost 50 pounds within the last year and a half; lost 16 pounds in three months; had dilatation of the stomach.

IV.

Jas. Scott, aged 34 years; American; teamster by occupation; has been drinking for the last 20 years; had syphilis during the last 8 years.
V.

Jno. S. Smith, aged 54; Canadian; single; orphan at eight years; father a drunkard; drinks from 15 to 20 glasses of whisky; also much beer; teamster by occupation; out of work for the last seven weeks; had syphilis during the time; has eruptions every few weeks.

VI.

Mr. Harris, American aged 46 years; drinking for the last 23 years; has reformed; has scrotal hernia.

VII.

John Smith, aged 36; hard drinker for the last 16 years; drinking hard at the present time.

VIII.

Capt. W. H. Hayes, aged 72; American; hard drinker for 20 years; Drunk at the present time; unable to stand up straight.

IX.

Tom Sutton; Englishman; aged 44; one of Chicago's worst drinkers; drinking constantly all he can get.

X.

Fred Baldwin; American; aged 39 years; has no trade; syphilis drinking for the last 20 years.

XI.

John Martin, aged 38; Englishman; married; child and wife both dead; tailor by trade; out of work at present; sleeps in streets; drinks very hard.

XII.
XII.

W. Driscoll, aged 35; drinking 18 years; is hackman by occupation; attended McGill's College for 5 years in Canada; drinks from 5 to 10 glasses of whisky per day and all the beer he can get.

XIII.

Thomas Mack, English born; aged 30; Irish parentage; left an orphan at 15; unmarried; drinking for the last 15 years; drinks very hard.

XIV.

James Smith, aged 38; unmarried; American; he is a machinist by trade; commenced drinking at ten; drinks whisky and beer; drinks from 20 to 30 glasses of whisky per day; came to dispensary with a black eye; slept in the streets for the last week or so.

XV.

Frank Orr, aged 39; American; orphan at one year old; his father was of temperate habits—a physician. Mr. Orr is a broom maker by trade; he commenced life in a saloon; ran away from home at 14; he worked for two years and then returned to his home; he has remained with his brother since; came to World's Fair one week ago, and had 18 dollars with him; became drunk and while drinking he had his nose broken. He came to the dispensary, had treatment, attended a meeting, and the same evening gave up drink; when last seen he had been sober for four days; his home is in Bloomington, Ill.

XVI.

Jacob Harry, aged 47; American; an orphan at 24; is a
druggist by profession; he is drinking hard at present; out of work; sleeping in streets.

XVII.

Wm. Lang, aged 34; is American by birth; orphan at two; has been married twice; had two children; both wives alive; printer by trade; drinks at spells; has been a member of a Christian Association; has been drinking very hard for the last six weeks.

XVIII.

Miles Morgan, aged 35; American; is a cook by trade; orphan at 20; fair education; has been drinking very hard for the last 15 years; has had delirium tremens twice; is now on the border; very talkative and very nervous; when pricked he jumped out of chair.

XIX.

David Carroll, Irishman, 63 years old; plasterer and bricklayer; his wife is dead; two children in orphan asylum; drinking for the last 30 years; out of work; slept under bridge for the last month.

XX.

Mr. J. B. Hamran, aged 23; American; pressman; out of work three months, drinking very hard; slept in box car last night.

XXI.

John Fornut Deroy; Frenchman; American by birth; 46 years old; hard drinker; has been drinking for the last 20 years; drunk when specimen was taken.
XXII.

Bill Bliss, 54 years old; American; very hard drinker; very noisy; staggering about and offering to fight; hard to obtain specimen, so nervous; drinking for 30 years.

XXIII.

E. Mc Connell, aged 29; American; graduate of the State College of Illinois; he is a barber, nurse and bookkeeper; he is also a salesman; has been drinking for the last ten years; orphan at 16; has no place to sleep.

XXIV.

J. W. Mitchell, aged 34; American; married; two children; has been drinking 20 years; the last ten years has been drinking very hard; also taking morphine for the last nine years, in form of laudanum; at the present time has given up both drink and morphine; July 3d he took Keeley's treatment, and claims to have been cured of the habits of taking both morphine and whisky; intelligent looking young man, but out of employment; has no place to sleep and no food to eat; his home is in St. Joe, Mo.

XXV.

John Boyle, aged 38; American; single; is a boiler maker; drinking for 25 years; his father died a drunkard. Had nose broken while in drunken spree; drunk at the time he came to dispensary.

XXVI.

Wm. Clayton, aged 46; is single; orphan at 4 years; brought up by his aunt; he works as fireman; drinking all his life; has not been sober for the last month. Drinks whisky.
XXVII.

Frank O'Neil, aged 36; painter; he is married; wife dead; has three children who are living with relatives; drinking for 20 years; intoxicated when at dispensary.

XXVIII.

Thos. Russell, 37 years old; is American; his father was a hard drinker; he is by trade a bookbinder; has been drinking very hard for the last month; out of employment and no place to stay nights; unmarried.

XXIX.

Peter Thomas, aged 40; very drunk when specimen was taken.

XXX.

Chas. Chambers, 36 years of age; is single; American; baker by trade; out of work for the last two months; commenced drinking at 18; drinks hard; uses tobacco.

XXXI.

H. J. White, aged 32; Married; three children; he is an upholsterer by trade; out of work; drinking for the last 14 years; uses tobacco; needy circumstances.

XXXII.

John Himes, aged 53; is a polisher; father died a drunkard; he commenced drinking at 15; also uses tobacco; lost his right arm on railroad while drunk; has been drinking very hard the last few months.

XXXIII.

John Conroy, Canadian, aged 36; married; one child living with friends; uses tobacco; very hard drinker,—ten to twenty
-7-
glasses per day.

XXXIV.

Wm. Ryan, aged 42; Irishman; married; wife dead; is by trade engineer; orphan at 12; came to America when 14 years old; very hard drinker.

XXXV.

Morse Malane, colored; 41 years of age; unmarried; is a lumberman by occupation; uses tobacco; a very hard drinker; out of work for the last 11 weeks; has a bad leg,—very badly swollen—twice the normal size.

XXXVI.

Mr. Henry Dorn, 51 years old; married; wife dead; has two children; is an American; uses tobacco, and is by trade an upholster and decorator; commenced to drink very young, and drinks by sprees.

XXXVII.

Mrs. S. Tipkan, colored, aged 50; keeps house of assignation; suffers from rheumatism; has syphilis affecting throat; is considered hard drinker by those who know her, but upon being questioned closely, she had never used tobacco or drink in any form.

XXXVIII.

Mrs. Frances Green, aged about 45; married; husband dead 3 years; has 2 children; is a hard drinker; has been such for 10 years.

XXXIX.

Mrs. Emma Taylor, 50 years of age: American; colored; husband
dead; is a very hard drinker; very immoral.

XL.

Mrs. Hannah Brown; colored; aged 64; American; married; husband dead for the last 30 years; keeps a house of prostitution.

XLI.

Mrs. Nellie Steinlow, colored; 45 years of age; widow; 10 years ago had gonorrhea; has very large varicose veins of legs; hard drinker; very immoral.

XLII.

John Simmons, aged 45; Norwegian; painter; well educated; unmarried; drinking for the last 25 years; is a very hard drinker periodically; sober at the time the blood was taken.

XLIII.

Wm. Cook, 42 years of age; is a salesman; traveling; out of work all the season; married; has 2 children; has suffered from delirium tremens twice; at present fears he will have them again; in a very nervous state of mind and unable to sit still; has been drinking hard the last week.

XLIV.

Chas. Christ, aged 40; American; is switchman; out of work for the last four months on account of a syphilitic sore which he has had for 8 years; an orphan at 8 years old; has been a hard drinker since a child; smokes.

XLV.

Stephen Mitchell, 53 years old; unmarried; Irishman; no trade;
XLV.

Stephen Metcalf, aged 57; is a cook and painter; single; well educated; has been on a spree for the last week; is out of work, and when he has money drinks very hard.

XLVI.

John Smith, 53 years of age; unmarried; Irishman; no trade; unable to read; very hard drinker.

XLVII.

Mr. John Davis, aged 39; American; married; wife dead one year; has one boy 10 years old; has been drinking since very young; is a tradesman and machinist; he was "tight" when he came to the dispensary.

XLVII.

Mr. Reedy, aged 43; Irishman unmarried; steam-fitter; has been a hard drinker; at the time he came to the dispensary, he was on the border line of delirium tremens; shaking from head to foot; tears streaming from his eyes, and he exclaimed that he was on the road to hell; that unless "the boys" would help him, he was lost and lost utterly; appeared to be very penitent; was very desirous of being helped up; said he knew there was no help but in Christ; he had been helped by baths some 7 weeks previous when he was very tight; didn't ask for money or food, only he wanted to be "helped up once more."

XLIX.

John Tryon, aged 31; no trade; unmarried; Irishman; has been a hard drinker; drunk at present time; has syphilis; out of em-
employment.

L.

John Hastings, aged 35; no trade; has syphilis; hard drinker; drunk when he came to the dispensary.

LXI.

A. F. Gibson, aged 37; single; college education; has degree of "B.S." at college in 1891 he was cured for six or seven months when he commenced drinking; has been drinking very hard, since, has been drinking for 15 years; was "on a tight" the last six weeks; has been salesman for C.B. Bainbridge, also for father, Stephen Gibson; has money coming from England, and is American by birth.
The cocoa leaf contains elements of tea. A great deal has been said as to the wonderful effects of cocoa leaves as taking the place of food, how that persons will start off on a long journey taking nothing with them but cocoa leaves as sustenance. This has been given as an evidence of the value of tea as food. But the accounts of travellers who have recorded what they have seen in
The greatest single step forward movement ever made by a civilized country.

Production increased 25 to 30 per cent in ten years. Double the normal.

The loss of 15% in production puts the country on its back.

This great economic success in spite of the fact that the farmers have suffered, half the coal mines idle, the textile industry in a bad way.

The national income has increased from $66,000,000,000 in 1919 to $89,000,000,000 in 1928.

Prosperity chiefly due to the diversion of money expenditure from drink to goods, homes, etc.

Working men are riding in automobiles; their wives and children are well dressed.

Poverty has almost disappeared.

Universities and institutions of learning overflowing with students.

Saloons gone.

Drunkenness on streets and public places seldom seen.

Consumption of liquor enormously reduced.

Working men spending money on their families.

A manager of a large industry states that before Prohibition, the morning after pay-day always found 50 to 100 women in the office asking for advances because their husbands had spent all their wages the night before for drink, before coming home. Since Prohibition, he had never found more than two.
In one city, a supervisor estimated the saving by working men, due to Prohibition, as over $200,000 a week.

The testimony of 250 college presidents recently, gathered by the W. C. T. U., showed that drinking among students is diminishing.

The wild conduct of young people which followed the war, appears to be lessening.

The failure of enforcement probably not more than 60 to 70% successful, and may never reach more than 80 or 90%. As good as can be expected.

Other laws are even less successfully enforced.

The argument of wets that non-enforcement produces scoff-laws and encourages crime, not sound.

Many laws on the statute books are not enforced at all, such as blue laws.

Trenton blue laws on Sunday observance prohibit music and any kind of amusement on Sunday; forbid a man to kiss his wife.

(Read article prepared for C.H. on "The Medical Use of Alcohol").

Alcohol formerly regarded as a stimulant, a supporting agent, and needed in all cases of shock, fever and pneumonia.
Long before prohibitions this was found to be false. Alcohol is a narcotic, not a food, never a stimulant. Its use has been largely abandoned by medical men on this account.

Formerly the largest item in the budget of London hospitals. Now an insignificant item.

In this country the use of alcohol has been entirely abandoned in many leading hospitals such as Crile’s hospital, Cleveland, the hospitals of New Jersey, Wisconsin, Iowa, Michigan, Kentucky and also many of the leading hospitals of London, Paris and other European cities.

In Paris hospitals the use of alcoholics of all sorts, including wine, has fallen off within 41 years to a minute fraction of its former proportions. The present average is only 10 drops per day per patient.

Doctors have largely abandoned the use of alcohol for any purpose.

In states which have no laws against the medicinal use of alcohol only 43 per cent of the doctors prescribe it.

There are only 15 states in the United States where alcohol can be prescribed for medicinal purposes.

Some doctors protested against these laws restricting their use of alcohol, but the Supreme Court, after hearing the testimony on both sides, sustained the law.

A referendum by the Journal of the American Medical Association showed about an equal number of doctors on each side.

Those who voted in favor of alcohol being necessary believed it essential in the treatment of pneumonia, influenza and other infectious diseases and as a supporting agent
in old age, general debility, diabetes, heart failure, shock and convalescence.

These are evidently doctors who are not up to date and are not aware of the fact that for all these uses science has shown alcohol to be not only useless but harmful, and its use for such purposes has been abandoned by progressive up-to-date physicians long before prohibition.

A resolution against its use was passed by the American Medical Association in 1917, two years before prohibition.
into disrepute by the ridiculous claims which are made for the food value of their products. It is obvious that whatever food value may be possessed by the dry substance of a cereal coffee substitute, the actual food value is only that which is possessed by the infusion as presented for use at the table. Dr. Langworthy, of the United States Department of Agriculture, some time ago made a minimum study of the actual food value of the leading coffee substitutes on the market, and as a result of his investigation published the following in Bulletin 122 of the U. S. Department of Agriculture:

"The average cereal coffee infusion had the following percentage composition: Water, 98.2; protein, 0.2; and carbohydrates, 1.4, while the fuel value was 30 calories per pound. Skim milk, which is ordinarily considered a rather "thin" beverage, contains 3.5 per cent protein, 0.3 per cent fat, 5.15 per cent carbohydrates, and about 0.8 per cent ash, or almost twenty times as much food material as the average of the beverages made from cereal coffee. If made according to directions, one would have to drink four and one-half gallons of an infusion of one of them which made an especial claim to high nutritive value in order to get as much food as is contained in a quart of skim milk."

TEA AND COFFEE DRUNKENNESS.

Some years ago there was in London a club of newspaper reporters who every Saturday night used to get together and have "a spree on tea". After drinking a number of cups of tea, some of the members of the club were usually to be found under the table as thoroughly intoxicated as though they had swallowed a quantity of alcoholic drinks.

As a matter of fact there is more intoxication in a cup of strong tea or coffee than in an equal quantity of lager beer.

"Edward Smith, an eminent physiologist of England, once made an
experiment for the purpose of testing the effects of coffee. He made a decoction of four ounces, and he and his assistant drank it. In a short time they became dead drunk and lay insensible upon the floor of their laboratory for three hours."

"During an English expedition to Ashantee, one of the officers lost one of his finest horses. He was greatly distressed about it. They had carried their tea and their shelled corn for the horses in bags. At one encampment they had nearly emptied a bag of tea, and filled it with corn. The officer's horse happened to get the last of the corn in this bag, so that he ate the tea with his corn. He was seized with a wild delirium, and went plunging headlong, and finally threw himself over a precipice. That was the effect of the tea on a horse."

"The Medical Press recently called attention to the fact that coffee may produce effects similar to those induced by alcohol, among which are palpitation, a fable pulse, trembling, twitching of the limbs, and other indications of profound poisoning. This fact is one to which coffee drinkers should give attention. The use of tea and coffee is only a respectable sort of tippling, the effects of which may be as injurious as those following the use of alcoholic drugs.

Dr. Norman Bridge of Chicago asserts that coffee drinking is a frequent cause of dætabase, and reports the history of seven cases in which many obscure and distressing symptoms were present. All of these patients recovered when coffee was discarded.

Dr. Leszynsky of New York asserts that the "ill effects following the use of coffee are by no means uncommon." "The popular idea that coffee can replace food or increase the power for work without corresponding tissue waste is entirely erroneous."

According to Dr. Wm. N. Leszynsky of New York, the transitory susceptible sensation of wellbeing which is experienced by many persons after taking
The great need of the temperance cause at the present moment is the education of old and young respecting the physical effects of alcohol. Every man, every woman, every child needs to be convinced that alcohol is a deadly poison; that so-called pure whisky is bad whisky; that the most costly and refined brandy is a deadly poison; that alcohol is not a stimulant but a narcotic; that it is not sustaining food, but a dangerous drug; that it does not strengthen a feeble man, weakened by disease or hardship, but makes him weaker; that it never helps, but always hinders the sick man in his battle against disease; that alcohol is never a friend or a helper, but always an enemy and a deceiver.

By giving exclusive attention to law enforcement and neglecting education respecting the fundamental facts about alcohol, the issue is being camouflaged and made to appear as a question of personal liberty; that is, good whisky is all right if one can only get it without being caught.

A great nation-wide and world-wide campaign of education is needed to awaken intelligent men and women everywhere to battle against the Great Destroyer of soul and body. Every school in the United States from kindergarten to college, should teach and reiterate the basic effects about alcohol. Every pulpit, every Sunday school must be enlisted in the battle against alcohol, and the movie, the greatest of all educational forces, should be made to tell the story in every city, town and village of this great country.

When the whole people know the truth about alcohol, the enforcement of the Volstead Act will become as easy as the enforcement of city ordinances against speeding and parking of automobiles.
utilize advantageously.

2. Alcohol is a poison—a deadly poison in large doses; a slow poison in small doses.
half of that is absorbed. Of course, that would be distinctly variable. That is in smoking a cigar. But quite a portion of the nicotin is deposited in the stump of the cigar that is held in the mouth. It is cooled and condensed. It requires a very high temperature to vaporize nicotin as it is a very heavy oil, so a large part of it is cooled off and condensed in the cold end of the cigar, and does not get into the mouth at all. In smoking cigarettes, I should think the proportion would be very much larger. Wouldn't you think so? The cigarette is smaller and the material is very loose in the cigarette; there is not so much chance for condensation; and then it is nearly all smoked out. Cigarettes are smoked right up close to the end, aren't they?

Q. They used to make smoking tobacco out of cigar stubs, and you would get plenty of it there, I should think.

A. Yes, they do that very thing.

Q. Is there any difference between chewing and smoking?

A. I should think in chewing there is a smaller surface exposed to the absorption of the material, and the nicotin is not so very soluble in water as it is in alcohol. It is the vaporizing of nicotin that makes it so easily distributed.

**ALCOHOL.**

I want to talk to you a little while this morning about alcohol. We will get over the ground quite rapidly. My purpose in these talks is to get into your hands and minds in concrete form a summary of the facts in relation to some of these great evils which are so destructive to human life. The opinions about alcohol have greatly changed within a century. My father told me that when he was a boy it was the custom always to keep brandy on the sideboard in his father's house, and in all the houses, and when the preacher came, they
always opened a trap door in the floor, went down into the cellar and brought up some special brandy for him. When they saw the preacher coming, they always got out the brandy for him.

The first temperance society ever organized in this country was organized by Captain Joseph Bates, an old sea captain with whom I was very well acquainted. He organized the first temperance Society in the United States in 1826, almost 100 years ago, in New Bedford, Mass., and this was the first teetotal temperance society. There had been temperance societies before that time, but these temperance societies only required men to pledge themselves that they would not get drunk. They could drink as much as they were able to drink without getting drunk, but they pledged themselves that they would not get drunk on any occasions except weddings, raisings and funerals. I don't know as you know what a raising is. In those days the houses were constructed differently than they are now. In those days they made a frame, and the different timbers were all framed together; so, after making the foundation of the house and laying the timbers around, these timbers were mortised together, and fastened together with pins. Then they made the frame for the next floor, had the corners all fastened together, and then, being made of very heavy timbers, perhaps a foot in diameter hewed out of trees, hewn timbers, these heavy had 1 timbers had to be raised, and a large number of men would come in to the raising, and they would raise this fame up and hold it up until the props could be fastened beneath and secured the frame in its place. So whenever they built a barn or a house they had a raising. When they built a barn, it was a great raising, because it was very much larger than the house, and required a great number of men. So these men in those days made a pledge they would not get drunk on any occasions except weddings, raisings and funerals. Of course every-
body was excusable for getting drunk on these occasions.

Some thirty years ago I went as a delegate to a meeting of the American Public Health Association, which was held at Savannah, Ga., and after the forenoon meeting, we took a trip down the Savannah river to its mouth. When we came aboard the steamer, the first thing was a speech from the mayor of the city, but he was so intoxicated it was impossible for him to speak coherently; it was just simply gibberish, and the mayor tried to make a speech but it was simply incoherent. I said to myself, "These people must be terribly ashamed of this mayor." But there didn't seem to be anybody particularly ashamed. They seemed to take it as a matter of course. They went on down the river, and before we got back, the whole excursion was intoxicated. Dr. H. B. Baker, the secretary of the State Board of Health of Michigan, myself and one or two others, besides a few ladies that were present, were the only persons on that boat that were not either tipsy or hilariously drunk, or stupidly drunk. There wasn't anything but spirituous liquors on that ship to drink. Even the lemonade had whiskey in it. There was not a drop of beverage of any sort on that boat, of any kind, that did not have alcohol in it. I would have taken a drink of the Savannah River, as dirty as it was, if I could have gotten at it. When we came up to the landing in the afternoon, the tide was out, and there was a long walk leading to the landing, which was about ten feet wide. When we came to the landing, it was about twenty or thirty feet above the water, and when we came up to the landing, it was amusing enough to see that crowd going ashore. They could not walk alone. They did not dare take that trip across that ten foot walk alone; so they would lock arms, four and six together, and they went ashore in that way. Of course, that was an ingenious device, you see, because they did not stagger in unison. One man staggered in one way, and his staggerers were neutralized by the staggerers of the other men; so four or five or six of
them were together with their arms twined around one another's body, and they moved ashore in that way, and that is the only way they could get ashore. I thought some of them would go overboard as it was, and rather hoped they would. And a leading member of the society, a member of the national board of health, a prominent man, a man of sixty years, sat up on the front deck in a chair maudlin drunk, singing Yankee Doodle. He was one of the leading citizens of New Orleans, a gray haired man, a portly man, and he sat or stood up there singing "Yankee Doodle", as happy as a lark. Now, just think of that state of things. That was all over the South. In the sleeping car going to Savannah, a couple of hundred miles before we got there, three or four doctors got aboard and they were intoxicated, and they got more intoxicated, and they were making Virginia cocktails all along the road, and finally became so hilarious and boisterous, and talked so obscenely in the presence of several women on the car, and so perfectly rotten that they had to be suppressed. The conductor had to threaten them with arrest. When I got to Savannah and stepped up to the desk and paid my annual fees to get my badge, I met those three men coming back with their badges on. You can imagine I did not feel very proud to be with that company; but that was the state of society at that time.

Well, there has been a marvelous change in thirty years. And the same change has been coming over the medical profession. I am not going to go into the matter in an elaborate way, but I will read you a few brief notes here which are just facts, without elaborating upon them.

"Alcohol is a deadly poison. All scientists agree in this. Darwin showed, nearly a generation ago, in his studies of insectivorous plants, that alcohol is a protoplasmic poison." He took the drosera and some other insectivorous plants, covered them with a bell glass in a jar, and put some alcohol in the jar so the alcohol was allowed to evaporate, and the vapor filled the jar
the jar. These plants became intoxicated. The drosera, you know, is a fly-catching plant, and it became intoxicated so it would not pay any attention to flies or any sort of insects. It is generally very quick in its action, but it became intoxicated under the influence of alcohol so it could not act, and did not act. This shows that alcohol is a protoplasmic poison. Its toxic effects are the same whether the protoplasm is of animal origin or vegetable origin. Protoplasmin protoplasm, living substance. Alcohol impairs the life of all living cells.

I made an experiment some years ago by taking a plant and watering it with a very dilute solution of alcohol. I watered it with beer, with water containing alcohol in the same percentage as beer, and within a very short time the leaves of the plant turned yellow and it began to droop and die. And you can kill any plant with a solution of alcohol of two or three or four or five per cent--it will kill any plant; it is destructive to the plant.

I made an experiment some years ago with minnows. I took a glass of water, and put into the water, containing two or three very small minnows, a teaspoonful of alcohol; and in less than half a minute these fish were all lying on their backs and floating on top of the water. They were dead. I then made another experiment. I put the fish into pure alcohol, and to my astonishment they swam a long time in pure alcohol, while they died at once in dilute alcohol. They lived several times as long in pure alcohol as in dilute alcohol. Can you give me an explanation of that? You see the alcohol did not enter their bodies at all. It coagulated the mucous membrane of their mouth, and it was exposed to the alcohol and coagulated, so the alcohol did not enter the system at all; they were simply in the same condition as though they had been taken out into the air. They lived as long in pure alcohol as they would live in water if they were taken out of the water. I found that to
be true. So you see this powerful drug is deadly to all living things.

Now, it is natural that alcohol should be a toxic substance to all living things. Why? Because it is an excretory substance; it is an excrement. Now, waste substances of all sorts are toxic. Whether a drug is a waste substance of a plant or a waste substance of an animal, an excretory product is always poison. It will destroy the protoplasm quickly—the substance which produces it. Alcohol is a waste product of protoplastic activity and, like all waste products of protoplastic activity, it is a protoplastic poison. Now you see that point. That is a law, you see, which you can not get away from. My attention was first called to that by the editor of the British Medical Journal. In an address he gave at Milwaukee some time ago, some fifteen or sixteen years ago, at the time the cholera was raging in Egypt, he read a paper,--Dr. Hart, the very able editor of the British Medical Journal,--read a paper on the treatment of cholera, and he commented on the common use of alcohol in cholera. In those days in the collapse of cholera alcohol was considered to be the only thing. If a patient needed a stimulant, he was to have alcohol; so alcohol was universally given in cholera. In commenting upon it, he said, "Why should we give alcohol to combat the toxic effects of a poisonous bacillus when alcohol itself is a poison produced by a fungus?" You see? Alcohol is a poison produced by a microbe, a micro-organism,—the yeast plant. Why should we expect benefit to be derived from applying this to a man who is already suffering from a toxic condition through the influence of a pathogenic microbe? Well, I saw at once there was a very great argument there, and as you have followed that out, you see it is a universal law. All protoplastic poisons are toxic to protoplasm. Protoplasim is protoplasm, and all protoplasm is influenced by the excretory substances of other protoplasm.

Now, Sims Woodhead, who has been making some very interesting experiments on this subject, shows that the effects of alcohol upon protoplasm, all-
living cells are essentially the same in as those produced by the poisons of
diphtheria and typhoid fever. Diphtheria and typhoid toxins produce upon mus-
cles and nerves effects, as Sims Woodhead has shown, which are practically iden-
tical with those produced by alcohol. These effects produced upon living cells,
especially upon nerves and muscles of the body by alcohol, are also essentially
the same as those produced by lead and by arsenic, and other poisons; and
especially are almost identical with the effects produced by gout; the poisons
of gout have the same effect.

Kleefeld made some experiments some eight or ten years ago on this
subject—an eminent European authority, and he showed that in monkeys, in
experiments upon monkeys that one part of alcohol to 2500 parts of body weight,—
which would be one ounce for a man weighing 150 lbs., produces immediate change
in the brain cells. He made a study upon the brains of monkeys, and his stud-
ies were made by killing the monkey at once. He trephined the monkey's skull
on both sides, and he made an examination of the brain on the healthy side,
then he introduced alcohol, and then at once made an examination again on the
other side. And he found its effect was manifested within a very, very short
time, within a few minutes,—as soon as the alcohol had gotten into the circu-
lation. Now, these effects consisted in a drawing, in a contraction of the
tactile buds, the contact buds of the nerve dendrites and dendrons. These
little contact points by which the nerves make contact with one another are
withdrawn and separated. In fact, he found the effects of alcohol were identi-
cal, and the effects were essentially the same as those produced by sleep.

Now, sleep is the result of the withdrawal of contact of the nerve filaments
of different cells. When contact occurs, the nerve centers start again, and
consciousness is produced. As they are withdrawn, the loss of contact inter-
rupts consciousness.
We do not need to go very much farther with this subject with reference to the effects of alcohol upon digestion. It is generally supposed that alcohol aids digestion, and that idea is based upon the fact that a small amount of alcohol taken into the stomach will excite the stomach to secrete an acid liquid; but exhaustive experiments have shown that this acid liquid which is produced by alcohol has very little digestive power. It is a protective action rather than a normal action, and this fluid contains very little pepsin. This fact has also been shown: that when alcohol is used in this way to stimulate the gastric glands, the amount of secretion diminishes and deteriorates, and after while the glands are unable to secrete more gastric juice. I asked Prof. Pavlow's assistant, in St. Petersburg,--I asked him why he did not give alcohol to these dogs to stimulate their production of gastric juice. He said, "Oh, no, oh, no, because in the end it would destroy the production of gastric juice and wear out the glands." Now, it has been shown that while alcohol does stimulate the stomach to produce a flow of gastric juice, it at the same time lessens the digestive activity of the alcohol. The alcohol has less digestive power—the digestive fluid has less digestive power when alcohol is present with it; and if it is already a little bit inferior to normal gastric juice, the effect of the alcohol is to destroy its digestive activity altogether. In other words, if a man has a weak stomach, slow digestion, and alcohol is given to him, the effect of that alcohol is to lessen his digestive power, instead of to increase it. If a man has hypacidity, he can not take alcohol to better effect with more impunity than the man who has slow digestion, because when the digestive power of the gastric juice is already somewhat impaired, and alcohol is added to it, the effect is to still further diminish its digestive activity, and it acts in a very marked degree.

Now, we have made a large number of experiments here in our laboratory,
some years ago, which very definitely proved that. Chittenden first pointed out this fact, but I reviewed the matter in our laboratory with some scores of cases; in fact, I think with two or three hundred cases. The gastric juice, what was left after a test had been made, was taken, and after its digestive activity had been determined, alcohol in very small proportions, five per cent, two per cent, one per cent of alcohol was added to the gastric juice in such a way as to test the different portions, and it was found when in all save the very smallest proportions, the digestive activity of the gastric juice was greatly depreciated, very greatly diminished. One per cent of alcohol would produce a very pronounced effect in lessening the digestive activity of the gastric juice by using Metz test, which is an accurate test as you know. So the effect was such that it was proven very clearly that if a man who is eating his dinner takes a glass of wine, a small glass of wine in addition to his dinner, it greatly impairs all forms of digestive activity.

A curious fact was shown—that wines and beer have more effect upon disturbing digestion than brandy itself—more effect. Alcohol taken in the form of wine and beer have a very decided effect, because of certain substances present in wine and beer which act even more powerfully in deterring the digestive processes and hindering them than does alcohol itself. Dr. Sir William Roberts was one of the first to begin experiments upon this subject; and something like 17 or 18 years ago he made some experiments, and he believed alcohol aided digestion; that it was a very important aid to digestion. In fact, he believed essentially as Sir Crichton Browne, who claims that beer has made England great. He thinks Bovril is next to beer, and he manufactures Bovril, you know, which is an extract of meat that they use over there. It is just the same thing as bovinin. They have a great company over there that make it from
blood and scraps of meat—this extract they call Bovril—and Sir. Grichton Brown, a doctor and scientist of some repute, is the chief owner of this Bovril company, and he also is a very large shareholder in breweries. He is interested in beer.

Well, Sir William Roberts advocated the use of alcohol as an aid to digestion, and he undertook some experiments to prove that alcohol does aid digestion, or to get the scientific facts in relation to it, and he found that to his surprise, that alcohol hindered digestion, but he was not the least bit discouraged in his friendship, in his advocacy of alcohol. He said he had made a great discovery. He found that what the modern man needed was not an aid to digestion, but a hindrance. He found that modern cookery had rendered food so digestible that the greatest danger to which the civilized race was exposed at the present time was an undue acceleration of nutrition, and consequently we needed something to act as a backsetting medicine; we needed alcohol to hinder digestion, so as to prevent this dangerous acceleration of nutrition. So, while finding alcohol hindered digestion, he still continued to prescribe it.

Now, I have gathered together some facts into a little booklet entitled, "The Truth about Alcohol as a Medicine." This was prepared for popular use by the W. C. T. U. They asked me to prepare a paper for them, and I prepared this paper for them. And there are some facts in it that even a medical student or a medical man might profitably consider. Here is a very interesting thing,—interesting to me,—a statement made by Sir Thomas Barlow, one of the leading physicians of England—that fifty years ago when a temperance life insurance society was formed in England—some men who constituted the first board of trustees had actually been refused life insurance by other companies because they were total abstainers. Fifty years ago the use of alcohol was con-
sidered so important, so necessary and such a rational measure that men in good health were refused insurance by life insurance societies because they were total abstainers. These men with others got together and organized the temperance life insurance society of England, and they insure people at a lower rate than other insurance companies—they insure abstainers; and this has led the life insurance societies of Great Britain to make two classes of risks—the moderate drinkers, and total abstainers; and a total abstainer can buy insurance in England for a very considerably smaller price than the man who uses alcohol in any form or in any quantity. Now that is a fact of great commercial value, you see. It is a fact that shows that the commerce of the world, the financiers of these great life insurance companies, who are working all the while to make more dollars—that they have found it pays to be temperate; that the man who does not drink alcohol lives longer than the man who does; so they can afford to insure him for a smaller sum.

Now, some thirty years ago the London Hospital for the treatment of the sick without alcohol was organized. I visited this hospital twenty-seven years ago, a few years after it was started, and I found the doctors there were in a state of great perplexity over something. They did not know anything about hydrotherapy, and they were anxious to find some substitute for alcohol which would be useful for treating pneumonia. They were determined to get along without alcohol, and they told me they had not used it in a single case, except in one or two cases of pneumonia; they thought they must use it in pneumonia; and they wanted me to give them some idea how they could treat pneumonia successfully without alcohol; so I was very glad to give them the hydriatic method. I do not know whether they used it or not, but I told them about it at any rate. They had no one there who knew anything about hydrotherapy, and there was great prejudice against hydrotherapy at that time, and I am very
doubtful whether they made any particular use of it, but they got along without alcohol any way. But the fact I wanted to call your attention to was that threats were made when they started that hospital that if patients died without having had the benefit of alcohol there would be a legal investigation of the matter. A coroner's inquest would be demanded, and they would be called upon to show the reason why they did not give alcohol. When I began to practice some thirty-four or thirty-five years ago, I had an epidemic of typhoid fever, my very first year of practice, in which I had some 67 cases of typhoid fever in this community, and some very severe cases, and not a single one of them died, not one died. I had a great deal of anxiety about the matter, because the medical profession were looking on and watching the cases with great interest; for it was the first time they had ever heard of typhoid fever being treated by hydrotherapy. It was the first time there had ever been an epidemic in the city in which hydriatic measures were used. So they were watching with a great deal of interest, I assure you, and I had a very great amount of anxiety. In those days I expected—I didn't use alcohol, I didn't believe in it, and I would not use it, but I had great apprehension all the while—if this case died, and I had not used alcohol, what would I say? What could I say for myself? I knew that the medical profession was against me, and the case would go very hard with me before a coroner's jury if I should have a patient die without having used alcohol in an extreme condition. It was believed to be a stimulant. Dr. Todd, of England, had taught the profession that alcohol was a stimulant, and that it was necessary to use alcohol in fevers; that milk and alcohol, milk and whiskey, or milk and brandy was the regular diet of a patient suffering from typhoid fever. Dr. Austin Flint, my teacher of internal medicine at Bellevue Hospital, impressed his classes very forcibly with the
idea that alcohol must be given in all cases of typhoid fever, and in cases of fever in which the pulse was flagging, when the patient was apparently going into a collapse, that then the alcohol must be pushed, must be given in large doses, must be given in doses of sixteen ounces; that brandy, as I should say, or whiskey should be given in doses of 16, 18 and 20 ounces a day, or even more.

The same was true of tuberculosis. Why, in Bellevue Hospital, every patient that had tuberculosis got his pint of whiskey every day. We had a man there who kept the bookstand, in the hospital, in the college building, and he was coughing, coughing, coughing, and I asked him one day what the trouble was, and he said he had consumption. I said, "What are they doing for you?" "Oh," he said, "they give me a pint of whiskey every day." I said, "Do you think it helps you?" He says, "I don't take it; I don't take it; I give it to the attendants and they take it, and I get two quarts of milk extra instead." He said, "I have got to die, I know I have got to die, but I propose to die sober." Now, that was very interesting to me. The use of alcohol in cases of tuberculosis was the universal rule. I remember one of the early meetings I attended of the County Medical Society in this town, an old doctor, a Dr. Cox was there, and testified to the use of alcohol, and of course, I spoke against it, but Dr. Cox said, "Yes--his face was flushed and his nose was red, and everybody in town knew he believed in it and practiced what he believed; he was tipsy all the time. He said, "I believe in the use of alcohol; I know it will cure consumption. Of course, sometimes, he said, men get to be drunkards. I remember a young man about eighteen or twenty years ago that I prescribed alcohol for; I told him to take an ounce of whiskey three times a day to treat him for consumption, and he got well of the consumption, but I see him every day reeling down the street here, and sometimes lying in the gut-
ter. He has been a drunkard around this town for a good many years, and I have sometimes thought it might have been just as well if I had let him die as to make a drunkard of him." Now, as I say, it was the universal custom.

Now, at the present time, we have a great number of sanatoria where tuberculosis is treated, a great number of them throughout the country—several hundred in this country alone, and I do not know of a single one in which alcohol is used at all. I do not know of any reputable physician in the world that recommends the use of alcohol in tuberculosis. They all know that it lessens vital resistance; all of them know that it prevents the establishment of immunity; all of them know and admit that alcohol lessens oxidation in the blood—that it lessens the power of the patient to digest and assimilate, that it is an extra tax to his liver and kidneys which are already overtaxed, so alcohol is no longer used at all in these cases.

Now, the profession is coming to see the same thing in relation to typhoid fever. Yet, in the Spanish-American war, in which there were five times as many people, or four times as many persons died of typhoid fever as died from Spanish bullets—four times as many people; whereas in the Russo-Japanese war, among the Japanese, the number of deaths from disease were only half as many as the deaths from bullets; so you see there has been a great change. In one case there was good hygiene; in the other case there was not. In one case alcohol was freely used, in the other case it was not. Now, in the treatment of disease in the army it is routing. The surgeon-general sends out an order as to what should be done, and that is done. The assistant surgeon and the nurses all obey the orders of the surgeon-general in the army, and if a patient is treated in a certain way by one doctor, he will be almost certain to be treated in exactly the same way by another doctor; and the practice of the army during the Spanish-American war, only a dozen years ago, was to treat typhoid
fever in the same old way—by means of alcohol; water was not used. Alcohol or brandy and milk was the treatment for typhoid fever; and the result was the mortality was 30% or 40%, and it was simply terrible—simply terrible. And the same thing is true with reference to alcohol wherever it is relied upon. At the present time, among the teachers of internal medicine, you could not find a single man who would maintain that alcohol should be used as it was used and recommended by Todd and his followers, thirty-five or forty years ago.

The same thing is true of diphtheria. Thirty years ago alcohol was recommended in diphtheria in every case; it was the great remedy for diphtheria. The practice was to give alcohol in all cases of depression.

Now, here are some reasons why alcohol should not be used in any of these acute diseases. Here is one very good reason: Upon what do you depend for recovery in cases of diphtheria? When I was a boy and had the measles and mumps at the same time, I thought I had more than my share of trouble. And I asked my mother about it, why I should have those troubles, and she told me I caught the mumps from such a boy and I caught the measles from such another boy. And I said to my mother, "How am I ever going to get over it then? Because I was not very close to those boys, but now I have got the mumps and the measles myself, and I am nearer to myself than I could be to any one else, and I am exposed to myself all the time,—how in the world am I ever going to get over it?" And it was quite a problem to me to see how I could possibly recover. It puzzled me. I thought of that thing I suppose 5000 times—how it was possible for me to get well when I caught these things from other boys, and now why shouldn't I go on catching it from myself all the while? How could I ever get well? My mother didn't explain it to me, and it has been only in very recent years that I have found out how it is—that a person recovers from diphtheria or any other infectious disease—immunity. It is because the
body itself establishes immunity; certain antibodies are produced within the body, and a condition of immunity is produced. Now, then, that is the only thing that can save a man, then, isn't it—is the establishment of natural immunity. If you can keep a man with pneumonia alive until the body has had time to establish immunity, he recovers doesn't he? So, with diphtheria, if you can keep the patient alive until immunity is established, the patient gets well. That is why we give antitoxin—it is to hasten the development of immunity.

Now, Sims Woodhead has clearly shown that alcohol prevents the establishment of immunity. Experiments made with various animals which demonstrate that immunity can not be established in an animal which is under the influence of alcohol. Sims Woodhead shows that—that you can not establish immunity in an animal that is profoundly under the influence of alcohol, and that alcohol in every case hinders the development of immunity.

Thomas Barlow, of London, England, declared, in a paper which he read on the subject some time ago, that the conditions of the patient produced by the pernicious administration of alcohol, in a fever patient, are precisely the same as those produced by the nipping of an inebriate tippler. The old practice was to give every two hours an ounce of brandy to the fever patient. That was the old time treatment of the patient, so the patient was made drunk, and actually kept in a state of intoxication. Now, under that treatment, the mortality from typhoid fever was 20% to 30%. What is the mortality under the hydriatic method, the modern method, with good nursing and plenty of water? Two or three or four per cent; and one German authority gives a list of one thousand cases of typhoid fever in which the patient was treated hydriatically from the beginning, in which not a single patient died. One thousand consecutive cases none not one of which died. Just think of the
difference. In this country 91,000 people died last year of typhoid fever. Suppose that three per cent, under hydriatic treatment—that the mortality would have been three per cent—and under the present method it is doubtless fully twenty-one per cent,—seven times as great. Divide 91 by 7 and what would it be? It would be 13,000 wouldn't it? The proper mortality, that is, we may say the necessary mortality, the inevitable mortality was possibly 13,000. How many lives might have been saved, then? If they had had proper treatment how many would have been saved of those who died last year? It would be 78,000. Then we would have saved 78,000 lives last year if the doctors had known how to treat their patients with typhoid fever, and to treat them intelligently and rationally. Now, it is important that the information should be gotten out as rapidly as possible. A great many doctors do not know the way. We have a nurse here whom I met in our hall a day or two ago, and she said a certain doctor in Texas was a very good friend of mine. I said I had never heard of him. She said, "Well, he got acquainted with you through me." "How did that happen?" "Why, I was down there with a patient last spring," and one of them got typhoid fever down there, and I think she went down to take care of a patient with typhoid fever and contracted the disease; that is the way of it,—from the patient. They wanted us to send down a nurse, and Dr. Johnson went down and took a nurse with her to see the patient, and instructed the nurse what to do for her, and placed the nurse under the care of a local doctor. She said that doctor was just tickled to death to see the way I got along under Battle Creek Treatment. And he used to go out and have the doctors come in, and would bring in three or four doctors a day there to see how the nurse wrung out fomentations, and how she folded cloths and cold compresses, and he said he thought that was the greatest thing he ever heard of; and when I got well without any medicine,
just under hydriatic treatment, and the way my symptoms were relieved, he was perfectly amazed."

Now, see what an opportunity there is. You don't appreciate it because you are not in contact with it; but get out into the world and see the ignorance prevailing among the physicians, the average practitioners, and see how seldom really rational measures are brought into actual use—measures that you know about perfectly well, and that the profession know about perfectly well; but the practice has not yet changed; the old practice is still going on.

Well, the thing that drove alcohol out was the coal tar products. Antipyrin was discovered, and it was found that a small dose of antipyrin would bring the temperature right down. Well, that is beautiful. I visited Bellevue hospital, made a visit there some twenty-five years ago, soon after antipyrin was discovered, and I entered into the fever ward, and the nurse said, "Oh, do come in here and see my patients; I have some of the most beautiful cases to show you; antipyrin is such a wonderful remedy. Why, there is a man just come in here and see him. This man's temperature last night was 104°, and just look at it now; look at his chaff", and she showed me his chaff, and the temperature was 97° and I looked at the man and I thought the man was dead. He certainly looked as though he were dead. His face was gray, ashen gray, his lips were blue, his eyes were closed, and he looked like a corpse. I thought certainly he must be dead. I said, "Is he alive?" "Oh, yes, oh, yes; antipyrin is helping him very much"; and she shook him up to let me see that he was alive. Now, I went through the ward, and those patients were all of them just like that—those that were taking antipyrin. They looked like a man that has been knocked down with a club. Antipyrin is simply a powerful toxin, and they had been crushed with it. The wonder was that they lived through it.
Then it was discovered that antipyrin, while it lessened the temperature, while it immediately relieved the fever, relieved that symptom at once almost immediately relieved the fever, controlled the symptom of fever, that it did not diminish the mortality; that the mortality increased, and that after the patients died the post mortem examination showed that they had fatty degeneration of the liver, and degeneration of the kidney, degeneration of the heart and other evidences of poisoning, of acute poisoning; and then came along antifibrin.

"That is all right; that does not produce these bad effects." But not very long afterward it was discovered that antifibrin produces the same effect.

Then came along phenacetin, antiphlogistin, and all those,—and phlogistin, a drug by that name which has been out of fashion now quite a long time, and has not been used. It was gradually discovered that all those drugs produced most powerful untoward effects; so the profession has been giving them up one by one.

The thing that is accomplishing marvelous results for us in the medical profession is the scientific laboratory, the physiological laboratory, the bacteriological laboratory, and the pathological laboratory, the modern pathology, because they are bringing all these old remedies to scientific tests; they are brought under scientific criticism, and their effects can be studied accurately.

And then another thing that has been of vast help has been the development of the specialists in medicine. The pathologists do not care a fig for the reputation of alcohol or any other old remedy. It is the professor of materia medica that is holding up the old drug practice. What the pathologist wants to know is the truth—what produces this condition. So with the physiologist. He does not care anything about the hoary headed traditions of internal
medicine. What he wants to know is the truth; he is a scientist, and the students in physiologic medicine, and the physiologic laboratory, and the pathologic laboratory,—these have brought us to the appreciation of the fact—the scientific members of the profession have come to an appreciation of the fact that toxic substances of all sorts, no matter what they are,—all poisons of every kind are a burden and an injury, and that they are not any help to the body, and that they are obnoxious to the vital economy and waxes together if they are to be of any service at any time, in any way, it is only as a temporary palliative of pain, or as means of comfort affording some temporary relief.

Now, just a word more. I have got a picture here that shows the contact globules of a normal nerve; and here are some nerve-cells that show the effects of alcohol. There is a shriveling up of the dendrites and dendrons, and that is the reason why the man becomes stupid under the influence of alcohol. Now, you can readily see when alcohol is used, by a man under diphtheria or typhoid fever or in any other condition, whatever effect it has on every cell of the body. It is a protoplasmic poison, and poisons protoplasm wherever it is. Now, the old idea that alcohol is a stimulant has been a source of an enormous amount of wrong practice. Millions of people probably have lost their lives because of their belief in alcohol as a stimulant. Now, it has been clearly proven that it is not a stimulant. As one English physician said, "Alcohol gets strength out of a man instead of putting strength into him." Osger says, "Alcohol is strong only to do damage." The only strength it has is to do damage.

Now, when you come to test the blood pressure, you find alcohol does not stimulate the heart as was formerly supposed. The old custom was always, when a man was in a state of collapse, or fainted away,—why we must have
brandy, must have a stimulus, of some kind; but we now know perfectly well that alcohol is not a stimulant. Alcohol inhibits control; it inhibits, lessens the consciousness; it paralyzes the inhibitory centers; that is the reason why the face is flushed; it lessens will power, and it lessens the sensibility, and so gives a man a feeling, a sense of wellbeing when he has not wellbeing. A man has indigestion, takes a glass of alcohol in some form, alcoholic drink of some sort, wine or something, after a meal, and the discomfort he had in his stomach disappears; he thinks it has helped his digestion; but it has done nothing but lessen the sensibility of his stomach. If he took a dose of opium it would do the same thing. Morphia relieves his discomfort the same as alcohol does; it acts simply as a narcotic.

Grile made some experiments upon the conditions present in collapse, and in fainting, in shock, and he has found that in these conditions there is a paralysis of the vessels. That is the reason why the patient's heart fails—because the blood has accumulated in the great splanchnic area; the vasomotor centers are paralyzed so that the vessel walls are allowed to relax completely, and the blood runs away into the portal veins. Grile has shown this. Now, what does alcohol do? It does exactly the same thing—causes vasomotor paralysis. Why, then, should you give alcohol to a man who is already in a state of vasomotor paralysis? The old custom was when a patient was in a state of collapse, under anesthetic, and you were afraid he would die, was to inject alcohol under his skin. In fact, it was the practice at one time to inject ether. When a patient under ether anesthesia went into a state of collapse under ether, alcohol was injected, or ether was injected under his skin. I would not do those things, because I said alcohol is a poison, and it is impossible that such a patient can be helped by injecting a poison under his skin,
of the same sort—by putting more into him. I made up my mind the apparent benefit that the patients derived from the injection of alcohol under the skin—and they did get apparent benefit—was due to the local irritation produced. The patient who collapsed under ether—inject ether under his skin if he is too far gone, and he seems to be irritated by it. Alcohol does the same thing. I said this was simply the irritation that comes from the contact of these irritating substances with a great number of bared nerves, and tissues are hampered, and I said the patient would be just as well off or better if we did not put any more of these toxins into his body; and I adopted the hot and cold application—heat over the heart followed by cold—hot and cold to the spine, heat applied to the whole surface of the body followed by a short application of cold to the body, and vigorous percussion over the heart, or over the skin anywhere, and I found it produced very much greater effects, because you can keep right on doing it continuously as long as you want to, and the patient would continue to receive beneficial results. Of course, you could not continue to inject alcohol, or you could not continue to inject ether; you could only do it once. It was simply a form of irritation. This is the thing it did twenty-five years ago or more; and at the present time it has come to be generally recognized as a remedy for the so-called stimulant effects of alcohol which was formerly injected under the skin—simply the result of irritation produced by contact of the alcohol with the tissues; and as soon as the alcohol is gotten into the circulation, it comes in contact with the nerve-centers, and its effect is that of a narcotic; that is, its so-called stimulant effect is simply the slight irritation produced by the first contact of the alcohol with the tissue cells. It is a very important thing to remember that, because there does seem to be some stimulating effect from alcohol.
Now, there are two points: One is that the exhilaration that comes from the use of alcohol is due to inhibition and the inhibitory effect upon the nerves, or the centers of consciousness; while the really stimulating effects are due to the irritation produced by contact of alcohol with the nerves.

Now, some years ago I made an experiment upon a man, of this sort. I gave him two ounces of brandy in water, tested him with the dynamometer, tested his strength, and found he was able to lift a certain amount. Then I gave him the brandy, then afterwards I tested him again. He felt that he could lift more than he ever did before in his life, and he made a lift immediately, and he seemed to be able to lift a lot more; but when he made the last lift immediately afterwards he thought he could do more than he had before; but half an hour afterwards, when the alcohol had been absorbed, and he was fully under its effect, his ability to lift had depreciated nearly half; so there is no question any longer, I believe,—no chance for question on this point,—that alcohol acts as a stimulant only while its irritating effects last.

Then, any other irritant ought to produce the same results, and it will. Anything which will stimulate the circulation and excite the nerve-centers, will produce the same result. So alcohol is the last thing one should give in shock. It will itself produce shock. And what is true of alcohol in this regard is also true of strychnine. It produces shock instead of curing it. Guire showed that. If you have not studied that up, I hope you will. It is a very important thing. Alcohol has really come to be a discredited drug, and the men standing the highest in the medical profession are at the present time using it less and less and less; and if there are a few who still use it, they are using it more because they are not quite ready to break away from old usage,
and old custom; and because they hesitate to take that step; but they are not able to give any reason for their faith or their practice when they make use of it.

Now, is there any question you want to ask? I sincerely hope that none of you will find yourselves drifting into the habit of using alcohol because it is a handy thing to do, and a thing people like to have you prescribe for them. Alcohol generally makes a person feel better. It is like opium; but it does not make the patient really better. What we want is to make the patient better rather than to make him feel better.

Q. Is the external use of alcohol for the purpose of reducing fever?
A. I am glad that question is asked. Why do we use alcohol rubs? Why do we use alcohol externally? I wish we could get rid of it; I do not like to use it, because it gives a wrong impression. Alcohol applied to the skin is merely for the purpose of cooling the skin, and about the only use I know of that I make of it under any conditions is when you have a patient whose nervous state is such that you do not want to cool him off by a cold application. For example, in the case of a patient suffering from great pain, and you want to make a hot application to relieve that pain and do not want to make a cold application, for it would revive the pain. In such cases you want to cool the skin in some way. The skin is hot, and if you do not cool the skin in some quick way, it will cool slowly by evaporation of the water on the surface of the skin and which is in the skin, and this will chill the patient. His bloodvessels will contract, and the effect which you produce, the derivative effect, by making the blood get out of the skin, is withdrawing it from the internal parts where the congestion exists, in giz which gives rise to the pain,--if you do not do it in that way--cool the skin by some means,--this slow cooling will destroy the effect of the hot application.
Now, by the application of alcohol with we get a rapid cooling off and avoid a severe shock; but we get a rapid cooling from evaporation of the alcohol. If we could get some other thing I would like it very much better. I think it is almost as good, just as good, in fact, if you can cool the skin by a fan, provided you continue to rub the skin; so we have in the bathroom a fan, you know; and after taking a hot bath, the patient goes into that fan; and if he is rubbed vigorously while the skin is being blown upon by the fan, he can get just as good results exactly as by the use of alcohol. I hope we can find something which we can use in place of alcohol, which will obviate the necessity for the use of alcohol entirely. I do not think there is any systemic effect produced by it when used in this way. It might be used in fever without any untoward effects.

Well, I may not see you again before you get through; and I want to express you to you now the hope that every one of you will go out from this place thoroughly rooted and grounded in the principles you have learned here. The world does not need doctors very bad; there are plenty of doctors. What the world needs is better doctors. The world needs progressive doctors, doctors that are up-to-date; and not only that, but the world needs brave doctors—men who have got the courage of their opinions; men who can stand alone. I wish you would read Emerson’s essay on Self-Reliance, every one of you. Don’t live a month before you have done that. You will find some things in it very heretical that I advise you not to follow; he was a heretic of the first water; but, nevertheless, he inculcates the great principle of self-reliance, being yourself, being an individual, standing for something; and if you do that you will command respect; you will accomplish something; but live your own life; do not follow in the drift of conformity, as he says, for conformity is death.
To simply conform to the usages about you means stagnation. Now, it is only
the men who refuse to conform with common usage that have been the instruments
of progress. We would never have had any progress in the world if men had been
conformists. We would have never had any progress in politics, religion or
anything else; we would have been away back in the dark ages, away back in
heathendom if it had not been that there were here and there in every time,
in every age, and in every community men who have had the courage to stand up
for something that is right, something new; to stand up against existing condi-
tions, and against the current, and to stem the tide; and that is what every
one of you ought to be when you go out. That is what Providence has brought
you here for and that is why you have had these opportunities.

The principles of this institution were not discovered here; they
were not discovered by me or by the institution; but the principles that have
been advocated here and represented here,—there was a time when these prin-
ciples were scorned, were hooted at, ridiculed; but that time has been rapidly
passing away. When I took charge of this institution, it was a little two-story
wooden building with twelve patients, and I expected to be the butt of scorn
all my life. I never expected that the thing would ever come into repute in
the world. A friend of mine said that sometime the day would come when this
institution would be known all about the world and all over the world; and when
it would be spread all over this hilltop; and I could not see it, could not
believe such a thing possible. But that time has really come, when these prin-
ciples have come into respect; and are regarded and followed and valued; and
the institution here has no credit or standing at all in the world except for
the fact that it stands for certain principles; and I haven't any standing
in the world except that which grows out of the fact that I am standing for
certain principles; so you see principle is the thing that can help a man to
such
such success as this, and can attain to success,—it is to attach himself to
a truth, to a principle, and work for it. And in any of the communities where
you go, I sincerely hope every one of you,—I am having this few minutes’ talk now
because I may not have another opportunity to say what I am saying now,—I
hope each one of you will go determined to stand for principles which you
know are true. Don’t juggle with truth; don’t say, “Now, it won’t be popular;
I won’t get on so fast; I will lose patronage, and it would not be good policy
for me to declare myself.” You must use sense and tact, of course, but stand
by what you know is right; stand by what you know is true, and work for truth,
and if you work for truth, truth will work for you. That is the thing of it.
If you work for truth to make truth great and hold it up and give it a chance
to work in your life, and to work upon the people about you, it will be making
a way for you, and will make you great, every one of you. You can be wonder-
fully great; the knowledge you have gotten here makes it possible for every one
of you to get into some community where these principles are not known, and
make yourselves just a wonder all the time there. The going of this nurse into
that community down in Texas has awakened that whole community. Those doctors
have all been converted, and they only had just a little taste. Now, when you
go into a community, if you just set yourself out to educate that community—
do what Dr. Baruch did.

Dr. Baruch got hold of these principles all alone away down in West
Virginia. Our Judge Arthur here was well acquainted with Dr. Baruch; they were
boys in the same community, and went to school together, and they were good
friends, and the Judge knew him well. He told me about
his being a poor boy, but he got hold of this hydriatic idea. I didn’t know
anything about him until after his book was published. My book was written
and just going to press when I first saw his book, when it came out. So he
had
had no influence upon my life, and I had no influence upon his; but he was standing all alone, so far as he knew, for that principle; and when he began his country practice down in West Virginia, he used to carry a bathtub around in a wagon. He had a wooden bathtub made, and had a lumber wagon get that bathtub and carry it down and put it into the patient's house, and then he would go and give the patient a bath and show the patient how to do it. He had several of these wooden tubs that he used to cart around in that way, to treat his patients. You see, the value of that truth impressed him, and he laid hold of it and determined to work for it. Dr. Baruch has left a monument behind. He has written a book on hydrotherapy. It was the first book printed in English, in the English language, on hydrotherapy. I thought I was going to have the first book, but he got ahead of me. He had been doing it all these years, and I didn't know anything about it. As soon as I saw what he had been doing, and he saw that I had been doing, we became very good friends. He immediately wrote me a letter, and he said he guessed the old adage was true of him, that the prophet was not without honor save in his own country. I hear from him often, and he has never shown the slightest bit of jealousy because I was doing something. He has shown that he loves truth, that he is interested in hydrotherapy, working for it, just giving his life to it; and he has succeeded in New York, notwithstanding that he adopted these principles. He went at it in a scientific way, you see, and he worked on a high level. He joined the academy of medicine in New York, and for the last twenty-five or thirty years he has been hammering away at those New York doctors to convert them to hydrotherapy. He was telling me at one time of his experience with Dr. Oiler out in a certain medical society when he was advocating the use of water in fevers, Dr. Oiler got up and opposed very vigorously and ridiculed his use of water in typhoid fever. That was less than twenty years ago. Now, you all read Oiler's
books written twenty years ago and you will see he didn't recommend water. But you read his later books, and he says, try this, and try that, and if you don't succeed, then try hydrotherapy. That is his prescription. You know that; but he does not know how to use hydrotherapy; he does not know it practically, because he got to be a consulting doctor before he knew the value of hydrotherapy; so he has had actually no practical experience with it, and he makes some ridiculous prescriptions. Down at Johns Hopkins when I visited the place some time ago, Dr. Hurd, an old friend of mine, who was superintendent there, showed me around, and I said, "Doctor, where is your hydriatic department?" "Oh, we haven't any hydriatic department. We believe that is just a fad that is going out after a little; so we haven't thought it worth while to put it in." Just think of it. He is another doctor that has occupied an administrative position and has not been in active practice. He used to be superintendent of an insane asylum; and if he visited around the insane asylum of this country at the present time, he would find they are all putting in hydrotherapy. There is no insane asylum in the United States at the present time of any account that has not a hydriatic department. Go down to Kalamazoo, and go up into the disturbed ward, and you will find there six bathtubs, and you will probably find a patient in every tub, and they will tell you, this patient has been here three hours, or two hours, or an hour; and you will see the patient in the tub with eyes shut, lying just as quiet, and composed, and they just simply take turns in those tubs; there is somebody in the tub all the time; and instead of using alcohol, instead of using opium and chloral and those other drugs that they used to use to keep these patients still, they are now having a chance for their lives; and as men come to see the value of it, they appreciate it and they adopt it.

Now, the trouble was, twenty-five, 30, 50 and 100 years ago, the peo-
ple recognized the value of hydriatic methods before the profession did. The people were satisfied with the results. The profession wanted to see the scientific reason. They had not seen the scientific reason. Winternitz and other pioneers showed them the scientific reason. In this country, perhaps this little book of mine has helped to show some of them the scientific reason. Fifteen thousand of them, at any rate, have got the book in their offices, and some of them will probably look into it once in a while. I see by the literature now and then that the doctors are getting hold of the facts and the principles that we are trying to make plain to them, and the battle is won so far as physiologic medicine is concerned. Now, it is simply a question of the doctors getting themselves equipped with the necessary knowledge and the necessary appliances to make use of the hydriatic and the other physiologic methods which have been so clearly vindicated in these recent times. And when you go out, don't disgrace yourselves by going back to the old, barbarous methods, even though you saw things practiced in Chicago, and even though your teachers there recommended some things that they would not recommend if they knew something better. Bear that in mind. They would not recommend them if they knew something better. I remember one of our nurses some time ago—there was a doctor recommended in pneumonia strychnia as very necessary in pneumonia to sustain the heart—the patient must have strychnia to sustain the heart. And one of our students had a case of pneumonia, a little child, and the doctor saw the case and recommended strychnia as the only thing that would save the child's life. The student said, "Now, Doctor, let us see what we can do with hydrotherapy." "All right, you can try it if you want to; but the child will die." So the hot packs and cold compresses were given to the child, and the little thing came out so bright and happy the next day the doctor said, "That is doing good; go right along." And having that opportunity, that observation, he doubtless
took note of it, and has unquestionably modified his practice somewhat by that observation.

Now, you have got light that others haven't had, and you have a chance to know and to see things they have not had a chance to know and to see; so, as I said, you have a responsibility on your shoulders, and when you go out remember you are all going to make an effort to expand these principles, to sow the seed of reform wherever you go, and to demonstrate it in your practice. You may be sure the principles will stand by you and back you up, and won't go back on you. If you do your duty; but you must be sure to be thorough.

You haven't studied hydrotherapy half as much as you ought to. I advise you to take Hydrotherapy and begin at the beginning of it, and study every single page of it right straight through, and you will find it one of the most profitable things you ever did in your life. I find it does me good every now and then to read over a few pages, and to rub up on it myself. Hydrotherapy is a big thing, a tremendous big thing; it is the biggest thing in medicine, outside of pathology. Of course, I mean in therapeutics; and there is not a thing that compares with hydrotherapy, not only in the utility of the thing, but I mean in the scientific points that one needs to have in mind, to know, in the real depth and profundity of scientific character--there is not a thing that compares with hydrotherapy. Water is the most versatile remedy that exists, and it touches every single phase of bodily function and of vital activity; it touches every one, and one needs to be thoroughly posted in physiology and hydrotherapy in order to practice medicine. If you are well equipped in those two things, in physiology and hydrotherapy, you can meet almost anything in the way of internal medicine with hope of success. (Applause).

v-6-10-10.
The greatest single step forward movement ever made by a civilized country.

Production increased 25 to 30 per cent in ten years. Double the normal.

The loss of 15% in production puts the country on its back.

This great economic success in spite of the fact that the farmers have suffered, half the coal mines idle, the textile industry in a bad way.

The national income has increased from $66,000,000,000 in 1919 to $89,000,000,000 in 1928.

Prosperity chiefly due to the diversion of money expenditure from drink to goods, homes, etc.

Working men are riding in automobiles; their wives and children are well dressed.

Poverty has almost disappeared.

Universities and institutions of learning overflowing with students.

Saloons gone.

Drunkenness on streets and public places seldom seen.

Consumption of liquor enormously reduced.

Working men spending money on their families.

A manager of a large industry states that before Prohibition, the morning after pay-day always found 50 to 100 women in the office asking for advances because their husbands had spent all their wages the night before for drink, before coming home. Since Prohibition, he had never found more than two.
In one city, a supervisor estimated the saving by working men, due to Prohibition, as over $200,000 a week.

The testimony of 250 college presidents recently, gathered by the W. C. T. U., showed that drinking among students is diminishing.

The wild conduct of young people which followed the war, appears to be lessening.

The failure of enforcement probably not more than 60 to 70% successful, and may never reach more than 80 or 90%. As good as can be expected.

Other laws are even less successfully enforced.

The argument of wets that non-enforcement produces scoff-laws and encourages crime, not sound.

Many laws on the statute books are not enforced at all, such as blue laws.

Trenton blue laws on Sunday observance prohibit music and any kind of amusement on Sunday; forbid a man to kiss his wife.

(Read article prepared for G.H. on "The Medical Use of Alcohol").

Alcohol formerly regarded as a stimulant, a supporting agent, and needed in all cases of shock, fever and pneumonia.
Long before prohibitions this was found to be false.
Alcohol is a narcotic, not a food, never a stimulant.
Its use has been largely abandoned by medical men on
this account.

Formerly the largest item in the budget of London
hospitals. Now an insignificant item.

In this country the use of alcohol has been entirely
abandoned in many leading hospitals such as Crile's hospital,
Cleveland, the hospitals of New Jersey, Wisconsin, Iowa,
Michigan, Kentucky and also many of the leading hospitals of
London, Paris and other European cities.

In Paris hospitals the use of alcoholics of all sorts,
including wine, has fallen off within 40 years to a minute
fraction of its former proportions. The present average is
only 10 drops per day per patient.

Doctors have largely abandoned the use of alcohol for
any purpose.

In states which have no laws against the medicinal use of
alcohol only 43 per cent of the doctors prescribe it.

There are only 15 states in the United States where
alcohol can be prescribed for medicinal purposes.

Some doctors protested against these laws restricting
their use of alcohol, but the Supreme Court, after hearing the
testimony on both sides, sustained the law.

A referendum by the Journal of the American Medical Asso-
ciation showed about an equal number of doctors on each side.

Those who voted in favor of alcohol being necessary
believed it essential in the treatment of pneumonia, in-
fluenza and other infectious diseases and as a supporting agent
in old age, general debility, diabetes, heart failure, shock and convalescence.

These are evidently doctors who are not up to date and are not aware of the fact that for all these uses science has shown alcohol to be not only useless but harmful, and its use for such purposes has been abandoned by progressive up-to-date physicians long before prohibition.

A resolution against its use was passed by the American Medical Association in 1917, two years before prohibition.
London Hospital, the great English author upon foods, the average cup of coffee contains nearly two grains of caffeine—a poison which is capable of producing deadly effects in slightly larger doses.

According to Lehman, seven and one-half grains of caffeine found in four cups of coffee, when given at once to a healthy young man, made him ill for several days. He suffered from palpitation of the heart, intermittent pulse, pain in the head, confusion of mind, delirium, and singing in the ears.

COFFEE AND IDIOSYNCRACY.

Zenetz, an eminent German physician, has called attention to the fact that many people have an idiosyncracy against coffee and cannot take it even in small quantities without great danger. He reports three cases of death from caffeine taken in moderate doses. A young man dies suddenly after taking caffeine equivalent to two cups of coffee three times a day for three days.

Freidenwald, professor of diseases of the stomach, in the College of Physicians and Surgeons, Baltimore, asserts that coffee "in some persons produces nervousness, excitability, and insomnia."

It doubtless does more or less harm to all persons, but persons who are especially susceptible notice the effects immediately, while less susceptible persons suffer later from the cumulative effects. The same authority asserts that "tea retards digestion" and hence "is not a suitable beverage for persons suffering from gastric disturbances." He enumerates among the injurious effects of tea, gastric disorders, cardiac distress, a variety of nervous symptoms such as excitability, sleeplessness and muscular incoordination (unsteady gait).

One-eight grain of caffeine will kill a frog. Five grains will kill a rabbit. Seven and one half grains will kill a cat.
A pound of tea contains enough poison to kill seventy-five rabbits of fifty each.

A POISONED PROFESSOR.

Prof. Buchheim, while a student with the eminent Prof. Lehman more than fifty years ago was made the subject of an experiment with caffeine, then a newly discovered substance. The results afforded the most convincing proof that caffeine is essentially identical with creatin, a poison excreted by the kidneys and found in the urine. In these experiments it was found that ten grains of caffeine (five ordinary cups of coffee) "will produce the most violent excitement of the vascular and nervous systems—palpitation of the heart, extraordinary frequency, irregularity, and often intermission of the pulse, oppression of the chest, pains in the head, confusion of the senses, singing in the ears, scintillations before the eyes, sleeplessness, and delirium."

The daily use of such a powerful drug is in the highest degree detrimental to health, slowly but surely undermining the constitution, producing in the end arteriosclerosis or hardening of the arteries, failure of the heart, cirrhosis of the liver, Bright's disease of the kidneys, abdominal dropsy, general dropsy, nervous prostration, failure of memory, doubtless in some cases insanity and even death.

THE ILL EFFECTS OF COFFEE.

Dr. Gilman Thompson, professor of medicine in Cornell University Medical College of New York City, says, "Coffee should not be given to children as a daily beverage. The feeble bodies of children are very sensitive to poisons." Dr. Thompson asserts also that coffee "should be avoided by dyspeptics." Dr. Thompson asserts that the use of coffee to produce wakefulness at night "soon results in forming a coffee or tea habit"
head-raising, then breathing, leg-raising, breathing, head-raising, etc. The movement should be executed while taking a deep inspiration. This secures the greatest possible increase of intra-abdominal and pelvic cavities.

Position.--- On face lying grasping support above head.

1. Knee flexing. (a) Singly (b) In alternation, (c) together.

Remark. As the feet are raised the hand should grasp the support firmly, and flexion movement of the arm should be executed. That is, a downward pull should be made with the arms. As the feet are lowered push arms down to position, the movement should be repeated; just before the foot saches the table, the leg suddenly returned to a vertical position. This secures vigorous contraction of the lumbar muscles. This same plan should be followed in all the backward leg movements. This movement should be executed in two counts, (1) raising vertical, (2) lowering.

2. Knees flexion, leg backward raising. (a) Singly, (b) in alternation, (c) together.

Remark. The leg should be flexed upon the thigh as completely as possible. An attendant may assist at the end of the movement by pressing the foot down against the thigh. In making the flexion as completely possible the knee should be lifted from the table and the muscles of the back will be brought into vigorous action.

3. Knees 1/2 flexing, leg backward raising. (a) Singly, (b) in alternation, (c) Together.

Remarks. The thighs should be raised backward by forcible contraction of the muscles of the back, lifting the knee from the table. This movement is executed by counting as follows: (1) Knee flexion, (2) high raising, (3) thigh sinking, (4) knee extension.

4. Legs backward raising. (a) Singly, (b) in alternation, (c) Together.

Remark: This is a difficult exercise, and care should be taken to avoid straining the muscles of the back. The patient may at first simply lift the leg free from the table and allow it to return to position.
The effects of wine-drinking upon man are noticed upon his countenance, skin, and manner, giving him the stimulation of mind paralysis of body, etc, according to its quantity and quality, and even grave minded man can scarcely escape from being subjected by some out-of-sense doings.

Such a condition as is led by wine-drinking is called "Intoxication. To this land of "Intoxication" man is introduced by a guide named Alcohol, which is a member of wine, and also is the very one that leads him into already stated misunderstanding that wine is good for health, etc.

This alcohol is the only quality in wine that intoxicates man, therefore our subject, for a while shall be limited to the question, "What is Alcohol?"

Being very strong in the power of combining with water, alcohol can easily dry up material.

To examine this, take a piece of meat and soak it into Alcohol, then it will begin to shrink itself, the longer kept the more it shrinks, until it becomes such as a piece of leather. Again take two or three eggs, off the yoke, add some alcohol into it then the white, clear as it was, will become as that of hard boiled ones.

This last is a proof that alcohol, having absorbed moisture solidified albumen (Albuminous mixtures).

This very characteristic of alcohol is very damaging to blood brain and liver, of those whose albumen is exceedingly rich. Our wonder is slightened, Hyrti, a famous anatomist, through this very fact, was able to discover drunkard's brain from others in darkness.

Tough alcohol itself is made by means of fermentation, it
The Workings of the Prohibition Law in Georgia.

The remarkably eloquent and unusual charge of United States District Judge Speer to the grand jury, reported under the title, In re Charge to Grand Jury, 132 Fed. 736, besides declaring the rule on two unusual points of law connected with the unlawful sale of intoxicating liquors, is also, as far as we are advised, the favor of the absolute prohibition of the liquor traffic, and therefore deserves more than passing notice. Justice Speer said:

"Already, the most astounding benefits have been experienced by the people at large from the prohibition law. Why, even the dumb brutes, who have been subjected to the service of man, would, if they could, thank God for prohibition. The hard driving and neglect of the drunken negro, and the drunken white man as well, have been succeeded by kindliness and attention. The state of Georgia, in twelve months will gain incalculable advantage in the improvement of stock alone, because drunkards no longer handle and drive them. A prominent mill man in Macon, one of our best citizens, assured me that, while heretofore he could not get his men to work before Tuesday or Wednesday after Saturday night debauch, now that whiskey is gone, bright and early Monday morning they are at the engine, the spindle and the loom. Labor, which was almost impossible to obtain through the rural districts, is now plentiful, and the work has just begun. Little more than a year ago I heard experienced contractors complain that many of their laborers would work only a day or two in a week to obtain enough money for support, and the small amount of food consumed and then quit work until the money was gone. The police courts of such great cities as Macon, Augusta and Atlanta, when contrasted with their former methods, have
practically gone out of business. The offenses formerly engaging their attention are now not committed. This will be found true in the superior courts and the county courts throughout the state of Georgia. Where a week or two weeks of the people's time and money were expended upon the criminal docket, it will not bear out my experience if they do not finish in a day or two days. I well remember when I was a young solicitor general that in one county in my circuit the sale of liquor was forbidden. Early Monday morning the tall, stalwart, clear eyed people, cleanly, manly, quiet, temperate, and discreet would gather in the county seat. By the second day we were through with the criminal docket. In an adjoining county, and the same people, often the same families, the sale of liquor was present. The faithful judge was prompt to call the criminal docket at the first moment, but it was usually true, that, with all the energy and dispatch of its officers, at least two weeks were required for its disposition. The looks of the people were different. In one county there was the temperate life, where hope elevates and joy brightens. In the other the countenances of the people were sodden. There was the bleared and bilious eye, the lurid visage, the unshorn jaws, and not unfrequently the unbathed person, which dispelled in the court an odor that in the language of John Wesley on one occasion 'did not smell like balsam.' In a short time after the abolition of the liquor traffic, in the noble city of Athens, I have seen the drunkard reformed and reconsecrated to the duties of manhood, his dingy house repainted, his fences rebuilt, his once pathetic, bare-foot, dirty little children clean, well-clothed, well-shod and well-
fed, with bright eyes hastening to school, and the wife, whose once worn and wasted features, in the happiness and pride of his resurrection, had regained the loveliness and charm of youth.

"I have not discussed the moral phases of this great question, but merely those which seem to be legal and political. If the laws which the people of our state have enacted are enforced, the chief happiness to inure to those we love is the consciousness that henceforth, if we expel the demon of the still from our borders, confidence and peace will re-assume their place in happy homes among those dear objects of our love, dearer to us than are the ruddy drops that visit our hearts." Once there was within my own memory no such thing in all the borders of this Southland as that unspeakable crime, the bare mention of which will stir a fever in the blood of age, and make the infant's sinews strong as steel. It will disappear from our civilization when the brain of the docile African, even of the lowest order, is no longer infuriated and rendered careless or desperate of consequences by the drink he absorbs. In his furtive wanderings on the lonely roads, or in his solitary lair in the forest, the poisonous cardiac stimulant drives the blood of the savage in swift pulsations to his compressed or maddened brain, and then—no matter how desperate the chance or certain of detection—the crime is committed. This it is which has ranked the people of Georgia, save perhaps in one or two great cosmopolitan cities, in the serried ranks of those who have determined that the sale and furnishing of liquor shall stop within our borders. The politicians did not do it. They framed a platform for local option. The representatives of the people stamped
the planks of this platform into nothingness. It is a resolution, and it will not stop with the South. Even now the senior senator of this state has invoked the powerful aid of Congress to fulfill the purpose of this people. Lives will become irremediable by its presence. Gentle woman reassumes her rightful station as regnant queen. The prayers of good men in great cities, amid the dim religious light of great churches are heard that it may prosper. And in country churches, in the shade of gigantic oaks, or amid the sighing pines, the prayers and the song worship of the simple, earnest servants of the old-time religion, as they roll away amid the aisles of the forest, are a thank-offering of a long suffering and a sorely troubled people that strong drink has been forever banished from our state."

It is strange when one comes to consider it, how liberal is the attitude of public prosecutors, as a general rule, to their enforcement. The Supreme Court of the United States in ExParte Christensen has declared the saloonan outlaw, and outside the pale of constitutional protection, so far as the right to do business is concerned, and yet the sentiment in certain cities and localities is so strong in its favor, as to virtually nullify the enforcement of all laws attempting to repress, or even to regulate, this peculiar traffic. It is not so with any other law, will it ever be thus with our laws regulating the sale of intoxicating liquors?
Qualified for "Ananias Club."

The following extract from the Miles Daily Star of the 14th inst. indicates an utter disregard of fairness and truth and shows a degree of mendacity that could not possibly have come from any other source than from the camp of the boozers and boozt boosters:

"Today, at Paw Paw, the I. Cummings dry goods store closed for invoice, and later the goods will be sold out at a sacrifice. This was one of the finest stores in Van Buren County, doing a lucrative business, but since local option took effect business of all kinds has waned to such an extent in Paw Paw, and in fact throughout the entire county, that dealers must necessarily, on account of patronage going elsewhere, resort to some means to save their properties from total loss."

Any person who would give currency to such falsehood—mingled with so small a grain of truth, is certainly an "undesirable citizen," and should hasten to ally himself with the nearest accessible branch of the noted "Ananias Club."

It is true that the Cummings store was closed for invoice; that the goods are being sold at administrator's sale: that Mr. Cummings had one of the finest stores in Van Buren County, and that he was doing a lucrative business, but these statements were made by the Star paragraphist only as ornamentation to the plain, unvarnished lie that follows, the circulation of which was the sole purpose to be served by the publication of the above quotation in the columns of the Star.

"Mr. Cummings had resided in Paw Paw from the days of his boyhood until his death, and, by his untiring industry, rugged honesty and business ability, had won the admiration
and respect of his fellow citizens and had succeeded in
building up a lucrative, successful and prosprous business,
never more prosperous than during the years of local option,
as appears from the personal statement of Mrs. Cumings,
published herewith. Mrs. Cumings was always closely associated
with her husband in his business matters and speaks from
actual knowledge and experience.

Any statement that by reason of the operation of
the local option law, or from any other cause, any legitimate
business has "waned" in Paw Paw or in Van Buren County, is
utterly false; a libel and a slander upon the good citizens
of one of the best and most prosperous counties in Michigan.
The only business that has "waned" is the business of the
sale of booze, the manufacture of drunks and the ruin of
homes. This business has indeed "waned" practically waned out
of existence.

Van Buren County has been under the local option
regime for nearly two decades and they have been her most
prosperous years. More public improvements have been made in
those years than in all the previous years of her history;
more real estate has changed hands, and at better prices than
in any like period of time since the county was organized;
more substantial progress has been made by both towns and
country than ever before.

The following statement, drawn up by Mr. Cumings him-
self, a few months before his death, and which was signed by
nearly every business man in Paw Paw, and endorsed over their
own signatures by practically all the county officials, and
which could be easily duplicated in any town in the county,
shows not only Mr. Cumings' own view of the law, which, accord-
ing to the Star, was ruining his business and the business of
his fellow merchants, but also the views of his business associates and of others whose opportunity of understanding the operation of the law and its results are of the very best.

LOCAL OPTION A SUCCESS.--So affirm the following residents and business men of Paw Paw, Michigan, whose aggregate business amounts to over half a million dollars yearly. A success because it brings and upholds business. It has made Van Buren County the banner county of the state in wealth, in morals, in intelligence and christianity. In Paw Paw alone, it has given Michigan one of the brightest, best towns in the state; best in which to bring up families; the best of schools and churches; with miles of fine highways leading into town from all directions, and with its up-to-date and modern improvements it is second to no town of its size in the entire state. We should regard it nothing short of a public calamity be forced to return to the era of the open saloon. You will make no mistake to push your campaign for sobriety and good government. Pass this along to other counties engaged in the fight."

STATEMENT OF MRS. CUMINGS.

I desire to state that the business of my late husband was successful and prosperous up to the time of his death and that it never was so prosperous as it was under the local option regime. Our stock of goods is not being closed out at administrator's sale because of any lack of patronage or prosperity, but solely because of my desire to close it out and retire from the labor and care of its successful conduct, a task that I feel that I ought not to undertake, and preferring to retire from trade and relieve myself from the labors and anxieties that are inseparable from the management of a mercantile establishment like the one left in my charge by
my husband. Any statement to the effect that the stock is being closed out by reason of lack of patronage is wholly outside the domain of truth and is made without regard to the facts of the matter. Mr. Cunings was an ardent supporter of the local option law from the time of its first adoption and regarded, it was not as a hindrance, but as an advantage, not only to his own trade, but to business in general.

Mrs. I. Jay Cunings.
ALCOHOL COMPARED WITH FLORIDA SUNSHINE

Address Prepared by Dr. Kellogg for the Anti-Saloon League Convention

Alcohol is the very reverse of sunshine; it is midnight darkness of the densest sort. For centuries its votaries have proclaimed alcohol as an illuminator, a lightener of burdens, a dissipator of gloom, a real joy maker, a rejuvenator and a stimulant of marvelous potency; and I am sorry to say medical men more than any others have been responsible for these false ideas. But modern scientific research has shown that all these claims are absolutely false. They are, in fact, the very opposite of the truth. Alcohol is not a stimulant; it is a depressant. It is not a food; it is a poison, the excretory product of a fungus plant. Instead of strengthening, it paralyzes. Instead of enlivening, it sows the seeds of death, degeneration and decay. It is the god of poverty, the demon of despair, the enemy of decency and health, a riotous disturber of society, a generator of crime and one of the greatest of all obstacles to human progress.

Another point which I wish to emphasize is the fact that the moonshine which flooded Florida in boom days and the years immediately following is still here notwithstanding the claims of the anti-prohibitionists that repeal of the prohibition amendment would wipe it out. We hear little nowadays about moonshine because there is no occasion for concealment. Beer, whisky, rum and other intoxicating liquors are flaunted in the face of the public on every corner, in every public house, in the newspapers and magazines and on billboards and wherever they can be displayed. Beer soaked politicians wax jubilant as they total up the tax income from whisky and beer, neglecting to mention the enormous economic losses resulting from direct expenditures of cash for a worthless and harmful thing; and the blunders made by minds flabbergasted by the devil's broth concocted in breweries and the soul and body destroying whisky and gin poured out in an
ever increasing stream from hundreds of distilleries.

How different is the work of this destroyer of men, soul and body, this debaser of women, this Moloch of childhood which brings into the world every year thousands of infants stamped with inferiority of even imbecility,—how utterly different in its character and influence is the sunshine, which rarely even for a day fails to spread its effulgent rays over the broad acres of this glorious region. Sunshine is the greatest source of life and health and energy known to science. The energy of the sunlight that falls upon the State of Florida every day, if it could all be utilized, would run all the machinery in the United States for a hundred years. The green leaf is a cunning trap which catches the sunshine and converts it into dollars in the shape of oranges, green vegetables, luscious papayas, things that the rest of the world are hankering for and must have. Your wonderful sunshine is creating wealth for you every minute and it is inexhaustible. Phosphate mines and coal mines get dug out and gas and oil wells run dry. But your sunshine will go on forever. All you have to do is to plant the seed to create the green fields to capture it.

But alcohol, instead of making money, wasted money; instead of creating, it destroys. It is a veritable demon of destruction. It destroys life, property, intellect, happiness and peace. It has made more widows and orphans than any other drug.

Sunshine creates, alcohol destroys. It is a consuming fire, a bottomless pit of waste and destruction.

Sunshine creates food and comfort. The chlorophyll of the green leaf converts sunshine into delicious fruits and nutritious vegetables which the millions of people in the frozen North are hungering for. Every fruit and every vegetable is simply sunshine in cold storage.

But alcohol is a poison, a very repulsive, delusive and dangerous drug. As a matter of fact, it is an excrement. The yeast plant which pro-
duces it is a member of the fungus family, a class of plants which in several respects resemble animals. Like animals, fungi excrete poisonous substances, and the alcohol which men so highly prize and seek so persistently is an excrementitious substance. It is thrown off by the plant as a useless poisonous excretory waste. One experiences unpleasant qualms at the thought of the Chinaman's bird nest soup, but beer and wine, cocktails, punch and toddies are in the same class. They are excrement, as far removed from food as possible.

And sunshine cures disease. I have seen veritable miracles of healing wrought by sunshine. In one case the whole abdomen was filled with tubercles. A poor girl was suffering agonies and nearly dead. As a last resort an operation was performed to relieve a terrible dropsical distension, but the condition found was apparently hopeless. It seemed certain that a visit from the undertaker would occur within a day or two. Although the case appeared to be practically hopeless, it seemed worth while to make one more effort. She was placed in the sunshine for half an hour and each day a little longer. At the end of a week she was still alive and a little better. In three months she was able to return to her home and a few months later she was teaching school, and today, after ten years, she is a rosy cheeked, handsome young woman enjoying excellent health without a trace of her old malady.

Now, what could alcohol have done in such a case? Alcohol never cured anything. It is not a healing agent. At best it is merely a narcotic which may relieve pain by numbing the nerves like an anesthetic, but does nothing to help nature in the cure of diseases. It hinders instead of helping. I have been practicing medicine for more than 60 years and have never found it necessary to prescribe one dose of wine or whisky.

But what a real stimulant the sunshine is. When the winter shows are gone the fields are all brown, not a green blade in sight. The warm sun's rays smite upon the brown earth for a day or two and a carpet of green springs up spreading out over millions and millions of square miles. In the
words of the poet Lowell:

"Every blade feels a stir of
night,
Something within it that reaches
and towers,
And groping blindly above for
the light
Climbs to a soul in the grass and
the flowers."

Now, how about alcohol? It was once thought to be a stimulant. Some people still talk about alcohol as a stimulant, but science long ago declared it to be a narcotic. It has no stimulation properties whatever; it is a depressing agent. It is a deceiver. A man feels weak and he takes alcohol and he imagines he is stronger; but when science tests him with a dynamometer, he is not stronger but weaker.

A man feels cold, he takes a toddy and thinks he is warm; but he is not warmer, he is actually colder. The thermometer shows that his temperature is lower. Alcohol brings the blood to the surface so that the body loses heat more rapidly than before.

A poor man spends his last dollar for drink and has a glorious delusion of wealth when he is actually penniless. Alcohol is a nerve fooler and a fakir.

Sunshine prevents disease if we open our doors and windows and let it in.

Alcohol causes disease. A study of statistics in Sweden showed that 25 per cent of cases of apoplexy and hardening of the arteries must be charged to alcohol. Reports from State Lunatic asylums show that more than 25 per cent of the wretched inmates of those institutions were sent there by alcohol. And it is so-called "good" alcohol that does the mischief. Alcohol belongs to a bad family. There are half a dozen members and they are all bad, some a little worse than others, but not one good citizen among them.
The notion some people have that whisky is all right if it is only good Scotch is a snare and a delusion. It is good whisky that is responsible for the terrible burdens which intemperance has laid upon the world. The little extra harm that denatured whisky, and so-called bad whisky, does, is not a drop in a bucket to the woe which "good whisky" pours into human society.

Florida sunshine is a marvelous rejuvenator. I can hardly venture out upon one of your streets without meeting some old patient, often an elderly person, who has come down here to Florida and in a few months here or a few years has become so transformed as to be scarcely recognizable. I met a lady who was my patient twelve years ago and was then so wrinkled and haggard and wizened and prematurely old that when I met her here, a plump, rosy cheeked, handsome woman, I did not recognize her and could discover little resemblance to my old patient. When I asked her what had wrought the miracle, she answered, "Two years in Florida sunshine."

Did whisky ever do that sort of thing for anybody? Never. But millions of times it has done the very opposite. Alcohol is a regular recruiting agent for Old Father Time. A habitual drinker is older at 40 years than he ought to be at 75. Insurance statistics show the mortality of moderate drinkers to be 40 per cent greater than that of abstainers.

But you say, "What about these men who come down from the North with big purses and big paunches and whisky bottles in their hip pockets? Are not they proof that alcohol is harmless?" Sam Jones, a great revivialist, answered that question when an old fellow stood up in one of his meetings in Kansas City when he had been telling some damaging facts about alcohol and said, "Mr. Jones, look at me. I have been smoking ever since I was 10 and drinking whisky ever since I was 14 and now I am 84 and a sturdy man yet. What can you say to that?"

Mr. Jones replied, "All that means is that you are uncommon tough, and if you had not smoked tobacco and drank whisky they would have had to kill
you with an axe on Judgment Day."

For every one of these extraordinarily hardy men who have stood up for years and years in spite of tobacco, alcohol and other unwholesome things a thousand younger men who have tumbled into premature graves while following their bad example.

No man who desires to enjoy the use of his faculties, physical, mental and moral, to their full capacity can afford to use alcohol in any dose. There is no such things as moderate drinking. Since alcohol is a poison, all use of it is immoderate. The difference between a food and a poison is that a food is wholesome in ordinary doses and only harmful in immoderate doses, whereas a poison is harmful in all doses.

Some forty years ago, the writer demonstrated by means of the chronometer of Verdin and other delicate measuring instruments, that alcohol, even in small doses, depresses all the nerve functions concerned in the sense of touch and sight. The reaction time was notably lessened, even by very small doses. The lifting power of the moseles was also reduced nearly twenty-five per cent by a dose of whisky. The maximum effect was noted at the end of one or two hours.

F. C. Benedict, of the Carnegie Nutrition Laboratory of Boston, published the results of elaborate studies of the effects of alcohol by means of the most delicate psychologic tests, conducted by himself and his colleagues, concerning which he says: "It will doubtless be considered of enormous practical significance that in none of the data have we any indication of the pure facilitation of the motor processes, but depression... seems to be one of the most characteristic effects of alcohol... The general neuro-muscular depression may be regarded as presumptive evidence of the effect of alcohol on organism efficiency." In other words, Dr. Benedict finds unmistakable evidence that alcohol is first, last, and all the time, a depressing drug, a poison which strikes at the organic processes, the very foundations of life.

Smith found that moderate amounts of alcohol daily (one to three
ounces) for twelve days, diminish the power to memorize seventy per cent. Smith concluded that half a bottle of wine or two to four glasses of beer a day not only counteract the beneficial effects of "practice" in any given occupation, but also depress every form of intellectual activity, that every man, who, according to his own notions, is only a moderate drinker, places himself by his indulgence on a lower intellectual level and opposes the full and complete utilization of his intellectual powers.

Nervous impressions travel over nerves in a healthy person at the rate of ninety-one feet per second; but under the influence of alcohol the rate of transmission may be as low as thirteen feet per second. That is, under the influence of alcohol, seven times as long may be required to hear, feel, taste or to receive an impression of any sort, as by a normal person. Such a man called upon in an emergency would require at least seven times as long to make up his mind what he ought to do as a healthy person requires, and when large doses of alcohol are administered, the effects are still more pronounced.

Smiedeberg, more than thirty years ago, pointed out the fact that under the influence of alcohol "the finer degrees of observation, judgment and reflection disappear," and that all the affects produced by alcohol are really those of a sedative or paralyzing agent. Benedict has shown that the depressant toxic effects of alcohol are produced by ordinary beverage doses, and that not alone the higher faculties are affected, but the automatic reflexes, including those which control the circulation and other vital functions. Indeed, the carefully conducted researches of Benedict and Wells showed that the reflexes are much more sensitive to the effects of alcohol than the higher faculties, and are the first to show its influence.

When a person suffers from typhoid fever, smallpox or any other infectious disease, if he recovers it is because the body gradually acquired the power to destroy the infecting germs and thus establishes immunity whereby it conquers its germ assailants and reestablishes health. In view of this fact
it is no wonder that the method of treating typhoid by frequent doses of whisky was followed by a mortality rate of 25 to 30 per cent, whereas at the present time since fever patients are no longer kept in a state of intoxication, the death rate has been reduced to a level less than half as high.

I think the majority of practicing physicians at the present time rarely prescribe alcohol in any form. The mystic spell by which this subtle drug has held the race in bondage has been broken by laboratory researches which have demonstrated the folly of administering alcohol in any form or in any dose in cases of shock, collapse, fainting, heart failure, weaknesses, depression, or in cases in which quickened vital activity is desired. Alcohol is a thoroughly discredited drug, and only awaits the wide diffusion of the established facts concerning its baneful and deceptive effects to lead to its complete retirement to the limbo of discarded drugs. It is highly important that this fact should be spread as widely as possible. Preachers should proclaim it from the pulpits and our public schools and our Sunday schools should make it known to the rising generation.

Scientific research has stripped the deceptive drug of every one of its supposed virtues, and it stands exposed as the most delusive, treacherous and pernicious agent that has ever been widely trusted by mankind. The popular faith in its healing power, in its value as an emergency aid, must be uprooted by education.
THE EVII EFFECTS OF ALCOHOL.

1. Alcohol is a Chemical Agent.
2. Alcohol Comes of a Bad Family.
3. Alcohol is a Poison to Plants.
4. Alcohol is a Poison to all Animals.
5. Alcohol is a Poison to Human Beings.
6. Alcohol is a Narcotic.
7. Alcohol Not a Food.
   a. Lager-Beer Not a Food.
   b. Water is the only drink.
8. Alcohol Degeneration.
9. The Drunkard's Brain.
10. The Drunkard's Tomach.
    a. Stomach of a Moderate Drinker.
    b. Stomach of a Hard Drinker.
    c. The Tomach in Delirium Tremens.
11. Drunkard's Dyspepsia.
    a. Effects of Alcohol upon Digestion.
    b. The common use of alcohol as an aid to digestion.
    c. Examined in the light of scientific facts.
    d. The digestion of albumin in the presence of even a very small amount of alcohol was retarded to a very marked degree.
    e. An after-dinner aid to digestion.
12. Alcoholic Insanity.
13. A Drunkard's Liver.
15. Alcohol vs. Strength.
17. Alcohol vs. Longevity.
18. Alcohol not a Stimulant.
19. Effects of Moderate Drinking.
20. Alcoholic Heredity.
22. Moderate Drinking.
   a. The use of alcohol in small quantities leads to its use in larger quantities.
   b. Many of the worst effects of the use of alcohol are to be seen in moderate drinkers.
   c. "Bitters."
   d. Alcohol in Cookery.
   e. Alcoholic Candies.
   f. The only safe rule for a person who desires to lead a temperate life is to avoid everything which contains alcohol in any form.
   g. Absinth.

HOW TO REFORM.

1. Resolve to stop and to stop at once.
2. The individual should be placed under circumstances which will protect him so far as possible from temptation.
3. Great care should be exercised respecting diet.
4. The inebriate suffers most of all from weakness of will power and loss of resolution and decision of character.
(Ed.G.H.)

ALCOHOL A WET OVERCOAT.

Somebody has suggested that alcohol may be aptly compared to a wet overcoat. An overcoat is useful when dry, although its extra weight may under some circumstances prove a burden, but a wet overcoat is not only a heavy burden to carry, but when wet it is a good conductor of heat and hence cools the body instead of keeping it warm. The cooling process is also increased by evaporation, so that it ceases to be of value as a protection. Alcohol has the reputation of being a stimulant or strengthening agent, but practical experience has abundantly proven the fallacy of this view. Alcohol not only does not strengthen the vital forces or in any way facilitate vital work, but on the contrary it exhausts the energies of the body while adding a burden to the liver, kidneys, and other eliminative organs grievous to bear. It is truly a wet overcoat.
Dr. Kent, in an able paper, read at the Annual Debate of the North Carolina Medical Association, expressed a very decided opinion against the almost universal employment of alcohol as a stimulant to the digestion, a Cardiac Tonic & a Sustainer of the Vital Energy, in the following sentences: "I began the practice of Medicine with the popular belief that we all lose forums of disease. Alcohol was the all-safe, all-potent & only Stimulant to be used. Experience
Has taught me a different lesson, & the more experience I have, the stronger my convictions grow that this too-general & too-excessive use of Alcohol as a stimulant is erroneous. With our improved therapeutics, Alcohol is pretty losing ground as a medical agent.

For a long time Alcohol has been & even at the present time is, the only stimulant administered by the general practitioners. Notwithstanding its pernicious effects, if there be heart failure, he gives Alcohol; in profound coma, Alcohol; in Chloroform narcosis, Alcohol; in febrile agitation, Alcohol; in flagging nerve force, Alcohol; in debilitated constitution, Alcohol; in dyspeptic complaints, Alcohol; in...
From post-partum hemorrhage, Alcohol; during the crisis of consumption, Alcohol; in the exhaustion of Typhoid Fever, Alcohol; in every great critical condition, where the patient is vibrating between life & death, alcohol is the first & only thought.

Not content with the abysm reckless use of a bad agent, he must needs foretell all these expected evils by the early use of Alcoholic Stimulants in almost every case of sickness.

It is in Typhoid Fever that Alcohol is, perhaps, most used & it is for that reason it is here that it likewise does its greatest amount of harm.
While it is claimed that alcohol stimulates the function of digestion, the quantity usually employed in fevers materially interferes with, or entirely arrests, the digestion by precipitating the peptic, the natural ferment of the gastric juice. Strength can only be supported by food, and this excess is ruled by alcohol. Alcoholic depletes the patient of this all-important support, without which he cannot long be sustained. Moreover, alcohol flushes the capillaries of the stomach just as it does those of the skin. Where there is already a congestion of the mucous membrane of the stomach, it takes but little to light up the fire of acute inflammation.
Many patients, who are making a feeble, yet hopeful, struggle for life, are thus deprived of natural food. As they grow weaker, this mistaken conservator of strength is still pushed in quantity and frequency, until gastritis is added to more severely than the already failing vitality. One of the commonest and most dangerous uses of alcohol as a stimulant is during hemorrhage. It is customary when hemorrhage occurs, to administer, whether or brandy, under the false idea of supporting the vital powers. In every form of hemorrhage, alcohol only increases the danger, by increasing the hemorrhage.
The same true increases the force and frequency of the heart's action. Alcohol destroys the contractile power of the middle muscular coat of the arteries, preventing this natural means of arresting the flow from the dilated vessels, and also by increasing the heart's action and a greater and more rapidly flowing volume of blood to the dilated vessels. Then, thus washing out and preventing the formation of a clot, the most effective possible check upon the flow.

In typhoid fever, when the arterial walls are weakened at certain points by ulceration, their contractile power lost, admitting of over-distension, the arterial resistance to the force of the heart's action lost, allowing the entire force of the volume
Blood sent from the heart to be exerted upon the weakened points, rupture of hemorrhage must. Of necessity he more liable to happen. Alcoholics being in such general use in typhoid fever, who can say how many cases of hemorrhage may or may not be due to alcohol alone?

We are certain of the fact that where hemorrhages are likely to occur, the use of alcohol increases that liability.
POISONING BY WOOD ALCOHOL

Drs. Builer and Wood have contributed to the Journal of the American Medical Association an article giving an account of 89 cases of blindness due to wood alcohol. Ten of these cases were due to the absorption of the fumes of alcohol. Two hundred and seventy-five cases of blindness of this sort have been reported, and one hundred and twenty-two—nearly half—proved fatal.

Wood alcohol is sold at the present time under various names, of which the following are a few:--

Columbian Spirits
Eagle Spirits
Colonial Spirits
Union Spirits
Deodorized Spirits

Most liniments, extracts, essences, etc., contain more or less of this poisonous wood alcohol, and even some bitters and other proprietary medicines have been adulterated in this way. The use of wood alcohol in bath cabinets, in the form of linaments, or any sort of application to the skin, in cleaning woodwork, brass, etc., is highly dangerous. The poisonous symptoms do not always appear at once. They are often delayed for several days. Some persons are much more sensitive to this poison than others. A few persons seem to be immune against this poison.

The writers above named, who have made a careful
BRITISH SURVEY REVEALS PARASITE OF DISEASE

London, Dec. 6 (AP)-- The Westmoreland field commission for cancer research has brought forward evidence to show that cancer is caused by a specific germ attacking animals and human beings indiscriminately.

The commission's preliminary report published in the British Medical Journal contains many remarkable statements about the distribution and prevalence of the disease among animals.

Dr. Louis Sambon, who supervised the investigation, believes "cancer is caused by the activities of a most minute endocellular parasite strictly adapted to its specific host. As in tuberculosis so in cancerosis, the specific germ appears to be universally prevalent and of wide zoological distribution."

The report refers to the fact that certain villages in Westmoreland county are totally free from cancer while others suffer heavily. This variation is true even of streets and single houses in the same community.

The most striking discovery of the commission is the great prevalence of all types of malignant neoplasms in animals.

"We met cancer in all kinds of wild and domestic animals, pet animals and animals used for foods," the report says.

One memorable example recalled was that of a Russian border village stricken with plague. Russian artillerymen were sent to destroy all the inhabitants in order to stop the spread of the disease. The people were sacrificed but as nobody bothered about the rats, the disease soon spread through the district like wildfire.

PROHIBITION

The production of the country has increased within ten years by between 25 and 30 per cent instead of at the normal rate of about 15 per cent. We have had a clear gain of about 15 per cent. The margin between "bad times" and "good times" is rarely as much as 15 per cent; when in the past we went down 15 per cent, we were flat on our backs and the bread lines were everywhere.

In ten years we have not only increased by more than the margin between good and bad times but have added another 15 per cent. It is in this extra percentage that we find the cause of our abundant prosperity.

The one great and fundamental change that has taken place in this country during the past ten years has been the coming into force of the Prohibition Amendment.

It is a great economic experiment in changing the direction of the spending of money.

Prohibition is an economic success.

It is absurd to trace any of our prosperity to the war; one does not gain wealth by squandering it.

The farmers have, most of the time, been in straightened circumstances.

Coal-mining industry and textiles have been in a bad way much of the period.
There is a keen desire to work.

The outstanding fact of Prohibition is that, by diverting expenditures from drink, it has made the country prosperous.

During the last ten years, the United States has become infinitely the richest country that the world has ever known. We everywhere regard poverty as an abnormal condition.

Mr. Edison thinks "we have about a 60 per cent enforcement. We can never expect a 100 per cent enforcement of the Prohibition or any other law.

"If we get an 80 per cent enforcement, no country anywhere can compete with us in anything. We are steadily developing to a point where drinking will not fit into any of our programs in or out of the shops."

The total income of the nation for 1919, as found by the President's committee, stood at not quite $50,000,000,000. It dropped to $33,000,000,000 in 1921. For 1928, it was put at $29,000,000,000

Money diverted from drink to goods can be counted as new money.

Professor Feldman, of Dartmouth, the only man in the country who has made a real study of the economic effects of Prohibition.

Absolute unanimity of opinion that wage earners are spending more on their families than ever they did.

Increased savings accounts.
There are fewer cases of distress among employees reported from time to time.

Men either own or are paying on homes, own automobiles and many other present-day conveniences.

Families are saving more and they are buying things they could never afford before.

The chief executive of a company said that before Prohibition it was usual to have from fifty to one hundred women in the office on the morning after pay day asking for advances because their husbands had spent all their money in the saloon before coming home. In the past three years, he has had exactly two such applications.

A supervisor in one of the larger cities estimated that $200,000 a week was now being taken home that formerly went into saloons.

Testimonies of different firms were given showing that their workmen were spending less money for drink than before Prohibition.
The saloon is the reputed headquarters of intemperance. It is certainly a stronghold of this gigantic corpse, but the real fountain-head of drunkenness is to be found in the home. Here are found and developed those unnatural appetites, those perverted instincts, which later in life lead to the use of alcohol as certainly an cause leads to effect.

Alcohol is the devil's substitute for obedience to the divine laws of health. Fatigue, weariness, is the voice of the Creator, saying, Rest, rest and recuperate. Alcohol says, You need not rest; drink and be refreshed.

Alcohol is the universal comforter. Sorrow, disappointment, pain, care, worry, anxiety, nervousness, -- a host of neurasthenic sensations and distresses are all relieved, may even be abolished, by a glass or two of wine or a few teaspoonfuls of brandy. No other drug is capable of causing so sudden and so complete a translation from absolute misery to perfect comfort. This fact is the charm by which the serpent lures its victims.

All erroneous habits of life which lead to morbid conditions of brain and nerves, open doors to the drink demon. For example, meat eating produces high blood-pressure; alcohol lowers blood-pressure. Meat produces gastric discomfort by producing hyperacidity of the stomach and irritation of the stomach, and an all-gone sensation. Alcohol at once completely relieves this unpleasant sensation. A meat diet, filling the body with toxic substances from the flesh of other animals, introduces an unnatural state, a feeling of fatigue, a sensation of weariness, exhaustion, weakness. Alcohol immediately relieves this by paralyzing the nerves of fatigue, so that the man, although he is just as weak as before, is not aware of the fact. He feels strong when he is not strong. Alcohol relieves a great variety of neurasthenic symptoms. Meat eating produces these symptoms which are at once relieved by alcohol. Alcohol is such a pleasant remedy, can be so easily taken that one very
quickly learns to resort to its use. Meat eating is one of the causes of insomnia, as it produces an abnormal irritation of the nerve centers; so the man who is tired out at night can not go to sleep. He is suffering from autointoxication. Alcohol relieves him.

The suppression of inebriety in the community and in the individual requires first of all a return to natural conditions in nutrition and habits of life. Inebriety is only one of the consequences of the departure of the race from the normal conditions of life. It is not altogether a cause of these degenerate conditions; it is a cause, but it also is in large measure a result. The work for temperance reform is not simply to abolish an evil custom; it is not simply to correct a vice; it is to save the race.

The people of the 20th century are carrying about with them the burdens of all the follies of the preceding centuries. Dr. Oliver Wendell Holmes says every man is an omnibus in which ride all his ancestors. Society is an omnibus, the race is an omnibus, and we have in it all our ancestors and all their follies. We can not get any of the drunkards out of the omnibus. The only thing we can do is to keep the new drunkards from coming in, and to suppress the hereditary drunkards which are coming along the line. Before we can get the inebriate out of society, we must cease to cultivate the alcohol habit; we must cut the strings which lead from the dinner table to the saloon; we must dry up the springs of inebriety which are found in every kitchen; we must weed out the inebriate-producing habits which our degenerate civilization has fostered; we must exterminate the roots as well as the branches and the trunk of this upas tree of human life,—the foe of religion, the enemy of society, the robber of the home, the assassin of the race.
The Fountain Head of Intemperance

The saloon is the reputed head-quarters of intemperance. It is certainly a strong hold of this gigantic curse, but there is the tap root of the tree deeper yet than the saloon. The chief real fountain head of drunkenness is to be found in the home. Here are pruned and developed those innate perverted instincts, unnatural appetites, which later in life lead to the use of liquors as certainly as cause leads to effect.
Theobal is the devil's substitute for obedience to the laws of health. Fatigue, weakness, is the voice of the Creator, saying, Rest, rest and recuperate. Alcohol says, you must not rest, drink and be refreshed.

Alcohol is the universal comforter. Sorrow, disappointment, pain, care, worry, anxiety, nervousness, a host of nervous and physical distresses are all relieved, all abolished or may even be abolished by a glass or two of wine. But a few teaspoonfuls of brandy, no other
drug is capable of complete recovery.

In any case, the after effects of the drink are remarks of brain and mind. The brain is the proper nurse of the drink.

The proper nurse is the drink. A brain without a drink is remark of the brain.

The brain is the proper nurse of the drink. The brain is the proper nurse of the drink.

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ALCOHOL IN THE NUTRITION OF DIABETICS.

Some recent investigations by Benedict and Torak, reported in the Zeitschrift fur klinische Medizin, Vol. 60, Nos. 3 and 4, seemed to show that in diabetics this is a fact, although control experiments in nondiabetic patients were by no means conclusive. Alcohol was then employed as a substitute for the fat and the result was most favorable. The writers found that alcohol will bring about a marked diminution in the amount of acetone and also reduce the quantity of sugar, while at the same time it supports the nutrition. The administration of alcohol is particularly indicated in the severe cases in which it is the aim to render the patient as free from glycosuria as possible. For with an exclusive meat diet the danger of acetonuria and coma is always present, and it is therefore most desirable with to replace some of the fat with alcohol. The amount of alcohol depends on the severity of the individual case; from one-half to one liter of light wine may be administered with impunity daily for prolonged periods. The exciting or depressing properties of alcohol seem to be less marked in xalurexa diabetics than in others, which reminds one of the tolerance displayed by diabetics to opium. In order to avoid abuse of the alcohol it is well to regard the latter as a medicine and to administer it as such rather than as an article of diet.

There are of course self-evident contraindications against the employment of alcohol in diabetes. Among these are albuminuria, especially when this is increased during the administration, neuritis, arteriosclerosis, as well as diabetes in children where dietetic precautions are also often without effect.---Medical Record. February 23, 1907.
THE TRUTH ABOUT ALCOHOL AS A MEDICINE.

The eminent English physician, Sir Thomas Barlow, Bart. M.D., of London, England, in commenting upon the great change which has taken place in the opinions of the medical profession in relation to the necessity of alcohol as a remedy, remarks that fifty years ago, when the Temperance Life Insurance Society of England was formed, some of the men who constituted the first Board of Directors had actually been refused insurance by other Companies because they were total abstainers; and when the Temperance Hospital of London was founded thirty years ago threats were made that if any deaths occurred in the institution in cases in which alcohol had not been administered, a coroner's inquest would be demanded. This occurred when the medical profession was still under the spell of the teaching of the famous Dr. Todd, whose sole prescription in a grave fever case was "more brandy." But there have always been great men in the profession who have not endorsed the use of alcohol as practiced by the medical profession in general.

 Jenner, the discoverer of vaccination, and Cullen, one of the greatest of modern English physicians, never endorsed the teaching of Todd, although in this country the late Dr. Austin Flint, and most of his eminent contemporaries, following Todd, led the medical profession to adopt the whiskey bottle as the mainstay in the treatment of typhoid fever, pneumonia, and most other acute febrile disorders.

This practice, which may be fairly regarded as obsolete among intelligent and progressive practitioners, is still, unfortunately, in vogue in the United States Army, and is perhaps responsible for the enormous mortality from typhoid and other fevers which is shown by the medical report of the Spanish-American War. The time has certainly arrived when the general public, as well as the medical profession, should be informed respecting the change of views which has been forced upon medical men by the results of modern
research in relation to the question of the use of alcohol in health and disease. The Report of the Famous Committee of Fifty, made up of men who were, to say the least, not in the smallest degree prejudiced against the use of alcohol, placed before the world a formidable array of the most cogent facts bearing upon this question. A host of scientific authorities, who enjoy world-wide reputation as chemists, physiologists, clinicians, and experts in the various lines of research, is marshalled by the Committee and made to testify in relation to the influence of alcohol upon the body in health and disease. The verdict of this Committee, briefly summed up, amounts to this:

1. Alcohol even if it may be tolerated in some doses by healthy men for a considerable length of time, can not be shown to be capable of supplying any appreciable, or essential, or characteristic value.

2. Alcohol is a poison, -- a deadly poison in large doses, and a slow insidious poison in small doses.

3. Alcohol in all doses diminishes muscular vigor, nerve sensibility, and vital endurance.

4. Pure alcohol in large doses produces immediately and in marked degree a retarding effect upon digestion, while in small doses its affect is such that it can not be said to be in any respect an aid to the digestive process.

5. The seeming stimulating effect manifested in one direction is counteracted by an equally retarding effect in another direction. Beer and wine retard digestion in all appreciable doses, producing in this respect an effect even greater than whiskey and stronger liquors.

It must be evident to any thinking person that a drug which produces the effects described above upon a healthy person, could not be expected to do a sick person any good. The popular faith in alcohol as a valuable remedy in certain cases of disease or vital emergency is so deeply rooted, it may be worth while to inquire into the facts respecting a few of the most common medical uses of this seductive drug.

Since Paracelsus, that prime of charlatans, first discovered the agent which he named *elixir vitae*, alcohol has been appealed to as a remedy at one time and another for almost every human ailment. Ethyl alcohol is certainly a most remarkable agent. It possesses properties which produce at least an impression of benefit in the most varied conditions.

The idea of Paracelsus that alcohol was in some way a vital stimulant, seems to have taken deep root in the human mind, and this is probably the foundation for the popular faith in its efficacy in almost every form of disease. But Darwin showed, nearly a generation ago, in his studies of insectivorous plants, that alcohol is a protoplasmonic poison. *Dodder* and other similar plants ceased to exhibit their marvelous animal-like functions under the influence of alcoholic vapor. Sims Woodhead, the eminent Scotch pathologist, in a memorable lecture, clearly demonstrates that alcohol is a poison to protoplasm, and produces changes in muscle and nerve tissue closely allied to those produced by the toxin of the diphtheria bacillus and other bacterial poisons. Oxidation is the essential element in all metabolic activity. It is, according to Woodhead, seriously interfered with by alcohol.

The deadly influence of alcohol upon living cells is well shown by its effect upon the cells of the blood. It is to the white cells of the blood more than to any other structures that the body owes its power to resist an infectious disease. When the germs or microbes enter the body, a battle is waged upon them by the white cells of the blood, which capture and destroy them in countless numbers. If the blood cells are victorious,
the germs are destroyed and the attack is headed off. We are all constantly exposed to infection from various sources. The germs of disease are constantly in our mouth and our nostrils. Deadly germs are present in countless numbers in the alimentary canal. Prof. Swartzenberg estimates that the number of germs constantly present in the intestine is not less than 128 trillion. It is only because the cells of the body are able to resist the encroachments of these germs, and to destroy them as fast as they invade the body, that infection is prevented. Thus the human life is maintained only by its constant defensive activity. It has been proven that alcohol lessens the activity and efficiency of the cells of the blood to such a degree that animals which are proof to infection by certain germs readily become subject to infection and speedily succumb to the action of germs while under the influence of alcohol. The same has been shown to be true of man. A physician wrote from Tiflis many years ago, when cholera was prevailing in that city, "Drunkards are dying off like flies." And during the last great epidemic of yellow fever in Jacksonville, Fla., the physicians and nurses who were attending the sick in that great city sent the same message to the Northern newspapers.

Prof. Woodhead has also shown that much alcohol prevents the establishment of immunity. A word of explanation may be necessary. When a child is stricken with diphtheria in the midst of a family of children a health officer comes and administers antitoxin to the stricken child. But not only the sick child is treated with the antitoxin, but the well children also, it having been found that if the antitoxin is administered to those who have not yet contracted the disease, a condition of immunity—that is, protection against the attack of the diphtheria germ—may be established. By similar means immunity may be established against lockjaw, hydrophobia, and other fatal disorders.
According to Woodhead, experiments have been made with various animals which demonstrate that immunity can not be established in an animal which is under the influence of alcohol. The reason for this is because alcohol not only lessens the resistance of the body, but also destroys its power to fortify itself against the attacks of germs and germ poisons.

Sir Thomas Barlow, M.D., of London, England, calls attention to the fact that the conditions produced by the frequent administration of alcohol to fever patients are precisely the same as those produced by "the nipping of an insatiate tippler." In other words, the fever patient is made drunk, and in this condition the ability of the body cells to fight against the invading germs that produce the fever is lessened, and the mortality is necessarily increased.

The death rate under the old method of treating typhoid fever and pneumonia was from 20 to 30 percent. That is, twenty to thirty out of every hundred died. Since the use of alcohol has been lessened, and water and other physiologic remedies have been substituted, the mortality from typhoid fever has been reduced to three to five percent. In fact an eminent German physician has reported a series of one thousand cases of typhoid fever treated by the new method without a single death; and in a series of twelve thousand cases the mortality was scarcely 3 percent. Think of the tremendous saving from dispensing with alcohol! In the twelve thousand cases at least two thousand more would have died if the old method had been pursued. In this country the number of deaths from typhoid fever each year is about seventy-three thousand. In view of this fact no intelligent physician can be justified in prescribing alcohol as a remedy for febrile diseases.

But how about alcohol as a tonic? As long as the fact is known that alcohol is in all doses a narcotic, that it lessens nerve sensibility and nerve conductivity, as well as cell activity of every sort, it will
at once appear that there is no foundation whatever for the confidence which has been placed in it as a tonic or stimulating drug. Piotrowski has demonstrated that alcohol even in small doses diminishes the ability of the nerve centers to receive impressions, and increases the length of time for impressions to be conducted over the nerves. That is, nervous excitability and nervous conductivity are both decreased. For example, nervous impressions travel over nerves in the healthy person at the rate of 91 ft. per second; but under the influence of alcohol the rate of transmission is only 13 ft. per second. That is, it takes a man under the influence of alcohol seven times as long to hear, to feel, to taste, to receive an impression of any sort as a normal person. Such a man called upon to act in emergency would require at least seven times as long to make up his mind what he ought to do as a healthy person requires, and when large doses of alcohol are administered the effects are still more pronounced. Certainly this can not be regarded as the effect of a tonic. Alcohol possesses no tonic or stimulating power. When taken into the stomach there is a very slight transient irritation produced, which gives the impression of tonic or stimulating effect, but as soon as the alcohol has been absorbed into the blood so that it actually comes in contact with the nerve centers and other delicate structures of the body, its real effects, which are those of a narcotic poison, become at once apparent.

Kleefeld has shown that alcohol, when taken into the blood, produces an immediate effect upon the structures of the brain. The effects caused are similar to those which occur during sleep, but there are changes in the form and shape of the brain cells which are identical with those of an animal in a state of hibernation, or a person in an unconscious state. When alcohol is taken in repeated doses its effects become permanent. The accompanying cuts show the changes in the form of nerve cells which take place under the influence of alcohol.
The flushing of the face seen after the administration of alcohol, and the exhilaration felt by a person in ordinary health, are due, not to a stimulating, but rather to a paralyzing or sedative effect. That alcohol is a sedative rather than a stimulant was pointed out by Wilkes a whole generation ago. A person who is fatigued after taking alcohol feels relieved, not because he is rested or his muscles have been reinforced, but because the nerves of fatigue are paralyzed so that he no longer appreciates the fact that he is fatigued.

A person who is cold, after taking a dram, no longer suffers from cold or chilliness, and imagines that the alcohol has warmed him. This is not the case, however. The alcohol has only lessened the sensibility of his thermic nerves, so that he is less sensitive to cold, while at the same time increasing the flow of blood to the skin by paralyzing the vasomotor centers. Smedsberg, nearly twenty years ago, pointed out the fact that under the influence of alcohol "the finer degrees of observation, judgment, and reflection disappear," and that all the effects produced by alcohol are really those of a sedative or paralyzing agent.

One of the most common and pernicious of the popular errors relating to alcohol is the supposition that it somehow strengthens the heart. The full, bounding pulse usually produced by the administration of an ounce or two of brandy, gives the impression of an increased vigor of heart action; but it is only necessary to determine the blood-pressure by means of a Riva-Rocci instrument, or Gaertner's tonometer, to discover that the blood pressure is lowered instead of raised. This lowering may amount to twenty or thirty millimeters, or even more. The tonometer measures, not the average blood-pressure, but the actual force of the heart. It can readily be seen, then, that the bounding pulse is not the result of increased heart vigor, but indicates rather a weakened state of the heart, combined with a dilated condition of the small vessels.
In this connection the fact should be recalled that the heart is not the only force involved in the circulation of the blood. It is doubtless the great engine of the circulation, but it has been clearly shown by Schiff and numerous other physiologists that the movement of the blood is greatly aided by a rhythmic action of the small vessels, both arterioles and capillaries. These contractions are not simultaneous with those of the heart, hence do not interfere with its action; but as the pressure in the veins is very much below that of the arteries, these contractile movements serve most efficiently in pushing the blood along toward the veins. The heart keeps the large arteries pumped full of blood, while by means of the contractile movements of the peripheral vessels, the blood is, so to speak, milked out into the veins.

Alcohol dilates the small vessels, that is, it paralyzes the peripheral heart. The apparent increase of strength which follows the giving of alcohol in cases of cardiac weakness is delusive. There is increased volume of the pulse for the reason that the small arteries and capillaries are dilated, thus lessening resistance and cardiac work; but this apparent improvement is very evanescent, as naturally results from the fact that while the heart is relieved momentarily by the sudden dilatation of the peripheral vessels, the accumulation of blood in the venous system through the loss of the normal activity of the peripheral heart, gradually raises the resistance again by increasing the load of blood which has to be pushed along in the venous system. This loss of the action of the peripheral heart thus in the end more than counterbalances the temporary relief secured by the paralysis of the vasconstrictors. This accumulation and sluggish movement of the blood in the venous system is shown by the purplish hue of the skin in a person under the influence of alcohol—a wide contrast to the ruddy glow presented by the skin in which the small vessels are actively engaged in the pumping of the blood out of the arteries into the veins, an action in which the whole body may be made to participate by a suitable application of cold water to the surface. It is evident then that the beneficial effect of alcohol upon the heart is apparent only, and not real.

JHK v--m 4/10'06.
ALCOHOL IN SHOCK AND COLLAPSE.

The common habit of administering alcohol to persons in a state of shock or collapse from hemorrhage or accident, or a person who has fainted away, has been shown by recent investigations to be almost the worst thing possible that could be done. If a person has simply fainted away, the pouring of a few drops of alcohol down the throat, or even the administration of a few spoonfuls of brandy diluted with water does apparent good, and possibly does no great amount of harm; but that it does no real good even in such cases, and that the administration of alcohol does great mischief in the more serious cases of shock or collapse, the result of hemorrhage or grave accident, or following a surgical operation, has been clearly shown by the clinical experiments of Crile, who has made a careful study of the subject of shock and collapse and the influence of various drugs in relieving this condition. Crile found that in shock and collapse brandy there is a dilated condition of the blood vessels. This is the very condition which is induced by alcohol, hence the more alcohol administered to a person in a state of shock or collapse the more the vessels will be dilated, and the more serious will be the condition of the patient.

The apparent beneficial results following the administration of alcohol in such cases are caused by the irritation produced by alcohol when it first comes in contact with the mouth and the stomach. Alcohol is highly irritating to the sensitive nerves of the mucous membrane, and the irritation or excitation thus produced is followed by a slight stimulating effect. But this disappears very quickly, for as soon as the alcohol is absorbed its narcotic or depressant effects begin to make their appearance. Then the vessels dilate, and the heart's energy is weakened, and the pernicious effects of the drug become manifest. This fact is now so well recognized that railway surgeons instruct employees to be very careful to avoid giving
alcohol in cases of shock from accident, as the affect of the drug may be to take away from the victim of the railway smashup his one remaining chance for life.

If the question is asked—What shall be taken in place of alcohol in such cases? a satisfactory answer may be promptly given. The application of cold over the face, chest, and especially over the heart, accompanied by rubbing, is a very effective means of arousing the heart to increased activity. Strong compression of the abdomen is another measure of the very highest value. The writer has seen patients whose condition was apparently hopeless as a result of shock brought back to consciousness, and subsequently to good recovery, by simply compressing the abdomen by means of a rubber bag slipped under a bandage and inflated with air. An ordinary hot water bag will answer the purpose very well, or the abdomen may be strongly compressed with the hands. Pressure must be made continuous, and with such force as the patient can bear without great discomfort. In case of a large adult two persons are required.

ALCOHOL AND STRENGTH

There is probably no drug that has been so generally and frequently used with the idea that it is possessed of strengthening properties as alcohol. As a matter of fact, however, there is not the slightest scientific foundation for the popular faith in alcohol as a strengthening agent. Within recent times this matter has been subjected to accurate laboratory investigation, and it has been invariably found that alcohol in appreciable doses always diminishes both muscular strength and endurance. In some experiments made by the writer in which the total strength was obtained by the dynamometer applied to the various sets of muscles, it was found that the total strength of the body was diminished one-third by a single ounce of brandy diluted with water. It is true that an exhausted person feels less sense of fatigue
when taking wine and alcohol in some other form, but the reason for this is not that the strength has been increased, but simply that the nerves, which are the seat of the sense of fatigue have been benumbed, so that the condition of the body is not appreciated. Work done under the influence of alcohol is always followed with more sense of fatigue than when done without alcohol.

**ALCOHOL AND DIGESTION.**

In the words of Holy Writ "The blood is the life." It is the blood that repairs wasted tissues, heals diseased structures, and maintains all the activities of the body. The blood is formed through the food, hence digestion, whereby food is prepared for absorption and conversion into blood, is one of the most important of all the bodily functions. And if it were true that alcohol aids this process, this fact alone would be sufficient apology for its general use, and especially for its use in the treatment of cases of disease. Being narcotic, alcohol naturally produces a feeling of relief when taken after an excessive meal which has produced a sensation of weight and heaviness in the stomach. But the same result can be obtained by the use of opium or any other narcotic drug.

It has long been known to physiologists that the administration of alcohol excites the stomach, and causes an increased flow of gastric juice. But Radzikowski, the famous Russian investigator, has shown that the gastric juice thus produced by the action of alcohol upon the stomach is absolutely worthless as a digestive agent, since it contains no pepsin, which is one of the two essential principles required for digestion. Alcohol, then, only induces the stomach to pour out an acid liquid which has no digestive power. Prof. Chittenden, the eminent director of the Sheffield Scientific School of Yale University, in experiments upon a dog found that strong alcohol produced an abundant flow of gastric fluid, but he also observed that an equal quantity of simple water produced an equal amount of gastric juice.
Further investigation showed that the gastric juice produced by the administration of water was possessed of much more powerful digestive properties than the gastric juice produced by the administration of alcohol. Since the alcohol was well diluted with water, it is probable that the actual effects of alcohol produced by the diluted were the result of water used with it rather than of the alcohol itself. This conclusion is, in fact, irresistible in the presence of the fact that pure water, if taken in quantity of seven or eight ounces, produces a decided flow of gastric juice possessed of active digestive properties. And the further conclusion may also be drawn that alcohol actually hinders the development of pepsin, since the juice produced by pure water manifested more active digestive properties than the juice which followed the administration of diluted alcohol.

Other investigators, especially Haan, have shown that the effects of alcohol in stimulating the formation of acid by the stomach glands has a temporary effect which rapidly disappears, so the ultimate effect of the administration of alcohol is not only to hinder the formation of pepsin, but also to diminish the acid secretion as well. Large doses of alcohol interfere seriously with the secretory processes of the stomach by pouring into the stomach a large amount of an alkaline fluid which completely interferes with normal stomach digestion. The reason for this, according to Lauder-Brunt, is that alcohol blunts the sensibility of the gastric nerves, so that the stomach fails to respond in a normal way to the natural stimulus of the foodstuffs. The only natural stimuli of the stomach are those which are found in food. Pavlov has shown that each food contains stimulating substances which cause the stomach to produce exactly the sort of gastric juice necessary for the digestion of the particular food in question. These stimuli always act upon the healthy stomach in exactly the same manner. The stomach never becomes immersed with their effects so the stimulating influence disappears. How contrary the effects of mixed alcohol! The apparent stimulation which is at first produced quickly gives place to
the opposite condition. In other words, if it be granted that alcohol produces a temporary stimulating effect, this effect is in the highest degree undesirable, for it quickly disappears, leaving the stomach in a state of complete collapse, and incapable of other stimulation, either by alcohol or by the natural stimuli which are found in the food. This condition, fortunately, does not last indefinitely, and so in the majority of cases, when alcohol is distributed, the stomach rapidly recovers its normal state. This is just the difference between normal healthy gastric stimulation and an abnormal, unwholesome, and dangerous one.

The stimulating effects of alcohol can be kept up only by repeatedly increasing the dose, and in a short time even this method is found ineffective, for the gastric glands are rapidly destroyed by the degenerative influence of the drug, so that even the normal stimuli which are found in the food, and which under natural conditions always produce exactly the same results, no matter how frequently repeated, because of the destruction of the secreting glands of the structures associated with them, lose their power to act. This is the condition in which the stomach of the habitual drunkard is sooner or later found.

From the above facts it must be very evident that alcohol can never be relied upon as an agent to aid digestion in cases in which the digestive organs are the seat of disease. Chittenden and many other investigators have shown that alcohol, when taken in any but very small quantities, interferes with the action of the various digestive juices upon the several food stuffs, and the final result is the complete loss of digestive activity by the stomach, a condition which prepares the stomach to become the seat of cancer and various other degenerative processes. The influence of wine and beer upon gastric digestion has been shown by Chittenden and many others to be even greater than that of whiskey and the other stronger liquors.
An important fact was pointed out by Chittenden, viz., that alcohol in all forms is particularly injurious in cases in which the gastric juice is feeble in digestive power. While the detrimental effect of alcohol upon digestion was less apparent in cases in which the gastric juice was normal or unusually strong, the retarding influence of this drug upon digestion was always apparent when the gastric juice was inferior in quality. This fact makes it very evident that alcohol can not be relied upon as an aid to digestion, for although under its influence there might be an increased flow of acid secretion, the digestive activity of the gastric juice formed under these circumstances would be so lessened by the alcohol present in the stomach that no beneficial effects would be experienced, and on the whole the effects would be detrimental.

The experiments conducted under the writer's supervision in the Laboratory of Hygiene in the Battle Creek Sanitarium in a great number of cases of healthy stomach fluids of different qualities, have shown the entire correctness of the different conclusions drawn from Chittenden from the experiment made by him upon dogs through gastric fistula. In an experiment made under the supervision of the writer, in which two ounces of brandy were given to a vigorous young man of twenty-four years in connection with a test meal, it was found that while there was an increase of acid, pepsin was entirely lacking, although without the brandy the amount of pepsin present in the particular stomach fluid employed had been shown to be more than four times the normal.

It is thus apparent that alcohol does not aid digestion, but on the contrary hinders it. A great number of authorities might be cited, the results of whose observations agree with those of Chittenden and others who have been referred to above. It might fairly be said, indeed, that there is no fact in physiology more clearly established at the present time than that the use of alcohol as an aid to digestion has no support on scientific grounds.
ALCOHOL IN CONSUMPTION

Twenty-five or thirty years ago alcohol was regarded as almost a panacea for consumption. In nearly every large community could be found persons who had become confirmed drunkards through the use of alcohol as a remedy for pulmonary tuberculosis or lung consumption. But this popular apology for the use of alcohol, like others of its sort, has been shown by modern research to be absolutely baseless. Indeed, it has been proven beyond all possible controversy, that alcohol produces consumption. There is indeed a distinct form of the disease known as alcohol consumption. There are at the present time many scores of institutions which are especially devoted to the treatment of cases of pulmonary tuberculosis. Many of these institutions are very large, the inmates numbering many hundreds. The experiences of these institutions, which are for the most part under admirable scientific management, have shown the absolute futility of alcohol as a remedy for pulmonary tuberculosis.

The evil effects of alcohol upon the liver, kidney, and other vital organs have been conclusively demonstrated by Boix, and numerous other investigators.

In view of the above facts we are brought irresistibly to the conclusion that alcohol has no legitimate place in the materia armamentarium of the up-to-date physician.

The verdict of modern science respecting the use of alcohol in disease may be briefly summed up as follows:

(1) Alcohol never, under any conditions, increases the vital energy of the body, but, on the contrary, decreases it in a marked and uniform manner, through its poisonous influence upon the living cells.

(2) Alcohol is never a tonic or stimulant. It is always a narcotic, interfering with the bodily functions and lessening the nerve tone
and vital energy.

(3) Alcohol always diminishes, never increases, the energy of the heart, and hence is detrimental rather than beneficial in cases of shock, collapse, fainting, etc.

(4) Alcohol increases liability to contract infectious diseases, and prevents the defensive development of immunity.

(5) Alcohol does not aid digestion, but actually hinders it, especially in cases in which the digestion is already weak or slow; hence its use in connection with meals is absolutely unscientific and irrational, as well as its use as an aid to vital digestion.

(6) Alcohol diminishes the alkalinity of the blood, and so diminishes vital resistance and increases susceptibility to disease.

In view of the above facts, what apology can be offered for the continued use of alcohol in medical practice? As far as the writer is himself concerned, he finds none, and is glad to be able to say that during a practice reaching over many years experience in the profession, during thirty years in charge of a large medical institution, the Battle Creek Sanitarium, he has found no use for alcohol. In the treatment of the many scores of thousands of patients who have visited this institution, not a single dose of alcohol in any form has ever been administered as a curative agent. Alcohol is not employed in any form whatever as a tonic. In this institution, and in scores of allied institutions in which the Battle Creek Sanitarium system of treatment is employed, located in various parts of this and other civilized countries, the same practice is maintained. Of the more than ten thousand patients treated annually in these various institutions not a single one receives alcohol as a remedy. The Battle Creek Sanitarium system of physiologic treatment has always excluded this drug, and the results which have been attained in the treatment of acute and chronic disorders of all sorts without alcohol are certainly sufficiently satisfactory.
to justify the course which has been pursued.

Thousands of intelligent physicians in different parts of the world are dropping the use of this deceptive drug. Prof. Kassowitz, the eminent professor in charge of the clinic of children's diseases of Vienna, after many years of careful study and observation has finally abandoned the use of alcohol entirely in his clinic. When an eminent medical man of world-wide reputation takes a stand of this sort in a country like Germany, where alcohol in various forms is used perhaps more freely than in any other country in the world, the fact must certainly command the attention of both the laity and medical profession. No better evidence could be afforded of the inutility of this drug.

Alcohol has clearly no proper place in medicine. It is a discarded drug, and only waits the further diffusion of knowledge respecting its baneful and deceptive effects among the profession and the laity to lead to its retirement as an addition to the growing list of obsolete drugs, along with tobacco, which once enjoyed almost as enviable a reputation as a remedy as its congeners ethyllic spirit.

The writer considers this question one of the most important that can be considered by the medical profession. There can be no doubt that thousands of men and women have become addicted to the use of liquors through first taking liquor in some form on a physician's prescription. Many thousands more have become drunkards as the result of the use of proprietary medicines, such as *Parens*, Richardson's Bitters, and other so-called Bitters, tonics, blood-purifiers, etc., nearly all of which contain alcohol in large proportion. Many thousands more, comprising perhaps a large proportion of the vast army of the drinking men and women who are hurrying down to premature and drunkard's graves, owe their enslavement to alcohol to the popular belief in the strength- and health-giving properties of good wine, sound beer, pure cider, gin, champagne, etc.
It is entirely an error to suppose that the evil resulting from the use of alcoholic drinks can be attributed to adulteration. The worst thing to be found about alcoholic beverages of any sort is alcohol itself. This is the poison that must be held responsible for the terrible consequences of alcoholism which are filling our homes, our prisons, our lunatic asylums, and which are entailing upon a yet unborn generation a veritable Pandora’s box of mental, nervous, and moral maladies, if possible, even worse than those which may be today witnessed in every great center of civilization. The influence, the teaching, and the practice of the medical profession must be held more responsible than any other single influence in the production and maintenance of the alcohol habit, and there can be no doubt that a practical recognition of the facts now known and recognized by the leading men of the medical profession as scientific truth, would accomplish more in a single year in the destruction of that hideous monster, the liquor traffic, and the staying and the stopping of that great tidal wave of destruction which is sweeping the whole human family down the hill to degeneracy and race extinction, than all other reformatory forces combined.

The medical profession owes to society an obligation in relation to this question which can not be discharged by any other means than by sober serious consideration of it, and frank admission of the truth in relation to alcohol, and an honest, earnest, straightforward effort to stay the ravages of one of the greatest plagues which has ever afflicted the human race.

JHK v-m 4/13'06
THE CURSE OF INTEMPERANCE.

Alcohol, the essential constituent of all fermented and intoxicating liquors, is an aged foe of the human race. From the time that Noah fell into shame and disgrace through the intoxicating effects of wine, alcohol has never ceased to be an enemy of mankind. Like the arch deceiver himself, alcohol, one of the devil's most efficient agents for destroying the happiness of man for the present and the hereafter, gains the confidence of its victims by making great promises which it never fulfills.

Alcohol promises pleasure, but instead of the true pleasure, happiness and contentment which come from a life of sobriety and uprightness, it gives a mere transient tickle of the palate, a thrill to the nerves, a momentary exhilaration, and with it the bitterness of a ruined life, loss of friends, home, property, a wrecked body, premature death, disgrace and misery. Alcohol promises comfort, but instead of the comfort and well being which come from health, strength and vigor, the result of a wholesome life, alcohol gives simply a temporary benumbing of the sensibilities certain to be followed by an increase of pain and suffering and an aggravation of all the miseries which it promises to relieve.

The weary man takes a glass of intoxicating liquor—whisky, tequila, pulque, beer, or some other fermented or distilled liquor—for the relief of pain, a weakness of the nerves, a sinking at the stomach, a general discomfort. His misery disappears. He congratulates himself that he has a never-failing remedy—a panacea upon which he may always rely. But he soon finds that his malady, his misery, is aggravated instead of cured. His weak nerves, when the influence of the liquor is gone, are weaker than before. He is completely unstrung. More whisky, more tequila, more beer, more pulque is required to put to sleep his crying
nerves and to relieve his discomfort. Alcohol is in every way a deceiver. It fulfills none of its promises. It relieves hunger because it destroys the appetite and the power to digest food, but it does not nourish the body. It destroys pain by paralyzing the nerves, but it does not remove the cause of the pain. It makes the poor man feel for a moment that he has boundless wealth, but it leaves him poorer than before. If a man is cold, it gives him a sensation of warmth, but makes him actually colder than before. The man who is weak imagines he is strong, while he is actually weaker than before.

The purpose of the following pages is to present in a brief and concise manner, the facts which modern scientific discoveries and the experience of a race have shown to be true respecting alcohol—facts the truth of which is testified to by the most eminent scientific physicians throughout the world.
THE COMPARATIVE VALUE OF ALCOHOL AS A TOPICAL APPLICATION IN INFECTION

Buchner, Munch. Med. Woch., 1899, has recently called attention to the importance of increasing the local blood supply as a means of combating infection. This suggestion is by no means new. The point was made and vigorously enforced by Winternitz many years ago. The last named clinical teacher especially calls attention to the fact that it is the body that heals, not the physician nor the treatment, of whatever sort it may be, but the body, and that the healing power of the body is chiefly in the blood. Buchner refers to the well-known explanation of the healing power of the blood, viz., the presence of bactericidal substances in the blood serum and the capture of bacteria. Scharrin and others have also set forth very clearly the anti-toxin properties of certain substances thrown into the blood in the form of internal secretions. It is evident, then, that in a part which has before the seat of bacterial infection, one of the most important things indicated is an increase in the volume of blood in the part and in the movement of blood through it. Induced leucocytosis unquestionably constitutes one of the most important of all means of combating localized infection. Buchner calls attention to the beneficial effects obtained by the application of hot air (?) to chronic the joints in rheumatism. This is supposed to be in part due to the influence upon the diseased parts of the alekina or bactericidal substances which are produced by various calls in the body, and stored in the serum.

Thus far the suggestions of Buchner seem very rational. At this point we must part company with him, however, for the reason that he placed first and foremost in the list of substances useful in producing dilatation of the vessels and increased local supply of blood, a toxic substance, recommending 90% alcohol as the best of all vaso-dilators. But when it is considered that the influence of alcohol applied to the skin must be
very superficial indeed, and that its influence cannot possibly extend beyond the very smallest vessels, it must be evident that, it must be evident that the addition of a toxic substance capable of paralyzing the vaso-constrictors, perhaps also the visceral ganglia of the vessel walls, must likewise be capable of lessening the vital activity of all the cells which are exposed to its influence. In addition to this it must be at once recognized that heat is an incomparably better agent for producing vaso-dilatation than is alcohol. Alcohol can penetrate the tissues only as it is taken in by or absorbed by the lymphatics, or by osmosis, whereas heat passes in by conduction and to some extent by radiation, and is thus capable of rapidly penetrating to a considerable depth below the surface and so influencing the larger arterial and venous trunks. Alcohol produces stasis of blood rather than increased rate of blood movement. There is dilatation of the small veins and accumulation of blood as the result, but the bluish tinge characteristic of dilatation resulting from alcohol is evidence of slowed movement of blood, and the overaccumulation of carbonic acid gas, with other toxic elements. The influence of these toxic substances upon the tissues must be in the highest degree detrimental. By the application of heat it is possible also to produce venous stasis, although the stagnation is by no means so great as when alcohol is employed, but by the combination of heat and cold there is a decided increase both in the volume of blood and in the activity of the blood current. Cold contracts the vessels not only of the surface, but to a considerable depth through reflex influence. The application of heat at once restores the temperature of the skin and causes vaso-dilation both in the superficial and in the deep vessels. By the alternation of heat and cold, the vessels are made to alternately contract and dilate, thus actually pumping the blood through the affected part. The hot fomentation to a rheumatic joint followed by a heating compress consist-
ing of a towel wound dry out of cold water, wrapped with flannel, and covered with a rubber cloth, will accomplish ten fold more in the concentration of blood in a part than alcohol or any other known means. No sound scientific argument can be offered for the medical use of alcohol either internally or externally. It is a toxic substance which ought to be retired from the Materia medica and placed in the catalogue of obsolete drugs along with tobacco, lobelia, and like useless but highly toxic drugs.
STEREOPTICON LECTURE.

THE EFFECTS OF ALCOHOL UPON THE BRAIN AND NERVES.

J. H. Kellogg, M.D.

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ALCOHOL is destructive in its effects: It produces irritation and paralysis of the bloodvessels and the delicate nerves of the stomach—the nutritive condition of the mucous membrane fails; the nutritive processes fail and as the result there is ulceration taking place.

Dr. Beaumont, who had the privilege of studying the effects of alcohol upon Alexis St. Martin through a hole in his stomach caused by a gunshot wound, observed that when Alexis St. Martin had been on a spree there was an extensive ulceration in his stomach: When he had been drinking it presented this appearance (Screen.) Here are clots which are formed. Alcohol paralyzes the stomach so that it loses its power to protect itself from the action of the gastric juice and that action has caused this erosion.

Now the effects which alcohol produces upon the nerves of the stomach, it produces upon every nerve with which it comes in contact. It produces the "gin liver" or "hob nailed' liver" of the drunkard; it produces congestion of the brain; it produces a bloodshot eye, which is simply the effect of brain congestion; it produces a ruddy nose, which is another evidence of the paralyzing influence of alcohol upon the sympathetic nerves. From this cause the bloodvessels of the face receive too much blood; the nose grows too fast for the rest of the face and produces what is called the "run blossom." (Screen.)
we have been speaking particularly upon the effects of alcohol upon the nerves, so I will show you here upon the screen one of the most wonderful things ever seen under a microscope—a nerve cell. This is one of the cells found in the cerebellum. Here is the body of the cell, and here are the branches. You recollect that this is not a photograph taken from a microscopic view specimen, but it is a photograph of the actual cell—of the thing itself. It is a photograph of the thing itself taken while looking through a microscope at a portion of the brain structure which had been hardened. This represents only a small portion of the branching fibrils or find fibers of this cell which spread out on all sides. Here you see a blurred appearance around the cell which represents the additional fibres; here is a great cloudy mass here. There are other branches in different directions, and they are reaching out in all directions in the body—just as you see them here. (Screen.)

Thus these cells have different forms, as shown in the microscopic views of the brain. Here is another portion of the brain, representing the gray matter, which covers the brain—the cortical portion of the brain. (Screen.) There are more than ten million of these nerve cells. We have white matter—a layer of the brain about 1/8 inch deep; here is where we find these cells. Some of them are very long; some of them run clear across the microscopic field, running in all directions, showing a minute network of nerves. There is a great number of these long slender fibres which make up the white matter of the brain. This gray matter is made up of cells, the cells being living structures. You notice that each cell has a number of these little fibres. Each cell has a nerve fibre. Here are a number of short
fibres, and then there is this one long fibre which runs off to the other side of the brain or perhaps to the spinal cord, and then running down into the arm,--and it may send a branch clear down to the tip of the toe. Every portion of the skin everywhere contains a number of these minute fibres which run down into the cells of the spinal cord and then these cells of the spinal cord send out branches to the brain and the different parts of the brain are all connected together by means of these slender branching fibres. (Screen.)

Here is another portion, showing a very large cell---a multipolar cell, as it is called,---sending out these large branches running in different directions. We can hardly realize that the gray matter of the brain is all made up of these cells,---that there are more than ten thousand million of them to be found in the brain, and each one of these has a number of branches. Each one of these branches has its functions and properties, and as we shall look a little further into this matter we shall see that the cell structure is still more intricate than I have described. (Screen.)

Here we have a drawing representing the lower brain, one inch in thickness,---the cells covering the cortical gray matter of the brain,---of the cerebellum, showing these various cells. (Screen.)

These are called Purkinje's cells. Here is one of these large Purkinje cells; here is a long fibre running downward and running from here way down into the spinal cord for some distance. Each one of these cells has smaller ones. Here is a neuroaxon---a long fibre---which has been cut off so as to show a section on a slide, and here is another---these are cut off in making these experiments. These are so small that it would take twenty thousand of them, arranged side by
side to make one inch in width. Please observe that some of these cells send their neuroxons upward, making a little tuft or brush at the end.

(Screen.) Here is another cell sending out a long neuroxon, and here is another cell, sending a neuroxon down. Here is a cell sending our quite a number of neuroxons or branches going up to the surface. (Screen) Here you see a mass of fibres by means of which all these different portions or masses of cells communicate with each other. These cells over here are sending fibres or cells in other directions. Here are cells sending fibres along this mass of white matter. (Screen)

Here is a strange looking cell—a multipolar cell—with a number of branching fibres. Here are cells connecting with this one cell, and their number is almost infinite. This represents only what is seen in a single vein. I am showing you this picture to give you some idea of the intricate character of the structure of the brain. (Screen.)

Here is another picture of a Purkinje cell: Here is the body of the cell, here are the dendrites, and here is a portion of the neuroxons which have been broken off. The whole cell with its branching fibre is called a neuron, and the long fibre connecting it with some other cell is a single cell.

The body has the power of storing up energy in the liver in the form of \textit{fatty} glycogen, where we need it to keep us warm, and the liver sends it out to the body as it is needed,—it is stored up in the muscles in form of glycogen and it is burned when we exert the muscles in any way or even thrum out the arm. Any exertion of the muscles uses up a portion of this energy. The cells of the stomach also store up energy to be used in making gastric juice. When a cell has been making gastric juice, if it is examined, it is cloudy, granular, and large, when it is in its normal state, but when it has become tired and exhausted, it
becomes pale and shriveled. This is the case with the salivary glands—before they begin to make saliva they are very large, but after one has been chewing and expectorating for some time, these cells become exhausted and are pale and weak and are incapable of making a good quality of saliva. The same thing is true of all the cells of the body, and especially the cells of the brain and spinal cord. The cells store up energy, and this energy is derived from the blood; the food is converted into blood and carried along in the circulation and stored up by these cells as materials for work. Now when a person is weary, fatigued, etc., it is because the energy which he has stored up in the nerve cells is used up, and then he must rest—he must sleep, in order that this material may be replaced. It is like an electric battery, which has frequently been used for a plying electricity: Sometimes the battery is weak, and then you can only get a little current. The battery runs down after a while, so you can only get current enough to feel it. It is so with the nerve cells. The nerve cell is a sort of a battery. Every nerve cell may be compared to a battery. It stores up energy the same as a battery stored up electricity; the cells store up energy which is sent out to these neurofibras which I have described.

Another very interesting thing in reference to these nerve cells is the way in which they communicate with each other: A neurofibrax comes down into these little dendrites cell communicates with another cell. Second, there is not an actual continuity of this structure; one cell does not actually coalesce with another cell. The neurofibrax or branch which is sent down to another fibre does not enter into actual connection with it—that is, it does not touch it—but each cell has a large mass of fibres called dendrites, and they communicate with the dendrites of another cell by means of a sort of tongue on the end of its
long fibre or neuroaxon--its tuft; it inserts its filaments among the dendrites--they come together--not in actual contact, but they come very near together. So that you see a neuroaxon coming down from another cell, and they have fibers running down through here, not touching each other, but coming very close to it. If this were magnified by a glass, you would see a great number of little gemmules or very fine droplets or buds--a fine fringe which runs along these fibres. A large quantity of this fine fringe is known as a contact globule. By this means a larger number of points will touch than these two tufts or dendrites can touch.

When we think that it is because there is a large number of these cell bodies which have been associated together through the neuroaxons that are all working together to hold a thought,--that it requires fifteen to twenty thousand of these little cells to hold a single thought in the mind,; that an idea is one thing, but when we come to examine it we find that it has a great many things about it--for instance; suppose I have a chair--now suppose we look at that chair for a moment and consider how many things constitute that idea. We can see the chair, and all its different pieces, very quickly, and you look at each of its different parts very quickly, and the idea is very simple, but when you come to look at it sharply, you find that there are a thousand different thoughts about that chair. So it is in reference to these cells and their relations to each other. It requires a great many cells to hold a single thought. This being the case, it is impossible for us to remember a great number of facts. There is not a person here who could possibly remember all the streets and their locations, in the city of London. There is not a person whose brain is large enough, no matter how hard he may study, to hold all that is known of the sciences; or all that is known of a single science. There isn't a man who can learn
INFLUENCE OF ACUTE ALCOHOL POISONING ON NERVE CELLS.

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In 1895 Dehio demonstrated changes in the ganglion cells of the cerebellum produced by acute alcohol poisoning. In his research eight rabbits, of which two were controls and one, being diseased, was useless, formed the first series for experiment. Alcohol was administered by the stomach and by subcutaneous injection, the latter method producing the greatest result in the shortest time. The usual dose was 7 to 10 cubic centimeters of ninety-six per cent alcohol, reduced with water to about forty per cent, followed, as consciousness returned, by a further dose of 5 cubic centimeters, until in all 20 or 25 cubic centimeters had been given. Death occurred in from one to thirty-four hours, according to the amount given, though the rabbit living thirty-four hours was allowed to recover during the night.

Slides were prepared by Nissl's methylene-blue method. The alcohol effect was not observed with any certainty in those animals which died in the earlier stages of intoxication, while the others showed the following definite changes in the appearance of Purkinje's cells: The cells showed, instead of the normal, fine-meshed, stained network, fine irregularly arranged granules of approximately uniform size, while the normally unstained substance had taken on a pale blue tone. This change affected sometimes the whole of the cell, sometimes a part only, while nucleus, nucleolus, and the granules of the cell processes remained unchanged. By no means all the ganglion cells were affected. In most cases whole rows of normal cells were observed, with pathologically altered cells
scattered singly or in groups. Other parts of the central nervous system were studied in the same way, but nothing was observed to warrant any conclusions as to experimentally induced changes.

A second series included three dogs, one living five hours, one thirty hours, and one a normal control. The one living five hours showed nothing, but the one intoxicated for thirty hours gave more pronounced results than the rabbits.

**EXPLANATION OF PLATE XXVI.**

Figs. 1, 2, 3, 4, 5, and 6.—Large pyramidal cells from the central cortex. Figs. 1 and 2 are from Cat 1, normal; 3 and 4 are from Cat 2, alcohol for fifty minutes; 5 and 6 are from Cat 3, alcohol for fifty-four hours and a half.

Figs. 7, 8, and 9.—Purkinje's cells. Fig. 7 is from Cat 1, normal; 8 is from Cat 2, alcohol for fifty minutes; 9 is from Cat 3, alcohol for fifty-four hours and a half.

Figs. 10, 11, and 12.—Multipolar cells from the spinal cord. Fig. 10 is from Cat 1, normal; 11 is from Cat 2, alcohol for fifty minutes; 12 is from Cat 3, alcohol for fifty-four hours and a half.

Drawings are made with Zeiss Oc. 6, and homog. imm. lens, 2 millimetres, aperture 1.30. Outlines were drawn with Zeiss camera lucida after Abbe.

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the names and characteristics of all the different plants, and not a man who could learn the names and characteristics of the different animals; nor not a man who could learn the names and characteristics of all the different insects. There are two hundred thousand varieties of beetles alone,—just beetles, of all the vast numbers of insects. Then there are mammals and birds and fishes—there is not a living man who could remember the names and characteristics of them all. So the brains are limited in their xxaxxaxxx; they are limited by the number of cells and the relations that can be established between those cells. It is probable that no ordinary brain can hold more than a couple of thousand thoughts.

It is astonishing, when we come to look into the matter, what a small amount of mental capital we have. The average man does not use over fifteen hundred to two thousand words. It was only Shakespeare who could use over fifteen hundred words. The ordinary man does not use more than ten or twelve thousand words in ordinary speech—he doesn't have to use more than that. It is astonishing how little mental capital we can get along with. There are some uneducated tribes who have not more than three or four hundred words in their whole vocabulary, and they manage to get along very well. But such people live a very solitary and restricted life.

Now let us spend a moment in considering a person's mind: How do we remember? We sometimes get tired in trying to remember, and we sometimes get weary trying to think of something. It seems as though what we were trying to think of would almost flash into our minds sometimes, and away it goes,—we have just got it at our tongues end, and it escapes and we search our brains for it. Now what do we do when we are searching for that idea or that thought that was lost? These cells that are
located in the front part of the brain send back their long fibers into the back part of the brain where the impressions of sight, smell, and sound, etc., are located—their location is where the memory of words is stored; there are different things stored in different parts of the brain. The cells of consciousness have their location in the front part of the brain and they send out sensation into all parts of the brain. Now in trying to think, we stimulate the cells in the front part of the brain, stimulating branches reaching into the back part of the brain, and making them all "bristle up," so to speak, to communicate with the cells in which the lost memory is stored. Now these neuroxons which run out and run off such a long distance and end in tufts, have the power of movement to project or retract themselves; they have the power of projecting themselves upward and to retract themselves inward. So that when we try to recall something, to accomplish some mental effort, we are simply thrusting out these cell fibers and reaching them out and trying to touch the cells in which is stored the things we are seeking to recall, until finally we stimulate a certain group—for instance, we want to recall something that we saw—then the cells which store up the memory of sight or pictures will be reaching out all their fingers or fibers up and down, like a musician running up and down the keys of his instrument searching for a lost chord, until by and by the lost chord is struck and recognized. So it is with the cells of the brain: While seeking for a lost memory or idea or word or thought, these fibers are stimulated, and they reach out and come closer and closer in contact with the dendrites of thousands of other cells, and by and by as the effort increases the right cell is touched, and just at that moment the picture flashes before the mind and the word or thought is instantly recalled. That is the way we remember.
Now I have been speaking for some time about these cells, so I will tell you about this one: (Screen.) This is a degenerate cell, and this is a healthy cell. This healthy cell looks like a flourish- ing tree with all its branches, twigs, fibers and other portions complete. The trunk is all sound. Now the other cell looks like an old decrepit oak. You see these knobs, resembling the stigmata results of the stings of insects or injuries resulting from the bark being rubbed or from some other cause—the little knobs running along there indicate disease; the fine fibers have fallen away and the twigs have dropped off, and the larger branches are covered over with knobs. These knobs and opaque masses indicate a disease of the cell. This is the kind of a diseased cell which is found in apoplexy—cases where the brain is degenerated so that emotion is gone, will is gone, judgment is gone and the intelligence is almost entirely gone. That is the condition and this is the state in which this cell is found in the drunkard's brain. In such a brain it is found that one fourth of the cells are degenerated. (Screen.)

This represents the cells of a drunkard's brain, and it emphasizes this subject. I will ask you to look sharply at this picture. Now you see the cells very clearly. This represents the thickness of the whole layer—one-eighth of an inch—covering the whole cortical portion of the cerebellum; there is the tuft and here is the bottom under the layers and here are the different brain cells. Here are some small cells down here adjacent to the little fibers here at the surface. (Describing different fibers running in different directions.

This represents a single convolution of the brain. (Screen.) The brain is convoluted, and this shows one of the little convolutions which produce a greater surface. As you come down the brain becomes smoother and smoother. The infant's brain has a smaller number of convolutions than has the brain of the well-developed man. The
brain of the shepherd dog has a larger number of convolutions than has the brain of the poodle. The convolutions vary in proportion to the intelligence of the animal—the more intelligent the animal, the larger is the number of convolutions. (Screen.)

This represents the fibers running in. There are the cells of this portion of the convolutions, the gray matter. This portion runs down into a center from all directions. This whole mass is made up of fibers running off into some other convolution or into some other part of the brain. (Screen.)

This shows how the cells come into contact; this shows how the cells take hold of hands. (Screen.)

This shows a degeneration of the cells. Here are two healthy cells coming in contact. When they wish to come in contact, they throw down their tendrils and draw their fibres apart; when they don't wish to come in contact, they draw their fibres in. The reason we sleep is because the fibers are drawn apart, for as soon as the cells stand apart from each other, there is no such thing as consciousness. What we call consciousness is the consciousness of a community of cells—and not simply the consciousness of an individual cell. Each cell has its own individual consciousness and life, and each cell has its own not independent being and existence. What we call consciousness is simply the consciousness of individuals, as we might say, but of vast numbers of cells coming in contact. The moment these branching fibers are no longer in contact, that moment we cease to think. So, in sleep, these fibers are drawn apart. This action of extension and retraction has been actually seen in the lower organisms. It has not been seen in the human being, because the human being cannot be examined under the microscope when alive. But this action has been seen in the lower
organisms through the microscope. (Screen.)

This represents two degenerate cells. You see the fibers are drawn apart. The fine twigs and fibers have dropped off and withered away. It is like the decay of a tree. This is the effect of alcohol, and also of all other irritating poisons—tobacco, for instance. (Screen)

This represents a vast number of layers, each about an eighth of an inch in thickness which cover the gray matter of the brain, showing how thickly these processes are massed together. These cells exist in the greatest number in the human family. This slide shows you a small portion of the end of a tuft—the end of one of these long fibers. Here you see the tuft, and the minute gemmules: The purpose of this arrangement is that when this tuft comes in contact with the dendrites of another tuft, and when these little fibers reach down between the dendrites of another cell, there is the largest possible number of points in contact with the dendrites of another cell, there is the largest possible number of points in contact with the dendrites of another cell, there is the largest possible number of points and when the brain is stimulated these fibers come together in this manner, and then this brain action, or cell action,—the nerve action which we call "thought" is caused. (Screen.)

This represents the havoc wrought by alcohol upon the cells. Here is a healthy tuft—a portion of a healthy fiber. Here are its tufts. This shows how these large knobs are formed—they are formed all over the fibers—Here are some more of these large knobs. This represents the effects of alcohol: This is almost entirely destroyed—the contact here is almost entirely broken. These representations will show you that the drunkard is affected physically, mentally and morally, is the result of the use of alcohol. (Screen.)

This is the representation of two healthy cells. See how they look upon examination when stained. Here are two diseased cells, and they don't take the stain well. When the cells are not diseased
they take stain well, but when diseased they don't stain well, because
the coloring matter is taken up and absorbed and held by the energy-
producing substances which the cell contains, but when the cell is paral-
ized it contains so little of this energy-producing power that, as I
said, the coloring matter is absorbed and the cell doesn't take the
stain properly. So by staining the brain it is possible to tell how
many cells are degenerated, and the drunkard's brain shows us the
evidence of this degenerating process. (Screen.)

Here is a cell which is only partly degenerated. Here is a cell
with these long fibers or neuroxons. Here we see how many branches
it has. Here is the end of one of these tufts. When it is magnified
you will see it just as it was a moment ago,—a large number of branches,
each with a little fringe like the gemmules we were talking about. This
cell is partially degenerated. The representation on this part of
the cell shows a great number of twigs and branches covered over with
 Gemmules, and here and there we find a healthy
portion, but the greater portion of the cell is degenerated. Now
suppose this cell was a cell in which some particular thought or memory
was deposited. There is a neuroxon coming down here. Suppose this
was the end of a tuft,—a long tuft coming down between these dendrites
is what would come in contact with this neuroxon. Now if a portion
of the cell was degenerated on this side it would be impossible to get
any communication with this cell, because the means of communication is
destroyed. That is the way the cells of the drunkard degenerate,
and this is the result of such degeneration. (Screen.)

Here is another picture showing one of these fine gemmules. These
fibers are subdivided; this cell is begun to degenerate. Here we see
that these ugly knobs have gone off, and the gemmules have entirely
disappeared. Here is a cell that is absolutely rotten. It has lost
all its branches. There were a great number of branches which used to surround it on all sides, but they are all gone or else that are so far degenerated as to be of no effect.

Now we can see how alcohol affects the drunkard. First his brain is irritated; the skin may be abnormally sensitive and the brain be abnormally sensitive— it is irritated because the tendency of alcohol is to increase its active functions without increasing its power. Then when this destruction begins to take place, such as you have seen, there is a deposit from them which obstructs the blood vessels, the lymphatics are obstructed, and the fine fibers of the nerve are destroyed as you see here. When that stage is reached then the drunkard begins to experience a loss of memory, a lack of judgement, a loss of the sense of propriety—a loss of respect for himself, for his country for his wife and children, for his family, and for his home—a loss of regard for the feelings of others and a loss of love for the good and the true and the beautiful. We find the drunkard loses the power of action; his power of will is diminished so that he cannot resist the temptation to indulge in the cup; as he goes by the saloon he is powerless to resist the temptation which presents itself. He has not the will power to control himself; he is under the control of his habits. This man, when he has reached the stage which we have been describing, if he takes a glass in his hand, he must keep his mind on it, or he will drop it, because it requires a constant effort of will to control these muscles, so as to be able to hold his glass. When the drunkard is carrying his jug, if some one speaks to him he is liable to drop his jug to the ground and break it because he forgets it for the moment; he must keep his mind on it all the while. So in walking, he must keep his mind upon his feet, or he stagers, and very likely falls down,—
and if he doesn't fall down he staggers all the time while making efforts to walk straight. (Screen.)

Here is another slide which shows you the forms of a number of fibers; here and there are fibers running back and forth in the structure of the brain. (Screen.)

Here again we have illustrated the contrast between the healthy cells, and the cells of the diseased brain. Here is a healthy cell, and here is a diseased cell. Here is a neuron running out; here is a healthy nerve cell,—the foundation of ideas—memory and everything which the brain is capable of, and here is a brain cell which has degenerated through the use of alcohol. (Screen.)

Here is what you see looking through a microscope at a portion of the brain structure. Here are a large number of healthy cells, and a large number of diseased cells. This represents the unhealthy cells which are imperfectly stained because of the poisoned condition of the cells in consequence of their losing their power to store up energy. Now we can understand why the drunkard's muscles become flabby because the nerve centers which control the muscles have lost their power of storing up energy, and these muscles degenerate. Sometime ago I made an experiment upon a young man—I gave him some alcohol: I first gave him something bitter, so he would not get the flavor of the alcohol—and I then tested his strength, and the result was as recorded on the strength chart. (Screen.) This strength chart is familiar to most of you. This young man's strength was tested, and it was found when it was first tested as represented by this blue line, which recorded something more than 4900 pounds. He was then given a couple of ounces of brandy and afterwards the test was taken when there had sufficient time elapsed for the alcohol to take effect, and the loss of strength
was seventeen hundred pounds,—a difference of more than three fourths of a ton,—caused by taking two ounces of brandy, which contains a little less than one ounce of alcohol. Now if alcohol is strengthening, and increases the strength, we ought to have found this young man stronger after taking the alcohol than before. After taking the alcohol he thought he was stronger, but he was not. This chart also shows that the strength of the muscles of the legs fell about fifty percent,—for instance, the strength of one muscle was 358 pounds before taking the alcohol, and only 160 afterwards, so his strength was lessened one-half by taking the alcohol from what it was before. The total strength of his legs was notably lessened, diminished, after taking the alcohol; it was only fifteen hundred pounds, and before it was twenty-five hundred pounds, showing the diminution of the total strength of the legs to be nearly one half,—a difference of a little more than a thousand pounds. This is due, not to loss of energy of the muscles, but it is due to the paralyzing effect of alcohol upon the nerve centers which control the muscles.

I might spend considerable more time in talking to you upon this subject, but I will close by a little experiment by which I can demonstrate to you one of the means by which the effects of alcohol have been studied. I have a little machine here which shows how long it takes a man to think. Now if some one will come up here, I will show him how fast he can think. Here is a little instrument, the chronomet, which will record time down to the hundredth part of a second. Here is a dial, and a little pointer which revolves very rapidly. These revolutions may be controlled by these little switches which I hold in my hand. Now when I close this it stops the pointer instantly wherever it is. Now I will ask this gentleman to take this in
his hands without closing it—it is now at zero. Now close your eyes.

(Experimenting with chronometer.) When I was at Staten Island delivering a lecture a young man was brought up for the experiment who had been drinking. I asked him how much he drank, and he said he drank as much as he could get. He was under the influence of liquor, but he could walk straight; you couldn't tell that he was under the influence of liquor unless you got near enough to him to smell his breath. When he was subjected to the test it was found that it took him three times as long to think as it took another man who was not under the influence of liquor. It required the man under the influence of liquor fifteen seconds to receive an impression and report it, while it required five seconds. So it took the man under the influence of liquor three times as long as it did the other man to receive and report an impression. And that is not a serious indication in itself, but it is also an indication of a paralyzed condition of the brain and a deteriorated state of the brain. When this effect is made apparent, it becomes a matter of very profound consequence.

Now by the same test it has been found that every single nerve function of the drunkard has been diminished. Sometime ago I made an experiment by giving a person small quantities of alcohol, and I found that every single sensory function was diminished by this means. The senses of weight, pressure, etc., were all diminished, showing that these persons had only half their ordinary sensibility. In order to test the digestion I gave him a test meal, and found that his stomach was doing a little more than the ordinary work of a healthy stomach. In another ex-
periment I gave him an ounce of brandy, and in another experiment I gave him eight ounces of wine, and I found that when I gave him the eight ounces of wine, his stomach, instead of doing the work of an ordinary stomach, was only doing half the amount of work of the ordinary stomach,—in other words, he was a hypopeptic. When the brandy was administered his stomach did nothing at all, and thus he became a hypopeptic—it dropped to the bottom of the chart. And so we find that alcohol, instead of being a stimulant, as it has been called, is a narcotic, and instead of being an agent which would enliven and energize the stomach, it is a paralyzing agent. So these public notions which lead to the use of alcohol whenever the patient is feeling a little weak, when he faints, whenever there is anything the matter with him, that alcohol is a universal panacea—these notions are based entirely upon error; they have not the slightest foundation, and we have nothing but the antiquity of these notions to recommend them.

Now my friends, my purpose in presenting these thoughts to you, is to make missionaries of every one of you. Alcohol is a deceiver; it promises things which it never performs: It tells a man he is strong when he is weak; it tells a man when he is weak it will make him stronger—but it makes him weaker; it tells a man when he is cold it will make him warmer, but it makes him colder; it tells him when he is poor it will make him rich, but it makes him poorer; it tells a man that he is strong when he is weak, and that he is rich when he is poor: The drunkard thinks he is rich, and offers to treat every one who will drink with him—if he has ten cents in his pocket he thinks he is rich—he thinks he is rich when he is poorer than he ever was before. So alcohol is a deceiver in every sense of the word. It is
the greatest possible mistake to think that alcohol in any form or under any conditions will carry a man through all his sicknesses and enable him to recover. It does not carry him through; if it has any effect, it is to shorten his life—it does not extend his life, it shortens it. Pneumonia is another disease in which alcohol is supposed to be helpful—especially helpful in sustaining the vital powers, and acts as a "stimulant," as it is called. It is not a stimulant, but it is a depressant, as you can see from the evidence shown you to-night. It lessens the vital activity of every function of the body, and consequently it is in every respect a deceiver and a harmful agent, and it might be entirely eliminated from the materia medica or the armamentarium of every physician without the risk of a single life or endangering the safety of a single individual, so that every curable patient might be cured without its use.
OF the great evils that afflict modern society, there is probably none greater than that which grows out of the use of alcoholic liquors. Alcohol has been used for several hundred years in the distinct form of alcohol only. It has been known for thousands of years in the form of fermented liquors, and probably the human family has suffered more from the use of alcohol during the last two or three thousand years than from almost any other cause.

Out of intemperance grows a host of other evils,—immorality and various forms of vice and crime are, according to the statistics of the police courts, almost entirely attributable to the use of alcoholic liquors. Very few men commit suicide who have not been addicted to the use of alcoholic drinks, and very few men commit homicide who are not under the influence of alcoholic liquor at the time, and a large share of those who are in prison for theft, burglaries, highway robberies and other crimes, were under the influence of liquor at the time the crime was committed. Our prisons are filled with the children of those who have grown up in drunken homes and the streets of our great cities swarm with beggars as the result of intemperance.

Notwithstanding it is a most remarkable fact that this drug, alcohol, which is evidently the cause of so much suffering and so much immorality, and so much vice and crime,—that this liquor is looked upon by the great majority as a good thing. Indeed there are those who apologise for the use of alcohol by saying that it gives a sort of divine inspiration to those who make use of it; that it inspires
the orator; that there is something in it which gives life and energy and vitality to the man who is weary, or the man who lacks strength and energy.

There are those who apologize for the use of alcohol by saying that those who get along very well in the world without the use of alcohol and who are known as total abstainers, are possessed of a sort of idiosyncrasy; that they have a peculiar kind of constitutional development and that they do not appreciate—that they are not able to appreciate—the advantages of the stimulants. That they get along very well without the use of stimuli, because they are peculiarly constituted.

Now it would be very interesting to make a comparison between those who have this sort of idiosyncrasy, and those who have the other kind of idiosyncrasy,—that of alcoholics—between those who are total abstainers and those who do not abstain. Now suppose we compare these two classes of people,—people who abstain entirely from alcoholic liquors and those who depend entirely upon alcoholic liquors for their inspiration.

We should find among the latter class, all the criminals, nearly all the paupers, a large number of the insane, a large number of all the imbeciles and the idiots and the cranks—and the mentally infirm—we should find these among the alcoholic classes, and their children and friends and neighbors, who depend upon them largely the resulting of those who make use of alcohol and its poisons; we should find among them nearly all the paupers,—while in the other class we should find the well-to-do college men, the lawyers, the doctors, and the professional men,—those who are in the highest rank—scientific men—the best class of society and the best people. We should find these on the one side, and
on the other side we find a few good people among the moderate drinkers, among those who think that alcohol is a good thing. And we should find a good deal of what is called the debris of humanity, --the debris of society--we should find them on the alcoholic side. Now if we should judge from appearances, we should certainly think that there was nothing good in alcohol from this comparison, --nevertheless it is a true comparison.

Now there is another remarkable thing in reference to those who claim that alcohol is useful as a food or stimulant; and that is, that they persist in using but one kind of alcohol, and do not recognize the fact that there is more than one alcohol; that there are many alcohols, --in fact, that there is a very large family of alcohols, --broth rs and sisters, aunts and cousins and nephews, --a whole lot of them. Carbolic acid belongs to the alcohol family; it is a sort of second cousin, perhaps, but there are several members of this alcohol family, some of which are found in the picture here on the screen. We find that there are several members of the alcoholic family, which are almost exactly alike; they only differ, perhaps, in the amount of hydrogen and oxygen which they contain; in other respects they are all practically the same. Beginning with methylic, or wine spirit, which is the first spirit, the next is the ethylic, or wine spirit; then we have butyric alcohol and other varieties of spirits, one of which is fusil oil. Now fusil oil is an alcohol, just as much as the wood spirit or the wine spirit or naptha; it is alcohol just as much as the alcohol which is produced in wine--the alcohol produced in gin, brandy, etc. So you see the alcohols are all alike. Wood spirit, or naptha, is intoxicating as well as wine spirit. But fusil oil is much more intoxicating than the ordinary wine spirit. 

When a person gets intox-
icated for example from fusil oil mixed with ethylic alcohol, it is termed "bad whisky," which is the ordinary appellation for that whisky that has not been redistilled enough to get all the fusil oil out of it when a person gets intoxicated with that, it takes the body a long time to get over it, because it is a heavy alcohol and it takes the body a long time to get rid of it. A person who is under the influence of an anesthetic is intoxicated. A person may get drunk on ether. A person under the influence of ether is simply intoxicated. A person is in the condition of being drunk when he does not know what is happening to him while under the influence of an anesthetic. In olden times, before alcohol and ether were known, it was the fashion among physicians to make the patient drunk before an operation, but it was observed that they were very slow in getting well. If a person's leg had to be amputated, he was made drunk so that he would not feel it, but he was very likely to die from the operation, so that physicians did not like to operate under such conditions because they found that intoxication from alcohol interfered seriously with their getting well; so that alcohol is evidently not a food in any sense.

Some time ago I tried alcohol as an anesthetic. I had a nice old lady under treatment, who had to have an operation upon her eye. She did not like to have an anesthetic, because the doctors told her not to; so she insisted that I must find some other way of operating. That was before cocaine was discovered. After thinking the matter over, I finally decided to give her some alcohol; and I gave her a good sode of whisky, and she got very intoxicated over it, and she allowed me to operate upon her eye without any complaint, although it was quite a painful operation. After I got through, she said "Doctor, I want to kiss you," throwing out her arms toward me; I said "No thank you." She seized upon my coat tail and said she must kiss me. I told her
Mrs. Kellogg might hear of it, and that it would not do, and that there were several looking on, and tearing myself away, I ran out doors. I mention this to show that when the senses are benumbed with alcohol, that while it is a thing that benumbs the nerves of sensation, it also benumbs the moral sense, the sense of propriety and all the senses are benumbed while under the influence of this baneful drug. As I remarked, it is a curious fact that those who apologize for the use of alcohol, insist that it is a good thing if only used in moderation, if we use it just as we use bread, potatoes, and other articles of food it would not do us any harm; I say I do not see why they do not use the other alcohols. Why do they pronounce wood spirit, for instance, a poison, and pronounce ethyllic, or wine spirit, a food? What reason have we for pronouncing one alcohol a food and the other a poison, when they belong to the same chemical series, in their composition? All have the same properties; all intoxicate; all are inflammable; all burn with a lighted match; they are all of them intoxicating; they are all of them capable of accomplishing the same ends things practically; when applied to the body they have practically the same effect. Now why is one a food, and the other a poison? Certain it is, that if, at the present day, any one should make a discovery of alcohol de novo, should make a new discovery of alcohol and bring it forward, as I said, no man on earth would ever think of recommending it as a food. Alcohol is a product of decay; it is a product of fermentation; it is a product of the action of germs upon food substances; certain germs, yeast, among other micro-organisms, are capable of converting sugar into carbonic acid and alcohol.

Whenever fermentation takes place, a little alcohol is produced, for instance in making bread. There was at one time a certain London baker who had made this discovery, and he attached a great still to his
baker, so that the alcohol as it was formed would be condensed, and he could save the alcohol and thus save some money by this means. He was thus enabled to sell his bread half a penny cheaper on account of saving his alcohol and he got along very well, and had a great run of custom until his neighbor baker across the street discovered what he was about, and then he put up a sign, "Bread with the rum in it," and then everybody flocked to him to get bread that did not have the rum all taken out. So the other baker was obliged to dispense with his still and give up the business.

Now alcohol is produced wherever fermentation is taking place, or whenever there is fermentation that produced carbonic acid gas in the presence of sugar, we have alcohol produced. Sometime ago I made an experiment to show that alcohol is produced in the stomach: I took a breakfast and swallowed it into a glass flask and added yeast and sugar and two or three hours later I made an examination and found that there was a large quantity of alcohol in this flask. I had distilled about half a tablespoonful of alcohol from that breakfast and it was sufficiently strong to enable me to light it with a match. I scratched a match and lighted it and applied it to my breakfast and it burned. Whenever we have this fermentation, alcohol is produced; it is the action of the germs that produce the alcohol; it is not a product of natural growth; we do not find alcohol in any spring or tree— we find it nowhere as a product of nature; but alcohol is the excretion of certain fungus plants— low orders of vegetable life that belong to the class of fungi, or organisms below the fungi— below the toadstools, and the molds and other rooted things. These microscopic fungi produce alcohol as an excretion and then, to take this alcohol, and to insist that it is a wholesome food— a secretion of the lower organisms— there is
no such axiom or proposition known in the whole category of scientific theories; you cannot find such a proposition there. Nothing is so monstrously absurd as the idea that the poison which is the excretion of a micro-organism should be the food for the highest being that lives on earth—for man.

Now it seems an extraordinary thing that anybody should stand up and apologise for alcohol as a food. Dr. Roberts, of London, some years ago tried to prove that alcohol was useful, somehow—in the process of digestion, or some other way. Dr. Hammond claimed that alcohol was **somewhere a food**, because it diminished the oxidation of the body and so saved the body from the wear and tear from the breaking down of the tissues by work, and various physicians have at various times asserted that alcohol was an aid to digestion,—it is quite customary for English physicians to recommend to their guests, port wine as an **after-dinner stimulant,** as a means of aiding digestion, and a great many took a little champagne or whisky after dinner to aid the digestion, especially if it was a hearty meal, with the idea that it is going to help the digestion. Dr. Roberts was making some experiments upon digestion, and among other things it occurred to him to test the various alcoholic drinks, some of which are enumerated upon the screen here, to determine to what degree they would aid digestion. So he arranged to carry on the process of digestion in a glass flask where he could watch and investigate the results of digestion and see how much digestive work was done, and, to his astonishment, he found that alcohol in all doses interfered with the process of digestion. He found that beer and wine entirely prevented the action of the saliva upon starch; he found that brandy, gin, rum, and all the strong liquors
even in small doses, interfered with the digestion of albumin; that they destroyed the pepsin and hardened the albumin and rendered the digestion of albumin impossible in the stomach. So he found that alcoholic substances—alcoholic drinks of all kinds—had the effect to hinder the processes of digestion. What was Dr. Roberts going to do? So he started out to bolster up the waning influence of alcohol. Temperance men had been inducing a great many to become total abstainers, and alcohol seemed to have a fair chance of being driven to the wall. But Dr. Roberts comes to the rescue, and to his astonishment he has proven the very thing that the temperance people wanted him to prove—that alcohol hinders digestion. So he turned a scientific summersault; he simply keels over and says: "We have been entirely mistaken in supposing that alcohol is useless as an aid to digestion, because it hinders digestion; instead, we have been suffering from too fast digestion, instead of too slow digestion. Our modern cookery so simplifies and aids digestion—(our modern French cookery, you know,—beef steak, potatoes, Welsh rarebit, etc.)—he says that our stomachs are in danger of digesting too rapidly and throwing such a large quantity of nutrition into the blood that, as Dr. Roberts says, "we are suffering from undue acceleration of nutrition." The doctor thrusts out this phrase at us and tells us that the great danger to modern life is the acceleration of digestion; that what we need is a little alcohol to put on the brake so that our stomachs won't do too much; that we get too fat, and die of undue acceleration of nutrition. This is a fair sample of the way in which scientific men bolster up the use of alcohol. Prof. Chittenden, of Yale University, a year ago went to work in a "Committee of Fifty," appointed for the purpose of making a careful examination and investigation into the whole question of alcohol, and ascertain
whether it is really useful to the human family or not; whether it should be recommended for use in moderation or not; Prof. Chittenden was set to work to find out whether alcohol hinders or aids digestion, but it did not seem necessary for him to do this, because Dr. William Roberts, a greater than he, had settled it that alcohol hinders digestion and the same thing has been done by investigators in France, who assert that alcohol hinders digestion. This thing is as well known as their A.B.C. among physiologists, but Prof. Chittenden was set to do this work, and he made a very elaborate investigation, and made some scores and scores of experiments with all kinds of distilled liquors and all sorts of fermented liquors, and Prof. Chittenden found in his experiments, which were performed in a glass flask, that when alcohol is used in the very smallest doses, that it decidedly hinders digestion; he found out that it impairs the digestive process in almost every experiment which he made. In one or two instances there seemed to be an increase of digestion, but I dare say, it was through some error. In nine tenths of the cases, alcohol hinders digestion. But Prof. Chittenden hardly knows what to say as to the result of his experiment, because the Committee of Fifty were evidently bent on finding that alcohol was not harmful, unless abused, so the Professor says that it is not a final test, showing that we diminish oxidation, because there are other influences relating to digestion other than the mere solution of food by the pepsin and the hydrochloric acid. I think Professor Chittenden is right about that, but let us see what the result of alcohol upon digestion is when the experiment is performed in the stomach. Some time ago a young man laid himself upon the altar of science as a sacrifice and was induced to swallow some alcohol with a test
meal. His stomach had been examined, and he had only a slight degree of hyperpepsia. As the result of this experiment which was performed it was found that the wine had reduced the hyperpepsia to hypopepsia; it diminished the work of the stomach more than half, and when he took a couple of ounces of brandy or whisky along with his test meal, it was found that his stomach did nothing; it simply folded its arms and laid down, metaphorically speaking, absolutely paralyzed; it was unable to do anything in the presence of that whisky. Now why should it be unable to do anything in the presence of that alcohol?

I want to call your attention to ginger beer; it has one percent of alcohol in it. Ginger beer and Hire's root beer and all these so-called "Temperance drinks" we take, in with few exceptions, contain alcohol, although this alcohol is not sufficient to make a person intoxicated, it is enough to get a person in the habit of drinking. By the way, it is injurious to get people in the habit of drinking out of a bottle because if a boy drinks out of that kind of a bottle, he will be willing to drink out of a black bottle, out of the whisky flasks that some people wear in their inside pockets; he gets in the habit of drinking out of a bottle, and the habit grows upon him; so I do not approve of that, so long as we have such a fine drink in what is known as "Aram's Ale." Now small beer, such as sarsaparilla beer that is alcohol in from one to three per cent; if it has been fermented a week, it may have three per cent; cider has 5 to 10 per cent, and when a man gets drunk on cider, he gets badly drunk, because he don't get over it very quickly; the acetic acid which cider contains is even worse than the alcohol. Lager beer is 5 per cent alcohol, and it may contain even more than that.
glucose in from five to ten per cent; we cannot get 20 per cent of any kind of alcohol by fermentation; 14 per cent is the largest quantity we can get by fermentation; we have 6 to 22 per cent—like ale. But these stronger wines are 45 per cent—alcohol is added to them, so that they have just the strength of liquor required. Gin, is 40 to 50 per cent alcohol—it will burn like ordinary alcohol. Gin may have a little more proof spirit; brandy contains 55 per cent. The so-called "bitters," that you buy at the drug-store and take into your stomachs contain from 6 to 60 per cent alcohol. Richardson's Bitters contain more alcohol than Scotch whisky—it contains 60 per cent, and it has a good deal of fusil oil in it. There are bitters which contain only five per cent—just enough to prevent souring. You will find 5 per cent of alcohol in Walker's Temperance Bitters. The Some ten or twelve years ago I made something of a stir in Walker's Bitters camp by distilling a bottle of Walker's Bitters and taking it to a temperance meeting and setting it on fire. About this time the manufacturer of these bitters was running for President on the Prohibition ticket, and I believe he gave them several thousand dollars' worth of the Bitters by way of advertising them, hoping he would get it out of the Temperance people in that way. To use a plain English word, this preparation is "nasty,"—and it's nothing but nastily—awfully nasty; it is made out of sour lager beer—that is what it is. He goes around San Francisco, California, and collects the dregs from the old beer barrels—he uses sour beer and adds a little aloe bitters and some other things to his mixture and calls it "Temperance Bitters."

Now if we can not understand really what the influence of alcohol upon the human body is, we want to know something about what the body is. It is made up of what might be termed the brick and mortar and nails and other materials of the house; these are the primary tissues; these tissues are different in different structures. We have fibred here
These are bones, (screen). Here is the adipose tissue or fat formed by the little globules of fat being gathered by the little tissue fiber. Here is a bone with a channel running through it lengthwise—these are similar structures of which the body is composed in which you will see some other structures entering into the composition of the body. Here is a view of some of the connective tissues, and these little spaces here are filled in with fatty tissue. This is the sort of structure which is called elastic. These fibres are called yellow elastic fibres, and stretch like India rubber. Here are the fibres which compose the ligaments—the white fibrous tissue.

But the most interesting things are those which represent the cells of the body. (Screen.) This represents an amoeba, which you will find in stagnant pools. Scrape up a little of the mud from the bottom of a little pool, and you will find some of these curious creatures in it. They have curious movements; they look like little jelly drops. This little creature has no organ of locomotion, but it can move; it has no nerves, but it can feel; it has no mouth, but it makes a mouth on the spot. Here is one that has run across a germ, and he extends himself and glows around it and encloses it. Here is a white corpuscle of the body; they flow along in the blood, and they really belong to the amoeba class; they are little creatures of the same class. They are similar in their habits, similar in their habits, similar in their make-up, and in their structure to an amoeba, and they behave in the same way; they creep along the sides of the blood vessels and gather up the germs and capture them and digest them. The white corpuscle has no stomach, but makes one on the spot—here is one—(screen.)

Every 500 of the red corpuscles contain one of these white corpuscles. In the brain we have what is called neurons, or individual cells.
They take hold of one another, but they do not touch. The liver is made up of little cells, which make bile. The kidneys and other portions of the body have their peculiar cells and each one of these little organisms is a distinct cell; just as distinct as is a fly, or a bee, or a fish, and has its particular work to do. Now you can see, here are the muscles of the body—(screen.) It constitutes but a small part of the 500 muscles of the body,—by which the body is moved about—and the internal motion of the cells—and their external movements, are the result of the contraction of the muscles.

There are certain nerves among these muscular fibres,—the muscles are the servants of the nerves, and when a message comes down through the nerves to a muscular fibre, it contracts like the trigger of a gun, and touches off the muscular energy, and gives the muscle a little dynamic explosion by which its energy is struck off,—by which the hand or the foot is moved or the heart beats, or some other muscular movement is produced. (Screen.)

Here we have a representation of the nerve cells with their long fibers by which the nerve cells come out to the long fibre. These are some of the minute structures of which the body is composed. Here are veins which carry the blood to the heart. Here is the right side of the heart and the left side of the heart. The human heart is double—we really have two hearts, the right heart and the left heart. A heart which pumps impure blood and a heart which pumps pure blood. Here valves of are the walls of the heart. Here they are shut. Here is a valve which is open; the blood comes into it here into the left heart and after it goes in the valve contracts and closes and the other valves open, right and the blood passes on into the next heart. (Screen.) Here is a
representation of the blood flowing through the capillaries—you will find the same thing in a frog’s foot; you will see the blood running through these little channels, and running very rapidly. We can scarcely see them slip by, they go so fast.

Now we want to show you the effects of liquor upon the circulation. When alcohol gets into the heart it has a poisonous effect on it which can be discovered by examination of the pulse. (Screen.) This represents the tissue of a healthy person. I made a sphygmographic tracing by a little instrument placed upon the pulse—a lever connected with it so that when the pulse beats it makes the arm of the lever write upon a piece of smoked paper, scratching off the black and leaving a white line and showing when the pulse beats—when it beats the lever rises and the arteries empty into the veins; each beat is a duplicate of the other,—the beats are just alike.

Now look at the pulse of a moderate drinker,—can you make out whether the heart beats at all? I suspect there is one here and another one there, etc., but I could not tell where. (Screen.) This represents, if you please, the weak and feeble heart of the moderate drinker. Here is the drinker; here is the jerky sort of movement,—we cannot tell where the heart beats. It is the tremulous pulse of an old drunkard. We should expect a drunkard who was recovering from an attack of delirium tremens—that his heart would be in an exceedingly weak and tremulous state. I would like to call your attention to this tracing of a tobacco user; I would like those of you who use tobacco or know a tobacco user, to tell them about this. This poor boy’s heart is nearly paralyzed by the use of tobacco, be cause he
has not acquired the control of his heart, and his heart can hardly beat at all.  (Scream.)

This ear, you see, is too big for his head; it is larger than the other ear.  This represents an experiment that was made when I was a student; the professor cut the nerve which controls the blood supply of the ear, and the result was that the ear immediately became red; it was the case of a rabbit; in consequence the skin became red and in a few months that ear had grown considerably larger than the other one, so that the rabbit did not seem to be evenly balanced.

This represents that,—this represents the drunkard's brain; his face is congested, because the alcohol has paralyzed the nerves which control the circulation, and the blood vessels have become dilated.

That is the reason the drunkard feels warmer when he is no warmer, because the alcohol dilates the blood vessels all over the body, while his temperature was really lower than it was before, and he feels warmer, when he really is colder than he was before.  Alcohol is altogether a deceiver, for it makes a man think he is colder when he is hotter, stronger when he is weaker; rich when he is poor, that he is fed when he is hungry.  You see it deceives all the time; it is a universal deceiver.  When alcohol gets into the blood it effects the blood-corpuscles, which are nearly round,—and when applied in considerable quantities, it causes the blood corpuscles to all shrivel up.  The poisons of tobacco also effect the blood.

Now I will call your attention to the fact that alcohol has the effect of making the rabbit's ear grow large.  I sent a man to Chicago to paint another man's nose, at one time; he had an exceedingly rosy nose, and I sent an artist to him.  When he was a boy, he did not have that rosy nose.  I sent a man to make a drawing of a politician, and
he made it, and I put it on a chart; his nose had grown to be nearly
twice as large as it ought to be, and was as red as blood. It grew
too large for his face—the same as the rabbit's ear did—because the
alcohol had paralyzed the nerve. (Screen.)

Here is a representation of a drunkard's heart in which fatty
degeneration has taken place as the result of the alcohol, which deposits
little globules of fat in the tissues; this fat has invaded the heart;
the heart is too big. You will find the pulse of such a man weak;
that is the reason of what you saw in the tracings a little while ago,—
that it was irregular and weak; it was because the heart was weak;
so you can see what a condition this drunkard must be in. This man
takes alcohol to give him strength. Then the idea that alcohol is going
toxigize stimulate the heart is a mistake; instead of that, we find
that the heart of the alcohol user is getting weaker all the time.

Now there is a popular notion that alcohol somehow helps the heart,
and so doctors give persons having a collapse of the heart or one who
has fainted away, a dose of alcohol; they say, "get some spirits;"
spirits is the universally administered remedy for every condition of
collapse of the heart. Now it has been proven that even large doses
of alcohol, as well as small doses, make a person weaker; that there
is no such thing as alcohol strengthening the muscles or nerves or heart.
You know the frog's heart remains alive out of the body for a time:
I made a lever and applied it, and found that even small doses weakened
the heart. Some time ago we had a young man lift all he could, and he
lifted nearly 5000 pounds; we then gave him a little whisky, (we
called it "medicine,") a little while afterwards while he was under
the influence of the alcohol we asked him to lift again. He did so,
and found that he had lost one-third of his lifting power, showing
clearly that alcohol does not make a man stronger. (Screen.)
Nu this is a diagram of the circulation, the purpose of which is to show you why alcohol has so pernicious an effect upon the liver. I am going to show you pretty soon some alcoholized liver. This diagram shows the right and left heart; the right heart pumps blue blood through the lungs to purify it, then it comes around to the right heart to be sent out to the body, from whence it returns to the right heart by means of the portal vein. Here we have the circulation from the right heart.

Here is a representation of the capillary net-work; I have demonstrated that the blood that gets to the stomach, the pancreas, the spleen, and the intestines—the blood that gets into these four organs,—instead of going directly into each of them, it is carried directly to the left heart and is gathered up into the vein itself, which is called the portal vein, and through the net-work of capillaries it is passed through the liver and is finally gathered up in the hepatic vein and from that carried to the large vein going to the heart. Now the purpose of this is to filter the things that get into the stomach,—that they should be passed through the liver and inspected by the liver, so that every poisonous thing shall be taken out by the liver. Now when we take alcohol into the stomach, before getting to the brain or kidneys or heart or lungs or any other part of the body, it must go through this portal vein and then be carried through the liver, so the liver has the first chance at the alcohol, and the liver captures as much of the poisons as it can, and absorbs as much as it can, and holds it back so as to protect the delicate structures of the brain and the heart and the other vital organs,—those which we cannot get along without. The liver sacrifices itself for the rest of the body, so we see why the liver of the gin drinker becomes diseased. (Scream.) Here is the representation of a liver: In a drunkard's liver we find
all these various tints which are represented here. These are drawn from the actual livers of drunkards. Nearly all these drawings are made from the livers of men who died under the influence of liquor—from great drinkers who were found in the great hospital in Vienna—the drawings were made at their post mortem examinations, and are not diagrams, simply.

Now here is the "nutmeg liver." (Screen.) When a person is addicted to the use of alcoholic liquors, his liver is diseased with fatty degeneration, and becomes what is known as the "nutmeg liver." This represents a liver that has undergone fatty degeneration. You can see the difference between this liver and that liver. (Screen.) Instead of the brown, or chocolate color, it has the color of fat, and it looks almost like tar. (Screen.)

Here is a representation of the liver of a person who has used alcohol for so long a time that his liver has become congested, and it has undergone the change which has given it this peculiar appearance. This is a case that is unusual, but still it does occur occasionally. This sort of liver is the result of the use of alcohol, and the use of alcohol only; it does not occur from anything else. That is the usual cause of this condition; it is a state of inflammation following the taking of a large quantity of alcohol, and is very likely to terminate in a case of delirium tremens. (Screen.)

Here is a liver whose surface is covered with a warty appearance; here is the small lobe of the liver and the rest of the liver is squeezed up so that the interior portions of the liver are pressed out, presenting a warty appearance. This is the cirrhotic, or "gin liver," which is directly due to the use of alcohol. (Screen.)

Here is a liver which is called the "hob-nailed" liver, because
it has the appearance of the hob nailed shoes worn by English laborers. (Screen.)

Cancerous liver. The liver suffers more from the effects of these poisons, than do all the other organs, because it receives the brunt of the attacks of alcohol and the other poisons. (Screen.) This shows you the effect of alcohol upon the kidneys. Here are the blood vessels; here is a kidney which has undergone the fatty change, and the natural structures of the liver have been replaced by fat; it has lost its ability to remove poisons from the body, which it is its duty to carry away. (Screen.)

Here we can see the fatty liver of the beer drinker, and here is the gin drinker's liver. The beer drinker's liver is enlarged in consequence of the large amount of material eliminated from the body, and here we have the gin kidney, which has been contracted by the poisons of the large amount of this dessicating substance which alcohol contains. (Screen.)

Here is a healthy stomach: The interior has a uniform tint; it has a reddish hue, uniform in color. (Screen.)

This is a liver which shows the effect of moderate drinking. Alexis St Martin, while under the treatment of Dr. Baaumhoft, would have a spree, occasionally, and a single ounce of alcoholic liquor would produce the congestion which I have shown you. When he came back from drinking, his stomach would be covered with ulcers as the result of the irritation of alcohol, and yet Alexis St Martin would say that he felt as well as usual; that he had no pain in his stomach. (Screen.)

This represents the appearance of the stomach in a case of deler-
ium tremens; in this condition the stomach is in a state apparently
bordering upon gangrene. Some years ago I showed this picture,--
I showed it in a big tent nearly twenty years ago— it was twenty years
ago this summer—while exhibiting it, I noticed a disturbance in the back
part of the house, and I afterwards inquired what it was; I saw a
couple of men carry another man out, and I asked what was the cause of
the disturbance, and a gentleman brought this man to me and introduced
me to him. He was a tall, broad shouldered man, active and vigorous,
and looked like a giant, and I found that he had fainted away. I asked
him how he fainted away, and he said "It was that Picture on the black-
board." That man used to be a drinking man, but he was so horrified
by the condition of his stomach as represented by this picture, that he
fainted away on the spot. I was sorry that I did not have all the
drunkards present, it might have reformed them on the spot. (Screen.)

This is a stomach in a state of chronic inflammation. The stomach
has lost its power of resisting germs and this thickening occurs, and
the lower opening of the stomach closes up so that the food cannot pass
through, and so the poor victim dies. This is one of the awful condi-
tions which arise in the stomach because of alcohol. Alcohol affects
every organ of the body—not a single organ escapes. At another time
I am going to show you the effect of alcohol upon the nerves.

Now in conclusion, I want to show you the tremendous size of this
question: When you look up at this diagram, you will see a large
black line running clear across. That represents, if you please, the
amount of money that is expended for alcoholic liquors in the United
States every year. We are told by the national Government statistics
that this amount of money is nine hundred millions—almost one billion
that is expended in alcohol every year. Please note the amount that is
represented by this black line. Alcohol wastes twice as much money as is
required to furnish all the people of the United States with bread. So if this great expenditure for alcohol were should be stopped, and the money was expended for charity, no one would be hungry. Here is a lesson on the question of poverty. We would have three times as much money as we now have for charitable purposes; we would have twice as much money to spend for bread for those who do not have any; and we would have a large surplus besides. We spend four hundred and ninety millions a year on tobacco, — almost as much as for bread. Men smoke and chew up nine almost as much money in the use of tobacco as is required to feed the seventy million people of the United States. It seems to be incredible, nevertheless it is true; statistics show it. Public education costs eighty-five million. Just think of it! All the money expended for public education amounts to less than one-tenth of the amount of money expended for alcohol. Think of it! Put down some of these facts and talk about them to others; and then here are tea and coffee and opium and whisky and tobacco; what would the result be? Why it would give every child a chance for a better education; then we could have manual training schools, swimming schools, and sanitary arrangements of a proper kind in every school; medical inspectors — so that every child could be examined without any expense; we could have the children brought up as they ought to be, and trained physically as well as mentally and morally. Now I want to call your attention to one thing more — the five and a half million poor unfortunate people who have not the blessings we enjoy, while we are spending nine hundred millions a year for alcohol — just think of that! If we could devise some means by which this great curse — alcohol, might be put down, and by which the manufacture of alcohol could be abolished except for chemical purposes, what a marvelous blessing it would be, — not only for this country, but for the whole world. Men
would cease to poison their brains with alcohol and live more for their neighbors. Here is something at the bottom of this diagram:

Tea, coffee, tobacco, whisky and opium, $1,468,500,000 -- a billion and a half dollars, every year expended for these poisons, which do no good, and which do an immense deal of harm. The cost of bread, meat, clothing, education and missions, $1,345,500,000, an excess of $123,000,000 for liquor, opium, tobacco, tea and coffee--these five poisons cost us so much more than all the bread, and meat and clothing and education and missions. Now these are solid facts--

Q. What is the remedy?

A. The question is, what is the remedy. It is very easy. Sometime ago an old gentleman asked a Quaker how he should stop drinking. The Quaker said, "I can tell thee, friend, how to stop drinking. It is just as easy as opening thy hand. When the wishes to drink a glass of liquor, and raises it to thy lips, just before it gets to thy mouth, open thy hand and it will fall away." Now it is not so easy for people who are drinking to let their hand open and let it drop, but if a sufficient number of people could be found who would insist upon the doing away with this immense evil, it could be done. I used to think that I could not vote the Prohibition ticket because it would interfere with some one's inalienable rights--but I intend to vote the Prohibition ticket, that is, if it is a straight out Prohibition ticket. The only reason I have not voted that ticket before was because I did know whether it contained what I wanted or not; but if they are up for the abolition of alcohol in proper form, I will vote for it every time. I do not believe that I shall ever see the Prohibition party ever get into power, but I believe that if we keep voting and working I believe it would set people to thinking, so that the tendency would be to do away with this monstrous evil.
EFFECTS OF ALCOHOL UPON NERVE CELLS.

Shrinkage in size of all cordical cells.
2. Disappearance of gemmules.
4. Roughening of the stronger processes.

Remark: The degeneration involves all the different cells of the brain and all parts of the brain; one-fourth of all the cells are involved.

In some brains nearly all the cells seem to be altered.

Swellings like the knots which form on an oak tree from the attacks of parasites.

The swellings increase while the finer branches and twigs of the tree and the leaves fall off, and the limb shrinks, decays, and dies. The same thing happens to nerve fibers under the effects of alcohol. The processes of the inner cell body are roughened and seamed like the bark of the tree.

The dendrites dwindle and shrivel. The cells become corrugated.

Axis cylinders are not changed.

Correspondence between cell changes and clinical picture.

Increased sensibility of the skin; anesthesia.

Disturbance of the eye and ear.

Tremor; tremulous speech.

Weakened muscles.

Trotting gait.

Paretic attacks.

Incoordination.

Mental disturbance.

Loss of moral tone.

Weakened mental faculties.

Disordered judgment.
Disrupted memory.
Dementia.
Explanation of the symptoms.
Poison irritates the cells, and causes overaction.
Nutrition is impaired, resulting in impaired structure, the shrinking of cells.
Swelling of dendritis.
Swelling causes anesthesia and paresthesia.
Loss of memory of recent events.
Disturbances of eye and ear.
Changes in the cell body, resulting in tremor.
Loss of co-ordination.
As degeneration of cells continues, will power, judgment, memory, fail; the result is finally dementia.
The cells of the brain are closely united so that a disease of one causes disordered action in many.
Effects of alcohol are not peculiar to it, but result from the use of any irritant poison.
The effects have been observed in both human beings and rabbits.
OTHER EFFECTS OF ALCOHOL.—The distension of vessels.
Small ruptures.
Obstruction by crystals and other detritus in the sheaths of vessels, blocking the lymphatic channels, by a small coaguli and crystals.
Disturbances of nutrition resulting.
EFFECTS OBSERVED.

Effects of acute alcoholic poisoning observed by Dehio in 1895.
--German.
Death in one to thirty-four hours.
Special changes in Purkinje's cells.
Instead of normal, find meshed, stained net work; irregular granules.


Poisoned brains stain poorly.

Multipole cells showed great decrease in granules, also cells and cord.

Make drawing.

Observations of Andriesen.

Swelling of fibrils and disappearance of contact of granules.

Softening of the protoplasmic twigs; finally leaving a ghost-like tattered stump.

The fibrils in health are fine, delicate, smooth, clear-cut, like a thread of silk; in disease, granular and wrinkled; internally, irregular staining.

The first changes produced by alcohol are in these final terminal filaments, which give rise to delay in reaction time, and slowness in arousing associated images.

Increase of pigmentation an indication of progress of degradation in activity of cells through the replacement of living protoplasm by pigmentary matter, such as is found in senile decay and chronic epilepsy.

Intense staining of the cell protoplasm and the swelling and softening of the intracellular rods of granules,—reservoirs for the storage of nerve energy or the food of the cells.

The symptoms arising from these changes.

Inability to re-arouse the past.

Diminished ability to receive and register impressions.

Diminished power of attention.

May be confined in one case chiefly to the visual sphere, in another
to the auditory, in another, to the olfactory power, etc.

The drunkard drops a ball or a jug from his hand unless he continues looking at it.

There is a diminished discharge of energy from the weakened brain cells, requiring constant stimulation from the will to maintain it.

The effects of alcohol upon the cell body are the same as those of fatigue, the changes being in the energy-storing portion of the cell.

After great fatigue the nucleus and protoplasm lose all power to take stains the same as cells degenerated from alcohol.

This condition is present in inebriates.

Consider the absurdity of using alcohol for the relief of such a condition.

This subject has been studied by Fiske, Hodge, and many other animal observers, monkey, swallow, pigeon, and sparrow by Guérard, Beaunis, in pigs.
EXPERIMENTAL RESEARCHES RESPECTING THE EFFECT OF
ALCOHOL UPON THE HEALTH OF HUMAN BODY.

At the last annual meeting of this Association I communicated
a note which recorded the results of experimental inquiries in the
same line with those which I present in this paper. It may
be well to present a brief summary of these results, which I will
do as follows:

I found the time of normal tactile reaction, with the means
which I employed, to be .140 sec. After 2 oz. of whisky the
reaction time was .303 sec. The normal temperature reaction for
heat was .389 sec., after 2 oz. of whisky .796 sec. Temperature
reaction for cold .323 sec., after 2 oz. of whisky .750 sec.
The accommodation test, by making the patient place his finger upon
a point, after closing the eyes, was found to be greatly dimin-
ished; the average distance from the point at which the finger
touched the paper, before taking alcohol, was 8.1 MM.; after taking
2 oz. of whisky, 13.2 MM. From the above figures it would be
apparent that the constant effect of the alcohol was to lessen
the sensibility of nerves and nerve centers.

Another experiment, the results of which were reported
one year ago, consisted of a careful test of the strength of a
vigorous young man before and after taking 2 oz. of whisky. The
total strength of the young man in his normal state was represent-
ed by the ability to lift 48.6 lbs. By this statement it is not
meant that the young man actually lifted this amount at one lift,
but rather that this was the sum of all the lifts made by the principal groups of muscles in the body. Two hours after taking of 2 oz. whisky, the same person's lifting capacity was 3385 lbs. or 1500 lbs. less, a diminution of fully one third. In other cases a diminution was found, but not always so great as in this case.

Still another test consisted in an investigation of the effects of alcohol upon digestion. Dr. Roberts, the eminent English physiologist, showed some years ago in an experiment with artificial digestion, that alcohol in all but the smallest proportion lessens the activity of stomach digestion. Dr. Roberts, notwithstanding, finds in this fact occasion to recommend alcohol for general consumption, basing this apparently inconsistent advice upon the supposition that the average civilized stomach is possessed of so great digestive properties that it is necessary to slow down the digestive activity by means of alcohol, in order to prevent what he denominates and "undue and dangerous acceleration of nutrition", which he claims to be one of the greatest dangers of modern civilized life.

After a test of askfast administered in the usual manner, a careful quantitative analysis of the stomach fluid was made by a method which I have employed in the examination of more than 3000 stomach fluids, and which consists in a quantitative determining of the amount of chlorine present in the stomach fluid, and of the different conditions in which the chlorine is present. The method employed is that of Hayem & Winter of Paris, the emi-
eminent French physiologists, an improvement on the method developed by Golden Bird of Guy's Hospital some fifty years ago. The result of this investigation showed that this young man, who was made the subject of the test, had an extraordinarily good digestion. The amount of useful work done by the stomach was found to be .270, in comparison with .180, the maximum normal or ordinary amount of combined chlorine, or more than fifty per cent better than the average. The quality of the digestive fluid was represented by .80 as compared with .86 normal. These facts are shown upon the colored charts accompanying my paper of last year, a method which I have designed for graphically representing the results of the analyses of stomach fluids. After determining the normal condition of digestion in the case of the young man, made the subject of the experiment, I administered a test breakfast which included 4 oz. of claret, the claret being substituted for 4 oz. of the usual 8 oz. of water usually administered with the 1 1/2 oz. of unfermented bread and one per cent of chloride of sodium. The analysis of the stomach fluid one hour later showed an entire absence of hydrochloric acid, which before was present in normal quantity; the useful work in the stomach had diminished from .270 to .125, a loss of more than one half; while the quality of the work done had fallen below .75, indicating a depreciation of about twelve per cent. Instead of hyperpepsia the examination indicated a very marked degree of hypopepsia. Some days later the experiment was repeated, 2 oz. of brandy being substituted for an equal quantity of water in the test breakfast, the other
conditions being remaining the same. The examination of the stomach fluid made after this breakfast showed almost complete aepisia, the acid was reduced from .245 to .025, a depreciation of more than 1100 per cent. The free hydrochloric acid which should have been present in quantity of .025 to .050 milligrams c.c. of stomach fluid, was reduced to .000; the combined chlorine, representing the useful work of digestion, had fallen from .270, found at the first test, to .035, a depreciation of nearly 800 per cent; while the coefficient of the stomach work, indicating the quality of the digestive products, had fallen to .48, a colored little more than half the normal figure. The graph chart, already referred to, shows in a very graphic manner the results of these several tests, which, it seems to me, demonstrates in a manner too clear and conclusive to be controverted, the painful even influence of alcohol when taken in so mild a form as claret, which some people recommend as an aid to digestion.

Alcohol doubtless interferes with the digestive process not only by precipitating the pepsin, ptyalin and rennet ferment, but by narcotizing the peptic glands, and thereby diminishing their activity. The peptone and propeptone was found notably diminished in the last test in which brandy was taken, indicating almost complete inactivity of the peptone ferment.

The conclusion which I drew from these experiments was that the effect of the administration of alcohol to the healthful human being, even in small doses, is,-
1. To diminish nerve activity.

2. To diminish cerebral activity.

3. To impair the co-ordinating power of the brain.

4. To lessen muscular strength to a notable degree.

5. To diminish digestive activity.
(Memo for Paper)

The process of digestion as relating to this discussion will be considered under three heads: (1) The secretion of the various digestive fluids, (II) The motor activities of the alimentary canal which are concerned in the digestive process, (III) The action of the digestive fluids upon the food stuffs, transforming them into substances which may be readily absorbed and assimilated by the body tissues.

(1) Secretary of the digestive fluids—brief account of the digestive organs and of the digestive processes.

(2) Brief description of the experiments of Pavlov, Starling, and others.

(3) Experimental work with reference to salivary digestion.

(4) Experiments in relation to gastric digestion.

(5) Experiments in relation to pancreatic and intestinal digestion.

(6) Summary.

Welch states that "in Friedenwald's experiments on rabbits there was frequently observed during life a gradual reduction in the amount of free hydrochloric acid in the gastric contents. In some cases hyperemia, increased secretion of mucus, and fatty degeneration of the epithelial cells of the gastric tubules were found."

In a series of experiments Prof. Atwater sought to prove that alcohol produced a loss of protein and other elements of the tissues. This is one of the claims of alcohol set up more than fifty years ago by Wm. Hammond and others. He maintained that although alcohol may not be in itself a food, it protects the system against all destruction of tissue and economizes
the body resources. Atwater's carefully conducted experiments, however, absolutely destroy this ingenious apology for the use of alcohol. Atwater says in regard to the results of his experiment that in each case the substitution of alcohol for butter or sugar in the diet "resulted in a loss (or an increased loss) of body protein, which loss continued through the three days of the alcohol period."

Commenting upon the results obtained, Atwater remarks that they may be "interpreted as indicating that the subject worked to better advantage on the ordinary diet than on the diet of which a part was alcohol." (p. 257)

In the case referred to the average elimination of nitrogen in the non-alcoholic period was 15.5 grams daily. In the alcoholic period (each period lasted for three days) the loss of nitrogen was 17.1 grams daily, and in the after non-alcoholic period 15.5 grams; a difference of say 6 grams of nitrogen, the equivalent of 10 grams of protein, representing 41,000 calories (lesser) of energy. Allowing a possible gain of 1 percent from the food, from an improvement in digestion produced by alcohol, though Atwater admits this to be very problematical, there is on the whole a great loss, for an increase of 1 percent in the utilization of the foodstuffs has amounted to not more than 2,500 to 3,000 calories, less than one-tenth the amount shown to be lost by the increase in the waste of nitrogen produced by alcohol. Notwithstanding his evident purpose to maintain the food value of alcohol, Atwater makes the following frank admission: "In large quantities it is positively toxic, and may retard or even prevent metabolism in general and protein metabolism in particular. In small doses it seems at times to have an opposite influence, tending to increase the disintegration of protein. This action, though not conclusively demonstrated, is very probable. It offers a satisfactory explanation for the occasional failure of alcohol to
protect protein, the assumption being that the two tendencies counteract each other. The only justification for calling alcohol a proteid poison is found in this disintegrating tendency." [257]

This last admission by Atwater is highly significant. He frankly states that in large doses alcohol is positively toxic, and demonstrates this by reference to the fact that it retards or prevents metabolism in general, "and proteid metabolism in particular." Here Atwater cites as proof of its poisonous properties the very fact which has for nearly half a century been harped upon as evidence that alcohol is a valuable remedy. In discussing this subject just thirty years ago the writer wrote as follows:

"But if alcohol did really hinder the destruction of the tissues, so as to prevent the natural process of disintegration, it would still be very injurious; for all the processes of life are dependent upon destructive changes of tissue; and hence, anything which would hinder this process would hinder vital action, would interfere with the life processes which are essential to the manifestation of life."
During the thirty years which have elapsed since the preceding paragraph was written we have carefully watched the progress of physiologic experimentation in relation to alcohol, and have found no occasion for changing the position then taken, and are glad now to know that this position is backed up by so distinguished an investigator as Prof. Atwater.

Having shown that alcohol is "positively toxic" in "large quantities," Dr. Atwater presents another fact which is equally important in this connection, stating "in small doses it seems to have an opposite influence, tending to increase the disintegration of protein." So we have indelible proof that small doses as well as large doses of alcohol are also "positively toxic." This Atwater recognizes in the admission that a "justification for calling alcohol a proteid poison is found in this disintegrating tendency."

If then alcohol is a positive poison in large doses, and a protein poison in small doses, in what doses can it be called a food, and under what circumstances can it be recommended for habitual or daily use?

In view of the different facts the statement was amply justified that Prof. Atwater's exhaustive experiments with reference to the influence of alcohol upon digestion and nutrition show its effects to be damaging rather than beneficial. First, because the effects of alcohol in increasing the palatability of the food nutrients were nil.

Second, because the loss of energy through the increase of proteid waste under the influence of alcohol was 10 to 15 times greater than the possible gain from the influence of alcohol upon proteid digestion.

Third, in large doses alcohol diminished metabolism, and hence hindered the use of the proteid after it had been absorbed, while in small doses it increased proteid waste, thus demonstrating itself to be in both large doses and small doses a proteid poison, and hence in no sense a proper nutrient.
Fourth, in all of these experiments the subjects were healthy persons, so that no conclusion whatever can be drawn respecting the value of alcohol as an aid to digestion in the cases of persons who are suffering from slow digestion, as in hypopepsia or hypochlohydria, or those possibly needing artificial aid. The experiments show simply the degree to which a healthy organism may tolerate the introduction of this substance, a confessed poison, without grave interference with normal physiologic processes.

The experiments made by Chittenden, referred to later, show most conclusively that alcohol even in very small doses interferes seriously with the digestive activity of the gastric juice which is already of inferior quality. The same fact has also been demonstrated by the writer in a series of experiments elsewhere detailed.

INHIBITION

Pavlov and his pupils have demonstrated the existence of a secretory-inhibitory influence controlling both the gastric glands and the pancreas. The facts developed in these great experiments are of such great importance in relation to this question that we will quote the exact words of the eminent investigator in the following paragraph:

"Our experiments, in which diseased conditions of the large or small stomach were experimentally provoked, have shown with great regularity that the first reaction of the peptic glands to a powerful and unusual influence consists in a marked depression of their activity, lasting for several hours or even days. This depression is of a reflex nature. It is due to the influence of the inhibitory nervous system which is thrown into activity by the more than ordinary degree of stimulation. When one, for instance, pours ice-cold water, or a solution of nitrate of silver, into the large stomach (experiments of Dr. J.C. Soborow), the secretion which is subsequently produced by an ordinary meal is less than normal, more especially
in the first hours. This happens not only in the large cavity but also in the small, the walls of which latter at no time come into direct contact with the injurious substance. The thought suggests itself that, as soon as the stomach encounters an unaccustomed stimulus, the activity of the peptic glands is at once inhibited by means of a special reflex, whose object is to protect the deeply lying cells still further against harmful influence. The only exception to this is observed after the action of strong alcohol. When alcohol is poured into the large stomach, an extremely free secretion of gastric juice begins from the small cavity. Conversely, by acting on the latter, the alcohol is also able to set up an abundant secretion in the large. (Experiments of Dr. J.C. Sawvew.)” (p.172, *Reactions of Digestive Glands*).

Here we have the actual proof not only that alcohol may possibly destroy through its narcotic influence the inhibitory control of the nervous system as ordinarily exercised upon the gastric glands, but that it actually does this. After having established the fact that the strong stimuli of every sort, thermal as well as chemical, have the uniform effect to lessen gastric secretion when brought in contact with the mucous membrane of the stomach, and calls special attention to the fact that alcohol is the one and only exception to this rule. When introduced into the stomach it produces the very opposite effect, evidently through the destruction of inhibition. Although this explanation may be in a certain sense hypothetical, it can be taken on sound basis for the hypothesis that everywhere else in the body, no matter what the structure or organ with which alcohol is brought in contact, its influence is universally found to be inhibitory.

For example, Nadler found that men on the verge of delirium tremens had a much shorter reaction time than healthy persons. Kraepelin and others have also shown that various elementary mental processes are hastened. This fact, however, as is considered by Abel, and numerous other physiologists, does not prove that alcohol is a stimulant of the function of the brain.
while a depressant of all other function, but is an indication of the paralyzing influence of alcohol upon the inhibitory functions upon which the regulation of the bodily activities ordinarily depends. It is just as important that the secretory activity of the stomach should be raised by inhibitory nerves as that it should be stimulated by excitatory nerves. If the excitatory nerves were alone operative, then the stomach would become the cataleptic, as James suggests in relation to the cerebrum. That is, the secretion of gastric juice having once begun would continue indefinitely. This is in fact the condition which does exist in certain cases of disease (gastro-in succorrea), in which the absence of all stimuli the gastric secretion continues day and night without cessation, evidently because of the suspension of the normal control exercised by the secretory inhibitory mechanism.

Pawlow's experiments show beyond chance for reasonable doubt that the effect of alcohol when applied to the stomach is to set aside a portion of this mechanism. The smaller the dose, of course, the less the effect. In a small dose the organism might possibly be able to struggle against the toxic influence of the drug, and so maintain a fair degree of control of the secretory process, and in a larger dose, the influence of the inhibitory nerves being wholly overcome, the result is, as Pawlow says "an extremely free secretion of gastric juice."

The fact that this secretion is observed in the small cavity of the Pawlow pouch as well as in the large stomach is the real indication that the effect produced operates through the nervous system, and that it is not due simply to the local influence of alcohol upon the secreting cells with which it comes in contact.

That it is has a depressing rather than a stimulating influence is also shown by the fact that the universal effect of stimuli is to produce suspension of secretion, rather than "an extremely free secretion."

Although Pawlow makes no comment in relation to the mechanism of the effect
observed from the use of alcohol, the conclusion we have drawn seems to be the only one possible in relation to the influence of alcohol upon gastric secretion. This explanation also accords with the facts of clinical experience. The withdrawal of the normal controlling influence exerted by the inhibitory nerves upon the gastric glands permits these secreting structures to exhaust themselves by excessive or continuous activity. While the first effect is to produce such an over-action as seems to greatly add to the individual's digestive capacity, the final result is premature exhaustion, and in the end atrophy and degeneration of the secreting structures of the stomach. This is the condition commonly associated with gastric catarrh, so commonly found in free users of alcoholic liquors. First, a hypersecretion and hyperchlohydria, later hypochlohydria, or even atyesisia. These facts are well known to the physicians who have made careful study of the digestive fluids. As additional positive evidence the writer desires to put on record the following clinical facts gathered from his long observations and those of his immediate colleagues:

Total number of alcohol users reported 1496

They are subdivided as follows:

Hyperpeptics (A 200 or more) 627
Hypopeptics (A 179 or less) 754
(Of these hypopeptics H was zero in 256)
Simple Dyspeptics (A 180 to 199 inclusive) 115

Total 1496

In 65 cases in which it was distinctly stated that they came to the Sanitarium for alcoholism, there were:

Hyperpeptics 15 (23%)
Hypopeptics 46 (55%)
Simple Dyspepsia 4 (7%)
In 13 cases in which it was distinctly stated that they came to the Sanitarium for treatment for morphinism, there were:

Hyperpaeptics-----------------------------  3  (23%)
Hypopeptics-----------------------------  8  (61%)
Simple Dyspeptics------------------------  2  (15%)
Apeptics-----------------------------  4  (30%)

In 30 cases in which it was distinctly stated that they came to the Sanitarium for treatment for the tobacco habit, there were:

Hyperpaeptics-----------------------------  15  (50%)
Hypopeptics-----------------------------  14  (46%)
Simple Dyspeptics------------------------  1  (3%)
Apeptics-----------------------------  2  (6%)

It should be remembered, however, that in each of the last named cases, alcohol was used to a greater or less extent.

Of the 1496 cases collected, the total acidity was more than .250 grams per 100 c.c. in 306 cases. The average of the 306 cases was .2988 grams, total acidity.

The total acidity was .150 grams or less per 100 c.c. in 607 cases, with an average total acidity in the 607 cases of .0815 grams per 100 c.c.

Average total acidity

| Hypers (above 250) | 306 | .2988 |
| Hypom (150 or less) | 607 | .0815 |

Within the last ten years there have been made in the physiologic laboratory, under the writer's charge, analyses of more than thirty thousand gastric fluids. The methods employed are a combination of the methods of Hayom and Witter, and Toepfer, and constitute, we believe, the most extensive
and thoroughgoing research of the sort which has ever been carried out. The work has been done by persons skilled in chemical manipulation, so that its accuracy may be vouched for. The accompanying form, which is completely filled out in every case, indicates the nature and the amount of the data collected in each case.

(Attach gastric chart)
Schniedeberg, Bunge, and other investigators have shown most conclusively that alcohol is a depressant agent, lessening all those physiologic activities which are involved in oxidation and circulation, respiration and body temperature. It is altogether inconsistent, then, to suppose that an agent which is a depressant everywhere else in the body becomes in the alimentary canal a stimulant. If we accept the views of Edkins, Starling, and Bayliss that the gastric secretion is greater afterward, not under the influence of excitatory nerves, but rather as the result of the stimulating influence of gastrin or gastric secretin produced by the mucous membrane of the pyloric end of the stomach, and set free by means of dextrin, maltose and peptogen, and various other so-called peptogens, the influence of the secretory inhibitory nerves in the control of secretion becomes in the highest degree important, since it is only through inhibition that any control whatever can be exercised by the central nervous system over the secretory function of the stomach. Hence the facts above stated, and the conclusions drawn, remain valid, no matter which view of the mechanism of the secretion is adopted, or whether both these are correct, as has been suggested by Frouin(1). ---Lancet, August 13, 1905. Page 502.
Singer in comparatively recent investigations upon rabbits has shown that the motor activity of the digestive tract increases under the influence of alcohol. Here is another illustration of the effects of alcohol in paralyzing inhibitory nerves. In no other way could this increase of activity be accounted for, since it is well enough known that the direct influence of alcohol is to lessen muscular power of activity, as shown by the fact that so small an amount as half of 1 percent applied directly to the heart of a frog produced decided diminution in its energy. It is true that the same apparent effect might be produced by stimulation, and if alcohol is known to be a stimulant, this conclusion can be legitimate; but when the depressant and non-stimulating properties of alcohol have been so thoroughly established by a multitude of competent investigators in all parts of the world, consistency requires that the phenomena following its use should be explained in harmony with this well-established fact, rather than in opposition to it. To assume that alcohol is capable of stimulating peristalsis by exciting muscular activity, is to deliberately contradict all the positive facts which are known in relation to its influence upon living tissues and vital functions.

If it be argued that a depressant effect would not equally upon both the inhibitory and the excitatory nerves, so that no change in activity would occur, it is only necessary in reply to recall the fact that inhibitory influences are necessarily weaker than excitatory influences. The excitatory impulses are primary and essential to life, while the inhibitory influences exist merely as a modifying and controlling factor. Hence the presence of a paralyzing agent would naturally make itself felt more distinctly by its effects upon the inhibitory rather than the excitatory mechanism, unless applied with such vigor as to overwhelm and annihilate all nervous influence. Abel says with reference to muscular action in general, "Both science and the
experience of life have exploded the pernicious theory that alcohol gives any persistent increase of muscular power." This principle must hold good in relation to the internal and involuntary muscular structures as well as to the voluntary muscles. The experiments made by Hare, and numerous other investigators upon the heart, show this to be undoubtedly true.
ATWATER ON MEAT AND ALCOHOL.

No physician in the United States, and probably no man living at
the present time has given more extended or more thorough study to the
composition and properties of food stuffs than has Prof. W.O. Atwater, who has
for many years been at the head of the Government Department for the further
study and investigation of problems relating to food. Some years ago Prof.
Atwater made a very extended and exhaustive study of the properties and
affects of alcohol, one of the evident purposes of which was to demonstrate
the value of alcohol as a food. While maintaining this theory, however, Prof.
Atwater readily acknowledged that alcohol is a poison in large doses
(and inadvertently also in small doses). Notwithstanding this fact, however,
Atwater maintained that it should be regarded as a food. In the course of
argument for this purpose he remarked, "If we exclude from the list of foods
those things which are either injurious to health or tend to become so, we must
exclude alcohol, in excess, but we must do the same thing with many. Only
it takes much more meat to constitute excess, and the tendency to excess
(Phys. Aspects Liquor Problem) is not so great as with alcohol."
In this statement Prof. Atwater clearly
admits that both alcohol and meat are very "injurious to health or tend to
become so." He does not, however, venture to put into this list such articles
as wheat, corn, rice, potatoes, bread, milk, ripe fruit, and other substances
which are universally recognized as food.

Prof. Atwater has clearly made two mistakes in his professional
career, which relate specially to alcohol and to flesh food. While recognizing
the fact that these substances both tend to produce injurious effects in
the human body, he has been a warm advocate of their use, and until his recent
mental and physical collapse has continued to maintain that proteins, especially
in the form of meat, should be used in considerable amount, the quantity
recommended in his being in fact nearly three times the amount
found necessary by Prof. Chittenden in his classical experiment in which the advantages of the low-protein ration were so thoroughly and clearly established. The premature culmination of Prof. Atwater's public career as a teacher by apoplexy and mental collapse is in itself a demonstration of the falsity of his teaching. On the other hand Prof. Chittenden is an equally splendid demonstration of the truth of the contrary teaching. The latter, although well past the meridian of life, and a man of very slight physique, is still performing prodigies of work while apparently every year growing younger and more vigorous under the rejuvenating influence of the low protein diet which his experiments led him to adopt in his habitual dietary.

Meat and alcohol are in some way curiously related. Gautier asserts that one may acquire a meat appetite just as the drunkard acquires an alcohol appetite, so there are meat drunkards as well as alcohol drunkards. In this respect meat differs decidedly from ordinary foods. Who ever knew of a potato drunkard, or a bread drunkard, or one who had an insatiable and insane craving for any other wholesome food, except, of course, in conditions of special mental perversion? The mere fact that meat, like alcohol, opium, cocaine, and various other drugs is capable of developing such an appetite is evidence of its unwholesomeness and its unnaturalness.
Another point of relationship between flesh and alcohol is to be found in the fact that the free use of flesh food creates an appetite for alcohol. The reason for this has not been clear until recently. So far as the writer knows the following explanation has never yet appeared in print, but it is offered as the physiologic solution of the well-established clinical fact which heretofore has not been easy to explain.

Meat contains uric acid, creatin, creatinain, and various other substances which have the effect to raise blood-pressure. This fact has been clearly pointed out by Hald, Paul, and other numerous investigators. Tobacco-smoking produces a similar effect. Alcohol, on the other hand, produces the very opposite effect. By dilating the blood vessels alcohol lowers blood-pressure, while beef tea, beef extracts, and meats of all sorts raise the blood-pressure by contracting the blood-vessels. A large meat eater, then, naturally suffers from depressant headache and other unpleasant symptoms which arise from increased blood-pressure, and intuitively seeks relief in alcohol, which dissipates his unpleasant symptoms simply by dilating the blood vessels which have been abnormally contracted by the poisons absorbed from the meat. Smoking has a similar effect.

It is quite probable that other factors are involved in this interesting question, as is suggested by the following incident. Recently a patient with whom the writer was expostulating because of his use of cigars, replied, "Doctor, I should continue the use of the Sanitarium diet. I think I should very soon dispense with cigars altogether, for I observe that since I have been eating your diet, abstaining wholly from meats, I can smoke but very little. Formerly I smoked twenty to thirty cigars a day. On your diet I can only smoke half a cigar two or three times a day. Somehow they don't taste right. They have a bitter, unpleasant taste, so I am satisfied with a few whiffs. On the other hand, when I eat a meat dinner, and drink one or two glasses of champagne, or a glass of whiskey, I can smoke the
longest and the strongest cigars, and just as many as I want." This experience is wholly in accord with many others of a similar sort which have been reported to the writer by intelligent business and professional men in the last twenty years.

A full comprehension of the effects of alcohol upon digestion requires first of all a knowledge of the essential features of the digestive process. Digestion can be no longer regarded as the simple process which it appeared to be when considered in the light of the observations of Beaumont nearly a century ago. During the decades which have passed since Beaumont’s studies were begun hundreds of thousands of observations made in the sick room and the laboratory have been classified and correlated by a multitude of earnest investigators, and our knowledge of the marvelous transmutation processes which are carried forward in the alimentary canal has gradually advanced, until at the present time our knowledge of the several vital operations which constitute the process of digestion rests upon a solid foundation of well attested facts.

In a biological sense digestion is a function of the individual cell. This is true in the human body and other higher animal forms, as well as in minute unicellular organisms in which digestion is constantly carried forward as one of the essential processes of life. Hence in considering digestion in the human organism in its broadest sense, we must consider the process as beginning in the mouth and terminating in the tissues or individual cells of the body. In a general way the process of digestion in higher animals may be said to consist of the liquefaction and transformation of food-
stuffs so as to permit them to be carried by the circulation to the individual cells of the body, by which they are reorganized.

The materials which constitute foodstuffs as they exist in food substances consist of highly complex arrangements of a few elementary elements. By the process of digestion these complicated groupings are broken up into a great number of simple molecules, which are thus prepared for absorption into the circulation, and finally reaching the individual cells of the body are again reorganized into those highly complex and elaborated substances which are found in the nerves of the muscular, osseous, glandular, and various other tissues and structures of the body. There are then essentially two phases of the digestive process. First, a breaking down, or reduction of complex molecules into simple ones, and second the rebuilding and reorganization of these simple elements into highly complex molecules.

The process of solution and simplification seems to be carried forward in the alimentary canal. The chief mechanisms involved are first, the alimentary canal itself, which is a muscular tube extending from the mouth to the anus. Second, various glands and other accessory organs located along the tube. The digestive tube presents near its beginning a large dilatation, the stomach, which constitutes a reservoir into which the food is received, to be disinfected and otherwise changed before entering the small intestine, in which the principal part of the digestive work is done. The lower 5 ft. of this 30 ft. tube present another dilatation, in which the food is stored for some hours after being passed through the various digestive processes, to afford opportunity for the absorption of those portions which have been properly elaborated and prepared for distribution to the tissues.
In addition to the teeth, whose function is purely mechanical, acting in conjunction with the tongue and the cheeks to grind the food, the principal accessory organs which participate in the digestive process are various sets of glands by which digestive fluids are formed, each of which contains one or more ferments—substances which possess the remarkable property of causing by their mere presence changes in the physical, chemical, and vital properties of one or more food elements. The elements upon which these several juices are required to act are starch, proteids, fats, and sugar. In order that these substances may be absorbed, circulated, and utilized in the body, all of them must undergo very marked changes. The starch must be not only liquefied but transformed first into malt sugar, then into fruit sugar; the proteids must be converted into peptone; the fat must be saponified and emulsified; and the three sugars which are most abundant in ordinary foods—cane sugar, milk sugar, and malt sugar, must all be converted into fruit sugar. Fruit sugar, which consists of levulose and dextrose, is the only one of all the several food elements which requires no preparation for absorption. It appears also that maltose may, to some extent at least, be utilized when directly introduced into the blood, although in normal digestion it is converted into fruit sugar before finally reaching the blood.

The several glands by which the enzymes or ferments which effect these changes are produced may be briefly mentioned, together with the digestive properties of the several juices which they produce.

First, the salivary glands, three pairs of which pour their secretory fluid, the saliva, into the mouth.

Second, the stomach, which is a much more complicated organ than it appears. Although there is but a single pouch, the organ seems really to divide into two parts, both anatomically and functionally—the entrance to the stomach, the cardiac orifice, and the outlet, the pyloric, which are guarded by a ring of muscular fibers. Three or four inches above the pyloric orifice may be found on careful examination a reinforcement of the circular
fibers of the stomach, which has been termed the pre-pyloric sphincter.
That portion of the stomach which lies behind this point, or the pylorus itself,
is known as the pyloric portion of the stomach. The rest of the stomach is
the fundus, or cardiac portion. The mucus membrane lining the fundus
of the stomach is filled with glands which produce pepsin, renin, and hydrochloric
acid, which together constitute the gastric juice. The pyloric portion of the
stomach produces no acid, but rather acts as a mill, in which the materials
which fall into it from the fundus of the stomach are thoroughly mixed and
rubbed together, and by means of which it is reduced to a perfectly liquid
state, then forced out through the pylorus into the first part of the small
intestine, the duodenum.

Recent study by Edkins shows that the pyloric portion of the
stomach produces a secretin which he calls gastrin, the secretion free of which
is necessary for the production of pepsin and hydrochloric acid. Under the
influence of certain substances naturally contained in the food, known as
peptogens, also the products of digestion, particularly maltose and peptone,
secretin is set free, enters the circulation, and thus gives rise to the
formation of hydrochloric acid and pepsin by the glands of the gastric fundus.
This secretion free of secretin appears to be under the control of both excitatory
and inhibitory nerves.

The experiments of Pavlov, and others, have shown that gastric juice,
as well as saliva, may be made to flow in abundance by psychic influence alone,
as by mere sight of food. (I went to read page 538 of Schafer, Vol. I.)

The opening and shutting of the cardiac pyloric orifices are
likewise controlled through nerve centers and nerves. Some of these centers
are located in the organ itself, others in the spinal cord, and still others
in the brain. The interesting fact has been noted by Opanschowski that the
impulse which, passing to the stomach through the vagus, causes the cardiac
orifice to dilate, at the same time closes the pylorus.

Four inches below the pylorus the liver and pancreas discharge their secretions into the duodenum. The bile acts directly upon the fats, saponifying and emulsifying them, and also stimulates the activity of the pancreatic juice, which is possessed of most remarkable digestive powers, containing digestive principle which converts both raw and cooked starch into maltose. Another which emulsifies fats, and another which when brought in contact in the small intestine with entero kinase, which is produced in the upper part of the small intestine, produces trypsin, which digests proteins, converting them into peptones. Intestinal juice converts cane sugar, maltose, and milk sugar into fruit sugars. The production of pancreatic juice by bile and the intestinal juice, appears to be controlled by a substance known as secretin, which is contained in the mucous membrane of the duodenum, and appears to be set free by the acid contents of the small intestine, and entering the blood it quickly reaches the pancreas, liver, and other glands, and causes them to pour out their respective secretions in rich abundance.

It thus appears that the formation of digestive fluids is set in operation by two methods. First, by the nerves of excitation; second, by means of certain organic substances which under certain conditions are set free, and entering the circulation come in contact with the glandular structures, and in some way, not yet understood, enable them to pour out their secretions.

Recent researches, especially those of Pavlov, have shown that a third element enters into these secretory processes, namely, an inhibitory action exercised through the special nerves which, through their action, prevent the control of processes whereby secretory activity is set up and maintained.

(Here add a summary of Folin's views of proteid metabolism. Add also a study of the possible relation of these views to Atwater's observation that urea was increased under alcohol.)
The saliva contains an active principle which by contact converts starch into maltose. The process begins in the mouth and continues in the stomach until free hydrochloric acid appears in the stomach in such quantity as to suppress its action. A very small amount of free hydrochloric acid is capable of checking entirely the action of saliva upon starch, and until recently it has been believed that salivary digestion in the stomach is by this means suspended within thirty to forty-five minutes after eating; but the recent experiments of Cannon have shown that while this is true with reference to that portion of the digesting mass which lies in contact with the mucous membrane of the stomach where the hydrochloric acid is being produced, the conversion of starch under the influence of saliva may be carried forward in the center of the alimentary mass for an hour and a half, or more.
Notwithstanding the earnest efforts which have been made by temperance organizations of all sorts within the last quarter of a century, and especially by that grandest of all reformatory organizations, the Women's Christian Temperance Union, statistics show that there is no very perceptible diminution in the prevalence of intemperance. With the exception of states in which prohibitory laws are in force, there have, in fact, been an increase in the number of arrests for drunkenness and for other crimes dependent upon intemperance. The use of alcoholic drinks, as well as the use of tobacco, has perceptibly increased within the last quarter of a century. The amount of alcoholic liquor of various sorts used per capita is greater at the present time than at any previous time in the history of this country.

The significance of these facts is not that the Women's Christian Temperance Union and other similar organizations are not doing splendid work in behalf of temperance. The efforts which have been made, and which are being made are well directed, and will accomplish much to stay the march of this terrible Juggernaut which for so many centuries has been grinding beneath its slowly moving wheels multitudes of victims who have discovered their danger too late to escape, and who have gone down by the hundred thousands into untimely graves covered with shame. We have no criticism whatever to offer upon the efforts which have been made thus far by associations of men or women who are engaged in contending against this prodigious evil, but it occurs to us that there is a deeply rooted cause of intemperance which has heretofore received comparatively little attention. We refer to the use of alcohol as a medicine. The majority of physicians believe alcohol to be a good stimulant, and hence recommend it in nearly all cases which it is supposed the patient needs an increase of strength or vigor, better appetite, better
digestion, an increase of nerve energy, etc. After many years of practice, the majority of intelligent physicians discover that the increase of strength which follows the use of alcohol and other stimulants is only apparent in character, and that the use of these drugs inevitably gives rise in the end to a weakening of the very functions it is supposed to build up.

Alcohol, although called a stimulant from time almost immemorial, is in no sense a stimulant. It is a narcotic, hence should not be used where an increase of energy is required, but if used at all, its indication would be in cases requiring a diminution rather than increase of energy. Alcohol lessens the vigor of the heart, and hence must be discarded in syncope, fainting, collapse, shock, and other cases supposed to require a stimulant. Alcohol is, in fact, one of the very worst drugs that can be employed in such cases, as it is in its effect upon the body a narcotic. This fact is far less generally known than it ought to be. Physicians are using alcohol as a stimulant in cases where its influence as a narcotic is capable of doing the greatest possible harm. These facts ought to be brought before the public, so that men and women may be put upon their guard in relation to the use of alcohol as a medicine.

In the near future we shall publish a series of illustrated articles, showing the effects of alcohol upon the brain and other nerve tissues, by which its destructive effect will be very well shown by a series of photographs of the brain structure in the healthy state and the state to which they have been brought by disease resulting from the use of alcohol.
THE NUT CRACKER.

It is not the purpose of this journal, as its name might suggest, to undertake to crack hard nuts in the way of political or social problems, nor to solve knotty questions in mathematics, philosophy, or theology. It will deal with a much more reliable and practical subject. Nuts which we are interested in cracking are real nuts, nuts which grow upon trees and bushes, nuts which are really worth cracking, and which will amply repay one for the trouble, not only by contributing in a high degree to gustatory enjoyment, but by furnishing the body with the choicest of all food elements to replace its supplies of matter and energy.

Strange it is that nuts, the choicest of all food products, should have been so long neglected altogether, or employed only as a delicacy or a dietetic luxury. The nut is one of nature's choicest tidbits, it is, contrary to public opinion, one of the most digestible and wholesome of foods (when properly prepared), and, taken with fruits and grains, constitutes a perfect dietary for human beings.

This journal will be devoted almost wholly to the promulgation of information respecting nuts, their special characteristics, their dietetic value in health and disease, their nutritive value when compared with other food substances, their natural history, methods of culture, etc., etc. In the researches upon the subject of nuts, and in the large number of experiments which we have made with them the last few years for the purpose of developing the value of the nut as a source of food, a great number of new and interesting facts have come to light. These we shall present to our readers from time to time, together with the new facts which are constantly being developed by the experimental researches which we are continually carrying on. A vast amount of valuable information has also been collected from nearly every corner of the globe, through correspondence with reliable persons residing in those regions. A few of these garnered facts will appear in each number, with
the newest and best information which the world affords in relation to the use of nuts as food.

**THE USE OF NUTS AS A FOOD FOR HUMAN BEINGS.**—The squirrel and most of its relatives depend very largely upon nuts for their sustenance, and that they are able to live well upon this dietary is clearly shown by the plump sleekness of these little animals in the late autumn when they have filled their granaries with a plentiful supply of nuts and acorns for winter use during the cold months, and are ready to retire into winter quarters. The monkey, the ape, the gorilla, the chimpanzee, and the orang-outang are likewise great consumers of nuts. This, coupled with the fact which common observation as well as the study of comparative anatomy, discloses, viz., that the anthropoid apes are the most nearly related to man of all living creatures, ought to have led long ago to the recognition of the superior food value of the nut, and to its practical use as an aliment by human beings.

In a few countries, nuts form a very important constituent of the natural dietary. This is especially true of the following countries, as shown by the information which we have received from parties living on the spot, and who have taken pains to secure exact and reliable information for us.

(Get from letters from consuls, etc.)

(Look up a good picture of a cocoanut palm.

(Get recipes for use of nuts, both in their natural state and in the form of nuttose, etc.)
HE COULDN'T SHOOT.

Rev. E. Pay Mills, the great revivalist, tells a story of a hunter who employed as a decoy for deer a peculiarly constructed whistle which closely imitated the voice of a young fawn calling its mother. With his rifle in hand ready for instant action, he was one day blowing his whistle when suddenly a mother deer thrust her head out of the bushes and looked straight toward him. There she stood, trembling with fear, yet looking this way and that in search of the little one, which she supposed to be in danger. The hunter said, "As I looked into those eloquent eyes, anxiously glancing here and there with maternal anxiety, my heart melted; I could not shoot.

Let the deer hunter and hunters of every other description remember that every deer is a father deer or a mother deer, or a dear deer to some other deer, and that to kill an animal that possesses a mother instinct, that is willing to risk its life in defence of its helpless offspring, is nothing more nor less than murder. Man is a wholesale butcher, and we see verified in our daily experience the prediction in the words of Holy Writ, "The fear of you and the dread of you shall be upon every beast of the earth."

Deer are not afraid of cows: they often mingle with them in the pasture lot or on the prairies. Rabbits are not afraid of squirrels: they gambol together in the same thicket. But rabbits, squirrels, deer, are afraid of wolves, bears, tigers, panthers, and other ferocious beasts. They are also afraid of man, and for the very same reason. He is likely to kill them and eat them.

A thoroughly awakened human conscience regards all life as sacred. It was a heathen poet who said,

"Take not away the life you cannot give,
For all things have an equal right to live."
Surely the genius of Christianity is as humane as that of paganism, though some Christians are found indulging in practices which are in the highest degree horrifying to some pagans. A Hindu looks upon the slaughter of an animal with the same dread and horror with which he would witness the taking of life of a human being.
Good Health.

ALCOHOL AND CRIME.

The demoralizing influence of alcohol is forcibly shown by a recent article contributed to the Annales d'Hygiene. The writer calls attention to the fact that the official statistics of the Police Court of Paris show that there has for several years past been a rapid increase in juvenile criminality. Even among murderers, there is found a large percentage of young people, some almost children. This increase of juvenile crime is charged to alcohol which has been shown to act not only directly but indirectly through heredity. Alcoholic insanity is increasing with great rapidity in Paris. Alcohol is perhaps more than any other agent active in producing human degeneracy, and is one of the most direct and potent causes of criminality and insanity. The children of drunkards are very liable to be epileptic and idiotic as well as criminal. The children of alcohol drinking parents, when young, do not appear different than other children, but about the age of puberty their criminal instincts begin to manifest themselves.

The terrible blighting influence of alcohol should certainly lead us to study with care all the causes which lead to alcoholism. Careful observations have shown again and again that there is an intimate relation between diet and alcoholism, especially that tea, coffee, and condiments lead to the use of alcohol. It has also been demonstrated that
flesh eating creates a thirst for alcoholic beverages and an appetite for tobacco the use of which almost invariably leads, sooner or later, to the use of alcohol in one form or another.
THE HEREDITY OF ALCOHOL.

While this question is one which relates especially to the alcohol habit or the use of alcohol as a vice, it is also an important question as viewed from the standpoint of the medical use of alcohol, since the medical use of alcoholic beverages so often leads to the formation of the alcohol habit. In the writer's experience the alcohol habit in men and women, especially those of the better classes, in the majority of cases begins with the prescription of the drug as a means of lessening nerve sensibility or relieving nervous depression. Alcohol is not infrequently used as a beverage under medical advice by nursing mothers; the same is true of wine. Such use of alcohol brings a nursing infant directly under the influence of the drug and to an extent greater than is generally appreciated. The important practical bearing of the following facts collated from various sources will be at once recognized by the unprejudiced reader.

(Insert material.)
(Memo. Alcohol.)

Well authenticated facts and observations in relation to alcohol.

The effects of the use of alcohol upon human beings.
According to Prof. Charles L. Dana (Medical Record, March 16, 1901) the drunkard does not live more than fifteen years after beginning the use of alcohol, and it is very seldom that the human organism can withstand more than three thousand intoxications. Dr. Hermann H. Biggs has recently called attention to the fact (Medical Record, 1901) that within a few years diseases of the heart, bloodvessels and kidneys have increased nearly 150 per cent., while the increase in population has been only a little over 50 per cent.—in other words disease of the heart, bloodvessels and kidneys have increased three times as rapidly as the population. Other degenerations, especially those leading to insanity, epilepsy and imbecility are increasing at an equally rapid rate.

Berkley has shown that alcohol affects the brain by destroying, so to speak, dissolving, the dendrites or microscopical projections of nerve cells, and thus depriving them of the power of receiving impulses from other nerve cells. This leads to loss of memory, loss of the power of coordination and other defects which are easily recognizable in chronic alcoholic insanity.

Dr. Destree in an article published in the Journal of the American Medical Association shows that while immediately after taking a dose of alcohol there is an apparent increase in muscular irritability and capacity, the total work produced is very considerably decreased as the result of the decidedly paralyzing effects of the alcohol, which appear after the first half hour.

Woodhead has been making an investigation of the influence of alcohol upon the functions of the cells under the action of pathogenic organisms. He showed that animals when under the influence of alcohol are susceptible to the influence of disease producing organisms which are incapable of producing any effect when applied to animals not under the influence of this drug. The influence of alcohol in this regard
was the same as that of starvation carried to the extent of reducing the resistance of the body.
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(Insert material.)
While the effects of his drinking are not prominent in his appearance, they are very evident in his children; of three children by his first wife, two died in infancy; one became an epileptic and died at fifteen. Of four children by his second wife, one is feeble-minded, the second chioreic, the third is dissolute and drinks, the fourth is erratic, passionate, and a wanderer. "From New York Medical Journal, June 16, 1900.

"M. Nicloux has shown that alcohol ingested in a ten per cent solution passes into the testicles, the prostate, the ovaries, the fluids of the vesiculae seminales and the semen. The baleful influence in the offspring thus receives strong conformatory support." N.Y. Medical Journal, July 21, 1900.

T. D. Crothers, M. D., Hartford, Conn., states: "I examined two inmates of the deaf and dumb asylum at Hartford who, from birth, had distinct symptoms of acute intoxication. Both were boys, aged nine and thirteen, and walked with a staggering gait and great muscular co-ordination. One had a demented grin and nodded continuously whenever he saw any one looking at him. The other had a dull, vacant stare and congested, blear-eyed appearance. He was very sensitive, irritable, and trembled with anger from any little cause. These and many other signs of intoxication were present, and had been noted from birth. The parents were both inebriates. These cases aroused my attention and since then, I have gathered many notes and histories of similar cases. In another case, an imbecile from his birth, appears intoxicated when he first meets you, but quickly recovers himself and all these symptoms pass away. The history
Miscellaneous, Continued.-2.

Dr. Norman Kerr has treated 1500 cases of gout, in moderate and immoderate drinkers, and only one case in a total abstainer.

Dr. J. H. Kellogg has shown by experiment that the toxicity of the urine is increased by taking alcoholic beverages. In 1891, eight hundred thousand persons in the U. S. were arrested, charged with intoxication.

The U. S. census deaths from alcoholism, 1880, 1592; 1890, 2657; an increase of 67%.

Census of 1890, U. S., number of idiots in the U. S., 95571.

In the study of the report from insane hospitals from forty states and territories, between 1895 and 1896, show 9.35% were caused by excessive use of alcoholic liquors. The census of 1890 gives the number of insane in the U. S. as 100,725.

Authoritative staticians place inebriety as an active cause of insanity in from 10 to 60% of all cases.
of such cases uniformly points to inebriate ancestors. These symptoms are inherited as special pathological states representing the parents at the time of conception. In a private school for the feeble minded for the wealthier classes, three in fourteen cases, had these unmistakable symptoms, which had not attracted attention.

Charles Sullivan, M. D., medical officer of Her Majesty's prison, Pentonville, England, made investigation in 100 cases and found the death rate among the children of inebriate mothers to be nearly 2 1/2 times that of children of sober women of the same stock.

Dr. Legrain's investigation on alcoholic inheritance is tabulated as follows:

In the first generation from inebriety, the mental and physical degenerates were 77% of all; in the second generation, 96% were defectives; in the third generation, not one escaped; all were idiots, insane, hysterical, or epileptics.

Experiment of Nicloux. He administered a 10% solution of alcohol to guinea pigs in definite amounts per kilogram of body weight. After sufficient time had elapsed for absorption to take place, the animals were killed, the blood of the mother and young was collected and the percentage of alcohol estimated. The milk was also collected and tested for alcohol. He found that the alcohol ingested by the mother passes through her own blood directly into the blood of the young and into the milk. The percentages are approximately the same in both. Considering the established law as regard to hereditary syphilis, this would point definitely to the an established congenito form of alcoholism. A glass of beer or ale taken by the mother during the nursing period also engenders the appetite of the child. Phil. Med. Journal, April 28, 1900, Page 927.

See Sanitarium, April 1900. Influence of the maternal inebriety upon the offspring.
According to Prof. Charles L. Dana (Medical Record, March 16, 1901) the drunkard does not live more than fifteen years after beginning the use of alcohol, and it is very seldom that the human organism can withstand more than three thousand intoxications. Dr. Hermann M. Biggs has recently called attention to the fact (Medical Record, 1901) that within a few years diseases of the heart, bloodvessels and kidneys have increased nearly 150 per cent., while the increase in population has been only a little over 50 per cent.--in other words disease of the heart, bloodvessels and kidneys have increased three times as rapidly as the population. Other degenerations, especially those leading to insanity, epilepsy and imbecility are increasing at an equally rapid rate.

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was the same as that of starvation carried to the extent of reducing the resistance of the body.
ALCOHOL-EXPERIMENTS.

Dr. Victor Horsley, in the Less and Raper Memorial Lecture states that the toxic influence of chronic alcoholism, the dendrites of the pyramidal cells show swellings and shrinkages, and there is widespread pigmentation of the nerve cells. N.Y. Med. Journal, May 19'00.

The presence of alcohol in the stomach directly diminishes the digestive power of pepsin. Hugouneng in the Lyon Medical, March 1, 1892, Galzinski's experiments showed the same result.

That alcohol does not act as a respiratory or heat-producing food by uniting with oxygen or being burned up in the blood or tissues is proved by, first, the fact that the temperature of the body diminishes in direct proportion to the quantity used until life ceases and a temperature of from five to ten degrees below the normal standard of health. Second, no investigator has been able to find any increase of the well-known products of oxidation; namely, either aldehyde, carbonic acid, or acetic acid; third, it displays a much stronger affinity or attraction for the hemoglobin, albumen and water of the blood and tissues than for oxygen at the temperature of the living body. It retards metabolism. It prevents tissue waste, therefore an individual ought to be able to live much longer on nothing but diluted alcohol as in fermented and distilled liquors than he could on pure water alone, but we have heard of a number of men living on nothing but water forty or fifty days, but we have never learned of a well-authenticated case of a man taking or receiving into his system nothing but diluted alcohol for half that length of time without becoming sick with either gastro-duodenitis, nephritis, or delirium tremens.

The best test of the measure of the vital force in anybody is the degree of activity of its metabolism. Alcohol causes a diminution of metabolism with a loss of heat, does not generate or increase muscular force, diminishes nerve sensibility in direct proportion to the quantity consumed.
Statistics of trade in the Phillipines.

From May 1, 1898 to April 1, 1900, nearly one thousand soldiers have been shipped from their various ports in Hawaii, Porto Rico, Cuba, and the Phillipines to the military insane asylum in Washington. Of these, about ninety per cent have come from the Phillipines. During the same time, eighty-three suicides in the United States army have been due to insanity. Not less than two-thirds of the cases of insanity are due to drink. See pamphlet, "The Manila Drink Scandal."

Alcohol in contact with blood corpuscles causes them to shrink and destroys their full power as carriers of oxygen.

Alcohol works in opposition to water which is absolutely necessary for the conservation of animal mechanism.

In the case of a person intoxicated by alcohol, a cubic inch of brains contains much more alcohol than an equal quantity of any other organ.

The general effect of alcohol on the nervous system is that of a paralyzer.

Dr. Frederick Peterson, President of the Craig Colony, states that epilepsy afflicts from one to two in one thousand of the population. One hundred forty-five patients admitted to that institution show alcoholism as direct cause of epilepsy in four of the cases.

Dr. Charles Allen of Georgetown University, Washington, D. C. states that different kinds of multiple neuritis, alcoholic neuritis is by far the most common. Dr. C. L. Dana, Bellevue, observed this in one in four or five hundred cases, and in one or two per cent of men.

Of chronic paralytic alcoholism, Sharpentier found eighty-three out of one hundred thirty-five cases occurred in alcoholics.
(Memo. Alcohol.)

Well authenticated facts and observations in relation to alcohol.

The effects of the use of alcohol upon human beings.
W. C. Sullivan estimated the influence of alcohol as a causation of suicide from the study of 142 cases charged in the Liverpool police courts with attempting to commit suicide, as follows:

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-alcoholic</td>
<td>10 (15-6%</td>
<td>22 (28-24%)</td>
<td>32 (22-51%)</td>
</tr>
<tr>
<td>Alcoholics</td>
<td>54 (84-4%)</td>
<td>56 (71-61%)</td>
<td>110 (77-51%)</td>
</tr>
</tbody>
</table>

Suicidal impulse rarely appears before chronic alcoholism. It is usually attempted during the bout.

Rush estimated that in the beginning of the century, fully 4000 persons died annually in the U. S. from the excessive use of alcoholic spirits alone.

20\% of the inmates of insane asylum is due to drink. 30\% of the cases in law costs is due to drink.

Statistics obtained from the United States from reports of 909 prison governors show in Prohibition States or "boot-leggers", 37\% of crime is due to drink. In licensed states, 72\%.

Consumption of whiskey during 1898 highest ever reached in the United Kingdom, being more than a gallon per head for every man, woman and child. Compared to 1878, there has been an increase of deaths from chronic alcoholism of 82-1\% per cent among men and 145-1\% per cent among women.

Dr. Crothers relates a case of an eminent man who could not indulge in a midnight dinner without drinking to intoxication, but who never dissipated if avoiding all of these very late dinners.

Dr. P. C. Remondino reports a case of periodical alcoholism in a young man of 16, beginning by attacks of migraine once in six to eight months. During these attacks, he took two to three cups of strong
coffee daily, which seemed to alleviate the severity of the attack. Later, he took to drinking heavily at these periods, though between spells he never used liquor or tobacco. He finally lapsed into an uremic convulsion, followed by gouty rheumatism, which hereafter appeared periodically without the alcoholic dypsomania. He suggests a relation between gouty diatheses and dypsomania.

Every drop of alcohol or every particle of morphine that a well man takes makes him less a well man. J. H. Smith, Quarterly Journal of Inebriety.

There is a form of medication much in vogue at present by means of wines of various remedies, such as cocoa, quinine, kola, beef and malt, etc. Few of the public who quack themselves with these proprietary articles are aware that the basis of the solvent or preservative is alcohol often port or sherry.

Napoleon's experience--Drank once in his life three bottles of Burgundy, was completely drunk. He says: "Oh, how sick I was the next day! I wonder how a man whoever gets drunk can think of doing it again. Such headache, vomiting and general sickness! I was nearly dead for two days. Medical Times, March, 1900.

The capsizing of the Royal George many years ago was due to the intoxication of its officers. Several great liners have gone down in mid-ocean armed by such men. A New York writer says that fully one half of the ships wrecked are due to the alcoholism of the officers.

Treatment for alcoholism.--One-third grain apomorphine as hypo produces slight nausea and sleep; craving for alcohol is relieved as well as acute symptoms. After treatment, tonic, strychnine.

Acute alcoholism treated by digitalis. 10 cases treated, 2 died.
Hugh, of Paris, suggests the substitution of coffee, etc. for alcohol in restaurants and cafés etc. to suppress inebriety.

Sydney Ringer classes alcohol with ether and chloroform.

Bartholow with the cerebral sedatives. Carson with the arterial stimulants; others as a narcotic. See "A clinical lecture on alcoholic insanity."

See a clinical lecture on alcoholic insanity, Medical Fortnightly, June 25, 1900, Page 383.

Persons who should not drink alcohol. Nine classes of people.

Dr. Clouston, Cincinnati Lancet, Jan. 27, 1900. Page 91.


THE HEREDITY OF ALCOHOL.

While this question is one which relates especially to the alcohol habit or the use of alcohol as a vice, it is also an important question as viewed from the standpoint of the medical use of alcohol, since the medical use of alcoholic beverages so often leads to the formation of the alcohol habit. In the writer's experience the alcohol habit in men and women, especially those of the better classes, in the majority of cases begins with the prescription of the drug as a means of lessening nerve sensibility or relieving nervous depression. Alcohol is not infrequently used as a beverage under medical advice by nursing mothers; the same is true of wine. Such use of alcohol brings a nursing infant directly under the influence of the drug and to an extent greater than is generally appreciated. The important practical bearing of the following facts collated from various sources will be at once recognized by the unprejudiced reader.

The New York Medical Journal, June 16, 1900, reports a case, similar to the histories of a large proportion of the inmates of our asylums. A farmer living outdoors and working moderately drinks daily for sixty glasses one pint of spirits. He has attained the age of ninety-two years, being hale and hearty, and never having had any illness, but while the effects of his drinking are not prominent in his appearance, they are very evident in his children; of three children by his first wife, two died in infancy; one became an epileptic and died at fifteen. Of four children by his second wife, one is feeble-minded, the second choreic, the third is dissolute and drinks, the fourth is erratic, passionate, and a wanderer."

T. D. Crothers, M.D., Hartford, Conn., states: "I examined two ... distinct mates of the deaf and dumb asylum at Hartford who, from birth had ... symptoms of acute intoxication. Both were boys, aged nine and thirteen, and walked with a staggering gait and great muscular inco-ordination. One had a demented grin and nodded continuously whenever he saw anyone looking at him.
The other had a dull, vacant stare and congested blear-eyed appearance. He was very sensitive, irritable, and trembled with anger from any little cause. These and many other signs of intoxication were present, and had been noted from birth. The parents were both inebriates. These cases aroused my attention and since then I have gathered many notes and histories of similar cases."

"In another case, an imbecile from his birth appears intoxicated when he first meets you, but quickly recovers himself and all these symptoms pass away. The history of such cases uniformly points to inebriate ancestors. These symptoms are inherited as special pathological states representing the parents at the time of conception. In a private school for the feeble-minded for the wealthier classes, three in fourteen cases, had these unmistakable symptoms, which had not attracted attention."

Dr. Legrain's investigation on alcoholic inheritance is tabulated as follows: In the first generation from inebriety, the mental and physical degenerates were 77% of all; in the second generation, 96% were defectives; in the third generation, not one escaped; all were idiots, insane, hysterical, or epileptics.

The census of 1890 shows the number of idiots in the United States to be 95571, and the expert study of the report from insane hospitals from forty states and territories, between 1895 and 1896, reveals the fact that 9.35% of the cases were caused by excessive use of alcoholic liquors. Authoritative staticians place inebriety as an active cause of insanity in from 10% to 50% of all cases.

"M. Vicloux has shown that alcohol ingested in a ten per cent solution, passes into the testicles, the prostate, the ovaries, th fluids of the vesicala seminales and the semen. The baleful influence in the offspring thus receives strong confirmatory support." N.Y. Medical Journal, July 21,
In another experiment of Nicloux, he administered a 10% solution of alcohol to guinea pigs in definite amounts per kilogram of body weight. After sufficient time had elapsed for absorption to take place, the animals were killed, the blood of the mother and young was collected and the percentage of alcohol estimated. The milk was also collected and tested for alcohol. He found that the alcohol ingested by the mother passes through her own blood directly into the blood of the young and into the milk. The percentages are approximately the same in both. Considering the established law in regard to hereditary syphilis, this would point definitely to an established congenito form of alcoholism. A glass of beer or ale taken by the mother during the nursing period also engenders the appetite in the child. Phil. Med. Journal, April 28, 1900, Page 927.

Bourneville observed that of a series of 1000 idiots examined by him, 62% per cent were of alcoholic parentage; Harro noted an alcoholic parentage in 46 per cent of criminals, while 45 per cent of inmates in the Swiss prisons for juvenile offenders showed a similar past; and Madame Tarnowsky found that 65 per cent of Russian prostitutes were the offspring of alcoholic parents." Sanitarian.

We also quote: "Of 120 female inebriates whose histories were trustworthy there were born 600 children, of whom 265 (44.2 per cent) lived over two years, while 335 children (55.8 per cent) died when under two years of age, or were still-born. With a view to establishing comparisons with a healthy non-alcoholic standard it was found that 21 of the women were able to give details regarding female relatives (sisters or daughters) of sober habits who had contracted marriages with sober males and had borne children. Thus, of sober mothers, 28 in number, there were born 133 children, of whom 33 (23.9 per cent) died when under two years of age. Thus, the death-rate amongst the children of the inebriate mothers was nearly two and a half times as great as that amongst the infants of sober women of the same stock.

Another feature established by the observations was the progressive
death-rate in the alcoholic families when two or three or more children were born. This will be best seen from the following table:

<table>
<thead>
<tr>
<th>Cases</th>
<th>Dead and Still-born</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-born</td>
<td>80</td>
</tr>
<tr>
<td>Second-born</td>
<td></td>
</tr>
<tr>
<td>Third-born</td>
<td></td>
</tr>
<tr>
<td>Fourth- and Fifth-born</td>
<td>111</td>
</tr>
<tr>
<td>Sixth- to Tenth-born</td>
<td>93</td>
</tr>
</tbody>
</table>

These figures illustrate very clearly the progressively augmenting results of the influence of the mother's alcoholism on the offspring. The type of alcoholic family suggested by these results—a type characterized by decrease of vitality in the successive children—is fully realized in many of the observations, of which the following is an instance: S., aged thirty-four years; previous imprisonments, 41. Drunkard since first confinement; beer and spirits. Suffers from gastric catarrh and cramps; had one attack of delirium tremens. Attempted suicide twice; hysterical convulsions. Husband drunkard; never delirious. His and her parents sober. Six children; first, second, and third living, healthy; fourth, aged six years, epileptic idiot; sixth, still-born; seventh, a recent abortion.

In other cases we find the first-born healthy, one or two of the next dying from infantile convulsions, and the last child or two still-born.

Of the children comprised in the series 219 lived beyond infancy, and of these nine, or 4.1 per cent, became epileptic—a proportion extremely high as compared with the frequency of epilepsy in the general mass of population, which, according to Bruce Thompson, is less than 1 per 1000." London Lancet, Sept.30, 1899.

The following are a few well authenticated and established facts relating the effects of alcohol upon being addicted to its use.
According to Prof. Charles L. Dana (Medical Record, March 16, 1901) the drunkard does not live more than fifteen years after beginning the use of alcohol, and it is very seldom that the human organism can withstand more than three thousand intoxications. Dr. Herman M. Biggs has recently called attention to the fact (Medical Record, 1901) that within a few years diseases of the heart, bloodvessels and kidneys have increased nearly 150 per cent, while the increase in population has been only a little over 50 per cent—in other words diseases of the heart, bloodvessels and kidneys have increased three times as rapidly as the population. Other degenerations, especially those leading to insanity, epilepsy, and imbecility are increasing at an equally rapid rate.

Berkley has shown that alcohol affects the brain by destroying, so to speak, dissolving, the dendrites or microscopic projections of nerve cells and thus depriving them of the power of receiving impulses from other nerve cells. This leads to loss of memory, loss of the power of coordination and other defects which are easily recognizable in chronic alcoholic insanity.

Dr. Destree in an article published in the Journal of the American Medical Association shows that while immediately after taking a dose of alcohol there is an apparent increase in muscular irritability and capacity, the total work produces is very considerably decreased as the result of the decidedly paralyzing effects of the alcohol, which appear after the first half hour.

Woodhead has been making an investigation of the influence of alcohol upon the functions of the cells when subjected to the action of pathogenic organisms. He showed that animals when under the influence of alcohol are susceptible to the influence of disease-producing organisms which are incapable of producing any effect when applied to animals not under the influence of drugs. The influence of alcohol in regard was the same as that of starvation carried to the extent of reducing the resistance of the body.
"Dr. Victor Horsley, in the Less and Raper Lecture states that in the toxic influence of chronic alcoholism the dendrites of the pyramidal cell show swellings and shrinkages, and widespread pigmentation of the nerve cells. N.Y. Med. Journal, May 19, 1900.

Dr. Frederick Peterson, President of the Craig Colony, states that epilepsy afflicts from one to two in one thousand of the population. One hundred forty-five patients admitted to that institution show alcoholism as direct cause of epilepsy in four of the cases.

Dr. Charles Allen of Georgetown University, Washington, D.C. states that of all the different kinds of multiple neuritis, alcoholic neuritis is by far the most common. Dr. C.L. Dana, Bellevue, observed this in one in four or five hundred cases in men, and in one or two per cent of women.

Of chronic paralytic alcoholism, Charpentier found eighty-three out of one hundred thirty-five cases occurred in alcoholics.

That the presence of alcohol in the stomach directly diminishes the digestive power of pepsin is shown by Hugouneng in the Lyon Medical, March 1, 1892, and also by Galzinski's experiments.

"That alcohol does not act as a respiratory of heat-producing food by uniting with oxygen or being burned up in the blood or tissues is proved by, first, the fact that the temperature of the body diminishes in direct proportion to the quantity used until life ceases at a temperature of from five to ten degrees below the normal standard of health. Second, no investigator has been able to find any increase of the well-known products of oxidation; namely, either aldehyde, carbonic acid, or acetic acid; third, it displays a much stronger affinity or attraction for the hemoglobin, albumen and water of the blood and tissues than for oxygen at the temperature of the living body. It retards metabolism. It prevents tissue waste, therefore an individual ought to be able to live much longer on nothing but diluted alcohol as in fermented and distilled liquors than he could on pure
water alone, but we have heard of a number of men living on nothing but wa-
ter alone forty or fifty days, but we have never learned of a well authentica-
ted case of a man taking or receiving into his system nothing but diluted
alcohol for half that length of time without becoming sick with either gastr
duodenitis, nephritis, or delirium tremens.

The best test of the measure of the vital force in an organism is
the degree of activity of its metabolism. Alcohol causes a diminution of
metabolism with a loss of heat, does not generate or increase muscular force,
and diminishes nerve sensibility in direct proportion to the quantity used.

Some years ago, the author made the following experiment for the
purpose of determining the influence of alcohol upon urinary toxicity. The
subject of the experiment was a healthy man of 30 years, weighing 61 kilos.
For fifty days prior to the experiment he had taken a carefully regulated
diet and the urotoxic coefficient had remained very nearly uniform. The
for
urine carefully collected after the first eight hours after the administra-
tion of 8 ounces of brandy diluted with water, showed an enormous diminution
in the urotoxic coefficient, which was, in fact, scarcely more than half the
normal coefficient for the individual in question. The urine collected
for the second period of eight hours showed still further increase of toxic-
city, the coefficient having nearly returned to its normal standard.
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The New York Medical Journal, June 16, 1900, reports a case similar to the histories of a large proportion of the inmates of our asylums. A farmer living and working moderately has drunk daily for sixty years, one pint of spirits. He has attained the age of ninety-two years, is hale and hearty, and never has had any illness. "While the effects of his drinking are not prominent in his appearance, they are very evident in his children; of three children by his first wife, two died in infancy; one became and epileptic and died at fifteen. Of four children by his second wife, one is feeble-minded; the second choreic; the third is dissolute and drinks; the fourth is erratic, passionate, and a wonderer."

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"Another case, an imbecile from his birth, appears intoxicated when he first meets you, but quickly recovers himself, and all these symptoms pass away. The history of such cases uniformly points to inebriate ancestry. These symptoms are inherited as special pathological states, representing the parents at the time of conception. In a private school for the feeble-minded among the wealthier classes, 3 in 14 cases had these unmistakable symptoms, which had not attracted attention."

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and the percentage of alcohol estimated. The milk was also collected and tested for alcohol. He found that the alcohol ingested by the mother passes through her own blood directly into the blood of the young and into the milk. The percentages are approximately the same in both. Considering the established law in regard to hereditary syphilis, this would point definitely to an established congenital form of alcoholism. A glass of beer or ale taken by the mother during the nursing period also engenders the appetite in the child.—Phil. Med. Journal, April 28, 1900,). 927.

J. H. K.
The three classes of drinks—wines, spirits and malt liquors—although differing in their nature and mode of preparation, are alike in that they all contain alcohol, but the amount of alcohol varies in their different varieties. An equal amount of each, if administered for experimental purposes, would give different results. An attempt has been made to show how much a person can drink without injury, but it is evident that no general rule can be laid down, for what will benefit one may be a great injury to another. For instance, Anstie, before quoted, in The Practitioner of 1869, p. 54, says he has arrived by physiological experiment at a rough rule as to the amount of absolute alcohol that can be taken by a healthy man, although there are extreme variations in this respect. It should not exceed a daily allowance of from one to one and a half ounces, in whatever form; and in the same publication for 1871, p. 91, he adds that this should not exceed two ounces in cases of unusual exercises of the body or mind in adult men weighing about 160 lbs. Anstie's rule is very frequently referred to by medico-insurance writers, by examiners in their reports, and it is the usual working rule of insurance companies. In the Encyclopaedia of Practical Sciences, art. Alcohol, the rule is laid down as one gramme (about 15 grains) per kilo (2 lbs.) of body weight as the average, which cannot be exceeded without danger, and at the fourth Anti-Alcoholic Congress held at The Hague, composed of representative men from many countries in Europe and America, the first amount was mentioned, namely, one and one-half ounces of alcohol daily, taken with meals.

Tables of the approximate amount of alcohol in various liquors have been constructed from time to time. The following is from D. W. S. Greenfield as quoted by Ziemassén's Cyclopaedia, col. xviii., p. 176, viz:

<table>
<thead>
<tr>
<th>Alcohol</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whiskey</td>
<td>50</td>
</tr>
<tr>
<td>Brandy</td>
<td>50</td>
</tr>
<tr>
<td>Alcohol</td>
<td>Per cent.</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Whiskey</td>
<td>50 at 60.</td>
</tr>
<tr>
<td>Brandy</td>
<td>50 at 60.</td>
</tr>
<tr>
<td>Rum</td>
<td>60 at 77.</td>
</tr>
<tr>
<td>Gin</td>
<td>49 at 60.</td>
</tr>
<tr>
<td>Port Wine (strongest)</td>
<td>25</td>
</tr>
<tr>
<td>Port Wine (ordinary)</td>
<td>25</td>
</tr>
<tr>
<td>Port Wine (weakest)</td>
<td>15.5</td>
</tr>
<tr>
<td>Madeira</td>
<td>16 at 22.</td>
</tr>
<tr>
<td>Sherry (strongest)</td>
<td>25</td>
</tr>
<tr>
<td>Sherry (weakest)</td>
<td>16</td>
</tr>
<tr>
<td>Burgundy</td>
<td>10 at 14.</td>
</tr>
<tr>
<td>Claret (vin ordinaire)</td>
<td>8 at 9</td>
</tr>
<tr>
<td>Claret (mean)</td>
<td>15</td>
</tr>
<tr>
<td>Claret (strongest) Bordeaux</td>
<td>17</td>
</tr>
<tr>
<td>Champagne</td>
<td>5 at 13.</td>
</tr>
<tr>
<td>Nectar</td>
<td>9 at 12.</td>
</tr>
<tr>
<td>Sauterne</td>
<td>14</td>
</tr>
<tr>
<td>Cider</td>
<td>5 at 10.</td>
</tr>
<tr>
<td>Ale (Bartom)</td>
<td>9</td>
</tr>
<tr>
<td>Ale (Ordinary)</td>
<td>3 at 5</td>
</tr>
<tr>
<td>Perry (pear cider)</td>
<td>7</td>
</tr>
<tr>
<td>Brown Stout</td>
<td>6 at 7</td>
</tr>
<tr>
<td>London Porter</td>
<td>4.2</td>
</tr>
<tr>
<td>Small Beer</td>
<td>1.26</td>
</tr>
</tbody>
</table>

Prof. Brande also found that small beer contained one to two per cent., ales six to nine per cent., light sherry and other strong wines of France and Germany about twelve per cent., sherry and other strong wines about nineteen to twenty per cent., and brandy, gin and whisky from forty to fifty per cent of alcohol.
Lager beer is said to contain 2 per cent of alcohol; and absolute alcohol, while it should run as high as 98 per cent, yet by reason of its great affinity for water which it extracts from the air, it is this extraordinary power of absorbing water which produces the hardening of the tissues. Brain tissue once hardened, according to Forel, is irrecoverable.

It will thus be seen that there is no settled rule in regard to the amount of alcohol which an individual can use without injury: neither can such rule be established for the amount which can be taken varies with the age, sex, temperament, degree of tolerance, kind of alcohol employed, and numerous other factors entering into the problem.

The following extract from the Registrar-General's report (quoted by Dr. Allan McLean Hamilton, in his work on nervous diseases) shows the probable duration of life in individuals who have lived temperately or intemperately, who have reached certain ages:

The temperate

<table>
<thead>
<tr>
<th>Age</th>
<th>Temperate Chance of Surviving</th>
<th>Intemperate Chance of Surviving</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>44.21 yrs.</td>
<td>15.53 yrs., or 35o/o of the duration of life of the general population.</td>
</tr>
<tr>
<td>30</td>
<td>36.48 &quot;</td>
<td>13.80 yrs., or 38 o/o of the duration of life of the general population.</td>
</tr>
<tr>
<td>40</td>
<td>28.79 &quot;</td>
<td>11.62 yrs., or 40 o/o of the duration of life of the general pop.</td>
</tr>
<tr>
<td>50</td>
<td>21.25 &quot;</td>
<td>10.86 yrs., or 51o/o of the duration of life of the general population.</td>
</tr>
<tr>
<td>60</td>
<td>14.28 &quot;</td>
<td>8.94., or 63o/o of the duration of life of the general population.</td>
</tr>
</tbody>
</table>

What a penalty to pay for a literally short-lived pleasure!

Not only is alcoholism a cause of curtailment of the duration of life and a factor in the large mortality of insurance companies direct as well as indirect as we have seen, but as a corollary it is also the cause of a large percentage of the death losses in dollars and cents. This point has been conspicuously shown by the statistics of the United Kingdom Temp-
erance and General Provident Institution, of England.

For instance, quoting from Parkes' Manual of Practical Hygiene, Vol. 1, page 306: "One section of this institution consists of abstainers, another of persons selected as not known to be intemperate. The claims for five years anticipated in the temperance section were £100,446 (about $502,230); but there were actually only only claims for £72,676 (about $363,380). In the general section the anticipated claims were £196,352 (about$981,760), and the actual claims were no less than £230,297 (about $1,151,485). Not only this, but it would seem that the longevity of the abstainer was better seen by the amount of bonuses or dividend additions to the amount insured paid to sections for the same five years. The following table gives the profits allowed at every fifth age of entrance from 15 to 55, both inclusive, in the temperate and general classes:

<table>
<thead>
<tr>
<th>Age at entrance</th>
<th>Premium paid in five years</th>
<th>Bonus added in temperance section</th>
<th>Bonus added in general section</th>
<th>Dividend benefits in the temperate class</th>
</tr>
</thead>
<tbody>
<tr>
<td>15...</td>
<td>£63 2 6</td>
<td>£61 1 0</td>
<td>£35 10 0</td>
<td>75 o/o larger.</td>
</tr>
<tr>
<td>20/1/1/1/1</td>
<td>£93 6 6</td>
<td>£64 0 0</td>
<td>£37 0 0</td>
<td>73 o/o</td>
</tr>
<tr>
<td>25...</td>
<td>£106 9 6</td>
<td>£68 7 0</td>
<td>£40 0 0</td>
<td>72 o/o</td>
</tr>
<tr>
<td>30...</td>
<td>£122 1 8</td>
<td>£74 6 0</td>
<td>£43 0 0</td>
<td>72 o/o</td>
</tr>
<tr>
<td>35...</td>
<td>£139 19 2</td>
<td>£78 19 0</td>
<td>£46 0 0</td>
<td>72 o/o</td>
</tr>
<tr>
<td>40...</td>
<td>£162 5 10</td>
<td>£86 0 0</td>
<td>£50 0 0</td>
<td>72 o/o</td>
</tr>
<tr>
<td>45...</td>
<td>£188 10 10</td>
<td>£92 18 0</td>
<td>£54 0 0</td>
<td>72 o/o</td>
</tr>
<tr>
<td>50...</td>
<td>£226 5 0</td>
<td>£104 2 0</td>
<td>£60 13 0</td>
<td>72 o/o</td>
</tr>
<tr>
<td>55...</td>
<td>£264 3 4</td>
<td>£122 14 0</td>
<td>£71 11 0</td>
<td>72 o/o</td>
</tr>
</tbody>
</table>

The above is the record of one of the largest life offices of Great Britain, and which has been in business since 1840. Its mortality records have been most carefully kept and classified with the object of settling its financial obligations to its insured members on the basis of equity and justice. The result is an authoritative statement on this subject.

Long continued and immoderate indulgence in the use of alcohol is felt in varying degrees in every part of the body. Having a strong affinity for water, it created inordinate thirst when taken in the stomach, the
usual consequence being a desire for more alcohol and with a repetition of the same result. It causes dyspepsia of the catarrhal variety with a resulting interference with a sufficient supply of food; it acts upon the liver by creating new interstitial tissue, which contracting, causes the hob-nail appearance so often spoken of in autopsies of alcoholics; it causes a fatty degeneration of organs, thus interfering with their functional activity. Another property of alcohol is to harden tissue, and we often find such to be the case in the various parts of organization: The following diseases and conditions have been observed in this class of cases: Organic heart disease, especially fatty degeneration; a similar condition of the blood vessels; disease of the lungs, including consumption, and a proneness to pneumonia; kidney disease, particularly the variety known as Bright's disease as well as diabetes, and the deposition of urinary salts, predisposing to calculus; degeneration of the eye; inability to sleep (insomnia) and other nervous conditions, functional as well as organic, such as epilepsy, paralysis, delirium tremens, insanity; loss or perversion of the normal sense and passions inducing frequent perpetrations of all the crimes in the calendar, including murder—and defrauding insurance companies, which is a crime frequently committed against the widow and orphan!

Extracts from Medical Examiner.

Present and Former Use of Alcoholic Stimulants.

By George W. Wells, A. M., M. D., of New York; Resident Physician of Manhattan Life Insurance Company; Member First International Congress of Medical Directors; Association of Life Insurance Medical Directors, Etc.
Extracts from Editorial: ALCOHOL AND LONGEVITY.
New England Medical Monthly, August 1, 1901.

Conclusions based upon a study of 4234 deaths are given as follows, and show the average age attained by members of both of these classes:

1. Total abstainers, 51 years 22 days.
2. Habitually temperate drinkers, 63 years 13 days.
3. Careless drinkers, 59 years 67 days.
4. Free drinkers, 57 years 59 days.
5. Decidedly intemperate drinkers, 53 years 3 days.

These figures show singularly enough that those who reach the shortest age are those who drink no alcohol what ever. After them come the drunkards, who only exceed them by a trifle.

The Medical Association furnished further statistics of similar import. These were respecting persons who had attained the age of eighty and upward. Of the 530 deaths reported of persons between the ages of 80 and 90, 82, or 15.47 per cent. were total abstainers; 396, or 74.72 per cent. moderate drinkers, and 52 or 9.61 per cent. heavy drinkers. Of the 159 persons between ages of 90 and 100, 23 or 14.46 per cent. were moderate drinkers, and 10, or 6.29 per cent. were heavy drinkers. Of the 689 persons who died between the ages of 80 and 100, 105, or 15.52 per cent. were total abstainers; 522, or 75.76 per cent. were moderate drinkers, and 62, or 9.99 per cent. were heavy drinkers.

There is a large class among the total abstainers that is made up of men who have in past yeats drank to excess, and who are now suffering from former indulgence; and there is another very large class consisting of men who have never enjoyed robust health, and who therefore have been com-
pelled to abstain from certain foods.
Child Tippling in Wine.

Drinking Countries. In these days when prohibition is making such prodigious strides, the liquor dealers are bringing out all the antique arguments in the hope that they may extend their opportunities yet a little while. The long-ago-exploded argument that drunkenness is unknown in wine drinking countries is brought out with the rest.

Anyone who has ever travelled in a wine drinking country known the absurdity of this argument; but the average American has never been abroad, and so the trick works with not a few honest thinkers.

A study of the habits of the school children in the public schools of a German city revealed facts which are most appalling. One-third of all the children in the school drank a pint or more of alcoholic beverages daily; and in one city it was found that of 49 students in the lowest class in school, all used beer and 40 had used whiskey. In a class of 23 girls all used beer and half had used whiskey.

In a country school fourteen pupils were supplied with flasks of brandy by their parents, and pupils nine years of age were sometimes taken home intoxicated with liquor given them by their parents in their lunch baskets.

The remedy for intoxication proposed by the Bum-seller is to make the whole population drunk.
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A study of the habits of the school children in the public schools of a German city revealed facts which are most astonishing. One—
Among all the children in the school drank a fruit wine, an alcoholic beverage daily, and in one city it was found that of 749 of the students in the lowest class in school, all used beer and whiskey. Forty had used whiskey. In a class of 29 girls all used beer and half had used whiskey.
In a country school fourteen pupils were supplied with flasks of brandy by their parents, and pupils nine years of age were sometimes taken out intercalated with cognac given them by their parents in their lunch baskets.

The remedy for intoxication proposed by the chemist is to make the whole population drink.
A man said to an Irishman who was going into a saloon with a pair of boots over his shoulder, "Pat, are you going to get a drink for those boots?"

"No", said Pat, "Begorra they're tight already."

Evolution. Tight boots make a corn; corn makes whiskey; whiskey makes a tight man in his boots.
Couldn't Eat Hog Meat.

A prominent Rabbi riding in a crowded street car arose to offer his seat to a lady who was standing; but before the lady could reach the seat, a man near by appropriated it unto himself. For a few moments he sat in blissful contentment, then looking up he met the scornful glance of the Rabbi and said: "You look as though you would like to eat me."

"No," replied the Jew Rabbi, "I couldn't do that. I am a Jew."

How Hans Knew.

A temperance lecturer was one day trying to influence a manufacturer, who employed a large number of men, into using his persuasive power in winning his men away from beer drinking. The manufacturer held that beer drinking was neither very harmful nor intoxicating, and said he believed he had men working for him who could drink that pail (pointing to a twelve-quart pail) full of beer without harm or intoxication. The temperance man was horrified at the idea, and expressed his doubts in every possible positive terms. Whereupon, the manufacturer stepped to the door and called out "hans." A large good natured looking German came into the room, and the manufacturer asked him if he could drink the pail full of beer without hurting him.

"I don't know," said Hand, "but I will let you know in a leetle vile."

Hans went out and came back in about twenty minutes saying:

"Yes, I can trink him."

The pail was sent out and came back filled with beer. Hans sat down with the pail, and leisurely drained it to the last drop. He arose with a satisfied expression, and wiping his mustache started for the door. The manufacturer stopped him with the question:
"Hans, how is it that when I asked you if you could drink that pailful of beer you said you didn't know, and then in a few minutes you came back and said you could? How did you make up your mind?"

"Vell," said Hans, smilingly, "I didn't know till I tried him, so I went out and drank a pail of beer and den I knowed I could."

Annoyed by Mosquitoes.

One evening two Irishmen, new in the country, sat in their rooms in a hotel with the gas lighted. After a time some mosquitoes, attracted by the lights, came into the room and attacked the Irishmen.

They were told to put out their light and to close their window. Just as they were going to sleep one of the Irishmen saw a lightning-bug.

"Jamie, Jamie," he cried. "It's no use. Here's one of the cratures searching for us with a lantern."
He first, the taste of flesh from tables drove,
And argued well, if arguments could move;
O mortals, from your fellow's blood abstain;
Nor taint your bodies with a food profane,
While corn and pulse by nature are bestowed,
And planted orchards bend their willing load;
While labored gardens wholesome herbs produce,
And teeming vines afford their generous juice;
And tardier fruits of cruder kind are lost,
But tamed with fire, or mellowed by the frost;

While earth not only can your needs supply,
But, lavish of her store, provides for luxury;
A guiltless feast administers with ease,
And without blood is prodigal to please.
Wild beasts their maws with their slain brethren fill;
And yet not all, for some refuse to kill;
Sheep, goats, and oxen, and their nobler steed,
On browse, on corn, and showery meadows feed.
Beasts, tigers, wolves, the lion's angry brood,
Whom Heaven indited with principles of blood,
He wisely sundered from the rest, to yell,
In forest, and in lonely caves to dwell;
Where stronger hearts oppress the weak by night,
And all in pray and purple feasts delight.

O, impious use! to nature's laws opposed,
Where bowels are in other bowels closed;
Where, fattened by their fellows' fat, they thrive;
Maintained by murder and by death, they live;
'Tis then for naught that mother earth provides
The stores of all she shows, and all she hides,
If men with fleshy morsels must be fed,
And chew with bloody teeth the breathing bread;
What else is this but to devour our guests,
And Barb'rously renew Cyclopean feasts?
We, by destroying life, our life sustain,
And gorge the ungodly maw with meats obscene.

Yet so the golden age, who fed on fruit,
Nor first with bloody meals their mouths pollute,
Then birds in airy space might safely move,
And timorous hares on heaths securely rove;
Nor needed fish the guileful hooks to fear,
For all was peaceful; and that peace sincere.
Whoever was the wretch (and cursed be he)
That envied first our food's simplicity,
The essay of bloody feasts on brutes began,
And after forged the sword to murder men—
Had he the sharpened steel alone employed
On beasts of prey that other beasts destroyed.
Or man invaded with their fangs and paws,
This had been justified by nature's laws,
And self-defense; but who did feasts begin
Of flesh, he stretched necessity to sin.
To kill man-killers, man has lawful power,
But not the extended license to devour.
From whence, O mortal man, this gust of blood
Have you derived, and interdicted food?
Be taught by me this dire delight to shun,
 Warned by my precepts, by my practice won;
And when you eat the well deserving beast,
Think on the laborer of your field you feast!

Ill customs by degrees to habits rise;
Ill habits soon become exalted vice.
What more advance can mortals make in sin,
So near perfection who with blood begin!
Deaf to the calf that lies beneath the knife,
Looks up, and from her butcher begs her life;
Deaf to the harmless kid, that are he dies,
All methods to procure thy mercy tries,
And imitate in vain thy children's cries!
Where will he stop who feeds with household bread,
Then eats the poultry which before he fed?
Let plough thy steers, that when they lose their breath
To nature, not to thee, they may impute their death
Let goats for food their loaddudders lend,
And sheep from winter cold thy sides defend;
But neither springs, nor nets, nor snares employ,
And be no more ingenious to destroy,
Nor let insidious glue their wings constrain;
Nor opening hounds the trembling stag affright,
Nor purple feathers intercept his flight,
Nor hooks concealed in bait for fish prepare,
Nor lines to heave them twinkling up in air.

Take not away the life you cannot give;
For all things have an equal right to live;
Kill noxious creatures, where 'tis sin to save;
'Tis only just prerogative we have;
But nourish life with vegetable food,
And shun the sacrilegious taste of blood.
How Alcohol Affects the Muscles.

It used to be thought that alcohol braced up the body for hard muscular work and gave greater power of endurance. The soldiers and the sailors in the army and the navy were given their regular ration of grog, to assist them in enduring the hardships of their life. It is now well known, having been proved by thousands of scientific experiments, that muscular work of all kinds is not helped, but is actually hindered by alcohol.

When Lord Wolseley was Commander-in-chief of the British army, he had many careful experiments made to find out the effects of alcohol upon the physical endurance and the staying powers of the troops. One regiment would be deprived of every drop of alcohol, and another regiment given a daily allowance of whiskey. In each instance in which it was tried, this experiment went to show that while the alcohol might for a few days increase the dash and impetuosity of the men to whom it was given, by the fourth day they began to show marked signs of lassitude, lack of spirit and of endurance. The men who had received no alcohol on the other hand, increased in staying power, alertness, and vigor every day.

Soldiers in all climates and in all weathers, in heat, in cold, and in rain, are much better able to endure fatiguing marches when no alcohol is allowed them. Sir Frederick Treves, an English surgeon who was with the army in South Africa at the time of the Boer war, said that the users of alcohol could be distinguished just as easily as though they had been labeled, by the way they dropped out on the long marches.

A man who is exhausted with labor may think himself stronger after taking a glass of liquor, but this is because the alcohol has numbed the nerves that tell him of his true condition. Alcohol may be compared to a whip. An exhausted man may by taking alcohol force himself to further effort, just as a whip may excite an exhausted horse to work until it drops; but the extra effort is a draft upon his reserve strength which if continued will soon leave him a physical bankrupt.

More than a century ago Benjamin Franklin noticed that alcohol reduced the power of the muscles. Then working in a London printing house he was ridiculed by his fellows because he did not join them in their beer-drinking. But, he says,
"On occasion I carried up and down stairs a large form of types in each hand, while others carried but one in both hands. They wondered to see from this and several instances that the 'water-American' as they called me, was stronger than themselves who drank strong beer."

Dr. B. W. Richardson says, "Drink builds up no muscle, but destroys its power and makes it less active for work." For this reason an intelligent athlete training for an event will not use alcohol in any form. The leading trainers of the country absolutely forbid alcohol to the men under their care. Men become useless as soldiers, wrestlers, baseball players, or prize-fighters, when they get the liquor habit.

Tobacco also is forbidden to athletes in training, because it makes them unable to do their best. We have already seen that the tobacco poison weakens the heart and makes the breath short. This is a great handicap in taking the exercise necessary to develop the muscles. Besides this, the boy who smokes does not usually like to exercise so well as others. Tobacco makes him lazy and dreamy and idle and it is only by exercise of all kinds that boys grow strong and hardy.
RECENT TESTIMONY AGAINST THE MEDICAL
USE OF ALCOHOL.

At the 18th annual meeting of the New York State Medical Association, held in New York City Oct. 18-20, 1898, several eminent physicians discussed in a very practical and spirited way the various questions relating to the medical use of alcohol. A brief abstract of these medical papers is given in the Medical Record for Oct. 29.

"The Passing of Alcohol."—Dr. J. M. Farrington, of Broome County, read a paper with this title, in which he expressed the opinion that those of the profession who believe in the value of alcohol as a remedy were now in the minority. A great change in this respect had taken place in recent years. Alcohol, he said, was not a food, but on the contrary impaired nutrition. It was not a stimulant, but really a depressant. Recent physiological experiments showed that it retarded, perverted, and was destructive to normal cell growth. Life insurance companies had become convinced beyond question that alcohol, used in even moderate quantities, impaired health and shortened life. They declined to accept a risk unqualifiedly if the person used liquor in any form habitually. Railroad companies now required their engineers, brakemen, switchmen, and conductors to be total abstainers. The majority of Christian societies had banished wine from their religious ceremonies, and used instead unfermented grape juice. Notwithstanding the drinking usages of the time, he believed that there never was a period in the world's history when the use of liquor was considered so degrading. He attributed the superior accuracy of our gunners in the late naval engagements with Spain to the banishment of rations of grog. By order of Lord Wolseley, he said, careful experiments had been made regarding the staying qualities and health of the British troops using alcohol, as compared with those not using such drink. Certain regiments were allowed rations of grog, and from other regiments these were entirely withheld. It was found that
those receiving the grog made a very impetuous dash in their charges, but after a few days they showed a great deal more fatigue and weakness than those who had had no grog. As a result of these observations, and not from any conscientious scruples, rations of grog had been forbidden in the present campaign in the Soudan. Difficult as was this important innovation on time-honored customs, the results had fully justified the change. Dr. Farrington though the medical profession should be as active now in securing the banishment of alcohol as it had been in the past in placing it in a prominent position.

"The Retirement of Alcohol in Pharmaceutical Processes.-- Dr. E. R. Squibb said that it might be of interest, in connection with this paper, to learn of the work being done in the way of retiring alcohol as a menstruum for exhausting drugs. A good deal had been accomplished in this direction in the last two or three years. Of the other menstrua experimented with up to the present time, that which had given the best results was acetic acid in various strengths. It had been discovered that a ten-per-cent. solution of acetic acid was almost universal in its exhausting powers. There were now in use in veterinary practice and in some hospitals, extracts made with acetic acid. They were made according to the requirements of the pharmacopoeia except that acetic acid acid was substituted for alcohol. Acetic acid when used with alkaloids gave the physician certain advantages in prescribing, owing to there being fewer incompatibles. In small doses the percentage of acetic acid in the extract was so small as to be hardly appreciable, and when larger doses were required the acetic acid could be neutralized by the addition of potash or soda.

Dr. H. D. Didama, of Syracuse, said that it did not seem to him that the use of alcohol by the profession had been abandoned, either socially or otherwise. It should not be forgotten that the value of negative testimony could never equal that of positive testimony, and that, there-
fore, the observations of those physicians who had tried alcohol in their practice and abandoned its use should have greater weight than the results obtained by those who had always relied upon it. For the last four years he had not given the equivalent of a teaspoonful of alcohol to all of his patients put together, and he was better satisfied with this practice than with that of previous years, in which he had used alcohol more freely.

"Dr. Wickers Washburn, of New York, thought that in discussions of this nature it would be advantageous to discourse the questions of alcohol as a medicine and as a beverage. If alcohol were not a narcotic, we could not see "dead drunks." He used alcohol, in the critical stage of pneumonia, just as he did morphine, and to avoid its secondary or depressant action the second dose must be given before the second action of the first dose had developed. In his last forty-six cases of pneumonia he had given alcohol and morphine— in some cases, morphine to the extent of one-fourth grain every forty-five minutes— and had met with none of the secondary or depressant effects, or any tendency to narcotism. Further, there had been no tendency to continue the morphine or alcohol after recovery.

"Dr. Hiram A. Pooler, of New York, said that as a result of the experience gained through many years of practice he would say that alcohol must be prescribed with great care. He would not exclude it under all circumstances, but he would rather cut off his right hand than introduce it into a young person's system. It was without doubt very useful in the treatment of disease occurring in persons who had been addicted to the use of alcoholics for years, but he must confess with sorrow to having been responsible for sending two individuals to drunkard's graves by recommending alcohol when he should have advised the use of carbonate of ammonium, caffeine, or some similar stimulant. Sir Benjamin Richardson, who had had exceptionally good opportunities for the investigation of the effects of alcohol on the human system, had stated that alcohol was a deadly poison from its inception to its elimination from the human system;
that it did not promote digestion, but, on the contrary, retarded and interfered with it.

"Dr. Robert Newman, of New York, deplored the tendency of Americans to run to extremes. He felt that as a physician he had been instrumental, by prescribing alcohol, in saving several lives. At one time he had made a post-mortem examination on a man who he knew had been intoxicated almost daily for many years, yet he had failed in this particular case to find the ravages of alcohol so graphically described by those who believed its use should be entirely and forever abandoned. While it might be true that small doses of acetic acid were innocuous, he was positive that if the doses of drugs exhausted by the agency of this menstruum were large it would be found harmful, just as vinegar was prejudicial to health.

"Dr. Farrington, in closing the discussion, said that he thought close investigation would show that alcohol was entirely contraindicated in pneumonia. Alcohol was not a stimulant; it lashed the nervous system into great activity, but caused greater depression as a result."
Non Alcoholic Treatment of Consumption.

That consumption is a disease of lowered vitality, I think, is not today questioned. While the tubercular bacillus is the action agent in this disease, yet observation shows us that while the body tissues are well nourished, and the general vitality good, tissues cells have the power of repelling these germs even though they may, as they often are, quite plentiful in the body lowered vitality predisposes to tuberculosis.

Alcohol lowers the vitality of body tissue. On this point Dr. S. W. Davie says: "Alcohol is a poison, and when taken into the system is not assimilated, and while passing through the body it disturbs every physiological process, and is finally thrown off through the organs of excretion unchanged. Hence, if not assimilated it cannot be a food, and as it disturbs every physiological process, it cannot be a medicine. Therefore, if alcohol is not nutritious and serves no purpose as a therapeutic agent, then mankind should be so instructed, and its promiscuous use abandoned. This work can alone be done by the medical profession."

Also the following from Dr. J. W. Squires is worthy of note:
"Numerous scientific investigations by various distinguished authorities bear me out in the statement that alcohol is not a stimulant, but a depressant; is not a tonic, but an anaesthetic; is not a food for it is not digestible nor assimilative. — It impairs the senses, and that too in exact proportion to the quantity consumed."

A strong man in perfect health and strong mind, will degenerate physically and mentally by a liberal use of alcohol in any form. Examples need not be presented to this society.

Again we repeat, lowered vitality from whatever cause predisposes to consumption. Alcohol lowers vitality. Now are we ready to admit "Similia Similibus Curantur?"

It is true that in many cases alcohol increases the production of adipose tissue, but it is just as true that it decreases the amount of muscle. But in this case we are to choose between fat and muscle. What is the change in fatty degeneration of the heart? If adipose tissue is more valuable than muscle, why is our anxiety aroused and our advice so positive when we decide that the muscle fibres of the heart are gradually being degenerated and globules of oil are taking their place? Alcohol may and does without question often increase fat.

Bodily inactivity will as often do the same; but is a fat man stronger than a muscular man? Is a fat man more able to resist disease than a man who has less fat and more muscle? The cause of lowered vitality suggests the remedy.

That there is in all cases of consumption an unnatural and more or less rapid disintegration of bodily tissue, is not questioned. The name suggests the fact and the fact has suggested the name.
We have thus far spoken only of the basis for treatment and a word about climate, it altho as yet there has not been discovered any specific preparation which taken internally or externally will destroy the germ, yet we believe that by proper care combined with climatic advantages a much larger per cent of complete recoveries may be obtained.

We are convinced that tubercular patients need equally as regular management, advice and treatment as patients suffering from other protracted fevers.

The following outline of treatment and general management during the past two years seemed to bring quite gratifying results and a few cases are cited below to illustrate conditions of patients and results obtained from the change of climate combined with careful care.

The general treatment pursued has been substantially the following:

All patients are kept in bed for a few days after arriving to prevent too much reaction. When there is much fever the patient is kept quiet until the temperature shows a decided drop, and remains down. The most nutritious foods are given which can be well handled by the digestive system, paying attention to a frequent change and cool variety; but at the same time giving caution against "stuffing."

When the temperature runs above 100.5 F. we have employed the moist chest compress enveloping the whole chest and so adjusted as not to allow the air to pass under the compress. This is held firmly in place by another dry covering made of cheese-cloth which is wrapped about the chest and over the shoulders completely covering the moist one and holding the same close about the chest.
When this compress is removed in the morning, unless the patient is too liable to chill, a cool wet hand rub is given by a skilled attendant who follows it by a light medium or thorough massage, according to the patient's condition and the prescription given in each case. In this way the circulation is well started in the morning before breakfast and just at the time when the temperature is generally the lowest.

The object of this treatment is two-fold. 1st For its tonic effect on nutrition and 2nd its antiperiodic effect on the temperature. For it is well known that in any fever, if the periodicity can be broken or modified by antiliping the chilly stage by a thorough warming of the body, the chill is markedly decreased and the fever is in like proportion lessened. The patient is especially protected and kept warm in the morning but allowed to be out much in the cool air as soon as or a little before time for the temperature to begin to rise.

When there is a tendency to night sweats a hot vinegar or salt sponge will usually control this and so quiet the patient as to induce sleep.

From 5 to 20 drops of creosote is also given in an emulsion of oil of sweet almonds and the yolk of eggs by enema three times a week.

General treatment by an attendant is given, such as light massage, electricity, dry or wet hand rubs, or sponges according to the strength and reactive powers of the patient.

In cases where there is thickening, or much accumulation of secretion in the smaller tubes or air cells, we have used quite liberal inhalations of ozonized oxygen which serves to loosen up and clear out
such exudate are satisfactorily than perhaps any other one measure
we have been able to find. This gas of course acts upon this pus and
exudate in a similar measure as Dioxide of Hydrogen would and yet in a
very mild manner, in fact the results can be governed at will by
regulating the quantity of gas inhaled.

Ozone can be produced quite readily by whipping pure oxygen in
the static fume generated from a large coil attached to a dynamo pro-
ducing the direct current. Any coil which is strong enough to throw a
10 inch spark, will produce a liberal amount of ozone by using the
silent discharge but not the spark.

In cases where the bowels are especially involved and there is
much pain and looseness, we have been able to control both quite read-
ily by the moist abdominal girdle protected the same as for the chest,
the use of hot applications over the bowels and hot starch enemas. In
mild cases usually the girdle will relieve in a few hours; in more
severe cases each or all of the above measures may be required.

We find it very necessary to keep patients quiet while the tempe-

ature is high.

The following cases taken directly from our book of records with-
out selection, and including all tuberculous patients which entered
during twelve weeks ending Sept. 31, will give an honest average result
from the employment of the above outline of treatment:

Patient has been running down for a year, cough for past three months.
When received had a very distressing cough, raising quantities of heavy
yellow sputum, test showed tubercular bacilli. Temp. 101.5
Quite extensive thickening in right lung and rales in both apices. Treatment as indicated above. Result -- patient began regular work as a nurse in one month, in three months all indications of thickening had disappeared and the temperature was normal. She had gained 18 lbs. in flesh and no return of any symptoms to date, and yet regular work has been continued since the first month.

Case No. 2.

F.T.J. Age 21, Home, Iowa. Grandfather and mother died of consumption. Patient never very strong. Condition at first examination: Left lung lower lobe solidified, upper lobe much thickened, with rales quite general, temperature 101 to 103 with chills. Patient gained during the first three months, 15 lbs. Temperature normal, but lower lobe did not entirely clear up. Has been quite well until he took cold about three months ago which again caused much thickening in the left lung. Patient at present has some fever but is making a slow but steady gain. Temperature now about 100.

Case No. 3

Mrs. J. Age 19, sister of above patient, came at the same time. Large cavity in upper lobe of right lung, lower lobe filled, left lung slightly thickened; not able to walk; temperature 102 to 103, heavy chills, no appetite, bowels tender and loose, profuse night sweats. Patient made a steady gain for five months. Left lung gave no signs of further infection; right lung still slightly thickened but no rales. Temperature normal; cavity contracted. Mar. 1st, patient was discharged from treatment but advised to remain in Colorado. Five days later took a severe cold from extreme exposure, contracted pneumonia of the left lung, and died the following week.
Case No. 4.

Capt. R. Act. 60, Home, Iowa. Grandfather died of consumption. Patient suffered since the war with stomach and bowel trouble. Pneumonia two years ago involving the right lung. Marked pleuritic effusion. Physical examination showed left lung to be practically consolidated with breaking down near the apex forming a small cavity. Examination of sputum showed tubercular bacilli in large numbers. Had three severe hemorrhages. Temperature on entering 100. to 101.5. Had two quiet severe hemorrhages while under treatment, but is now gaining in flesh and strength. Temperature now normal both morning and evening. Especial attention has been given in this case to the digestive system as well as to the lungs.

Case No. 5.

Aug. 20/95, Miss C., Home, Mich. Act. 28. History: Always delicate, troubled with enlargement of the glands of the neck for 14 years. Have been removed twice. Was sent to Colorado by physician two years ago after having two hemorrhages. Made a very satisfactory gain for several months when she had what she termed "Grip." By the way, in my judgment, many of the so-called cases of so-called "Grippe" are simply an acute attack of tubercular invasion that is in these cases which develop later tuberculosis. Examination on entering our institution showed the left lung thickened especially in the lower lobe with only fine crepitation of air, and little if any normal vesicular sounds. The upper lobe showed decided signs of softening near the apex, and either dilated tubes or a small cavity. The temperature varied from 101. to 103.6 during the first week. The ozonized gas
The sputum casually, and the medicine was quite readily cleared out of the lower lobe but the indications of a cavity still remained near the apex. Patient has gained 10 lbs. at times but on the whole is in present about as she was first examined her only the lung has cleared up almost entirely.

Case No. 9.

M. M. L. 111, St. Louis, Mo. Patient never very strong. Has had hemorrages about one year ago. Began especially to run about about one year ago. Spilateral lesions, on the X-ray still found. Sent to Boulder by her physician. Physical examination showed marked thickening near apex of left lung with moist rales. Temperature long from 100. to 101., no night sweats; annoying cough. Treatment as given above and patient after two months shows no evidence of the thickening; temperature normal. No cough, has gained 12 lbs. in flesh and has since worked continually no indications of return of the disease.

Case No. 7.

Mrs. W. A. 214, Home, New York. Heredity, Father died of consumption. Patient well up to about five years ago, then had pneumonia. Has had severe hemorrages, coughed and raised most of the time for past five years. Has been especially failing for the past two years. shortness of breath, very nervous and appetite poor. Physical examination revealed general thickening of moist rales throughout both lungs with friction rales on right side. Temperature varied from 100.5 to 100. during the first week. As both lungs were so much involved the patient having already lost so much flesh, no encourage-
was used carefully, and the exudate was quite readily cleared out of the lower lobe but the indications of a cavity still remained near the apex. Patient has gained and lost at times but on the whole is at present about as when we first examined her only the lung has cleared up almost entirely. In still water observation, had not made

Case No. 6.

Sept. 1. Miss E, Act. 24, - Home, Mich. Patient never very strong. Had two hemorrhages about eight years ago. Began especially to run down about one year ago. Sputum tested, and the bacilli found. Sent to Boulder by her physician. Physical examination showed marked thickening near apex of left lung with moist rales. Temperature varying from 100. to 101., no night sweats; annoying cough. Treatment pursued as given above and patient after two months showed no evidence of the thickening, temperature normal, no cough. had gained 12 lbs. in flesh and has since worked continuously and no indications of return of the disease.

Case No. 7.

Mrs. W, Act. 34, - Home, New York. Heredity, Father died of consumption. Patient well up to about five years ago, then had pneumonia. Had seven hemorrhages, coughed and raised most of the time for past five years. Has been especially failing for the past two years, shortness of breath, very nervous, and appetite poor. Physical examination revealed general thickening and moist rales throughout both lungs with friction rales on right side. Temperature varied from 99. to 100. during the first week. As both lungs were so much involved and the patient having already lost so much flesh, no encourage-
was given her that she could get well. Very careful treatment was given her and special attention was given to the diet. She was also kept absolutely at rest for one month, after which time she began to take some exercise and for the past three months has been doing regular work from six to ten hours per day and her temperature has been normal for over two months. Much of the thickening has been cleared out and altho there are still some rales yet they have nearly disappeared. The patient was discharged from treatment about one month ago but advised to stay in Colorado the remainder of her life.

Case No. 8.

Sept. 10, Miss M., Home, Ind. Aet. 32. Heredity good; had what she called La Grippe four years ago, since which time she has had two hemorrhages with cough but would get better. For past year has had a persistent cough and throat remains irritable and husky. Physical examination showed general thickening of the right lung with mucus rales in upper lobe. The ozonized gas was quite freely used in her case with the other treatment and Nov. 23 she was discharged with only the slightest indication of thickening in the back part of the middle lobe of right lung. Temperature had been normal for several weeks when discharged.

Case No. 9.

Sept. 12/95. Mr. T. M., Aet. 20, Home, Iowa. Heredity, one sister died of consumption. Patient in fairly good health up to about one year ago, when he "took a severe cold," had pain in lung and after the "cold" was relieved, noticed a shortness of breath with cough. Thought little about it until later when he began to raise quite freely
and have chills and a regular daily fever. Sputum was examined and tubercular cocci were found. His physician immediately advised him to "go to Colorado" by wagon; the trip was a very tiresome one and patient lost much flesh and strength while on the road. He was put under treatment at our institution Sept. 12. Physical examination showed the upper lobe of the left lung decidedly softened and the whole lung thickened, with crepitation rales in lower lobe near apex; temperature first week varied from 101. to 103.6 with chill daily. Patient was kept absolutely quiet, the cool compress kept constantly about the chest as with all others with high temperature. The ozonized oxygen was freely used, taking about ten gallons, twice daily. Later, took careful exercise and spent much time out on the veranda and in the sun when it was not too cloudy. In this case the appetite was very poor, bowels sore and the patient much emaciated. Patient was dismissed from treatment Dec. 10/95 after having gained 22 lbs. Appetite good, no trouble with bowels, and but a slight thickening in upper portion of left lung. Patient is still in Boulder but has no rise of temperature.

Case No. 10.

Mr. W. Aet. 23, Homo.-New York. Heredity, one sister died of consumption. Occupation-clerk. Had been running down for about a year. Slight dry cough at first, gradually grew more troublesome, began raising about six months ago after an attack of "Gripe," so called. Patient was sent to us by his physician for our care and advice. Physical examination revealed marked thickening of upper lobe in right lung, and some considerable infiltration with the small tubes of the lower lobe.
chills daily in the morning, with a rise of 4 degrees by 2:30 P.M.
Tubercular bacilli found on examination, considerable expectoration.
Temperature gradually lessened under treatment and patient was discharged
Dec. 1, to all appearances well, but was advised to remain in Colorado
for one year at least. Two months later he passed an examination for
Life Insurance, and has to the present time shown no indications of any
return of the trouble.

The above ten cases are taken without selection, in the order in
which they entered our institution.

We are convinced, after watching a large number of patients in
Colorado, that tuberculosis is curable in a large percentage of cases
and that without alcohol, provided the same study and care is employed
with these cases as with other patients suffering with infectious
fevers.
ALCOHOL IN MEDICAL PRACTICE

by

J. H. Kellogg.

Of all the learned professions medicine is by far the most progressive. The theologian is anchored to his creed; the jurist is bound by precedent. The modern scientific medical man is an earnest, unprejudiced seeker after therapeuetic truth. If this has not always been true of medical men, it has been increasingly true within the last half century. Under the stimulating influence of the teaching and example of such men as Jacob Bigelow of Boston, Oliver Wendell Holmes, the poet-philosopher and professor of anatomy at the Harvard Medical School, Alonzo Clark, the elder Flint, Sir William Roberts, Lauder Brunton, Dujardin-Beaumetz, Bouchard, Roget, Winternitz, Brand, Liebermeister, and Ziemssen, there has been within the last half century, particularly within the last twenty-five years, a thorough overhauling of the foundations of therapeutics, and with the result that a vast multitude of time-honored remedies have been found lacking; though many of them are still to be found represented in that museum of therapeutic antiquities, the United States Dispensatory, they are by the great mass of most progressive medical men regarded as embalmed specimens, interesting only from a historical point of view.

The mighty change in medical practice which has been
wrought within a single generation must be attributed almost altogether to the development of the scientific method which in no other department of modern knowledge has found so wide a scope nor such marvelous opportunities for development as in medicine. Upon the foundations laid by Claude Bernard, Brown-Sequard, Lehman, and Liebig, the laboratory method which is to the medical man seeking for physiologic or therapeutic truth what the Urim and Thummim of the ancient temple was to the Israelite.

The improved teaching of the modern medical school, especially in laboratory training, in chemistry, physiology, and bacteriology, has developed in the medical profession, to an extent to which it did not exist before, the scientific conscience. The modern medical man demands something more than clinical evidence of the efficiency of a new candidate for therapeutic honor before he pins his faith to it. This attitude of mind and the facilities afforded by our modern laboratories have lifted our profession out of the quagmire of an ever-changing empiricism, and have made of it a science which assimilates and utilizes all other sciences, and in so doing has become the most useful, most beneficent, and most glorious of all the products of human inquiry and endeavor.

The change thus wrought has been a veritable revolution. In no other department of human knowledge and activity has there been such radical and such universal modification and reconstruction as in medical practice. It is the purpose of this paper to inquire what is the status of one of the most widely
widely used and trusted of all agents which have been used for
the amelioration of human suffering, when considered from
the standpoint of modern methods and modern knowledge. Since
Paracelsus, that prince of charlatans, first discovered the
agent which he named elixir vitae, alcohol has been appealed
to as a remedy at one time and another for almost every human
ailment.

Ethyl alcohol is certainly a most remarkable agent.
It possesses properties which produce at least an impression
of benefit in the most varied conditions. For the last
twenty-five or thirty years, however, there has been a growing
skepticism respecting the actual benefit produced by this drug
when therapeutically employed, and I think it will be generally
admitted that, especially within the last twenty years, the
have maintained an
number of physicians whose attitude of doubt has steadily in-
creased. That this is not due to the influence of temperance
agitators is I think clearly evidenced by the fact that not-
withstanding the active and continuous opposition of teetotal-
ners, the consumption of alcohol has steadily increased.

From the writer's viewpoint, the cause of the change
in the attitude of the profession towards alcohol is to be
sought in the laboratory findings in relation to the so-called
physiologic effects of this drug, and the submission of its
therapeutic claims to the crucial test of laboratory investi-
gation. Let us see what are some of the results of this study.

THE INFLUENCE OF ALCOHOL UPON LIVING CELLS. Darwin
showed nearly a generation ago in his studies of insectivorous
plants that alcohol is a protoplasmic poison. Drosora and
other similar plants ceased to exhibit their marvelous animal-like functions under the influence of alcoholic vapor. Sims Woodhead, the eminent Scotch pathologist, in a memorial lecture, clearly demonstrates that alcohol is a poison to protoplasm, and produces changes in muscle and nerve tissue closely allied to those produced by the toxins of the diphtheria bacillus and other bacterial poisons. Oxidation is the essential element in all metabolic activity. It is, according to Woodhead, seriously interfered with by alcohol.

The paralyzing influence of alcohol upon cell nuclei is clearly demonstrated by the fact that it lessens phagocytosis. The grave significance of the effects of alcohol upon living cells can be fully appreciated only when we keep in mind the fact that phagocytosis are the chief means of bodily defense against bacterial disease. It is only through leucocytosis—the migration of leucocytes—and their activity in attacking and destroying bacteria—that recovery from any infectious disease is possible. The paralyzing influence of alcohol upon the white cells of the blood, a fact which is attested by all investigators, is alone sufficient to condemn the use of this drug in acute or chronic infections of any sort.

Some years ago the eminent editor of the British Medical Journal, Mr. Ernest Hart, in a paper on cholera read before the American Medical Association, denounced alcohol as a remedy in the disease under consideration, even in cases of collapse for, said he, when the system is already overwhelmed with the toxins produced by the cholera bacillus, why should
we add alcohol, which is only another toxic body produced by a micro-organism of another species? Prof. Woodhead also pointed out the fact that through the influence of alcohol upon the hæmat cell the development of immunity is interfered with. The experiments quoted by Woodhead show that it is almost impossible to produce immunity against tetanus, anthrax, or rabies in animals which are kept under the influence of alcohol when being vaccinated against the maladies named. Any slight immunity which is conferred upon animals under the influence of alcohol is quickly lost.

That alcohol is a protoplasmic poison is a question which is no longer debated among physiologists. A whole generation ago the toxicologist enumerated alcohol along with other irritant, narcotic poisons. The latest finding of science confirms and establishes this view.

THE INFLUENCE OF ALCOHOL UPON THE NERVOUS SYSTEM. If alcohol is a poison to cells in general, it could not be otherwise than that it should be a poison also to nerve-cells, and hence its action upon the nerves must be to interfere with their functions. Piotrowski has demonstrated, according to Shaffer, that alcohol diminishes both nervous excitability and nervous conductivity. There is, of course, a very transient increase of excitability and, to a slight degree, of conductivity. These quickly give place to a very marked increase in nervous conductivity, that is, in the rate at which nervous impulses are transmitted, the retardation amounting to the enormous reduction from ninety-one feet per second to thirteen
feet per second—or a loss of eighty-six \%\%\% per cent.

Ten or twelve years ago I made an extended series of observations respecting the effects of alcohol upon the sensation, and upon reaction time. I found the effects of half an ounce of alcohol were to diminish acuteness of sensibility appreciably, and to nearly double reaction time. Prof. Gotch has recently shown that the effects of alcohol upon reaction time are the same as those of morphia, namely, a very marked increase. Coffee slightly diminishes reaction time, but alcohol increases it. The reason of this is evident, for if alcohol diminishes both excitability and conductivity, the effect could not be other than an increase of reaction time.

Has he shown that alcohol, when taken into the blood, produces almost immediately a marked change in the minute structures of the brain. The dendrons and contact globules are shriveled, thus breaking contact and thus interrupting the normal nerve circuits. This fact explains to a large degree, the mental and moral effects of alcohol, especially its effect in destroying inhibition. When often repeated, this toxic effect gives rise to degenerative changes which are seen in their full development in general paresis. The flushing of the fact seen after the administration of alcohol, and then exhilaration felt by a person in ordinary health are due, not to a stimulating, but rather to a paralyzing or sedative effect. That alcohol is a sedative rather than a stimulant was pointed out by Wilkes a whole generation ago.

A person who is fatigued, after taking alcohol feels relieved.
not because he is rested or because his muscles have been re-
inforced, but because the nerves of fatigue are paralyzed so
that he no longer appreciates the fact that he is fatigued.

A person who is cold, after taking a dram no longer
suffers from cold or chilliness, and imagines that the alcohol
has warmed him. This is not the case, however. The alcohol
has only lessened the sensibility of his thermic nerves so that
he is less sensitive to cold, while at the same time increas-
ing the flow of blood to the skin by paralyzing the vasomotor
centers. Smiedeberg nearly twenty years ago pointed out the
fact that under the influence of alcohol "the finer degrees of
observation, judgment, and reflection disappear" and that
all the effects produced by alcohol are really those of a
sedative or paralyzing agent.

EFFECTS OF ALCOHOL UPON THE CIRCULATORY SYSTEM. The
circulatory system is so completely under the control of the
nervous system it could not be otherwise than that the influ-
ence of alcohol upon the circulation must be that of a depressant
rather than that of a stimulant. It is true that an ounce or
two of brandy will often produce a quickening pulse, but
Zimmerberg showed long ago that this effect is extremely tran-
sient, and may not appear at all if the person is in a state of
rest. As a matter of fact, sipping a liquid of any sort
produces a slight exhilaration of the pulse as shown by Lauder-
Brunton years ago. The full, bounding pulse usually produced
by the administration of an ounce or two of brandy properly
diluted, gives the impression of an increased vigor of heart
action; but it is only necessary to determine the blood pres-
sure by means of a Riva-Rocci instrument, or Gaertner's Tonometer, to discover that the blood pressure is lowered instead of being raised. This lowering may amount to twenty or thirty millimeters, or even more. According to ________, the tonometer measures, not the average blood pressure, but the actual force of the heart. It can be readily seen, then, that the bounding pulse is not the result of increased heart vigor, but indicates rather a weakened state of the heart combined with a dilated condition of the small vessels.

In this connection the fact should be recalled that the heart is not the only force involved in the circulation of the blood. It is doubtless the great engine of the circulation, but it has been clearly shown by Schiff and numerous other physiologists that the movement of the blood is greatly aided by a rhythmic action of the small vessels, both arterioles and capillaries. These contractions are not simultaneous with those of the heart, hence do not interfere with its action; but as the pressure in the veins is very much below that of the arteries, these contractile movements serve most efficiently in pushing the blood along toward the veins. The heart keeps the large arteries pumped full of blood, while by means of the contractile movements of the peripheral vessels, the blood is, so to speak, milked out into the veins. We may say, in fact, that there are two hearts concerned in the systemic circulation, the work of the central organ being supplemented by the peripheral heart, -- the small vessels, -- working at the distal end of the vascular loop, where the resistance is greatest.
Active congestion, or hyperemia, is simply a state in which the movements of the small vessels are very vigorous, and have a wide swing, so that a large amount of blood is passed through the tissues. In passive congestion there is dilatation of the small vessels without increased activity. One condition results from increased action of the vessels through stimulation of both the vasodilators and the vasoconstrictors; the other from paralysis of the vasoconstrictors or excitation of the vasodilators, or both, resulting in dilatation of the small vessels, with stagnation of their contents. In active congestion, the aid afforded by the rhythmic movement of the small vessels is increased. In passive congestion this action is greatly diminished or entirely lost. The difference in the rate of the movement of the blood gives rise to the difference in color,—scarlet in active hyperemia or congestion, cherry red in passive congestion. In the one case a rich supply of fresh, oxygenated arterial blood is passing through the small vessels into the veins, the movement of the blood is rapid, and all the vital processes are quickened; the heart, as well as all other organs, is thus better nourished and energized. In passive congestion and all conditions of the circulation in which a cyanotic appearance is present, the usual condition in slowed circulation, the blood current is slow through cardiac weakness, or the lack of the active assistance of the peripheral heart; as a consequence, an insufficient amount of oxygen is introduced into the body, the blood is charged with CO₂ and other tissue poisons, and all the
the vital processes are depressed. To aid the heart and the circulation the thing needed is not simply an increased rate of activity of the heart, or an increased volume of the pulse, but an increased movement of the blood current throughout the entire system.

Pallor is due to contraction of all the vessels of the skin. Local cyanosis is due to greatly slowed movement of the blood, either from passive congestion or spasm of the arterioles, resulting in excessive absorption of oxygen and accumulation of CO₂ in the body blood.

In the application of any agent for the purpose of relieving conditions of this kind, the peripheral heart as well as the heart itself must be taken into consideration. In fact, the whole circulatory system must be regarded as one. The thing required when the heart's action is weakened is not simply relaxation of the peripheral vessels, but increased activity of these vessels, and increased energy of the heart.

Alcohol paralyzes the vasoconstrictors, and so dilates the small vessels and lessens the resistance to the heart action; but at the same time it lessens the energy of the nerve centers which control the heart, diminishes the power of the heart muscle, and lessens that rhythmical activity of the small vessels whereby the circulation is so efficiently aided at that portion of the blood circuit most remote from the heart. A cold application to that portion of the chest overlying the heart reflexly stimulates and energizes the heart through the cardiac nerves. This reflex action is not confined to the heart muscle; the stimulation of the activity of
the cardiac vessels improves the circulation through the heart structure, refreshing and energizing it in the same manner in which a voluntary muscle is energized by a cold application, as is so well shown by the ergograph.

It is well to remember that the vasoconstrictor nerves are one in kind with the excitor nerves of the heart, while the vasodilators are in like manner associated with the vagus. With this in mind, it is easy to see that while alcohol paralyzes the vasoconstrictors, it at the same time weakens the nerves and the ganglia which initiate and maintain the activity of the heart.

The apparent increase of strength which follows the giving of alcohol in cases of cardiac weakness is delusive. There is increased volume of the pulse for the reason that the small arteries and capillaries are dilated, thus lessening resistance and cardiac work; but this apparent improvement is very evanescent, as naturally results from the fact that while the heart is relieved momentarily by the sudden dilatation of the peripheral vessels, the accumulation of blood in the venous system through the loss of the normal activity of the peripheral heart, gradually raises the resistance again by increasing the load of blood which has to be pushed along in the venous system. This loss of the action of the peripheral heart thus in the end more than counterbalances the temporary relief secured by the paralysis of the vasoconstrictors. This accumulation and sluggish movement of the blood in the venous system is shown by the purplish hue of the skin in a person
under the influence of alcohol,--a wide contrast to the ruddy
glow presented by the skin in which the small vessels are
actively engaged in the pumping of the blood out of the
arteries into the veins, an action in which the whole body may
be made to participate by a suitable application of cold water
to the surface.

The custom of giving alcohol just before a cold
bath which has been introduced into this country from Germany
has no physiologic foundation. The only excuse that can be
found for it is in the fact that the alcohol produces an ap-
preciable benumbing sensibility of the thermic nerves, and by
dilating the surface vessels to some degree facilitates the
loss of heat. But the surface vessels may be as fully and
efficiently dilated by a short hot application to the
surface accompanied by rubbing and the diminished thermic
sensibility is not an advantage, but rather a thing altogether
undesirable, since it is through stimulation of the skin that
reaction and fixation of the blood in the skin is secured.
It is also through the reflex activity set up by contact of
cold water with the skin that the central ganglia are roused
to activity, and thus the depressing effect of the fever-pro-
ducing toxin antagonized. One of the most desirable effects
of the cold bath is its tonic effect upon the heart. This
as well as the tonic effect upon the peripheral vessels is
diminished by the administration of alcohol in connection
therewith.

Another point of very great importance is the fact
that alcohol raises the venous tension, and there is hence increased **diastolic pressure** in the heart, and, as a result, when this condition is long continued, dilatation of the heart. I have met many cases of cardiac dilatation which could be traced to no other cause than this. The increased venous pressure produces a sense of fullness in the head from venous congestion. There is also great congestion of all the abdominal viscera. Alcoholic ***paralyses*** the centers which control the splanchnic nerves. The result is relaxation of the great portal veins and stagnation of the blood in the liver, spleen, and other viscera of the abdomen. Nothing could be more undesirable than this in any acute or chronic malady, since the most vital interests of the body are thereby damaged.

The blood, which is the life, the healing power of the body, depends for its integrity first upon the stomach to supply it with new, perfectly elaborated material; second, upon the liver to close the door against toxins and to destroy toxins which may have been introduced with the food, and which are constantly thrown into the blood from the tissues; third, upon the kidneys whose duty it is to maintain the purity of the blood by removing tissue toxins which, without the renal activity, accumulate within a few hours in sufficient quantity to produce death. Congestion of these important viscera interferes in a most marked degree with their functions, crippling them instead of reinforcing their energy.

Dr. James Barr, president of the Liverpool Medical Association, and of an important branch of the British Medical
Association, at a recent meeting of the Association made the subject of his presidential address the question of "Alcohol as a Therapeutic Agent"; and, in summing up the effects of medicinal doses of alcohol upon the circulation, remarked as follows:--"It causes dilatation of the arterioles and of all the arteries well supplied with muscular fibers owing to its paralytic effect on the vasomotor nervous system, and its direct action as a protoplasmic poison on the muscular fiber. It has a similar though less marked action on the cardiac muscle. From these causes the systolic blood pressure is lowered, the systolic output from the heart is diminished, and the cardiac energy is wasted in pumping blood into relaxed vessels; the large bounding pulse with comparatively short systolic period, which gives a deceptive appearance of vigor and force in the circulation, is due to the large wave in the dilated vessels. The venous pressure and the diastolic pressure within the heart are at least temporarily increased, and may become permanently dilated; with the increase in the capacity of the ventricles the effective contraction of the cardiac muscle is correspondingly diminished."

**RELATION OF ALCOHOL TO DIGESTION AND NUTRITION.**

Chittenden has shown that wines, especially sherry, and even claret, greatly hinder gastric digestion. Sir William Roberts demonstrated the same nearly a score of years ago. The experiments of Chittenden showed that while alcohol excites the flow of gastric juice, this apparently favorable effect is wholly counterbalanced by its interference with the chemical process of digestion.
There has been an enormous amount of discussion of the question whether or not alcohol is a food. The answer to this question must depend very largely upon our definition of food. Prof. Atwater took the ground that any substance which is oxidized in the body must be a source of energy, and hence must be a food. That alcohol is oxidized in the body there can be no doubt; but at the present time there are few physiologists who are willing to give so wide a latitude to the term, food. It will never do to argue that because foods are oxidized in the body any substance which is oxidized in the body is a food. If we put the syllogism thus: All foods are oxidized within the body; alcohol is oxidized in the body, hence alcohol is a food, we have patently violated one of the rules of logic. The nature of the error becomes very evident when we put it in some simple form as, for example:--All dogs are animals; the frog is an animal; hence a frog is a dog. Prof. Atwater showed that alcohol is oxidized in the body, and that through its oxidation in the body the burning of the body tissues was to some degree economized, showing that the alcohol contributed something to the body heat. This same thing is true with reference to strychnia, quinin, and many other organic substances which are not oxidized while passing through the body; but we certainly would not be justified in calling all these oxidizable substances foods. Clothing economized body heat and saves the consumption of tissue; but an overcoat is a very different thing from a square meal.

Prof. Bunge of Basle takes decided issue with Prof. Atwater, as have nearly all the leading physiologists of this
country and Europe. Prof. Bunge maintains that a substance
to be considered a food must be not only capable of supplying
energy to the body, but it must supply energy at the right
time, in the right place, and in the right way. Any substance
to be considered as a true food must be capable of assimilation
after digestion and circulation; it must become a part of the
living cells of the body. Under the influence of the cell
nuclei the complex molecules of food substance must be broken
up into simpler ones, thus liberating energy. Alcohol and
many other substances may be oxidized in the stomach, in the
liver, in the blood, or in the tissues; but this is not the
sort of vital metabolism whereby the life processes are main-
tained; but a mere chemical process which, in case of alcohol,
is set up for the purpose of destroying and eliminating this
poison, thus preventing its harmful effects upon the body.

There are some very marked contrasts between alcohol
and true foods which are worth considering. 1. A habitual
user of alcohol has an intense craving for his accustomed
dram. Without it he is entirely unfitted for business. One
never experiences such an insane craving for bread, potatoes,
or any other particular article of food. One experiences
hunger when food is needed, but a normal hunger is satisfied
if the proper number of Calories in proteids, fats, and carbo-
hydrates are supplied, without special regard to the sources
of supply. Alcohol is simply a carbohydrate. If it were
a normal food product, it should be just as easy to replace
alcohol with bread or potatoes, as to replace wheat bread with
corn bread, rice, or any other cereal or source of carbohydrates. But it is not hunger which creates a demand for alcohol. Alcohol may appease hunger, but it does not satisfy the nutritive needs of the body. No evidence has ever been brought forward to show that alcohol could be assimilated even in the very smallest amount; that is, there is no proof that alcohol, when taken into the system, ever becomes in any sense a part of it. It is absorbed, taken into the blood, and eliminated, and incidentally, on the way, is oxidized; but it never becomes a part of the actual tissues of the body.

2. By continuous use the body acquires a tolerance for alcohol. That is, the amount which may be imbibed and the amount required to produce the characteristic effects first experienced, gradually increase until very great quantities are sometimes required to satisfy the craving which its habitual use often produces. This is never the case with true foods. A definite quantity of food possesses at all times the same ability to satisfy the body needs, and produces the same effect the thousandth time it is taken as the first time, taking into account, of course, enormous differences in body requirements which may occur. Alcohol behaves in this regard just as does opium or any other drug. It has no resemblance to a food.

3. When alcohol is withdrawn from a person who has been accustomed to its daily use, most distressing effects are experienced. A healthy man does not suffer a tenth part as much from the total withdrawal of food for twenty-four or forty-eight hours as does the habitual user of alcohol when his
accustomed dram is not obtainable. Who ever saw a man's hand
trembling or his nervous system unstrung because he could not
get a potato or a piece of corn bread for breakfast? In
this respect also alcohol behaves like opium, cocaine, or any
other enslaving drug.

4. Alcohol lessens the appreciation and the value of brain and nerve activity, while food reinforces nervous and
mental energy.

5. Alcohol, as a protoplasmic poison, lessens muscular power, whereas food increases energy and endurance.

6. Alcohol lessens the power to endure cold. This is true to such a marked degree that its use by persons
accompanying arctic expeditions is absolutely prohibited.
Food, on the other hand, increases ability to endure cold.
The temperature, after taking food, is raised. After taking
alcohol the temperature, as shown by the thermometer, is lowered.

7. Alcohol can not be stored up in the body for future use, whereas all food substances can be so stored.

8. Food burns slowly in the body, as it is required to satisfy the body's needs. Alcohol is readily oxidized and
eliminated, the same as any other oxidizable drug.

Alcohol promises much, but never fulfills. It relieves pain by lessening nerve sensibility; but it does not remove the cause of the pain. Under its influence, a man imagines that he is making a brilliant speech, whereas he may be making stupid blunders, for which he will afterward be ashamed. Alcohol gives a man a sensation of warmth when he is cold, but makes him colder. If he is weary, it destroys
his sense of fatigue and, perhaps, leads him to imagine that he is strong; but the final result is likely to be collapse from unwise exertion or increased exhaustion.

In an interesting paper entitled, "Alcohol as Food", Chittenden sums up a series of interesting laboratory observations as follows: "It is, I think, quite plain that while alcohol in moderate amounts can be burned in the body, thus serving as food in the sense that it may be a source of energy, it is quite misleading to attempt a classification or even comparison of alcohol with carbohydrates and fats, since, unlike the latter, alcohol has a most disturbing effect upon the metabolism or oxidation of the purin compounds of our daily food. Alcohol, therefore, presents a dangerous side wholly wanting in carbohydrates and fats. The latter are simply burned up to carbonic acid and water, or are transformed into glycogen and fat, but alcohol, though more easily oxidizable, is at all times liable to obstruct, in some measure at least, the oxidative processes of the liver, and probably of other tissues also, thereby throwing into the circulation bodies, such as uric acid, which are inimical to health; a fact which at once tends to draw a distinct line of demarcation between alcohol and the two non-nitrogenous foods, fat and carbohydrate.

"Lastly, I am inclined to emphasize another observation made by Dr. Beebe, viz., that certain alcoholic drinks, such as port wine, for example, exert a much greater influence upon the excretion of uric acid, than a corresponding amount of alcohol, thus suggesting that even moderate drinking of
alcoholic beverages may be attended with even greater disturb-
ance of the metabolic phenomena of the body than prevalent
ideas would lead us to believe."

Chittenden concludes his paper with the following
interesting statement which must be considered as an authori-
tative, since it is made by a man who has probably given more
exact and careful attention to this question than any other
living scientist:--"As an adjunct to the ordinary dialy diet
of the healthy man, however, alcohol can not be considered
as playing the part of a true non-nitrogenous food."
So much for the physiologic side of the question.

Let us now for a moment briefly consider what are the
actual, practical results in the disuse of alcohol as a therapeut-
ic agent. Thirty years ago, when the writer was a pupil of
the elder Flint, this able, physician, following the teaching
of Todd, urged upon his students the use of alcohol, even in
enormous doses, in pneumonia, typhoid fever, and other febrile
disorders, whenever it was thought necessary to sustain the
heart. The folly of this practice in pneumonia was early
pointed out by Graves and, at the present time, the best hos-
pital practice, both in this country and Europe, discards
alcohol almost altogether in pneumonia. The over-worked
heart in pneumonia requires, not an agent which will still
further weaken its force and waste its energy as alcohol has
been clearly shown to do, but something which will actually
energize its weakened muscle, while lessening the work required
of it.
The effect of alcohol in raising venous pressure, tending to dilate the heart, is in the highest degree calculated to do inestimable damage in pneumonia. The great fatality of pneumonia in men accustomed to the use of alcohol is well known. By a discontinuance of the use of alcohol its mortality has been reduced from thirty per cent to eight or ten per cent, and even less. In more than one hundred cases of pneumonia in the practice of the writer and his colleagues, in which no alcohol was used, the mortality has been but six per cent. If the pulse is weak, alcohol is certainly not needed, for the only effect can be to still further weaken it.

In the cases in which alcohol is prescribed, the blood pressure is already too low; but, as we have seen, alcohol invariably diminishes blood pressure, and never raises it; hence there can be no indication in such a case for this agent. The cold precordial compress, hot and heating compresses to the lower extremities, the chest pack, and other hydriatic measures afford most excellent, convenient, and efficient means whereby blood pressure may be raised or lowered at will, and the heart energized, its work diminished, pulmonary congestion lessened, and every other indication in pneumonia perfectly met.

It must not be forgotten that in pneumonia the issue entirely depends upon leucocytosis. How carefully the up-to-date physician watches the blood count from day to day. As he sees the leucocytosis rising from the normal 7500 to 30,000, 50,000, perhaps even 100,000 or more, he knows that the body is rallying its forces to battle with the invading microbes,
and that, if the battle can be maintained for a sufficient
length of time, the victory will be won. By what possible
argument can it be made to appear rational to administer an
agent whereby leucocytosis is hindered, the development of
alexins and antitoxins prevented, when it is only through the
operation of these marvelous functions that there is any hope
for success in the battle between the vital organism and the
death-dealing enemies which have invaded it?

Mays of Philadelphia, reports a mortality of only
three per cent in the treatment of a large number of cases of
pneumonia by the non-alcoholic treatment. There can be no
doubt, as has been asserted by an eminent English authority,
James Barr, M. D., F. R. C. P., F. R. S., that "alcohol di-
minishes the power of the cardiac muscle." This being true,
this drug would seem to have no place in the therapeutics of
a disease in which everything depends upon the maintenance of
cardiac energy under conditions which demand of the heart
muscle an unusual, sustained effort.

What has been said with reference to pneumonia
applies with almost equal appropriateness to typhoid fever.
In typhoid fever as well as in pneumonia there is present a
bacterial toxin the direct effect of which is to weaken the
heart. The effects of alcohol upon the heart are almost
identical with those of the typhoid toxin. When alcohol is
prescribed in typhoid fever, the usual purpose is to strengthen
the flagging energies of a weakened heart; but that it can
serve no purpose has been abundantly proven.
An eminent teacher of therapeutics who still maintains some faith in alcohol as a remedy, directs that it should be used with the greatest circumspection. Says Sir Lauder-Brunton, "The rule for the administration of alcohol is a very simple one. It is to sit by the side of your patient for a while and watch him after the administration of a dose of alcohol, and if you find that the alcohol brings back the various functions nearer to the normal than it is doing good; if the functions of the organs diverge further from the normal after the administration then it is doing harm."

In other words, Lauder Brunton confesses that there are no indications which can be relied upon as pointing to the necessity for the use of alcohol, but that after giving it the patient should be watched, and if it does him harm, it should be stopped; if it does him good, it may be continued. This is just where the opportunity for error occurs. Under the most favorable circumstances, the beneficial which is apparent may be even more beneficial than the really harmful. Increased fullness of the pulse means only paralyzed vessels, and a weakened heart; so when a patient seems better, he is really worse, and his chances of recovery are lessened.

Brand has shown that the weak heart of typhoid fever may be effectively energized by the cold bath. Winternitz has shown that the same thing may be accomplished by the wet sheet pack. The cold sponge bath, the cold compress over the abdomen, the precordial ice compress, are all means which can be relied upon to energize the heart and efficiently aid the
circulation, not only in typhoid fever, but in all forms of infectious, febrile disease. Under the non-alcoholic treatment, the mortality of typhoid fever has been reduced from twenty per cent to three per cent. In one hospital in London, typhoid fever has been extensively treated during the last twenty years without the administration of alcohol in a single case, and the mortality has been greatly less than in hospitals in which alcohol was freely used. The deficiency of alcohol as a remedy in this disease has come to be xx generally recognized among the English physicians. xx Twenty-five years ago, milk punch, brandy, and whiskey was the routine treatment of typhoid fever in nearly all the leading hospitals of England and of this country. At the present time, this treatment is practically unknown in this country, and the use of alcohol in English hospitals is very greatly diminished.

The injurious effect of alcohol in cardiac disease is now generally admitted. The excellent results obtained by the Schott brothers, at Badnauheim, in the treatment of cardiac disease by carbonated mineral baths and by carefully graduated exercise, has clearly demonstrated the practicability of a large number of cases which, under older methods including the use of alcohol, had been regarded wholly hopeless. In view of the facts now known with reference to the influence of alcohol upon the cardiac muscle, and the vasomotor centers, it must be considered wholly unjustifiable to prescribe alcohol for a weak heart with the idea of strengthening it. In fact, as Barr has pointed out, alcohol works great mischief in these
cases. The vasomotor paresis of the small arteries which is produced by alcohol prevents the storing up of energy in the walls of the vessels during a systole through the lessening of the elasticity of the vessels. An abnormal difference between diastolic and systolic pressure is produced, the arteries become rigid and tortuous, the heart first hypertrophies, then dilates, and a series of degenerative changes throughout the body are set up. If it has not been proven that alcohol directly produces atheroma and arteriosclerosis, it certainly does produce changes in the middle coat of the arteries and arterioles, and the pathologic conditions which have been described.

There is perhaps no condition in which alcohol has been more frequently or universally used than in cases of shock and collapse; yet Crile has demonstrated that this drug is not only of no use but is positively contraindicated. In both shock and collapse, there is a great lowering of blood pressure as the result of exhaustion of the vasomotor centers in collapse through inhibition of the vasomotor centers. Nothing can be more certain than that alcohol diminishes blood pressure. It is true that when alcohol is taken by the stomach, there is at first a very slight rise of blood pressure due to the reflex irritation set up by the contact of the alcohol with the nerves of the stomach, but as soon as the alcohol has been absorbed into the circulation, the blood pressure falls through dilatation of the small vessels, as a result of the paralyzing effect of alcohol upon the vasomotor
centers. The result is an overfilling of the veins and especially of those of the abdomen, for here both the veins and arteries have muscular walls, and are controlled by that great regulator of the circulation, the splanchnic nerve. The paralyzing of this nerve by alcohol opens up that great reservoir, the portal system, which is capable of holding all the blood of the body. When this condition already exists, through the exhaustion or inhibition of the vasomotor centers, what possible good can come from the administration of an agent which, through its depressing influence upon the vasomotor centers, must still further dilate the already paralized vessels, and hence diminish the amount of blood in circulation? When alcohol, ether, and similar substances are introduced hypodermically, the irritation produced momentarily exercises a favorable effect, just as any other irritant might do; but as soon as the drug is absorbed into the circulation, its pernicious attacks begin. The wonderful contribution to our knowledge of shock which has been made by Dr. George Crile must necessarily lead to the disuse of alcohol as a remedy in cases of shock or collapse.

The pernicious influence of alcohol in pulmonary tuberculosis has long been recognized. Instead of preventing or curing this disease, as was formerly supposed, it has now been clearly established that the habitual use of alcohol actually produces a special form of pulmonary consumption. The success which has attended the open air method of treating pulmonary tuberculosis has clearly demonstrated the uselessness of alcoholics in this disease, and its curability by rational
measures which improve the general nutrition. There can be no question that the use of alcohol actually predisposes to tuberculous disease. The weakened heart which is exhausted in its efforts to force the blood through a diminished respiratory field, is still further weakened by the depressing effects of alcohol when this agent is employed, thus impairing the general nutrition. Leucocytosis, upon which resistance to the attacks of disease and its ultimate cure chiefly depend, is lessened, and general vital resistance is diminished. In the light of our present knowledge, there can be no possible apology for the further use of alcohol in this disease. It must be relegated to the limbo of useless and obsolete remedies to which so many time-honored and long-trusted therapeutic measures have, within these recent years of great enlightenment, been consigned.

The tendency of alcoholic preparations of all sorts to the production of catarrhal affections of the nose, throat, and bronchi must also be considered in connection with its use in pulmonary maladies.

The folly of using alcohol as an aid to digestion was clearly exposed by Sir William Roberts in his masterly researches some fifteen or twenty years ago. This investigator showed that so small a proportion of a light alcoholic beverage as five per cent of claret, or a smaller percentage of sherry wine, greatly impaired digestion; while a larger amount practically suspended it. Chittenden, the world-renowned head of the Sheffield Scientific School, has, within recent years, confirmed the observations of Sir William Roberts,
as have also Buchner, Zuntz, and others.

Other forms of alcohol also seriously interfere with the chemical processes of digestion. If it is true that alcohol does increase the secretion of acid gastric juice, as seems to be proven, it has been clearly demonstrated by the same observers that even in so small a proportion as five per cent, proteolysis, that is, the gastric digestion of proteids, is seriously interfered with. It was further shown by Chittenden that the worst effects of alcohol are absent in cases in which the gastric juice is poor in quality; that is, the chemical activity of strongly acid gastric juice rich in pepsin was interfered with by the addition of a small amount of alcohol much less than was a gastric juice of inferior quality. In cases in which the gastric juice is abundant in quantity and of good quality, alcohol is not needed, though in moderate amount it might perhaps be fairly well tolerated; but in the very cases in which it might seem to be helpful, viz., in cases in which gastric juice is deficient in quantity or quality, its pernicious effects are especially manifested, thus wholly disqualifying it for use as a remedy in cases of this sort. Chittenden has certainly done the cause of therapeutics a great service in his careful study of this subject.

With the co-operation of my colleague, Dr. A. W. Nelson, I have, within the last year, made a great number of observations respecting the effects of alcohol upon the chemical activity of the gastric juice. These observations were made in connection with the analysis of stomach fluids of which from half a dozen to twenty are examined daily.
In making the Metz test for the peptic activity of the gastric juice, the fluid is divided into two portions, to one of which alcohol is added. Two tubes containing coagulated albumin are then dropped into each portion of the fluid, and the flasks are placed in the incubator where they are kept for twelve hours at 100°. These observations have invariably shown that alcohol lessens the activity of the gastric juice, and that its effect is most pronounced in cases of gastric juice of inferior quality.
The peculiar effects of alcohol upon the pulse, and the general transitory effects which occur immediately after its administration, afford ground for the popular belief in its stimulating properties, but the application of laboratory methods to the study of this drug, with thousands of others, has shown that the actual effect of alcohol is not that of a stimulant, but of a depressant, lowering the blood pressure, weakening the heart, lessening their sensibility, paralyzing the visceromotor centers, and damaging the leukoStick processes, hindering leucocytosis, lowering the temperature, and generally weakening the vital forces of the body.

Alcohol can no longer be considered a stimulant. It must take its place along with agents of the depressant and enervating class. The question naturally arises, If not alcohol, then what, in cases of shock or collapse? The master experiments of Crie have shown that while the shock can not be successfully antagonized by alcohol, nor to any appreciable extent by strychnin, simple pressure upon the abdomen produces marked and important beneficial effects by forcing into the general circulation the blood which is stagnating in the portal veins. I find a very convenient method of doing this is to slip under a binder an ordinary hot water bag with a tube attached. This may be inflated with a rubber bulb, or more quickly, and as effectively, by taking the end of the rubber tube in the mouth and blowing it up. The effect is instantaneous. A case occurred in my practice a short time ago in which I had removed an immense sarcoma from the groin. I found the blood pressure at the close of the operation...
the operation, which is my uniform practice, found the tonometer to be reading at zero. There was but little loss of blood, and the condition was more popularly speaking, one of collapse, the result, response inhibitive of the vasomotor centers from traction upon the large nerves involved in the operation. I quickly slipped a rubber bag under a closely fitting binder, inflated it, and on taking the blood pressure again found it to be eleven and a half. Letting the air out of the bag the blood pressure dropped at once to zero again. A second inflation brought it again to the normal. The pulse and the patient's countenance at once showed an improved condition, and by maintaining the compression for three hours the patient's life was saved. I constantly resort to this method in cases in which any increase of blood pressure is required. Simple pressure of the hands or abdominal massage produces an immediate rise of blood pressure which is so marked that almost instant relief is given in all cases of persons suffering from low blood pressure headache, and neurasthenic pains arising from low blood pressure. The cold compress or ice bag over the heart, cold rubbings of the surface, percussion over the heart and abdomen, general friction, very short very hot foot-bath followed by cool application to the feet, these and many other hydriatic measures produce immediate and most pronounced beneficial effects in cases of shock and paralysis, and effects from which there is no unfavorable reaction.
Chittenden showed that when the gastric juice is very weak, in the absence of pepsin, "even very small amounts of whiskey may exercise a very marked retarding effect upon the digestive process." Chittenden also showed that wines, and even malt liquors, produce a very decided effect upon both salivary and pancreatic digestion. On what ground, then, is the physician justified in recommending alcoholic liquors of any kind as an aid to digestion? Certainly physiology and physiologic research afford no basis for such a recommendation.

In relation to the use of alcohol as an aid to digestion, account must also be taken of its effect upon the liver. That alcohol in large quantities produces gastric and intestinal catarrh, and secondarily, catarrh of the biliary passages, and hence cholecystitis, gall-stones, and other hepatic disorders, is well established. It has also been proven by Boix and others that alcohol, when used for some time, produces degenerative changes of the liver and spleen. Beche, working in Chittenden's laboratory, has recently shown that alcohol in very moderate quantity, causes a notable increase of uric acid in the urine through impairment of the oxidizing power of the liver. But the liver has for its function, not only the oxidation of uric acid, but also of numerous other toxic substances, some of them, though less in amount, of far greater importance than uric acid, because of their high degree of toxicity. During an attack of typhoid fever, pneumonia, diphtheria, or any other infectious
disease, this oxidizing power of the liver is one of the most important means of protection against the destructive influence of the disease. The liver is also an important digestive gland, and if its oxidizing power is diminished, it is quite reasonable to suppose that other of its functions are likewise impaired. As Chittenden well says, alcohol "may also interfere with other processes normally occurring in the liver, and thereby lead to the presence of other undesirable substances."

In the light of the above facts, it is clearly evident that alcohol must be carefully interdicted in all cases in which there is ground for suspecting lithiasis to be an important factor in the cause of the pathologic conditions present. Chittenden's observations clearly show the influence of alcohol in producing gout and other uric acid disorders.

The few points which I have touched upon are only the introduction to this subject. A careful study of the whole list of acute and chronic disorders in the light of modern research will compel the conviction that no physiologic or scientific ground can be found for the practice, still common with some physicians, of employing alcohol to produce so-called tonic or stimulant effects. It has been clearly proven that alcohol is a depressing agent first, last, and all the time; that it is a protoplasmic poison, hence a paralyzer of muscles and nerves; and that it lessens vital resistance and metabolic activity and tends to a degradation of tissue activity whereby are set up degenerative changes
of various sorts and of grave import.

I will not prolong my paper further, as I do not wish to weary my auditors. I desire only to add that the statements which have been made in this paper are not simply my personal views, and are not, to any considerable extent, based alone upon my personal observations, but are the conclusions at which an application of the scientific method to this question compels us to arrive, in view of the overwhelming mass of testimony which has been brought forward by the recognized masters of laboratory research within the last few years.

That there are conditions in which alcohol may be used as a palliative, producing temporary effects, can not be disputed. When acting as surgical assistant to the late Dr. Lawson Tait, of Birmingham, some sixteen years ago, and having observed that Mr. Tait never prescribed either alcohol or opiates, I one day asked him the question, "Do you never prescribe alcohol to your patients, Mr. Tait?" His instant answer was, "No, or at least not unless they are going to die. Then I give them alcohol to make them comfortable." As a soporific, as an anodyne, as a sedative, alcohol will doubtless long be used by thousands who will not take the trouble to inform themselves respecting the use of superior substitutes; but, as a curative agent, this long-trusted and most alluring of all pharmaceutical agents must, in the light of modern research, be regarded as unworthy of the confidence which has so long been reposed in it.
HYDRIATIC SUBSTITUTES FOR ALCOHOL.

By J. H. Kellogg.

The question of the use of alcohol in connection with the cold bath when used for the reduction of fever and as a cardiac stimulant is one deserving of most careful thought and attention. The idea upon which this practice is based is evidently the supposition that alcohol is a stimulant, at least that it in some way sustains the heart or the vital powers. But this theory was long ago rendered thoroughly untenable by a multitude of carefully conducted experiments upon healthy subjects, showing that alcohol is always and in all doses a narcotic, and not a stimulant; that it depresses, and does not excite the heart and other vital organs; that it lessens vital resistance to disease; and that it is a toxic agent which the body must cast out, and not a food to be assimilated, nor a source of energy or aid to any vital organ or function.

The relation of alcohol to the heart and the circulation is a matter of most profound importance in the class of cases in which the cold bath is most frequently applied. In relation to this point the fact should be recalled that the heart is not the only force involved in the circulation of the blood. It is doubtless the great engine of the circulation, but it has been clearly shown by Schiff and numerous other physiologists that the movement of the blood is greatly aided by a rhythmic action of the small vessels, both arterioles and capillaries. These contractions are not simultaneous with those of the heart, hence do not interfere with its action; but as the pressure in the veins is very much below that of the arteries, these contractile movements serve most efficiently in pushing the blood along toward the veins. The heart keeps the large arteries pumped full of blood, while by means of the contractile movements of the peripheral vessels, the blood is, so to speak, milked out into the veins. We may say, in fact, that there are two hearts concerned in the circulation, the work of the central organ being
supplemented by the peripheral heart, the small vessels, working at the distal end of the vascular loop, where the resistance is greatest.

Active congestion, or hyperemia, is simply a state in which the movements of the small vessels are very vigorous, and have a wide swing, so that a large amount of blood is passed through the tissues. In passive congestion there is dilatation of the small vessels without increased activity. One condition results from increased action of the vessels through stimulation of both the vasodilators and the vasoconstrictors; the other from paralysis of the vasoconstrictors or excitation of the vasodilators, or both, resulting in dilatation of the small vessels, with stagnation of their contents. In active congestion, the aid afforded by the rhythmic movement of the small vessels is increased. In passive congestion this action is greatly diminished or entirely lost.

The difference in the rate of the movement of the blood gives rise to the difference in color, scarlet in active hyperemia or congestion, cherry red in passive congestion. In the one case a rich supply of fresh, oxygenated arterial blood is passing through the small vessels into the veins, the movement of the blood is rapid, and all the vital processes are quickened; the heart, as well as all other organs, is thus better nourished and energized. In passive congestion and all conditions of the circulation in which a cyanotic appearance is present, the usual condition is a slowed circulation. The blood current is slow through cardiac weakness, or the lack of the active assistance of the peripheral heart; as a consequence, an insufficient amount of oxygen is introduced into the body, the blood is charged with CO₂ and other tissue poisons, and all the vital processes are depressed. To aid the heart and the circulation the thing needed is not simply an increased rate of activity of the heart, or an increased volume of the pulse, but an increased movement of the blood current throughout the entire system.
Pallor is due to contraction of all the vessels of the skin. Local cyanosis is due to greatly slowed movements of the blood, either from passive congestion or spasm of the arterioles, resulting in excessive absorption of oxygen and accumulation of CO₂ in the blood.

In the application of any agent for the purpose of relieving conditions of this kind, the peripheral heart as well as the heart itself must be taken into consideration. In fact, the whole circulatory system must be regarded as one. The heart and the arteries are composed of essentially the same kind of tissue, and have practically the same functions. The arteries and capillaries as well as the heart are capable of contracting. Both the heart and the arteries are controlled by excitatory and inhibitory nerves. These two classes of nerves controlling the heart and the vessels respectively are kindred in structure and origin, the vagus and the vasodilators being medullated and of spinal origin, while the accelerators of the heart and the vasoconstrictors of the arteries are non-medullated.

Winternitz and other authorities have frequently called attention to the value of cold as a cardiac stimulant or tonic. The tonic effect of this agent is greater than that of any medicinal agent which can be administered.

The cold compress applied over the cardiac area of the chest may well replace alcohol, as a heart tonic. The application consists of a compress applied to the portion of the chest wall over the heart. This comprises the space bounded by the second rib above, the right border of the sternum, a line falling one-half inch to the right of the nipple, and the sixth rib below. The compress should be large enough to cover this space and to extend at least two inches outside of it. Ordinarily the best effects are produced by employing water at a temperature of about 60°. The compress should be wrung moderately dry, and should be very lightly covered. It is desirable that cooling by slow evaporation
should be encouraged, and should continue for some time.

The thing necessary to encourage the heart's action is not mere relaxation of the peripheral vessels, but, as Winternitz has shown, increased activity of the peripheral circulation in the skin, muscles, and elsewhere. Alcohol paralyzes the vasoconstrictors, and so dilates the small vessels and lessens the resistance to the heart action; but at the same time it lessens the energy of the nerve centers which control the heart, diminishes the power of the heart muscles, and lessens that rhythmical activity of the small vessels whereby the circulation is so efficiently aided at that portion of the blood circuit most remote from the heart. A cold application to that portion of the chest overlying the heart reflexly stimulates and energizes the heart through the cardiac nerves. This reflex action is not confined to the heart muscle; the stimulation of the activity of the cardiac vessels improves the circulation through the heart structure, refreshing and energizing it in the same manner in which a voluntary muscle is energized by a cold application, as is so well shown by the ergograph.

It is well to remember that the vasoconstrictor nerves are one in kind with the excitor nerves of the heart, while the vasodilators are in like manner associated with the vagus. With this in mind, it is easy to see that while alcohol paralyzes the vasoconstrictors, it at the same time weakens the nerves and the ganglia which initiate and maintain the activity of the heart. Cold, on the other hand, excites to activity these nerves and centers, and thus produces the opposite effect.

The apparent increase of strength which follows the drinking of alcohol in cases of cardiac weakness is delusive. There is increased volume of the pulse for the reason that the small arteries and capillaries are dilated, thus lessening resistance and cardiac work; but this apparent improvement is very evanescent, as naturally results from the fact that while the heart is relieved momentarily by the sudden dilation
of the peripheral vessels, the accumulation of blood in the venous system through the loss of the normal activity of the peripheral heart, gradually raises the resistance again by increasing the load of blood which has to be pushed along in the venous system. This loss of the action of the peripheral heart thus in the end more than counterbalances the temporary relief secured by the paralysis of the vasoconstrictors. This accumulation and sluggish movement of blood in the venous system is shown by the purplish hue of the skin in a person under the influence of alcohol, — a wide contrast to the ruddy glow presented by the skin in which the small vessels are actively engaged in pumping the blood out of the small arteries into the veins, action in which the whole body may be made to participate by a general cold douche or other suitable application of cold water to the surface. Cold applications, general and local, may be safely affirmed to be the true physiological heart tonic.

In Germany and France it is the almost universal custom to administer alcohol to the patient just before putting him in the cold bath. Some practitioners, as Winternitz, administer but a very small amount, as a single mouthful of wine; while others give brandy in considerable quantities. A few American practitioners also employ brandy freely with the cold bath. The unwisdom of this practice will be apparent on due consideration of the following facts:—

1. One purpose in administering the cold bath is to secure a true stimulant or tonic effect by arousing the vital energies, especially through excitation of the nerve centers of the vasmotor, sympathetic, and cerebrospinal systems. Alcohol was once supposed to be capable of effecting this, and was used for this purpose in typhoid fever and various other morbid conditions accompanied by depression of the vital forces. At the present time, however, it is well known, and with practical unanimity admitted, that alcohol is neither a tonic nor a
stimulant, but a narcotic; that it depresses and does not excite; that it
lessens, and does not increase, the activity of the nerve centers; and
that this is true of small as well as large doses, as has been
shown by the researches of careful investigators. In evidence of the
foregoing may be cited the following statements from medical men recog-
nized as authorities throughout the civilized world:—

Harnack says: "It should also never be forgotten, that, even in
small doses, the paralyzing action of alcohol is exercised most rapidly
and energetically upon the tonus of the blood vessels—the importance
of which tonus for the regularity of the circulation and the cardiac en-
exty is well known."

Victor Horsley, an eminent English surgeon, speaks thus respecting
the influence of alcohol upon the heart: "Surgeons of former days used
alcohol extensively to combat shock, but the old theories of shock
have been proved erroneous, and alcohol has consequently become unneces-
sary. It will be less and less used in the future, and the discredit
into which it has fallen is justified."

Hermann Frye, by the use of Mosso's ergograph, showed that "in the
unfatigued muscle, alcohol lessens the extent of its maximum contraction,
owing to a lessening of the peripheral irritability of the nervous system.

The heart is a muscle, and consequently alcohol can not be expected
to increase its working power; and when laboring under the influence of
toxic agents, as in a febrile state, it is clearly evident that the
effect of this agent must be distinctly and altogether pernicious.

Chantemesse calls attention to the diminished toxicity of the
urine in many cases of typhoid fever, the toxins being retained in the
body during the fever, resulting in an enormous increase of the toxicity
of the urine during convalescence. This fact is of great importance in
connection with the use of antipyrine and alcohol, which lessens the
activity of the kidneys, and so causes still further retention of the
toxins.
In a series of physiological experiments conducted by the writer in 1893, and reported at the meeting of the American Medical Temperance Association held at Milwaukee, in May, 1893, it was clearly shown that nervous, muscular, and glandular activities are all diminished to a noticeable degree by the ordinary medicinal doses of brandy and other stimulants.

It is clear, then, that those who administer alcohol before the cold bath, by so doing antagonize the therapeutic activity of the measure since so far as alcohol has any effect whatever, it is to depreciate or neutralize the very effect which it is designed to secure by the cold application.

2. The effect of alcohol is to cause dilatation of the peripheral vessels. This it does by paralyzing the vasoconstrictors.

As already stated, paralysis of the peripheral vessels and of the vasomotor centers of the medulla, as shown by Romberg and Paessler, are the real causes of heart failure; hence, alcohol, in its effect upon the vasomotor centers and nerves, can only aggravate the very condition for the relief of which it is administered. Alcohol at the same time exercises a like effect upon the accelerator nerves of the heart, which are both anatomically and physiologically associated with the vasoconstrictors, as Waller has so clearly pointed out. By this means, while the heart's action seems to be freer, the movement of the blood through the systemic circulation is slowed, as is shown the stasis in the peripheral vessels, which is clearly indicated by the dusky hue of the skin in a man under the influence of alcohol. The influence of alcohol is in this respect somewhat akin to that of the warm bath. The effect of a cold application, however, is the very opposite; viz., the stimulation of the vasoconstrictors. At first this effect is so pronounced that the blood-vessels are almost completely emptied of their contents, and the skin becomes blanched in appearance.
As reaction sets in, the caliber of the blood-vessels is increased, but stimulation of the vasoconstrictors continues in that wonderful rhythmic activity of the small vessels, the peripheral heart, whereby the blood is steadily pumped from the arterial into the venous system, resulting in a bright red flushing of the skin, which indicates an increased flow of the blood through the periphery and an increased rate of movement throughout the whole circulatory system.

3. It is not maintained that no preparation for the cold bath is needed, but rather that there is a far better method than by the use of alcohol. The ideal preparation is to be found in the application of heat. If alcohol in any way aids reaction, it is not by augmenting the activity of the nerve centers, but by encouraging the relaxation of the surface vessels. But this can be accomplished far better by either a general or local application of heat, as a foot bath, fomentations to the spine, or when convenient, a general application of heat, such as a hot full bath for one or two minutes, a hot-blanket pack, a hot shower, or even hot water drinking or a hot enema, or wrapping the patient in warm woolen blankets for a half hour or so, with hot bags about him. All these are measures whereby the preparation for the cold bath may be accomplished far more efficiently than by any form of medication.

Heat is a natural preparation for cold. The application of heat to the surface vessels is a physiological stimulus whereby the centers are aroused to activity, and the thermic nerves rendered in the highest degree capable of responding to the reflex stimulus which the cold applications communicate to the skin, and through it to the nerve centers.

4. While it is true that the patient seems to bear the cold bath better when alcohol is administered, this fact is the strongest kind of argument against the use of alcohol in this connection; for the only way in which alcohol can diminish the shock or lessen the discomfort of the patient in the application of cold water, is by lessening nervous sensibility through its narcotic effect; and just so far as this is accom-
plished, the effect of the bath is neutralized and its efficacy lessened, for the reason that the whole effect of the cold application depends upon the thermic impression made upon the skin. Thus, so far as this impression is diminished, the effect of the bath itself is diminished; the combination of such antagonistic measures as alcohol and cold water cannot be regarded otherwise than in the highest degree unphilosophical, and from the standpoint of rational therapeutics, absurd. The practice is one which appeals strongly not only to the prejudices of the laity, but to the predilections of quite too large a proportion of physicians; but not one scientific fact or even plausible apology can be brought forward in support of this practice.

The utility of the cold bath as originally practiced by Brand cannot be questioned; but Winternitz has shown that the rate of heat elimination may be very greatly increased by rubbing the patient continuously during the bath. At the present time Brand and his followers, who are adepts in the use of the cold bath in fever, uniformly employ vigorous friction during the entire bath. Those authors who forbid friction during the bath because of the supposition that heat production may thereby be increased evidently do not recognize the fact that by the maintenance of a vigorous surface circulation the rate of heat elimination is increased out of proportion to the slight increase of heat production, so that there is a decided gain to the patient by friction employed during the bath; and especially do these writers neglect the important fact that the greatest benefit derived from the cold bath is not the simple heat abstraction, but the general rousing of the vital powers, the increase of resistance, and the quickening of the recuperative and reparative activities of the body.

Another advantage of this method is that the patient is much more comfortable in the bath, and will tolerate the application for a longer time and at a lower temperature as well as more frequently than when it
is administered without friction. As elsewhere shown, friction also averts increase of heat production by preventing shivering.

The claim made by some authorities that friction during the bath lessens the permanency of its effect in temperature reduction, is perhaps correct, to a degree, but this only necessitates the more frequent use of the bath, which the friction renders readily tolerable.

Now, then, may we explain the good effects obtained by the method of Brand? The explanation is to be found, not in the subtraction of heat alone, but especially in the tonic effects of the cold water, and in the sedative influence upon the nervous reflexes concerned in the febrile process and in the powerful diuretic effects of the bath.

Ziemssen first, and later Glenara, recommended in high terms the so-called graduated bath, in which the patient is placed in an immersion bath, the temperature of which is 35° to 40° below that of the body. The temperature is then steadily lowered at the rate of about one degree every three minutes, until a temperature of 56° is reached. This method has the advantage that no shock is produced, as when the patient is placed in water at 58°, by the Brand method. There is, accordingly, no marked thermic reaction. If desirable, the temperature may be lowered still more, or until the patient becomes slightly chilly, but he should not be allowed to shiver. The bath should be accompanied by gentle friction for the purpose of preventing chill and to increase heat elimination.

With feeble patients who chill easily, the lowest temperature of the bath may be made 90° or 92° F. in the first application, the bath being more prolonged that when the lower temperature is employed. In such cases the temperature of the bath should be lowered one or two degrees at each application until the temperature of 70° or 75° is reached.

The graduated bath obviates the danger from syncope, which is one of
the inconveniences of the cold bath. It may be employed in cases in which the cold bath is contraindicated, as in cases of typhoid with serious renal or cardiac complications.

The results in temperature reduction obtained by the graduated bath are more permanent than those obtained from the cold bath of Benda or the cold effusion of Currie; and after several years' experience with this bath, the writer considers the graduated bath one of the most efficient and satisfactory of all the methods employed for reducing temperature in fever. Unfortunately, it is much less convenient for use in the ordinary home or in private practice than in hospitals. There are, however, other means by which very similar, and perhaps equally good, effects may be secured.

When the cooling wet-sheet pack is employed for the reduction of temperature, the sheet should be wet in cold or cool water, and should be wrung out slightly, then wrapped about the patient in such a manner as to come into immediate contact with every part of the body, being tucked in closely around each limb and about the neck. The patient should be covered very lightly if at all. In a few moments the temperature of the sheet will be raised to nearly that of the body, when it should be renewed, a fresh pail of cold water being employed each time for wetting the sheet, which should be wrung out as dry as possible, in order to remove the warm water which it contains, before dipping into the cold water for the second application. It is better to use two sheets, having the freshly prepared sheet on another couch.

The application may be renewed in this manner five or six times in succession, or even more. When the temperature of the body is very high, the sheet is so rapidly heated that it must be renewed every five to seven minutes, to make the cooling effect continuous. The applications should be renewed until the temperature has been lowered one degree or more, or until reduced to 101° or less, each successive application
being longer than the preceding. There should be good circulatory reaction to maintain an active cutaneous circulation. It is often well to secure this by friction with the hand outside the sheet.

Instead of removing the sheet from the patient, the same effect may be accomplished by opening the sheet and sprinkling the body as well as the sheet with cold water. The patient should be made to turn, first upon one side and then the other, so that the back and the whole body may be exposed to the cold application.

A better method still is to place the patient upon a cot covered with oilcloth, so arranged in relation to a tub placed at the foot of the cot that any surplus water may be caught as it runs away; then the water may be turned upon the patient from a watering-pot or poured over him either from a dipper or other convenient vessel. By this means the cooling effect of the sheet may be made continuous, and almost as intense as that of the cold bath.

The late Dr. Austin Flint, introduced this form of cooling bath in 1874, when the writer was a pupil under him in Bellevue Hospital. In a paper read by him before the Academy of Medicine at that time, he reported several obstinate and protracted cases of remittent malarial fever with very high temperature, that were rapidly cured by this measure repeated daily.

Water at any desired temperature may be used. If the patient does not well tolerate cold applications, water at a temperature of 60° or even 85° F. will be found efficient in lowering the temperature, provided the application is continued for a sufficient length of time.

The cold towel bath is essentially the same as the cold sponge bath, only applied somewhat differently. A towel of ordinary size is wrung out of cool or cold water, and spread out quickly over as large an area as possible. The hands are applied with a rubbing movement, outside, not under, the towel, first one part, then another, until the whole towel is
slightly warmed, when it is quickly renewed by dipping in cold water and
wringing slightly, and applied to an adjacent or corresponding surface;
and so on, until the entire body has been gone over, the operation being
continued as long as may be necessary to procure the desired results.
This method is applicable only to cases in which there is but a slight
rise of temperature, or where the patient is too feeble to be subjected
to more vigorous measures. Each part must be quickly dried, rubbed,
and covered after the application before proceeding to the next.

The cold-towel rub, the towel being wrung as dry as possible, is
of great service in cases in which the patient is in adynamic state,
with cold extremities, pinched features, and marked depression. Special
attention should be given to the limbs, and the application must be short
and instantly followed by vigorous rubbing. Partial cold rubbings test
the patient's reaction and preparation for more vigorous applications, as
such as the cooling pack and the graduated bath.

The cold wet friction bath, administered by means of the cold
friction mitt, is a most useful measure in cases of fever in which the
condition of the patient demands a cold application to lower the tem-
perature, energize the heart, and increase vital resistance, but in which
there are conditions that contraindicate the ordinary cold immersion,
or brand bath. It is most valuable antipyretic measure, and is always
indicated in fever, except in cases in which cold applications must be
forbidden altogether, as when the patient is perspiring freely. It may
even be employed when the skin is cold or cyanotic. It is possible to
use water at a very low temperature, even ice-water, in administering
this treatment. It is of the greatest possible service in the adynamic
or ataxo-adynamic conditions of typhoid fever, in cases in which serious
cardiac or renal complications have appeared, in intestinal hemorrhage,
and incollapse from hemorrhage or perforation. It rouses the vital powers
in a wonderful manner, brings to the surface the blood which is stagnating in the viscera, awakens the lethargic brain, slows and strengthens the fluttering pulse, and completely changes the aspect of an apparently desperate case, and often in a very brief space of time, a few hours, even. The bath may be perfectly graduated. At first the mitt should be only moistened. As the circulation improves, it may at the next application be saturated, and later it may be filled.

After twenty-five years of extended experience in the use of baths of all temperatures, the writer feels justified in taking a most uncompromising stand against the use of alcohol in any form in connection with hydriatic procedures. If there are any two agencies in the world which are absolutely irreconcilable, they are alcohol and water. Their application in conjunction gives, not the sum of two co-operating or complementing agents, but the difference between two neutralizing and antagonistic measures. In any case in which alcohol may seem to be indicated as a means of preparing the patient for the application of a cold bath, heat may be employed to far better advantage, with the certainty of better results, and with absolute physiological consistency.
THE MEDICAL USE OF ALCOHOL.

The popular idea that alcohol is necessary as a medicine, is as far from the truth as is the supposition that it is harmless or a necessary beverage. It is perfectly safe to say that any intelligent physician who understands his profession and is acquainted with physiological and rational measures of treatment can practice medicine more successfully without the use of alcohol than with it. Let us consider a few popular errors respecting the value of alcohol, which modern laboratory researches have thoroughly exposed.

ALCOHOL NOT A FOOD. – Liebig and his followers class alcohol along with fats, starch, and sugar, as a sort of fuel-food, which, by consumption in the body, might be somehow converted into energy. But later studies have demonstrated that any substance to be a food, must first enter into the composition of the body,—in other words, it must be assimilated and become a part of the body before it can be a source of living energy, either muscular, or mental; and this alcohol cannot do. It is not assimilated. It had long been demonstrated that not a single drop of alcohol, no matter how much one may swallow can be converted into muscles, nerves, brains, bones, glands, or any other tissue. Alcohol, when taken into the body, is treated as a foreign substance. It is true it undergoes some chemical changes or is oxidized, but this is equally true of iron filings, of opium, and of a great variety of metallic and other substances, none of which are recognized as foods.

Alcohol is not an isolated or unique chemical substance; it is one member of the large family of alcohol, the chemical substances of which are allied to one another, being similar in composition, and in other properties. They all burn ignited. They possess preservative properties, preventing decay through their destructive power upon germs. They are all poisons; whether administered to animals or plants
they destroy life very promptly. Their effects upon the human system are practically identical, only varying in degree; that is, they all produce intoxication, some, more than others. Fusel oil and wood naphtha are two members of this family. Fusel oil is much more intoxicating than ordinary alcohol, while wood naphtha or methylalcohol is much less intoxicating. It is absurd to suppose that one of these alcohols is a food while the others are poisons. We might as well try to imagine one member of a family of negroes to be a Caucasian, while the others are recognized as Africans, or call one of a brood of chickens a mocking-bird or a pigeon while the others are recognized as common dung-hill fowls. The alcohols are all birds of one feather and belong to the same flock; they are poisons and not foods.

Prof. Atwater's recent attempt to show that alcohol is a food, resulted in complete failure, and was denounced by nearly all the leading physiologists and chemists in this country as being entirely at variance with well known and well established scientific facts. The discussion aroused by Prof. Atwater's unwarranted assertions has accomplished great good by opening the eyes of a great multitude of those physicians and other tinkering people who had not previously given this matter particular attention. If a man is hungry, he may appease his desire for food by the use of alcohol, but alcohol does not take the place of food, and death from starvation will occur sooner if the man takes alcohol than if he takes nothing at all. Dr. Tanner, and others have shown the possibility of abstaining, absolutely, from food for a month or more, without the use of alcohol. No one has come forward to demonstrate that life can be prolonged to a still greater period, or with less loss of strength and energy by the use of alcohol.

The experience of ancient explorers has also shown the frutility of dependence upon alcohol as a food. The hungry man, after taking alcohol
is no longer hungry, but has not been fed, and will starve to death if he continues on this régime. The man who when cold, takes alcohol and feels warm, but when the thermometer is applied to his body he is found colder than before, and will freeze to death, unless other means than alcohol are employed as a protection against the cold.

It has been repeatedly demonstrated that men, when placed under circumstances where their physical endurance is greatly taxed, do better without alcohol than with it. Whiskey was formerly issued as a regular ration for soldiers, with the idea that it would sustain them while on long marches. The commander of the British army in Africa, has demonstrated that this is a mistake, and the same has been found to be true in military campaigns in this country and elsewhere. In the war between Greece and Turkey, the Turks, who are total abstainers, showed themselves to be immensely superior to the Greeks who made free use of alcohol and wine, both in courage and endurance. It was also noticed that when wounded, their injuries were very quickly repaired so that they were ready to take the field again.

Experiments made by the author, some years ago, by means of the universal dynamometer showed that whiskey notably diminishes muscular power. After taking two ounces of brandy, the muscular power was found to be diminished more than one-third. In this test, the dynamometer was applied to all the important groups of muscles in the body, thus obtaining the total capacity of the body. By this means figures were obtained representing the total muscular capacity of the whole body. These results have been frequently verified.

ALCOHOL DOES NOT AID DIGESTION. For generations, alcoholic beverages, particularly in the form of wine, have been recommended by physicians as an aid to digestion, especially after a hearty meal. The experiments of Dr. William Roberts, the great English physiologists,
made and published more than a dozen years ago, proved conclusively that alcohol most decidedly hinders, and does not in the slightest degree aid in any way the digestive processes of the stomach. The digestion of both starch and albumen was shown by Dr. Roberts to be hindered by port wine, and similar beverages. Experiments made more recently by Crittenden the eminent Professor of Chemistry in Yale College, has also shown that alcohol hinders digestion. Experiments made by the author, a number of years ago, showed that eight ounces of wine taken after a meal diminished the digestive activity of the stomach one-half, while two ounces of brandy absolutely paralyzed the stomach. In these experiments the subject was given a "test meal" which was removed at the end of one hour, and subjected to a careful chemical examination to determine the exact amount of digestive work done. These experiments were also published in the Bulletin of the American Medical Temperance Association.

Alcohol does not increase muscular or nervous energy. Experiments made by the writer some eight or nine years ago, with delicate instruments constructed for the purpose, showed that the sensibility of the nerves is notably diminished by taking with test meals one or two ounces of whiskey or brandy. I quote as follows, the results obtained in these experiments, from a report of these experiments in the Journal of the American Temperance Association.

"Dr. Thorne will select a

See next page"
A healthy young man was taken as the subject in these investigations. The average time required for his perception of tactile sensation was found to be .140 seconds; for heat, .389 seconds; and for cold, .323 seconds. The accommodation was tested by making the subject look at a small dot on a sheet of white paper, then close his eyes and place the end of his index finger upon the dot, or as near to it as possible. The average distance was found to be 8.1 millimeters. The total strength was ascertained by means of the mercurial dynamometer, an instrument by means of which the strength of each group of muscles may be obtained. In this case the total strength was found to be 4851 pounds.

In the following table are placed side by side the above results, and those obtained after the administration of two ounces of whiskey:

<table>
<thead>
<tr>
<th></th>
<th>Normal</th>
<th>After taking 2 oz. whiskey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tactile reaction</td>
<td>.140</td>
<td>.303</td>
</tr>
<tr>
<td>Temperature reaction (heat)</td>
<td>.389</td>
<td>.796</td>
</tr>
<tr>
<td>Temperature reaction (cold)</td>
<td>.323</td>
<td>.750</td>
</tr>
<tr>
<td>Accommodation</td>
<td>8.1 m.m.</td>
<td>19.2 m.m.</td>
</tr>
<tr>
<td>Strength</td>
<td>4851 lbs.</td>
<td></td>
</tr>
<tr>
<td>Strength (two hours after)</td>
<td></td>
<td>3355 lbs.</td>
</tr>
</tbody>
</table>

From these researches it will be seen that alcohol instead of acting as a stimulant, or increasing the muscular and nervous energy of the body, as it is generally supposed to be capable of doing, actually diminishes both in a notable degree.
Dr. Bunse, the eminent Professor of Physiological Chemistry at Basel, Switzerland, thus speaks respecting the delusive influence of alcohol upon the nerves: "Intoxicating drinks never make a man brilliant. The prevailing notion that it does is based on self-delusion, is only a symptom of incipient paralysis; in proportion as self-criticism is diminished self-approbation rises. A drinking company and a toper never become conscious of vacuity or want of intelligence. They require no interests, nor ideals; they have the rapture, the solace of a narcotic. Nothing is more fatal to the development of a human being, nothing is so undermining, so destructive to the best of which a man is capable. There is nothing that with such unfailing certainty will paralyze every remnant of energy as the habitual dispensing of tedium by means of alcohol. The Philistine never becomes indignant until after whiskey has converted a man into a murderer or a thief; the fact that beer renders thousands of men stupid, simple, and ragged, does not in the least disturb his selfish complacency. I call that man a toper who is not at ease unless he daily introduces alcohol into his system, no matter whether in the form of beer or wine."

Alcohol is not a stimulant. The popular notion that alcohol is a stimulant, and is somehow capable of helping the body through an emergency is a most fatal error. Alcohol is not a stimulant; it is a narcotic. This is shown by the experiments above quoted, and also by common experience. Alcohol benumbs the sensibilities of the brain and nerves, and never in the slightest degree increases the mental or nerve power. The flushed cheek of the drunkard is an evidence of the paralyzing effect of alcohol upon the nerve-centres which control the circulation of the blood. The disordered speech, the staggering gate, the stupefaction of the mental faculties are all evidences of the narcotic power of alcohol.

ALCOHOL IS NOT NECESSARY AS A MEDICINE.- There is no condition
of disease in which alcohol is generally supposed to be valuable in which there is not some other remedy which is capable of rendering far better service. In fact, in cases in which alcohol is commonly employed as a remedy, especially in fevers, in cases of heart failure and collapse, alcohol does far more harm than good. The remedy for heart failure is cold water. Almost every body knows this, as is shown by the fact when a person faints away, the first remedy suggested is a dash of cold water in the face. Cold water applied over the heart is more effective than when applied over the face. Slapping the face with the end of the towel that has been dipped in cold water is a powerful means of rallying a failing heart. Cold water applied quickly to the whole surface of the body, with friction, increases the energy of the heart and lessens its work. Alcohol seems to help the heart by lessening its work through dilatation of the surface vessels, but at the same time, it lessens the power of the heart to work, and hence it partially paralyzes the heart, thus lessening its capacity for work. If there is ever a case of cardiac failure, or general collapse, in which cannot render the slightest service, cold water, a remedy always at hand, is capable of rendering ten times greater service. This has been demonstrated thousands of times by Winternitz and other eminent European physicians as well as by the author.

Alcohol was formerly supposed to be essential in the treatment of fevers, but its use for this purpose is now almost entirely abandoned by progressive physicians, in favor of the cold bath in some form.

It is highly important that this fact should become known to the public, as the moderate drinker is very likely to argue that if alcohol in the form of brandy, port wine, or "bitters" is good to strengthen fever patients, it is good to strengthen the man who is battling with disease—it must be equally good to strengthen the man who is bat-
Iling with adversity, with business troubles, or who feels the need of something to prepare him for his task. If alcohol is good for a weak man certainly there is no man who needs it more than a habitual drunkard, for he is weak, and every morning feels he greatly feels the need of a stimulant to brace him up for the day.

The only source of energy is food. By the digestion and assimilation of food alone, it is possible for the weak man to be strengthened. If he is feable, tonic effects may be obtained by means of electricity short cold baths, and other rational measures, but alcohol is certainly the last thing which should be administered, for it is not a stimulant but a tonic, but a powerful narcotic.

It is well that the general public should become acquainted with these facts so that they may no longer place their trust in the false hopes held out by the multitude of nostrums advertised as tonics in the newspapers, nearly all of which are charged with alcohol or even worse drugs. Multitudes have, by this means, been led to become habitual drinkards, and have finally fallen into drunkard's graves, their lives wrecked by the false belief that alcohol is a useful remedy and capable of giving strength to the weak and nerves and reinforcing the vital energies to enable them to grapple successfully with disease or to tide over an emergency.
Poisoning by Wood Alcohol - 2-

investigation of this subject, state that "If ten persons
drink, say, four ounces of Columbian spirits within three hours,
al will have marked abdominal distress and four will die,
two of them becoming blind before death. Six will eventually
recover, of whom two will be permanently blind. With still
larger doses, the proportion of death and blindness will be
greater."
ALCOHOL RACE ENEMY NO. 1.

The human race, at least the civilized part of it, is in peril. There is every reason to believe that the next century will decide the fate of civilization and of the white portion, at least, of the human race. Grave scientists, the most eminent in the world, have in recent years, in their discussion of the results of extensive and profound researches, with bowed heads and with grave tones and solemn faces, annunced the fact that the civilized portion of the human race is degenerating and rapidly hastening toward extinction.

Major Darwin, son of the late Charles Darwin, professor of economics at Oxford University, one of the most eminent of living scientific men, whose snow white hair and carefully chosen phrases gave emphasis to his words, said some years ago, at an International Eugenics Congress, "If our civilization survives, and I fear it will not, it will have to be because the United States saves it, for there is no hope in any other part of the world."

Race degeneracy has advanced so far in all European countries that every student of race problems recognizes the fact that every European country is doomed to ultimate destruction. Some hope has been entertained that the United States, because of its comparative youth as a member of family of nations, might escape the tragic fate which older nations are facing, but recent developments show that in this country the same destructive agencies have made such headway in their devastating activities that America is only a few years behind European countries and, like the rest, is going headlong down to chaos and extinction.

These facts, appalling as they are, are by no means new to students of anthropology and eugenics. For more than fifty
years, the question, "Are we a dying race?" has been the subject of earnest study by scientific men. About the beginning of the last quarter of the last century, statistical facts began to appear in the reports of the Census Bureau which indicated that the great progress in conservation of human life and health which led to the extensive organization and development of public health work which began about the middle of the nineteenth century led to an increase of the average length of life of nearly fifty per cent, and promised a still further increase in average longevity. was not so desirable as it seemed to be.

The facts appeared to justify the belief which is generally held that the human race is making great progress in physical betterments as the result of the mastery won by science over most of the deadly maladies which in the sixteenth century made the average length of human life less than one-third of the present average.

But this view of the result of the labor of public health organizations through control of infectious diseases through quarantine, vaccination, serum treatment, etc., has been shown to be superficial and based on cursory observations rather than a deep study of the facts. The discovery was made more than twenty-five years ago that while scientific sanitation had acquired control to a notable degree of acute infectious maladies, chronic degenerative disorders, including that most incorrigible of all maladies, old age, were continuing to increase. Notwithstanding all the progress made in the last half century in methods of combating the enemies of human life, degenerative diseases which for the most part result from methods of living and personal habits, have continued to increase and at an accelerating rate.
The researches of the Census Bureau have recently revealed facts which, when truthfully interpreted, constitute the most sensational news the world has ever received. The human race is dying. The United States has joined the decadent nations of Europe in the death march toward extinction. It is true that for many years every succeeding census report has shown an increase of the average length of life in the United States, but the mortality rate for persons above fifty years of age has steadily increased and the percentage of centenarians has diminished. It is no longer possible to hide from our eyes the fact that the effect of the great progress made in public health and sanitation, and in the preservation of the lives of infants, and the prevention of deaths from acute infectious
Alcohol

diseases has not increased the average health and stamina, but has had the very opposite effect by keeping alive a multitude of individuals of feeble constitution who under natural, uncontrolled conditions, would have succumbed to the law of the survival of the fittest. So these great national and international agencies which have produced in the last century such an enormous saving of human life and have thus caused such a rapid increase in the world's population that many economists have advocated the necessity for the development of means for lessening the increase of population, have really had the effect to weaken the race and to produce accelerated race-destructive trends which must ultimately lead to race destruction unless checked by radical measures which have yet to be devised, if, indeed, the possibility of control is not already beyond hope.
Professor City, the world's greatest statistician, not long ago startled a body of eminent scientific men by calling attention to facts previously overlooked which showed unmistakable trends in the population of Great Britain, which, if continued, would reduce the number of inhabitants in that country within another century from the present 40,000,000 to 4,400,000. That the same trend exists and is already far advanced in the United States, is shown by the startling facts revealed by the last census that at the present moment there are living in this country more children 5-9 years of age than 0-5 years of age, which means of course that the younger group is not large enough to replace the older one; and so depopulation has started in this country, which the statisticians tell us, is only 40 years behind England in its mad rush toward oblivion through race suicide. And for the great catastrophe that awaits us, unless something radical and revolutionary is due to avert it, alcohol is perhaps more responsible than any other of the enemies of human welfare which are dragging us down to destruction. That alcohol is a poison, nobody now denies. The biochemists have proven that the amount found in a pint and a half of beer will impair a man's judgment, make him inaccurate and reckless. One part in 800 parts of blood. One-third of an ounce of alcohol will make an inaccurate and a dangerous driver. One part in 500 will make him (half an ounce of alcohol) will make him stupid, and one part in 200 (one ounce) will make him dead drunk.

To talk of such a drug as being a food is supreme nonsense. Scientific men have made themselves ridiculous in their attempts to prove alcohol to be "a good creature of God," tell...
an easily assimilable food, a good creature of God."

The fact that a small amount of alcohol disappears in the body
The fact that alcohol disappears in the body at the rate of a teaspoonful an hour is no proof that alcohol is a food, as some scientists have averred, but the very opposite. As recently pointed out by Sir Frederick Gowland Hopkins, one of the most eminent biochemists in England, the disappearance of alcohol is only evidence that the body is trying to get rid of it by destroying it, as well as by eliminating it. This is what the body tries to do with all poisons.

Alcohol is not a stimulant; it is a narcotic, a stupifier, a beverage, wine, beer and liquors, are still called stimulants is an illustration of the human obtuse men ness that leads us to cling so tenaciously to long obsolete and discredited beliefs. Alcohol is always a sinker, a despoiler, a destroyer. It hinders, deceives, perverts.

Alcohol lowers vital resistance, and hinders the body in its efforts to combat infectious disease. This fact has led to the disuse of alcohol as a routine remedy in the treatment of typhoid and pneumonia as a circulatory stimulant, it having become well known that alcohol distresses the heart instead of stimulating it.

During the World War, the following preamble resolution was passed by the American Medical Association: (p. 487, N.D.)

Later, under prohibition, when the law required men who wished to drink to get a prescription from a physician, After the war was over, during prohibition, when a man who wished a drink of whiskey was compelled to get a prescription from a physician and a statement that he needed alcohol as a medicine, many young physicians failing to fail
"Whereas, we believe that the use of alcohol is detrimental to the human economy, and whereas its use in therapeutics as a tonic or stimulant or food has no scientific value,

"Resolved, That the use of alcohol as a therapeutic agent should be discouraged."
building up

in a legitimate business, succumbed to their inclination
to increase their incomes by selling prescriptions for liquor
to those who were willing to pay for them. The number of these violators of the law became so great that pressure was brought to bear upon the members of the American Medical Association to change their attitude in relation to the therapeutic use of alcohol, and a new resolution was passed repudiating the former resolution, and recommending alcohol as a useful remedy. However, since the repeal of prohibition, the greedy brewers and whiskey dealers have shown such greed and uncontrolled rapacity in their exploitation of the lives, health and character of men and women, that members of the medical profession are becoming aroused to the need of opposing this terrible Moloch of destruction.

The brewers The attitude of liquor dealers in general is well illustrated by an announcement recently made by the English Brewers' Society. "We want..." p. 3.)

This led to a protest by a thousand physicians denouncing this effort to increase the youth of England in the beer-drinking habit, as a menace to the individual and national welfare of the people of Great Britain. The intelligent men and women of both England and America are becoming aroused to the peril that confronts these great nations before many years have been acknowledged leaders in human progress. The latest findings of scientific research, this leader. It is plain that this leadership will soon be lost in much less than a century.

The yellow races are rapidly increasing. Hordes of Asiatics, the yellow races will soon be the dominating factors in world's affairs. With England's population reduced with less than 5,000,000, and America's 120,000,000 reduced to half that number, or less, while the half
“We want more customers. We want to get the beer-drinking habit instilled into thousands, almost millions, of young men who do not at present know the taste of beer.”
billion of progressive Asiatics have swollen to one or two billion, led
and their ambitious leaders, have shown the way to the adoption
of all the civic and military achievements of England and America,
natural
and have availed themselves of the vast untouched resources
which probably exceed those of all the rest of the world together.
America and Europe will xxxxxx be approximating
the chaotic stage of final stage of chaotic extinction. Race degener-
ceracy has become a recognized fact. Depopulation is the canker
which will destroy every white nation in the world within a cen-
tury or two, and millions of persons now living in this country
within the not distant future, be wearing the yoke of slavonic
rule, unless Yng Alcohol can be dethroned, an end which the physi,
mental and moral decadence resulting from the subtle influence of
which race poison which has blighted the lives of millions before
they were born, and made of the United States, would be world leader
of light and progress, the most crime-infested country in the world,
the scene of 10,000 murderers every year, of whom but a very small
proportion are of the hands and immoral.
and fill our asylums with lunatics and feeble-minded, and idiots, and epileptics, giving us a popula-
tion 10 per cent of whom are believed to be mentally unsound.

The only possible hope that remains for the white race to
maintain a foothold on this little globe of ours, is a general up-

rising of the intelligentia of the world and the organization of a
campaign to undertake a life and death struggle to secure the sur-
ival of a remnant not yet hopelessly contaminated with the leprosy
of race degeneracy through which returning to nature in opposing
alcohol and every other enemy of human health and happiness by scrutiny
ous obedience to every law, every biologic principle, and the intelli-
gent use of all the resources of the individual and race improve-
ment which have made it possible the vast improvements in our do-
mestic animals, our farm crops, our fruits and grains and vegetables,
every living thing in fact with which man has made contact, excepting only himself. By these means, it is possible that the white race, which heretofore has probably stood as the greatest hope of the world, may survive the terrible ordeals which the future holds for it, and when the yellow Asiatics have followed the rest of the world down the same declivity of race decay, perhaps more rapidly still than Europe and America have gone, a new and better type of *homo sapiens*, made wiser, and happier, and selfish healthier, and nobler by turning away from the exploitation of the world's material resources as well as men and women for the mere gratification of greed and ambition, and concentrating their attention upon the betterment of man himself and his development into the being he was intended to be, the image of his Maker.
Disease treated without alcohol

Typhoid Fever

No. of cases: 75 to 100
No. of deaths: 2

The cause of death in one case was perforation of bowels with hemorrhage. Patient not following direction of physician.

Pneumonia

No. of cases: 25 to 40
No. of deaths: 2

Both cases of death were in men beyond the age of seventy.

J. M. Riley.
Subjects for Discussion.

Is alcohol essential in the rational treatment of disease?

Is the use of alcohol in medicine conducive to intemperance, and if so, in what manner and to what degree?

Is alcohol a stimulant?

New scientific discoveries relating to the influence of alcohol upon brain and nerves.

What is the duty of the medical profession in relation to temperance reform.

The physiological effects of alcohol.

Does alcohol in any form aid digestion or any other important vital function? Consideration to be given to the experiments made with artificial digestive fluids, made by Professors Crittenden and Mendel of Yale University.

Alcohol in the light of modern research.

Summary of medical experience in the treatment of disease without alcohol in the last twenty-five years.

Is alcohol necessary or useful as a prophylactic against the hot weather diseases of children?
Coffee houses.
Anti-tea and coffee crusade.

Report of insane asylum in Ireland attributes much of insanity to tea.
Dr. James Wood, visiting physician of Brooklyn Dispensary, New York, 100 cases of tea poisoning, 69 women, 31 men.
He says for some people two cups of strong tea a day produce tea poisoning.
One ounce of tea leaves a day soon produce grave symptoms of poisoning.

Among the symptoms of tea poisoning Dr. Wood found dizziness, faintness, nightmare, despondency, cerebral excitement, tremor, palpitation of the heart, anemia, insomnia, hallucinations, neuralgia, general weakness, sinking sensation in the stomach.

Chinese never drink new tea, wait till it is a year old, on account of intoxicating properties due to essential oil.

English servant girls addicted to tea drinking.
In some English towns scurvy frequent from tea drinking.
Nansen pronounces tea and coffee a scourge in Greenland.
Tea, combined with connective tissue of meat, produces leather.

Sincerely your friend

Wm. Roberts
(To be transferred to later point in paper)

The influence of alcohol, tobacco, tea, coffee, and all other narcotic and so-called stimulants, inducing old age is unmistakable. These drugs, together with cocaine and other similar substances involved in the various poison-habits to which human beings are attributed,—all have the effect to paralyze the recuperative and reparative processes of the body, at the same time that they benumb the sensibilities in relieving pain or distress merely produce a temporary nerve tingle or exhilaration. All such temporary falsity is obtained at the expense of future suffering and premature failure of the vital powers. That an individual is now and then found who has attained advanced age notwithstanding the addiction to the use of alcohol, tobacco, or other drugs is not an evidence of the harmlessness of these poisons, but rather a testimony to the toughness of the human constitution, its ability to endure abuses, and the possibility of a far greater extension of the period of human activity and usefulness than is generally comprehended.

The fact that tobacco weakens the heart and seriously disturbs its functions, that alcohol produces inflammation of the stomach, fatty degeneration of the liver, that tea and coffee produce, at first irritation and finally exhaustion and paralysis of the nerves, that cocaine induces not only general nervous exhaustion but insanity,—these are all indubitable evidences of the destructive character of these poisons, even in a small dose. The accum-
ment that a drug which, in a small dose, will kill a snake, as will tobacco, cannot be conducive to human health and longevity, is a perfectly legitimate and sound one.

The idea that these drugs are capable of exercising and beneficent influence by retarding nutrition or economizing vital expenditures, was long since exploded and has been discarded by scientific men. Total abstinence from all narcotics and stimulants must be regarded as one of the most essentials conditions to longevity.
Literature relating to alcohol and inebriety.

A correspondent inquires:—

Are there any publications or papers in this country exclusively devoted to the study of alcohol and the inebriates? What is the character of these journals, and where published?

A. There are two journals published in this country entirely devoted to the subject named. The Journal of Inebriety which is the organ of the American Association for the study and cure of the inebriate which was founded in the year 1870. The journal has been published since 1876 by T. D. Crowthers, M. D. of Hartford, Conn., and is unquestionably the ablest exponent of scientific principles relating to this subject published anywhere. It is the only journal of the sort published in this country. Every temperance lecturers and all who are actively engaged in dealing with the question of inebriety should be in possession of the valuable information which is to be found in the columns of this journal and for the most part are scarcely to be found elsewhere.

The Bulletin of the American Medical Temperance Association is another journal devoted wholly to the consideration of this question. This association was founded in 1891. The journal has been published since 1893 by the Modern medicine Publishing Co. of Battle Creek, Mich. It is edited by Drs. N. S. Davis, T. D. Crowthers and J. H. Kellogg. This journal is especially devoted to the consideration of the question of alcoholic medication. Every number contains interesting and able articles by Drs. Davis, Crowthers and others. It is a journal which ought to have a large circulation and temperance people might do a good work by placing it in the hands of physicians.
HOW TO REFORM.

This is a question which thousands of men who have unwittingly enslaved themselves to the fascinating vice of liquor drinking are daily asking themselves. Few if any would ever become addicted to the use of alcohol if they really appreciated the suffering which they must endure from the galling chain which the habit will sooner or later bind about them.

Alcohol is wholly merciless to its victims. It promises felicity but gives misery; it promises strength, but gives weakness; it promises vigor, but gives only disease; it promises new life, but it gives death in a most horrible form.

It is by no means easy to escape from the tyranny of a drug habit of any sort. Alcohol is one of the most difficult to overcome. A few of the following brief suggestions may be helpful to one who is really in earnest in his desire to escape from this soul and body-destroying poison.

1. Resolve to stop and to stop at once. Determine to be free or die in the attempt, but have no fears of death. The most abject slave to alcohol may stop immediately without any danger to life or health. The idea that one must taper off, or that the system becomes so accustomed to the drug that it is a necessity is entirely an error. Alcohol is a poison and the sooner one is rid of it the better. The suffering which results is far less if one stops at once and altogether than when an attempt is made to taper off.

Those who attempt to discontinue the use of alcohol by degrees seldom get entirely rid of it, and they are all the time relapsing into their old desire. One point must be emphasized, a person who has once been
addicted to the use of alcohol in any form must discontinue its use in
every form. You cannot use even light wine or beer, cider, or any
other alcoholic drink, even in the smallest quantity. Alcohol must be
shunned as one would avoid a venomous reptile, or any other deadly
poison.

2. If the extent to which alcohol has been used has been very
extreme in degree, and especially if several attempts at reform have
been made without success, the victim of this soul and body-destroying
vice should be placed under circumstances which will protect him so
far as possible from temptation. Removal for a time to some secluded
country place, away from old associates and where liquor will not be
offered him, is advisable in some cases, or even comminution.

Not infrequently the nervous disorders are so great it is im-
possible for the individual to continue his regular work or duties, and
it is then he should go to bed and remain there a week, if necessary. He
should receive daily treatment, such as fomentations to the spine, follow-
ed by sponging and rubbing. The nervousness may be wonderfully
relieved by applications of this sort. A cool shower bath, following a
short hot bath of some kind, is an excellent tonic for use in such cases.

3. Great care must be exercised respecting diet. Buttermilk
is an exceedingly wholesome food for such cases. Milk of all kinds
is usually well tolerated, also gruels. (Atolles, tortillas.) Avoid
altogether meats, spices, confectionery, tea and coffee and all sorts
of hot and irritating foods.

4. The inebriate suffers most of all from the weakness of will,
the loss of resolution and an decision of character, which is the
natural result of long yielding to the clamours of appetite.

The restoration of the will, while the most essential for
a complete and permanent recovery, cannot be accomplished by the
individual himself, nor by any mode of treatment which can be
applied to him. It is only by Divine power acting in co-operation with the man that the necessary mental and moral restitution can be accomplished; but this miracle of grace, the Divine power which created man and which dwells in him, is ever ready to accomplish for him who seeks deliverance from the thralldom of vice, that help in any time of need.

Read Psalms 107:17--21.