SCIENCE AND HUMAN LIFE
IN THE
ALCOHOL PROBLEM

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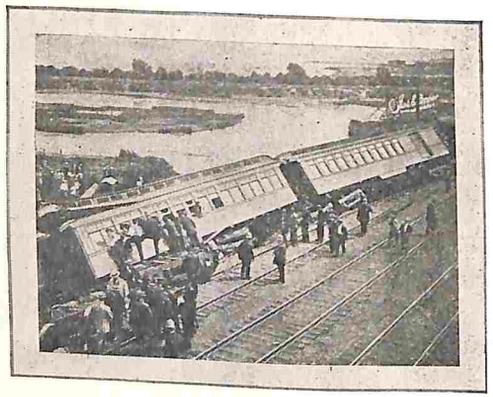
FOREWORD

This little volume is a continuation of "The Handbook of Modern Facts About Alcohol," published in 1914 which contained the scientific background of some fifty posters then being used for educational work.

The welcome in this and other countries given the data contained in the Handbook has encouraged the preparation of this second text, the illustrations of which cover a second series of posters published at intervals for further information on salient points of the subject of the effects of alcoholic beverages.

Scientific study of the alcohol question has advanced much in the past decade. There has been growing recognition of its essential and practical value to adequate understanding of the whole question and to methods of dealing with it. During this same decade there has been considerable extension of the movement in many countries for instruction of youth in these facts concerning the nature and effects of alcohol when used for beverage purposes. An attempt has been made in these pages, therefore, to bring out some of the newer important scientific evidence in its relations to present-day human interests and practical affairs.

RAILROADS NEED SOBER EMPLOYES



WHY?

"Two Fingers of Red Liquor can Turn a Ten-Million-Dollar Safety Block Signal In to a Ten-Million Dollar Waste of Money."

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51. RAILROADS NEED SOBER EMPLOYEES

It was a railroad employer who made the answer quoted in the illustration when someone asked him why American railroads have the following rule:

"The use of intoxicants by employees while on duty is prohibited. Their use (or their habitual use) or the frequenting of places where they are sold is sufficient cause for dismissal."

The answer quoted means, of course, that in the experience of the railroad the employe on railroad trains who takes even a small amount of alcoholic liquor may thereby become responsible for accident resulting in serious loss of property or life.

One of the most serious railroad accidents which occurred in the United States in the decade before alcoholic drinks were strictly prohibited was due to the fact that an engineer who was not obviously intoxicated when he started on the journey, but who had been drinking the night before, failed to see a danger signal. He turned the "safety-block signal into a waste of money." The experiments of Schulz[1] (No. 60) showed that, after taking alcohol in the form of half a pint of beer or a wineglass and a half of Rhine wine or champagne, ability to distinguish shades of red and of green was decreased. Impairment was worse for red, the color of the danger signal, than for green. With both red and green, Schulz found that ability to distinguish shades was poorer after taking beer than after taking other kinds of alcoholic liquors, possibly, it was suggested, because of the hops in the beer.

One experiment was made to ascertain whether as little as two-thirds of a tablespoonful of alcohol in the form of beer could impair ability to discern the

color of signals appearing for only an instant. One hundred persons of various ages, professions, and of both sexes were tested. Fifty-six saw better or as well after taking the half pint of beer. Forty-four saw less well. There were 18 in whom the diminution was marked. The experimenter repeated the tests with 13 of the 18 with the same results. His conclusion was that for a considerable number of people the absorption of even this small amount of beer brought about diminution of clearness of vision. This might easily be dangerous in the case of engineers, pilots, or chauffeurs who must often catch their signals through smoke, fog, rain, or snow, making sight difficult. The fact that not everybody so tested was similarly affected does not make less dangerous the activity of the 18 per cent who were affected.

Railroad workers themselves have understood the value of total abstinence from alcoholic beverages. In several European countries there are total abstinence societies composed wholly of railroad employees. In the United States, the railroad engineers have a trade organization, the Brotherhood of Locomotive Engineers. One of their strictest rules requires total abstinence at all times on the part of the members. The reason for the rule which was adopted many years ago is thus stated by the president of the Brotherhood, Warren S. Stone:[2]

"In these days of fast trains and heavy traffic, the locomotive engineer needs all the brains he has. He can not afford to have them muddled by drink."

Mr. Stone also said:[3]

"When you realize that on these fast trains the engineer must recognize and correctly interpret three signals a minute on an average, each of which means the difference between safety and disaster, you can understand why every sense must be alert. We who have spent most of our lives on a locomotive know the infinitesimal fraction of a second of time that often means safety. Alcohol slows down the brain. Any member of the Brotherhood found guilty of violating the rule which

forbids the use of alcoholic liquors either while on duty or while off duty must be expelled, and any lodge of the Brotherhood failing to enforce this law must have its charter suspended by the head of the National Brotherhood. This law is rigidly enforced. The Brotherhood of Locomotive Engineers at its international convention in 1918 with 902 voters present, by unanimous vote of all delegates declared in favor of national prohibition of the liquor traffic."

52. SMALL ACCIDENTS THAT MIGHT HAPPEN TO YOU

Machinery involves more danger to the worker than old-time hand work because: (1) it operates faster with more power; (2) it brings large numbers of workers together who may cause injury to one another.

Modern industry tries to prevent accidents by (1) safety devices; (2) teaching workers to be careful.

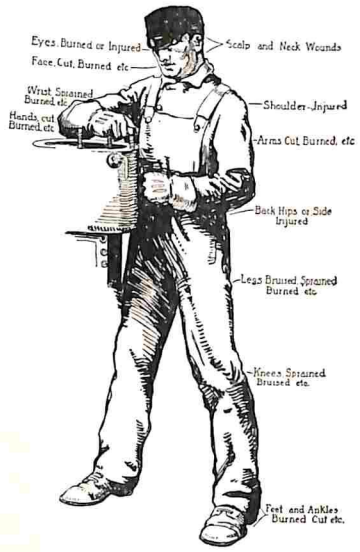
Safe men as well as safe machinery are necessary. The most carefully protected machinery or the best rules for safety will not make the worker safe from accident unless he obeys the rules, thinks what he is doing, and uses his wits to avoid accident. The careless worker may injure not only himself, but also his fellow workers.

Alcoholic drinks increase danger from accident. The alcohol in beer, wine and all alcoholic drinks makes one who uses them liable to accidents because: (1) it dulls mental keenness making him more careless and likely to take dangerous chances he would not take if his mind were entirely clear; (2) it dulls alertness in recognizing a danger or its seriousness; (3) it makes one less able to decide quickly and correctly the best action to take in an emergency; (4) it makes one less able to protect himself in dangerous places.

One does not have to be drunk to have an accident caused by alcohol. The mental confusion due

SMALL ACCIDENTS THAT MIGHT HAPPEN TO YOU

Insured Drinkers Had Three and One-Fifth Times as many Small Accidents as the Average Insured Worker



Sobriety Boosts Safety

Statistics from Leipsic Sick Benefit Societies, 1910

Drinkers were men 35-44 years old who showed signs of alcoholism. They had 320 minor accidents per 1,000 insured men to 100 per 1,000 among average insured workers. Report of Societies, 1910.

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to so-called moderate amounts of alcohol is a more frequent cause of accident than actual drunkenness; the visibly drunken man is neither able nor permitted to stay around dangerous machinery; he would not be allowed to drive an automobile.

The Leipsic Sick Benefit Societies at one time made a careful investigation of the comparative sickness and accidents among "drinkers" and the average insured workmen.[12]

Persons classed as "drinkers" were men who had so poisoned themselves with the alcohol in the liquors they drank that the insurance doctors recorded them as chronic drinkers.

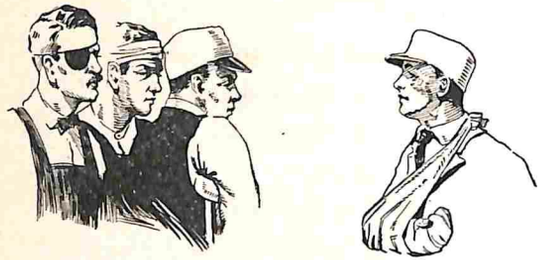
These men had 3 1-5 times as many small accidents requiring less than four weeks for recovery as the average workman insured in the society in proportion to 1,000 men employed.

53. BAD ACCIDENTS

When the Leipsic Sick Benefit Societies[12] studied their records of drinkers *(potators)* as compared with the records of the average insured workman in the societies, it was found that in the case of accidents which might be called "bad" or serious accidents because they required more than four weeks for recovery, the "drinkers" had, in proportion to their numbers about three times as many accidents as the average.

The use of alcoholic drinks is more dangerous to the worker today than it was a hundred years ago because machinery has taken the place of much hand work. Delicate machinery of high power requires alertness, ability to act quickly and accurately in the regular operations of work and especially in emergencies. It makes the use of alcohol more risky to

BAD ACCIDENTS



AGAINST DRINKERS **3 TO 1** AGAINST DRINKERS

DRINKERS had · 57
AVERAGE Workers 19
PER 1000 MEN

Drink Trebled the Danger

"The Fraction of a Second Makes All the Difference"

THE SOBERER THE SAFER

Statistics from Leipsic Sick Benefit Societies, 1910.
Drinkers were men 35-44 years old who showed signs of alcoholism. Had 300 serious accidents per 1,000 insured where average insured workers had 100.

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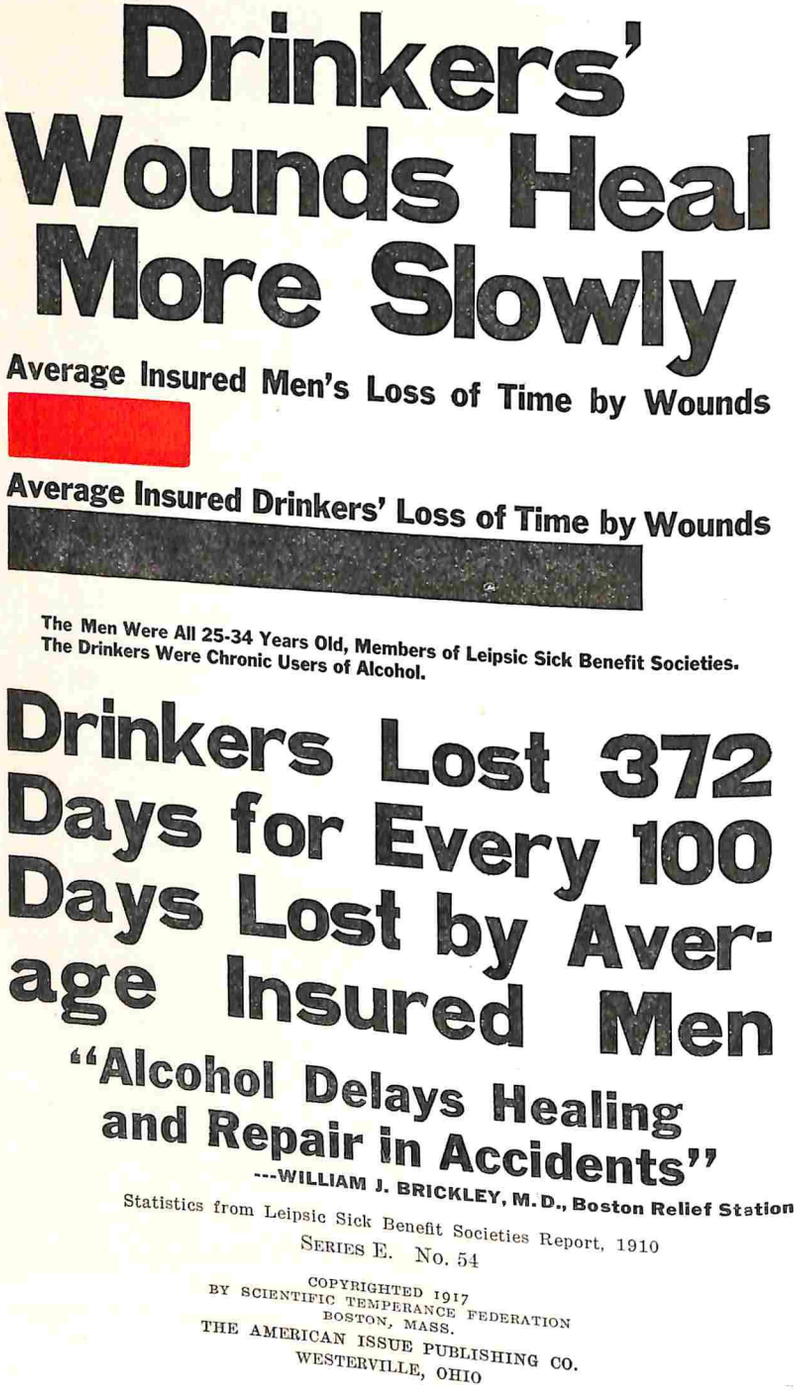
the worker than when he was working by himself using hand tools. Machinery is saving man much hard work by his muscles, but it requires clear brains and steady nerve control, and alcohol impairs brain clearness and nerve control.

"Human life, costly machines, and continuous, efficient operation are too valuable to be placed at the mercy of minds befuddled by intoxicants. When we realize how deep-rooted these demands of modern industry are, it is then that we see the absolute impossibility of mechanical advancement going hand in hand with alcoholism." [7]

54. DRINKER'S WOUNDS HEAL MORE SLOWLY

When the statistics of the Leipsic Sick Benefit Societies[12] were studied it was found that those who had been classed as "drinkers," when injured required, on the average, a longer time for recovery than insured workers as a whole. The black bar in the illustration shows that among men in the prime of life, 25-34 years of age, the relative amount of time lost by the drinkers was nearly three and three-fourths the amount of time lost by the average worker.

Dr. W. J. Brickley,[13] when in charge of the Relief Station of the Boston (Mass.) City Hospital to which some 40,000 patients were brought annually, found that alcohol was responsible for many accidents, and that drinkers when injured required a longer time for recovery, and often made a poorer recovery. The drinker's broken bone requires a longer time to knit because the body cells and tissues are impaired and only slowly "build the bridge" which "knits" the bones, or closes the wound.



55. DRINKERS HAD MORE DEATHS FROM WOUNDS

The figures are from those compiled by the Leipsic Sick Benefit Societies.[12] Others have shown that the habitual heavy drinkers had more accidents than the average insured worker (Numbers 52 and 53); that they were slower in recovering from injury (Number 54). This illustration carries the story to the end showing that proportionately more deaths occurred among injured drinkers than among the insured workers in general.

Dr. W. J. Brickley[13] (p. 13) thus explains the greater mortality among injured alcoholics:

"When certain types of injury occur to a patient while under the influence of alcohol it is impossible to make a full diagnosis until the effect of the alcohol has passed off. With contusions of the head producing concussion or other intercranial injury, it is impossible in the presence of alcohol to localize or estimate the extent of the injury. Abdominal injuries or cases where poison has been taken are obscured by alcohol. . . . By obscuring the diagnosis alcohol defers proper treatment. This delay diminishes the chance for life when the real conditions are discovered.

"By increasing the danger of infection, or by neglecting the beginning of the same, a condition is permitted to arise which aggravates the injury and lessens the chance for life.

"Alcoholics do not bear surgical shock well. After amputation due to injury and severe lacerations a longer time is required to bring them into a condition where it is possible to operate. This necessitates deferring urgent operations.

"Alcoholics do not live so long after being injured as abstainers do; which is another way of saying that their vitality is less."

Dr. Brickley thus summed up the points at which the drinker is at a disadvantage when injured:

"Alcohol obscures the diagnosis.

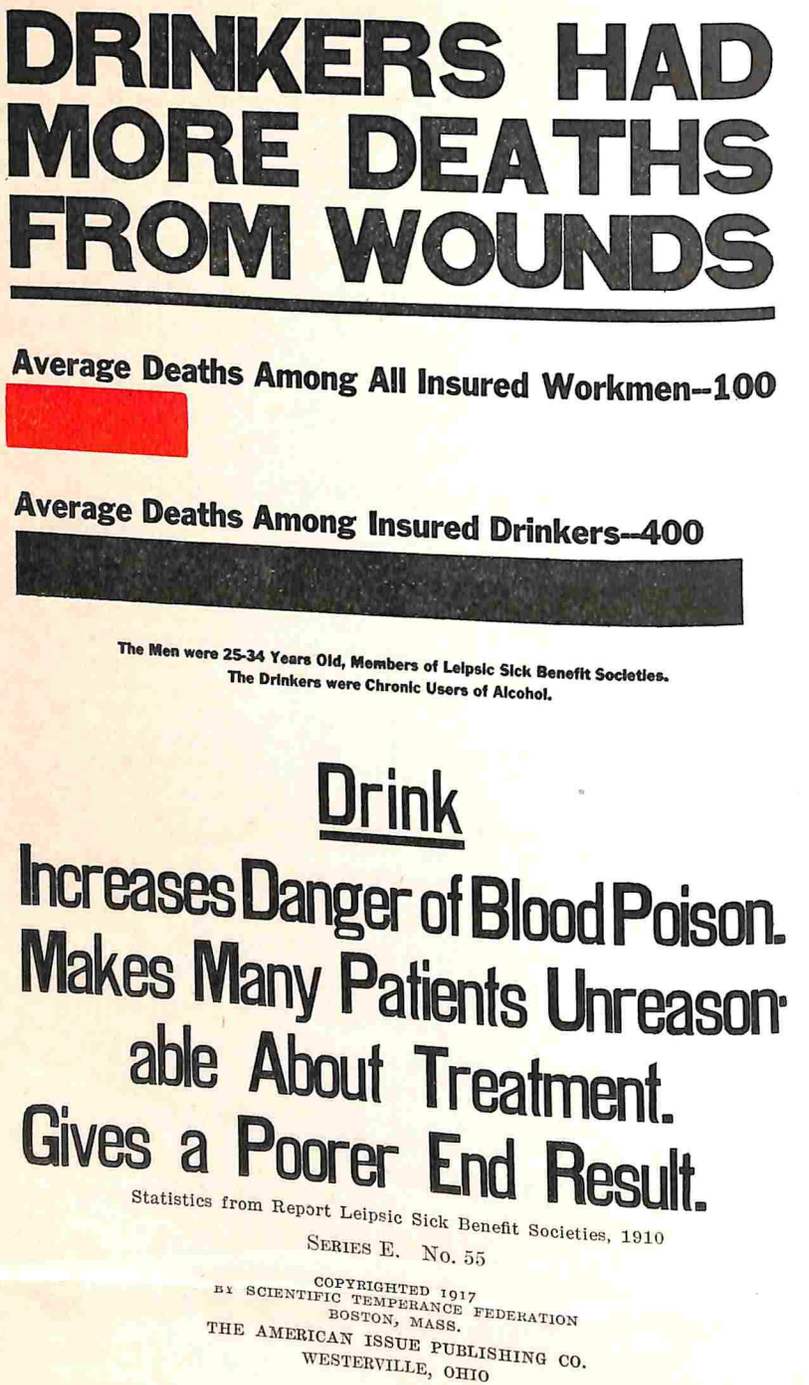
"Alcohol increases the chance of infection of a wound at the time of the accident.

"Alcohol prevents adequate treatment.

"Alcohol increases the danger of intercurrent complications.

"Alcohol retards the process of repair.

"Alcohol gives a poorer end or result.



"Alcohol increases the mortality in accidents."

Thus the drinking worker who belongs to a sick benefit society may cost the society and his more sober fellow workers a larger expense after an accident.

66. SAFETY REQUIRES SOBRIETY

The so-called "Workmen's Compensation Laws" require that under certain conditions when an employee is injured while at work, the employer must give some financial compensation for expenses involved in the injury, loss of time, or loss or impairment of further earning capacity.

This led to installation of devices and arrangements for making conditions of work as safe as possible, but always the human factor has to be taken into consideration. Sometimes the employer found that the courts did not make an exception in his favor when the injured worker was injured while under the influence of alcoholic liquor. Hence the employer who had work involving danger began to give preference to employees who are sober and, therefore, less liable to accidents caused by carelessness, unsteadiness, or inattention resulting from the effects of alcohol on the brain and nervous system.

One of the early narcotic effects of alcohol is the "blunting of self-criticism," with a consequent "disregard of occurrences and conditions normally requiring caution of act and word, trespass of rules previously respected." [4]

Alcohol thus tends to make the worker careless. Experimenters in laboratory tests have the evidence from their subjects that after doses of 30-40 c.c. of alcohol corresponding to about 2 pints of "2.75 per cent" beer,[41] they had the feeling that they did not

WHY AMERICA WENT DRY

Safety Requires Sobriety

Workmen's Compensation Laws made it necessary for employers to employ sober men.

One workman in ten was injured annually in United States' industries.

If no more than one-third of these accidents were due to drink, about 8,000 deaths, 100,000 severe injuries and 600,000 slighter hurts every year, WERE DUE TO ALCOHOL.

Sobriety Promotes Caution and Steadiness, Saves Lives and Limbs

Accident estimates based on Statistics by F. L. Hoffman, Proceedings Nat. Safety Council, 1914, p. 147.

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care what happened. The loosening of the sense of responsibility is likely to be dangerous when working with machinery.

As early as 1897 employers were discovering that the drinking workmen might occasion serious loss as shown by the inquiry of the United States Commissioner of Labor. It brought replies from 1,794 employers who required that their employees should be total abstainers from alcoholic liquors. About one-half of them gave as the reason for this requirement that they wished to guard against accidents. With this, which was given the sole reason in 686 cases, there were linked in the remaining replies such reasons as these:

"To guard against abuse of animals, dishonesty, ineffiicency, poor work," or "because of the unreliability of drinkers," or, "because of the responsibility of the work." [5]

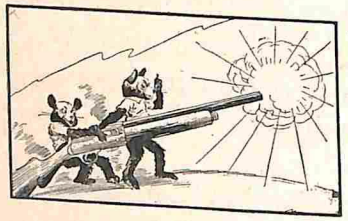
In the final report of the British Health of Munition Workers' Committee, there is related the experience of a factory where fuses were made during the war. The number of accidents among night-workers fell rapidly after the restriction of consumption of alcoholic liquors.[4]

67. THE DRINKER ENDANGERS HIS MATES

In his famous address, "The Alcohol Question," Dr. G. von Bunge discussed the question of the right of personal liberty to drink if one chose, saying: "Let us never forget that the drinker not only harms himself but exposes to harm those about him. Every year hundreds of thousands of human beings perish through the intoxication of another. Recall the statistics of accidents. . . . We have the right to defend ourselves. We are not obliged to live with men

WHY AMERICA WENT DRY

The Drinker Endangers His Mates



Bear in mind that the man who has had a little alcohol is liable to go off at half-cock.

He Acts thoughtlessly or Recklessly then Somebody Gets Hurt

Two Men were Killed and Three Crippled
because the crane operator had been drinking.

He started the machinery too soon and crushed his mates.

Theiss: The Outlook, August 8, 1914

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whose brains are constantly semi-paralyzed. As soon as we have the power to prevent it, we have the right to do so." [6]

The danger that the drinker might cause accident not only to himself but to his fellow-workmen is one reason why as machinery came more and more into use, employers began to require abstinence on the part of workers, and workers began to realize that abstinence is a safety measure for themselves. Sobriety, carefulness, and attentiveness are all necessary to industry, and sobriety will help secure the other two qualities. Scientific experiments with alcohol show that its narcotic effects dull caution, that sometimes it makes the worker act more quickly than he should, but with more mistakes. The National Safety Council of the United States, including a membership of 1,700 industries and employing over 2,500,000 workers, in 1914 adopted this resolution:[39]

"WHEREAS, It is recognized that the drinking of alcoholics is productive of a heavy per cent of the accidents and diseases affecting the safety and efficiency of workingmen,

"BE IT RESOLVED, That it is the sense of this organization that it go on record in favor of eliminating the use of intoxicants from the industries of the nation."

In the iron and steel industries much work formerly done by hand is now performed by machines. Laborers used to carry, pull, shovel, or lift materials. Now machinery lifts or carries in a few minutes more material than many men could lift or carry or pull in a whole day. In one of America's great steel companies a superintendent of labor said of the need of care on the part of the workers, "Cranemen must be exceedingly careful. They work with melted metal over the heads of workers and near molds that topple with a slight jar." [7]

This means that the machine operators must be on their guard against accident every minute of the

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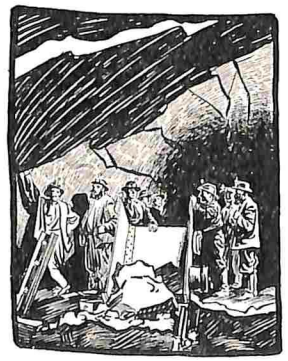
PROHIBITION REDUCED THE ACCIDENT RATE

54 Percent

In the steel mills in Coatesville, Pa., first six months after the city went dry.

83 Percent



In the largest copper-mining and smelting company in Arizona the first dry year [1915].

1. John H. Cole, Sec'y, Mendenhall, Pa.
2. Thomas K. Marshall: "Prohibition in Arizona and its Effect upon Industry, Savings and Municipal Government," p. 4.

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day. They can not afford to lessen by alcoholic drink their mental alertness in the operation of machinery. One error in judgment may injure machinery that will require two or three weeks for repairs, or may injure workers. The workers underneath the crane "are at the mercy of the judgment of the cranemen. Alcohol attacking the nervous system, as it does, becomes a menace to mechanical work; first, because it lowers and endangers productive power and organization of industrial establishments; secondly, because it increases error on the part of workers which, in machine industry, means great loss to life and property." [7]

68. PROHIBITION REDUCED THE ACCIDENT RATE

"If the actual cause of all the accidents occurring daily in the factories, mills, and various fields of labor could be truthfully determined, fully one-half would be found to be the result of carelessness, unfamiliarity with conditions, dulled mentality, or stupidity," said Dr. Nelson M. Black in 1916.[8] "As a rule, the man who is careless will not see that the machine he is working with is in perfect order, or that the tools he is working with are what they should be, and he will neglect to use the means of protection against injury furnished him by his employer. As a result he receives an injury. . . . A man may begin work and follow the instructions absolutely until he becomes familiar with their operation, and then have a contempt for the instructions and put his hand or foot in a dangerous place contrary to instructions. Having done the thing for so long a time he thinks there is no danger for him, and he does it just once too often, with a maimed hand, arm, foot, or leg, the

loss of an eye, or even the loss of life, as a result.

"An individual should not be employed where his lack of brains would endanger himself or others. By 'dullness' is meant slow thinking or a brain that is not alert, one that is dulled by late hours together with drinking and carousing and the resulting loss of sleep. The man who is rested by a good night's sleep and whose brain is not befuddled by liquor can look out for himself far better than the one who has to think two or three times before deciding what to do, especially in an emergency."

Vernon[9] found that when he took with food 60 c.c. of alcohol equivalent to a little over a pint of light wine, or 30 c.c.,[41] without food, within an hour or so afterward on beginning to do work requiring coordination of muscles, there was at the very first an excessive amount of clumsiness. He comments that if this proves to be generally true, it is "of great practical importance with reference to the causation of industrial accidents, for it means that a workman who started his work when under the influence of a special quantity of alcohol would have at the outset a special liability to make mistakes in coordinated movements; that is, he would be especially liable to meet with an accident or to spoil his work."

The general campaign in the United States to reduce the number of industrial accidents had begun before prohibition went into effect so that it is impossible to estimate exactly the effect which the prohibition of intoxicating liquors may have had in the country as a whole in reducing this class of accidents. The statements on the illustration relate to the experience in a city and in a state in the opinion of the employers. State prohibition went into effect in Arizona in 1915. The Copper Queen Company, at that

time the largest mining and melting company in the State, reported that they had many more men employed in 1915 than in 1914. But the accident rate in 1914 was 2.6 per 1,000 shifts of men; in 1915, the rate was but 0.45 per 1,000 shifts of men.[10]

The Manufacturers' Record in 1922 published many statements concerning the effect of prohibition on industry. Among them were the following as to the effect on accidents:

Henry M. Leland, President of Lincoln Motor Company, Detroit, Michigan: "At one time [before prohibition] there were eighteen saloons near our plant, and at noon and night these were crowded with men who returned to their work with trembling hands, unsteady legs, distorted vision, and soured dispositions. The frequency of accidents, to say nothing of indifferent workmanship and spoiled material, was formerly one of the heaviest burdens of industry. Prohibition has certainly made for contentment and prosperity among employes in industry."

E. T. Weir, President of Weirton Steel Company, Weirton, West Virginia: "The consensus of opinion from mangers of our different mills is that under prohibition there have been fewer accidents."

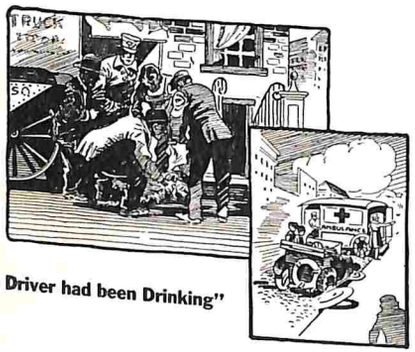
D. H. Campbell, Mining Engineer, Iron River, Michigan: "For the first nine months after the State of Michigan went under prohibition, the number of days of absence from work due to accidents fell off 68 per cent. I made inquiry from a large company near by and their results were practically the same, showing, beyond question, that the men were going underground in the mines in far better condition to take care of themselves."

69. SOBRIETY MAKES STREETS SAFER

Transportation is rapidly passing from the day when passengers or goods were transported by the horse-drawn vehicle. The steam-engine, the electric street car, the automobile and the auto-truck are displacing the older, slower, and safer methods. The United States of America alone has now in operation over 17,000,000 motor vehicles running over its city streets and country roads. It was possible, perhaps, in the old days for the half-drunken driver to depend on his horses to get him and his load safely home. But today, the enormously valuable loads carried by the motor trucks, the millions of lives transported by

WHY AMERICA WENT DRY

SOBRIETY
Makes Streets Safer for Children and Aged



"The Driver had been Drinking"

By use of a drink
A second was lost;
For want of a second
A life was lost.

Alcohol Slows and Confuses the Mind So It can not Easily Meet Emergencies

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motor cars can not be entrusted to half-drunken drivers, or to drivers who, because they have taken drink shortly before starting out, can not think quickly in emergency, or act quickly enough in the second of time in which action must be taken to avoid running over a child or to prevent a collision.

"The old beverage liquor system in operation in this automobile age in America is unthinkable. What degree of safety, under such a condition, would be possible to any traveler upon the roads or to any pedestrian on the sidewalks? If America faces such a situation now, what will the other countries of the world do in regard to this question as the use of automobiles rapidly increases as it is certain to do within the next few years?" [11]

58. DIFFERENT DRINKS, BUT THE SAME AMOUNT OF ALCOHOL

Because the wine, beer or cider drinker uses a larger quantity of his beverage he may easily drink in a day, or an evening, as much alcohol as the whisky drinker, or even more.

As shown by the illustration one pint of light wine (8 per cent alcohol) or 2 pints of beer (4 per cent) contain as much alcohol as 3 ounces of whisky. A large part of the popular consumption of alcohol in the United States formerly was in wines and beers. In the last normal pre-prohibition year (1916) the per capita consumption of alcohol in the form of wine and beer was greater than the amount consumed in spirits, assuming the wine to contain on the average no more than 8 per cent alcohol; the beer, 3½ per cent alcohol; and the spirits, 42 per cent alcohol (by volume).

WHY AMERICA WENT DRY

DIFFERENT DRINKS

But the

SAME AMOUNT OF ALCOHOL

Alcohol 1¼ oz. Alcohol 1¼ oz. Alcohol 1¼ oz. Alcohol 1¼ oz.

All fermented drinks, such as cider, wine, and beer, as well as whisky contain alcohol.

ALCOHOL is DANGEROUS WHATEVER ITS FORM

"We have three great habit-forming curses --- cocain, morphin, alcohol."
---Bulletin of New York City Board of Health

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Per capita consumption U. S. year ending June 30, 1916:[37]

Wine	0.47	gallons
Malt liquors	17.78	"
Distilled liquors	1.37	"

Glasses ordinarily used hold enough of these drinks to weaken the natural self-restraint of a person not accustomed to them. Weakened self-restraint sometimes results in readier speech; it is called "loosening the tongue" and is one of the arguments used for social drinking. Alcohol sets many people to talking more glibly at first, and, for a few minutes makes them more animated and more inclined to talk. But not infrequently after the drinking has gone on for a time, the talk is foolish or careless.

If no more drinks are taken, the effects pass off in a little while, but while they last the drinker is in greater danger of taking another drink than if he had his normal power of self-restraint, especially if people are drinking in company. Companions urge one another to drink again. Refusal is ridiculed as a sign of weakness or fear. One who in normal condition might have the courage to ignore such teasing is more likely to yield while under the effects of the first glass.

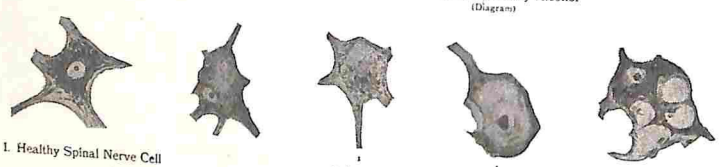
Thus, one chief danger in taking a single glass of any alcoholic drink is its tendency to lead to a second glass or more. Other effects may then become so apparent that all can see them. Some who are ignorant of the first effects of alcohol may condemn the drinker for not "knowing when he had enough." They are blaming him for not exercising self-control in using the alcohol, one of the first effects of which is to weaken self-control. He ran this risk in taking the first glass.

WHY AMERICA WENT DRY

Alcohol Effect Is a Drug Effect

Healthy Brain Cell
(Diagram)

Brain Cell Injured by Alcohol
(Diagram)



1. Healthy Spinal Nerve Cell

2, 3, 4, 5. Spinal Nerve Cells, Injured by Alcohol

The alcohol that every alcoholic liquor contains is a narcotic drug.

It injures body cells, especially brain and nerve cells, first in their action, later in form.

Thus, it disorders for a short time, or permanently if continued, nerve control of the body, reason, will, self-control, morals.

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61. ALCOHOL EFFECT IS A DRUG EFFECT

A nerve cell consists of a somewhat rounded body with several long thread-like fibres. Along the fibres of a healthy normal nerve cell (left-hand figure of the upper row in illustration) may be seen at quite regular intervals, numerous short "twigs."

Cells taken after death from the brains of men or animals that have been poisoned for a long time with alcohol, sometimes show (right-hand figure of upper row) irregular masses along the fibres in place of the fine twigs, as if something had caused the twigs to break down and run together.

If these branching fibres aid, as is supposed, in the passage of thought currents through the brain, their mutilation when it occurs must interfere with normal thinking power.

The body of a healthy cell presents the appearance of a fine regular net-work (No. 1 of the second row of figures on the illustration). Cells that have been injured by continued alcohol poisoning (Nos. 2, 3, 4 and 5 on illustration) lose their regular network and some of their parts appear to break down and fade out. A nerve thus injured is not replaced.

Not all damage to the nerve cells done by alcohol is severe enough to change their form. Small amounts used only for a short time might produce no effects on the form of cells that could be seen under a microscope. But effects on the working power of the brain and nerve cells have been detected after amounts of alcohol no larger than one would get in an ordinary glass or two of beer or wine. (Nos. 52, 59, 63, 64, 65, 78.)

Alcohol is a narcotic drug. Such drugs act principally on the nerve cells. They dull strong painful

feeling, reduce temporarily the action of the nerve cells. The length of time the effect lasts and the degree of the effect varies according to the drug used. Among these drugs are morphin, ether, and alcohol.

It is not known exactly how alcohol interferes with nerve activity; but the explanation considered most probable is that it acts upon the junctions between nerve cells technically called *synapses*.

"It is now pretty well established that we may properly regard the nervous system as consisting of a vast number of vital units, the nerve-cells, each consisting of a central body and one or more slender threads or fibres; each cell having no anatomical but only a functional continuity with others. Their relations to one another may be likened to those of a crowd of people in which each person maintains relations with his fellows and communicates with them only by the touch of hands and feet. There is much evidence to show that these points of contact are the weak points of the nervous pathways; the points that give way most readily under strain or shock and under the influence of fatigue and of various paralyzing drugs.

"Further, there is good reason to believe that in the pathways of the lower levels of the brain, those which subserve the functions first developed in the race and in the individual, the points of junction are relatively firm and open to the passage of the nerve current; while those of higher and later developed levels are less solidly organized, and that they therefore offer more resistance to the passage of the nervous current, in proportion as they stand high in the scale of function and late in the order of development. If we accept this view, and if we make the further simple assumption that alcohol acts equally upon all

such junctions of nerve cells (or synapses) we have the explanation of the phenomena of drunkenness [the successive stages of intoxication from excitability to unconsciousness]. For by the terms of the hypothesis, the alcohol, acting equally upon all cell-junctions in the nervous system to increase their resistance to the passage of the nervous current, will first raise this resistance to the point of impermeability in those junctions in which it is normally highest, that is, the latest developed paths of highest function; and it will progressively effect a similar paralysis of other nerve paths in the descending order of functional dignity and complexity." [38]

Thus would be explained the progressive narcotization observable in drinkers, ranging all the way from an increased feeling of well-being through the stages of blunting of self-criticism, impairment of self-control, emotional instability, uncontrolled passions or actions, finally unconsciousness, and even death, if the narcotization proceeds so far. The later scientific work, done with extreme care and all the latest mechanical devices for ensuring accuracy, indicates that alcohol "is from first to last a narcotic drug." [38] This narcotic effect explains why the alcohol in cider, wine, beer, or spirits gets a grip on many a drinker which he finds difficult or impossible to throw off. Alcohol has some kinship in action with other narcotic drugs. Morphin, for example, tends to produce a change in mental and bodily functions which creates a need or craving for the drug. The gratification of such craving is called habit-forming, and such drugs "habit-forming drugs." The user tends to become less and less susceptible to the immediate effects of the drugs; hence tends to increase the dose to get the effects. And when he is deprived of

the dose he feels discomfort and often shows serious symptoms.

Both of these conditions may appear in the alcohol addict though in less severe form than in the morphin addict. But the difference is one of degree rather than of kind. The body gradually becomes accustomed to alcohol so that it takes more and more of it to produce an effect that the user finds pleasant or to produce drunkenness. Thus an individual, who has been drinking for some time, may boast that he can get away with several drinks without getting drunk. This simply means that his body has become so far accustomed to alcohol that it takes more than it once did to make him drunk.

By the time that he finds that he can take more beer or wine or spirits, without getting drunk than he could at first, he has another motive for drinking besides the desire to be social. The narcotic effect of alcohol by benumbing the feeling of weariness, or of cold makes him think that he "feels good" after drinking; by removing restraints it causes him to feel gay or happy. Little by little more alcohol is required to produce this feeling. Just as he **can** drink larger amounts without getting drunk, so he **has** to drink larger amounts to get the feeling he wants, much as the user of narcotic drugs like morphin and opium has to use more and more of them to get their desired effect. So before he realizes that alcohol has been drugging him, he goes on increasing the amount that he drinks, believing that as long as he does not become drunken, or but seldom, no harm is done.

Just to the extent that the drinker finds himself uncomfortable in trying to stop drinking he has become addicted to the narcotic alcohol. The effect of alcohol in impairing the power of self-control, as a result of its continued action on the nervous system, increases the difficulty of breaking a habit once established. This is a possibility always to be reckoned with by the drinker, since no one knows in advance the extent of his susceptibility.

59. BEER IS A BLUFFER

Many a beer drinker claims that he uses it to give him strength in doing hard work. There is nothing in the beer except alcohol which he can not obtain in better quality in other forms of food or drink. The idea that alcohol furnishes strength for work is disproved by many scientific experiments which the mountain climbing experiment of Durig was one.[17] His carefully measured results showed that the alcohol taken made him work harder and longer to do a given piece of work than when he took none.

He thought that this result was due to impairment by alcohol of the skill with which movements are directed. It was as if the effect of previous training had been lost. The dose of alcohol reduced the experienced climber to the level of the beginner who makes too many movements and those badly directed or ill-judged. Thus the alcohol taken, equivalent to that in 1¼ pints of beer tended "to undo the effect of previous training." [38]

So, in colloquial phrase, alcohol is fooling men when they think it helps them to do their work.

Nor does beer improve the quality of work. Alcohol impairs the steadiness of muscles required by many kinds of work. Dr. H. L. Hollingworth,[18] of Columbia University, tested the steadiness of the extended arm in some young men before and after they had taken light beer containing 2.75 per cent alcohol (by weight). The dose was taken practically on

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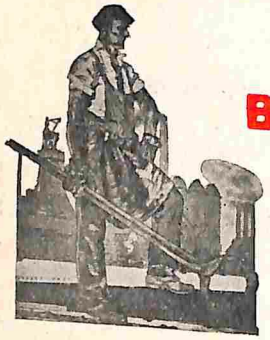
Beer is a Bluffer

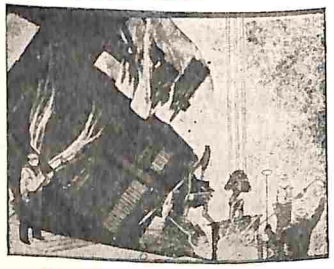


Beer doesn't Make Hard Work Easier

It *decreases* muscle power and *increases* waste motions and fatigue.

Beer doesn't Really Cool One Off

The alcohol in it disorders the body's heat regulating system, thereby *increasing* the danger from both heat and cold.



Beer doesn't Rest One

It *merely deadens* the tired feeling. Food, play and sleep truly restore.

Beer Contains Alcohol, a Habit-Forming Drug

Horsley: Alcohol and the Human Body

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an empty stomach at the noon meal hour. Six tests were made in the forenoon before the dose of alcohol, and six tests were made afterward. On certain days a "control" dose was given. This was exactly like the beer given, except that the alcohol had been removed. The experiment measured the tremor in the extended arm by the number of movements of a stated magnitude in one minute. On the control days the average net loss in efficiency in the afternoon was 21 per cent. On the days when 40-60 c.c.[41] of the light beer were drunk in the noon hour the steadiness in the afternoon decreased 68 per cent. After larger doses of alcohol (66-79 c.c.) the steadiness decreased 241 per cent in the afternoon.

Another test of work measured the number of taps made in one minute by a stylus held in the hand, using the forearm only. On the "control" non-alcohol days there was no loss in efficiency in the afternoon.

Miles (Carnegie Nutrition Laboratory)[19] also conducted experiments with an alcoholic solution containing 2.75 per cent alcohol by weight. The work done in the experiment was similar to that of steering a ship by compass. In the latter case the steersman has to control the wheel so that a certain point on the circumference of the compass card is always exactly opposite another point on the fixed framework of the compass. Any variation of the ship from her course makes the compass card swing in one or another direction and the steersman must bring it back by correctly manipulating the wheel. The electrical "pursuit-meter" used by Miles had a needle which the operator must keep steady. The needle received impulses to swing in varying directions even much more quickly and irregularly than

does a ship compass card. The operator has to counteract these impulses by moving a handle. When the needle deviated from its proper position the amount of electrical current was recorded. Hence the more inaccurate the movements of the operator, the more the meter recorded.

Miles found that after his operator had drunk alcohol diluted to the equivalent of about 1½ pints of 2.75 per cent beer, the meter recorded the passage of about 11 per cent more current than when he had drunk water only. This represents an impairment of accuracy of about 11 per cent after taking alcoholic liquid of only 2.75 per cent alcoholic strength.

Miles concluded from this and other experiments: "There is no longer room for doubt in reference to the toxic action of beverages as weak as 2.75 per cent by weight."

One popular idea about beer is that it cools one in summer and warms one in winter. It does not do this. It disorders the bodys' natural mechanism for maintaining an even body temperature. In cold weather alcohol gives a temporary **feeling** of warmth. The reason for this is that alcohol dulls the nerves controlling the blood vessels of the skin. When this control is impaired, more blood is allowed to flow near the surface of the body, and this warm blood feels warm to the nerves in the skin. But bringing this extra amount of blood to the surface in cold weather cools it, and causes the body to loose an unnecessary amount of heat, and the result may be a lowering of body temperature. Thus the person who drinks beer or any other alcoholic liquor to keep off cold is likely really to suffer more from cold, and may even incur serious injury or death if he has used much alcohol.

In summer, the cold beer feels cold as it is being swallowed, but the alcohol in it disorders the nerves which control the body's natural mechanism for cooling the body, and also may make the drinker careless about observing ordinary precautions.

Another idea is that beer taken after the day's work is done gives rest to the tired worker. It does not really rest him. It dulls the **feeling** of weariness, but this does not restore the tired body as do good food, rest, sleep, healthful recreation. These enable the cells to throw off the products of fatigue and rebuild for new work. In merely deadening the tired feeling, beer deceives the user, perhaps into doing more work when he ought to rest; perhaps into thinking he is helped when in fact he is being narcotized.

If the time spent in taking beer or other liquor in the idea that it rests one when tired from hard work were spent in completely relaxing the body, especially in the fresh air, it would give real rest, especially if a glass of milk or a cup of nourishing soup were taken to give the muscles genuine food. Milk has taken the place of beer with many American workers who formerly thought they had to have been when doing a hard piece of work.

60. WINE THE PASS-KEY TO ALCOHOLISM

Juice in the fruit in normal conditions is not fermented and does not contain alcohol. Inside the unbroken fruit skin it is protected from the yeast cells in the dust (or bloom) on the outside. When the juice is pressed out, the yeast cells pass into it. Pasteur taught that yeast cells, falling into liquors in shallow vessels, grow and multiply without producing alcoholic fermentation because they can get from the air the oxygen they need. But when man col-

WHY AMERICA WENT DRY

Wine a Pass-key to Alcoholism

All Wine Contains Alcohol

Wine contains from 8 to 20 per cent of alcohol. Unfermented grape-juice and raisins contain no alcohol and are desirable foods.

Wine Impairs Working Ability

Careful tests prove that as little alcohol as that in a half-pint of wine impaired work requiring skill and precision; also mental working ability.

Wine Leads to Stronger Liquors

Drink's Traces as a French Artist Saw Them in France.

"Men begin with wine; soon the palate is palled and asks for something *stronger*"

—The Paris (France) Constitutional.

1. Totterman: Finska Läkaresällakapets Handlinger, 1916
2. A. Smith: Report V. Int. Congress Against the Abuse of Alcoholic Drinks, 1895, p. 341

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lects a quantity of the fruit juice so that the yeast cells are immersed in it, they get their oxygen from the sugar in the juice; in doing so the sugar is broken up into alcohol and carbonic acid gas.

Fermentation is one step in the process of decay, breaking up the complex sugar into simpler substances. In the undisturbed fruit, nature accomplishes this by molds without producing alcohol liquors. Thus man, not nature, is responsible for providing the conditions necessary to production of alcoholic wine.

Some people think wine harmless because they have not put alcohol into it. This is not necessary. The yeast cell in the air, or on the fruit, passing into the liquid produces the alcohol. "Light" wines in which alcohol is thus formed contain from 7 to 14 per cent alcohol. At about the latter point, fermentation stops. Stronger wines have some form of alcohol added.

"The leading characteristic of wine," says the Century Dictionary, "must be referred to the alcohol it contains and upon which its intoxicating [poisoning] powers principally depend."

The ancients knew wine would intoxicate. From the most ancient times men have been warned against drinking enough wine to make them drunk, because, it was supposed, the harm was only in drunkenness. History, literature, and Scripture abound in illustrations of the drunkenness caused by wine.

Wine, like other alcoholic liquors, is drunk partly for its narcotic effect. At first this narcotic effect is represented by a feeling of well-being. (P. 34.) As time goes on, to get this effect of well-being, many habitual drinkers have either to increase the amount of wine as the body becomes accustomed to the alco-

hol, or to use stronger liquors. The idea that wine is a safe drink if used "moderately" arose before precise methods were used to study its effects; it was thought that as long as the drinker was not clearly drunken no harm was done.

Modern scientific experimentation has shown that amounts of alcohol formerly considered moderate, taken in the form of wine, can impair efficiency. Aschaffenburg[20] in a well-known experiment with four type-setters found that their efficiency averaged 8.7 per cent less on days when they took half a tumbler of Greek wine before beginning their type-setting test than they accomplished on corresponding non-alcohol days.

Experiments by Schulz[1] on the effects of alcohol on clearness of vision showed that 10 c.c. of alcohol, taken in the form of Rhine wine or champagne, in nearly all cases causes marked diminution in ability to distinguish shades of red and green; diminution of intensity of vision was more marked for red than for green. The tests indicated that even these moderate amounts of alcohol, equivalent to about one and one-half glassfuls of wine, might impair vision of persons who had to distinguish between shades of colors, so as to seriously impair efficiency.

Vernon[9] conducted experiments to ascertain the effect of alcohol on manual work and coordination of nerves and muscles. Tests were made with adding machine work, typewriting, and pricking dots on a target. In his own case, 30 c.c. of alcohol taken in the form of claret wine caused an average increase of error of 16 per cent. It was more injurious than a similar dilution of pure alcohol which caused an increase of 11 per cent in errors. A similar experiment with four students showed again that 30 c.c. in the

form of claret impaired accuracy, on the average, even more than the same amount of pure alcohol diluted to the same alcohol strength as the claret. In experiments with typewriting and adding-machine work, while the susceptibility of subjects tested varied, the effect was "invariably in the direction of diminished control of the muscles as proved by the increase in the number of errors." More errors were made when the alcohol was taken without food. One subject made 74 per cent more adding-machine mistakes after taking claret containing 19.4 per cent of alcohol; another increased her mistakes in typewriting 156 per cent after drinking sherry containing 22 c.c. of alcohol.

Vogt,[21] a Norwegian experimenter, committed Greek poetry to memory, sometimes after taking the amount of alcohol in half a pint of champagne, sometimes without alcohol. He found he required about five times as long to learn 25 lines after taking the alcohol, as on the days when he took no alcohol. Six months later it required more effort to relearn the lines committed to memory on the wine days.

Effects vary with individuals, some being affected by quantities which seemed to produce no conspicuous effects on other persons. But the fact that impairment of efficiency has been proven possible makes the use of even moderate quantities of wine a risky erperiment for the person who wishes always to be fit for his tasks and for emergencies which require quick, accurate thought and action.

WHY AMERICA WENT DRY

John Barleycorn Not a Good Sport

FOOT RACING

"I positively know from experience in fifteen Marathon races that alcohol used in any form in a race of this kind is a positive detriment."

GEORGE V. BROWN, *Mgr., Boston Athletic Association, 1908*

FOOTBALL

Coach "Hurry-Up" Yost says: *"Nothing tries a man's staying power like football."* He will not "waste his time trying to train a drinker."

BASEBALL

Connie Mack says:

"All umpires together haven't put as many ball players out of the game as OLD MAN BOOZE."

Alcoholic liquors impair strength, eyesight, judgment, quick thinking and reaction time.

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78. JOHN BARLEYCORN NOT A GOOD SPORT

The runner needs strength, endurance, good lung capacity, cool head.

The statement about the use of alcohol in running matches was made by the manager of the Boston (Mass.) Athletic Association. Every year this Association conducts a running match over a continuous distance corresponding to that covered by the famous runner from the field of the Battle of Marathon. One of the rules of the contest is that no alcoholic liquors are to be used before, during or immediately after the race, because experience has shown that the strength of the runners gives out more quickly when alcohol is taken. The South African runner, Heffron, ascribed his loss of an international race in London to the fact that two miles from the goal he accepted a drink of champagne. "It was a great mistake," he said. "I got a cramp a mile from the finish and then 'lost my head,'" that is, he lost the mental poise which perhaps would have helped him win in spite of hampering circumstances.

The football player needs strength. endurance and quick wits. Fielding Yost, who is quoted, has trained university football players for many years. He knows that alcohol impairs the endurance ("staying power") which the player needs, and has said further that "A boy or young man who drinks does not give himself a fair chance."

The baseball player knows that the man who throws the ball must be able to throw it exactly where he wishes to place it. One of the first effects of alcohol is to impair control.

On a baseball team every play is a signal to every member of the team to do something or to stay still.

Alcohol slows ability to respond to signals, or if a player has to decide quickly which one of two motions to make, he may move more quickly after taking alcohol, but is more likely to make the wrong motion. Control, quickness, accuracy are all needed in this game.

The sentence quoted about baseball was spoken by the manager of a baseball team that for several years won the national American baseball championship. When Connie Mack said that "Old Man Booze has put more men out of the game than all the umpires together," he meant that drinking on the part of baseball players had sometimes ruined their ability to play and compelled them to drop out of the profession. Hugh Fullerton once traced the careers of 32 players in the most important baseball teams. These men in 1903 were "moderate" drinkers. He compared them with 24 non-drinking players. The non-drinkers, as years passed, were the more uniformly dependable players. By 1914 out of 32 drinkers, only 4 (12½ per cent) were still playing. Of the 24 non-drinkers, 11 (49 per cent) were still playing. Here is what became of the players, so far as he was able to get information:

	Prosperous	Still Playing	Not Prosperous	Dead	Missing
Drinkers	5	4	6	8	3
Non-drinkers .	14	11	1	2	0

57. HIT THE MARK

Tests of the effects of alcohol on marksmanship were made by Dr. E. Kraepelin, the psychiatrist of Munich, on Bavarian soldiers.[16]

Twenty experts and reliable men were selected

for the 30 series of tests carried on during 16 days. Twenty thousand shots were fired at a distance of 200 meters. The men lived as uniformly as possible from day to day and were not allowed to take doses of alcohol other than those given in the experiment, or to use coffee. The day on which alcohol was given was followed by a day of like conditions in every respect, except that the same quantity of water (30-40 gms.[41]) was given instead of alcohol.

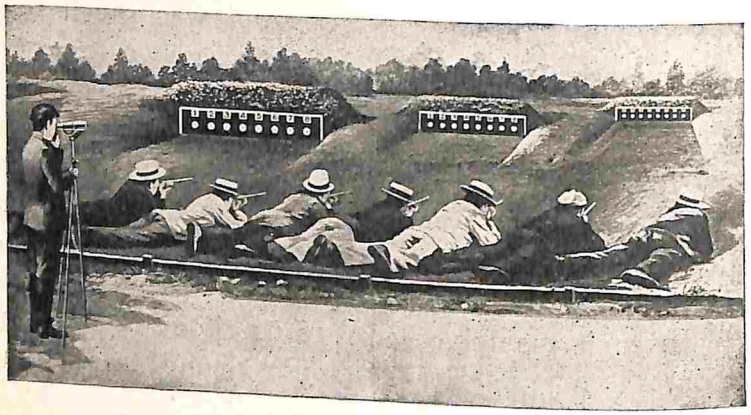
The records for shooting in the forenoon and in the afternoon were kept separate, as the afternoon efficiency in precision was not quite as well maintained as that of the morning.

In each case there were four shooting periods. Before the first neither water nor alcohol was given, and it was used as the standard for the half-day's work. It was followed by three shooting tests performed respectively at 5 to 10 minutes, 25 minutes, and 45 minutes after the water, or the alcohol, was administered. The value of the work done was estimated by the proportion of times the shot hit the center of the target or nearly hit it. This was reckoned carefully by sections of the field of the target showing where the balls had struck.

With 11 men there was nothing but impairment of efficiency from the beginning on the alcohol days. On the average this amounted to 4 per cent in the first period after taking the alcohol; with some men it amounted to 10 per cent. In a few cases there was a slight improvement in this period, usually amounting to only one-half of one per cent, but occasionally to 7 per cent.

In the second period (25 to 30 minutes after taking the alcohol) there was a sharp drop in precision, an average diminution of 2 per cent from the record of

HIT THE MARK



Twenty Skilled Marksmen Fired 17,000 Shots in 16 Days.

SHOOTING WAS POORER BY 3 TO 10 POINTS IN 100

HALF HOUR AFTER TAKING ALCOHOLIC DRINK EQUAL TO TWO PINTS OF BEER

Drink Impairs Skill

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Tests in Bavarian Army, 1908, by Prof. E. Kraepelin
Intern. Monats. z. Erforshung d. Alkoholismus, Heft 10-11, Oct.-Nov., 1916

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the non-alcohol days. Seventeen of the men showed a decided impairment which ran from 8 per cent to 12 per cent.

In the third period, 45 minutes after taking the alcohol, the impairment of precision had begun to subside. On the average it was still 3 per cent, but in some individuals ran as high as 10 per cent.

In only two of the men was the precision regularly unimpaired but slightly better after the alcohol; this improvement amounted to only about one-half of one per cent.

Dr. Kraepelin noted that in this experiment, as in many others, the alcohol caused delusion in the subjects as to the effects. When questioned concerning their impression as to the effect of alcohol upon themselves, five thought they could shoot better under the influence of alcohol. Actually two had shown a slight improvement at the beginning, and one at the end. But at the maximum of the effect all of these three had done worse. The other two, although they thought they had done better, had decreased in precision as much as 10 per cent.

Three men thought they shot worse under the influence of alcohol, and this was true, but in one case only a little worse.

The other men could give no opinion as to the effect of the alcohol, but had been unaware of the very marked effect of it upon their work. Ten of the men declared that they would rather have the alcohol when they were to shoot, and the majority of these were badly influenced by it. "Precisely in this self-deception," said Dr. Kraepelin, "which concealed from them the impairment of their ability, lies a special danger." It was due to the early effects of alcohol which impair the ability for self-judgment.

"The relatively small number of errors was probably due to the fact that the men were excellent marksmen. Efficiency less perfected by practice is more susceptible to the impairing influence of alcohol." This is a conclusion similar to that reached by Hollingworth (p. 37).

"It is, nevertheless, not an insignificant fact that even 40 grams of alcohol may cause impairment without their being conscious of it," said Dr. Kraepelin. "Conditions in war often must be much more unfavorable than those under which our subjects were tested. Loss of sleep, over-exertion, insufficient food, irritable state of mind, may greatly increase the impairing effect of the alcohol which predominates even under favorable circumstances."

63. ALCOHOL MAKES HARD WORK HARDER

The story of the marching test in the illustration is that of a Bavarian regiment during army maneuvers in time of peace. Company A and Company B were allowed a moderate amount of alcoholic drink during their rest periods. Company C. had no such drink. The result was as related in the illustration.[25]

General Wolseley[26] once made a similar test in the British army during one of several long marches which occupied several weeks. Some of the men were divided into three squads. The first squad was given a daily ration of whisky; the second, a daily ration of beer; the third, nothing to drink but water. At first the whisky squad marched gaily ahead of the others. Before long the beer squad overtook and passed it. Finally the water squad marching at a moderate steady gait, overtook, first the whisky squad, then the beer squad, and reached its destination long before the others. The alcohol benumbed the sense of fatigue in the two alcohol squads but from the beginning hastened fatigue.

Alcohol acts as a depressant on the nervous system so that control of muscles is impaired. As a result, useless movements may be made; muscles may not work together properly so that incorrect movements are made. These useless or incorrect movements use up bodily energy so that the worker works just as hard or harder after taking alcohol but accomplishes less.

Some very careful tests made with delicate instruments at the Carnegie Nutrition Laboratory,[27] Boston, showed that after taking 30 to 40 c.c. of alcohol,[41] the muscles of the lower leg responded more slowly to a measured blow upon the tendons below the knee ("knee-jerk"). The thickening of the muscles involved was decreased 46 per cent. This represents a loss in contractile power and consequently in lifting power.

There are muscles that pull the eyelid quickly over the eye in a protective motion when a sudden sound is heard. After alcohol in these experiments the protective motion was delayed 7 per cent, and the extent of the movement of the eyelid was decreased 19 per cent. The number of finger movements in a given time was reduced 9 per cent. The experimenters came to the conclusion that these and other results which they obtained were "clear indications of decreased organic efficiency as a result of moderate doses of alcohol."

WHY AMERICA WENT DRY

ALCOHOL

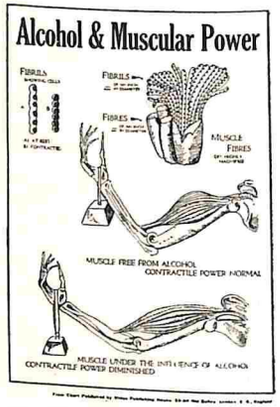
Makes Hard Work Harder

Drink Increases Exhaustion

In a marching test in a European regiment the soldiers in Co's A and B were given drink moderately; Co. C men took none. In Co. C *only one* man fell out exhausted; but in Co. A 20 men fell out; in Co. B 22 men.

Drink Decreases Strength

Recent precise tests showed that alcohol equal to that in a pint of wine or a quart of Beer slowed the action of muscles tested and *decreased their contractile power 46 percent.*



1. Hoppe: Die Tatsachen uber den Alcohol, 1912, p. 202
2. Dodge and Benedict: Psychological Effects of Alcohol, 1914

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64. ALCOHOL IMPAIRS SUPERIOR SKILL

In skilled work, brain, nerves, muscles, eye, hands, or feet, must work together according to the kind of work to be done. Practice is necessary to acquire skill.

Experiments with alcohol have shown that it tends to decrease the skill one may have won by practice and hard work.

The drawing in the illustration shows the results of one of these tests.

The experimenter[28] for the test threaded needles to find how much work his brain, nerves, and muscles of eye and hand could do and whether alcohol impaired this ability to work. He put 200 needles in a cushion, cut a lot of threads about 8 inches long, laid the threads straight on a board so that he could easily pick up single threads, then threaded just as many needles as he could in five minutes, throwing each needle as it was threaded upon a piece of paper. At the end of 5 minutes he laid a new piece of paper over the threaded needles, and went on threading for another five minutes, until he had worked twenty minutes in all. Then it was easy for him to count the number of needles he had threaded in each five minutes and the total number in the day.

The figures at the left in the drawing represent the number of needles threaded. The white columns show the amount of work each day when he took no alcohol; the black columns show the work done on the days when he took 25 c.c. of alcohol.[41]

The first group of white columns show that day by day he increased the number of needles he could thread in 20 minutes. The first day he threaded but 103; the second day, 150 needles; the third day 165. By the 12th and 13th and 14th days he could

WHY AMERICA WENT DRY

ALCOHOL IMPAIRS SUPERIOR SKILL

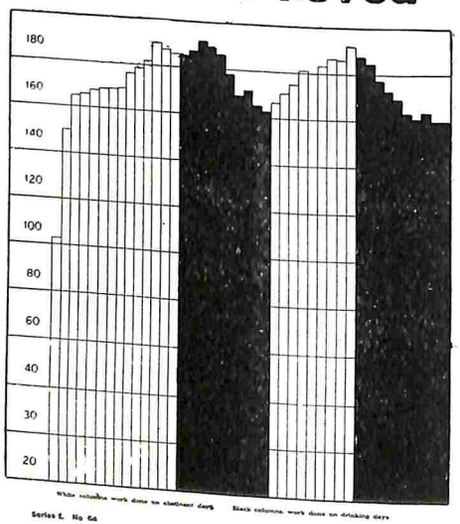
Experience Says:

Drinking Impairs all kinds of highly skilled hand work, such as watch-making, fine tool work, surgery, which require precise nerve control of the muscles.

Scientific Experiment Proved

Drinking decreased by 10 to 15 per cent *fine hand work* in tests made *11 hours after taking the equivalent of 1½ pints of 2.75 per cent beer.*

The worker also tired sooner.



1. Uno Totterman: Finska Lakaresallskapets Handlingar, Oct. 1916

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thread more than 180. He gained skill by practice.

Then he began taking the alcohol 11 hours before he did his needle-threading (black column). At first his skill continued to increase, but by the 20th day the number of needles threaded had fallen to 177 and from that time on through the rest of the alcohol days, the number continued to fall till on the 24th day he threaded but 164 needles. Alcohol caused him to lose some of the skill he had won by practice. During the last of these alcohol days he found that his hand trembled a little and his eyes grew tired more easily.

Then he stopped the alcohol. The second group of white columns show that skill returned quickly and increased almost constantly till on the last day he threaded 191 needles.

65. ALCOHOL HINDERS SUCCESS IN BUSINESS

The essentials of a good stenographer are attention, ability to think quickly, to transcribe notes accurately and speedily, care in details, a sense of responsibility.

"A typewriter is merciless. An error is an error and throws out the entire piece of work. One simply has to become 100 per cent. accurate. This habit of absolute occuracy is of highest value because into forming it, goes persistent honest effort."—E. S. Adams.

Reference has already been made (No. 60) to some English experiments as to the effect of alcohol in the form of wine on typewriting.

Frankfurther[29] made other tests on the effect of alcohol on typewriting. He wrote from memory a few lines from a poem of Schiller amounting to about 4,500 letters. Every day a preliminary test was made to ascertain the working ability of that day. Then the results of subsequent tests were compared with

WHY AMERICA WENT DRY

ALCOHOL
Hinders Success in Business

Speed in type-writing was reduced and more than twice as many mistakes made after taking alcohol equal to that in a pint bottle of wine or two bottles of beer.

Experiments in writing, adding and memorizing also showed poorer work.

Alcohol Impaired Nerve Control and thus Speed and Accuracy

Frankfurther: Psychologische arbeiten, Vol. VI, 1914

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the results of the preliminary test. The amount of alcohol used was 40 c.c.[41] diluted to half its strength and flavored with 20 c.c. of raspberry juice. Normal days alternated with alcohol days. The alcohol on the alcohol days was taken after the preliminary test and an interval of 20 minutes was allowed for the influence of the fatigue of the preceding work to pass off. The same interval was allowed after the preliminary test on the days when no alcohol was taken (normal days).

The amount of work done in the preliminary tests on the non-alcohol days averaged 109 letters per half minute; in the chief test, it averaged 108 letters, a decrease of but one letter which would reasonably be attributed to fatigue.

On the alcohol days, the preliminary tests averaged 114.2 letters per half minute; but in the tests made after alcohol was taken, only 108.6 letters were written.

Expressed in percentages the working ability in the chief experiment on the non-alcohol days was 99 per cent of that shown to be normal for the day. On the alcohol days the working ability after taking the alcohol was but 95 per cent of the normal for the average day.

The loss in quality of work was much greater than the loss in quantity of work.

On the non-alcohol days there were, on the average, 16 errors per 1,000 letters struck in the preliminary tests. In the chief experiment on these same days the average number of errors was 17 per 1,000 letters struck.

On the alcohol days there were 14 errors per 1,000 letters struck, in the preliminary tests. That is, the normal work on those days before alcohol was

taken was more accurate than in the same preliminary tests on the non-alcohol days. But notwithstanding this better beginning on the alcohol days, the errors after taking the alcohol increased to an average of 31 errors per 1,000 letters struck.

The experimenter said of his experience on the alcohol days:

"I had the feeling that the fingers ran faster than I could find the right place for the stroke. I often struck keys against my will so that I had to make an effort to hold back a motion in order not to make a mistake at every letter."

For employers of labor the evidence showing the greatest number of mistakes made after alcohol had been taken has a practical interest. In the case of a skilled workman, this effect of alcohol might result in spoiled work; in the unskilled laborer the result might be damage to property or accidents, or loss of life. Drink increases dangers for workmen themselves, may make them less skillful and, therefore, less able to earn good wages.

62. DOCTORS DROPPING ALCOHOL AS MEDICINE

With the wider medical knowledge of recent years physicians have been changing their methods of treatment of disease. Among these changes is a decreasing employment of alcohol as medicine.

About 30,000 physicians in the United States were asked in 1922 their views as to the necessity of using whisky, wine, or beer for medicine.[23] About one-half thought that whisky might be useful at times, but more than half had not found it necessary to prescribe it. Two-thirds of them said that wine is unnecessary; and three-fourths of them said there is no medical necessity for beer. The National Prohibition Enforcement Act of the United States al-

lows physicians to prescribe spirits for medical purposes if they observe certain limitations and regulations in obtaining it, except in States where State law forbids the sale even for medical purposes.

The hospitals are using far less alcohol as medicine than formerly. An inquiry[24] in 1922 as to the quantity of alcohol administered in many of the largest hospitals in 1920 and 1921 brought out the following facts:

Lakeside Hospital, Cleveland, with 300 beds and 106,000 patients in the out-patient department, with attending physicians from all parts of the city did not have a single prescription for alcoholic liquor handed in during 1921. Grant Hospital, Columbus, Ohio, reported: "We carry no brandy, whisky, or wine. We feel they are not needed."

Cook County Hospital in Chicago reported that it had used no alcoholic liquor in the treatment of diseases since national prohibition went into effect. The Hospital Division of the Department of Public Welfare of St. Louis, Missouri, reported: "We have neither purchased nor dispensed any whisky, brandy or wine during 1920 and 1921." Pennsylvania Hospital reported that it used half a barrel of whisky and brandy in 1921. This was about one-fortieth of what was used 25 years ago, although the number of patients was more than doubled. For the 10 public hospitals of New York City including the great Bellevue and Metropolitan Hospitals, not over 700 gallons of whisky have been purchased annually for several years. Only the older physicians prescribe it. The City Hospitals of St. Paul and Minneapolis and 44 other hospitals of the State of Minnesota reported that they use no alcoholic liquors in treatment of patients. The Presbyterian Home Hospital of Mem-

WHY AMERICA WENT DRY

Doctors are Dropping Alcohol as a Medicine

The Doctors Said:

"The use of alcohol in medicine as a tonic, a stimulant or for food has no scientific value and should be discouraged."

From Resolutions adopted (1917)
By House of Delegates of American Medical Association

Doctors agree that alcohol should not be used as a medicine, except when prescribed by a competent physician. Very little is prescribed by any doctor as compared with fifty years ago. Very many doctors never prescribe alcohol.

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phis, Tennessee, reported, "We get along just as well without it as we did when we used it." Dr. Charles Mayo in his address as president of the American Medical Association in 1917 said:[40] "Medicine has reached a place where alcohol is rarely employed as a drug, being replaced by better remedies."

The reduced medical use of alcoholic liquor which still remains represents a great change from the practice of even a century ago when it was largely used in the treatment of many diseases for which it is practically never used today.

70. WHY INVITE DISEASE?

Mortality from organic and degenerative disease is not confined, of course, to drinkers of alcoholic beverages. But life insurance experience shows that certain classes of these diseases occur disproportionately among those exposed to injury from alcoholic beverages.

The investigation of the records of the American and Canadian life insurance companies[14] showed that in the drinking groups the death-rate from Bright's Disease was above normal, and that among the so-called steady moderate drinkers (defined as those using more than two glasses of beer or a glass of whisky daily) the death-rate from cirrhosis of the liver was five times the normal.

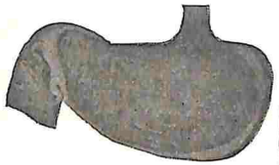
Among saloonkeepers who tended their bar where liquor was sold, the death-rate from cirrhosis of the liver was six times the normal; from diabetes, three times the normal; from cerebral hemorrhage or apoplexy, nearly twice the normal; from organic diseases of the heart, nearly twice the normal; from Bright's Disease, nearly three times the normal.

For brewery officials insuring under 45 years of

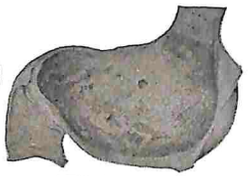
WHY AMERICA WENT DRY

Why Invite Disease?

ALCOHOL AND THE STOMACH



HEALTHY STOMACH



A STOMACH INJURED BY DRINK

The use of alcoholic liquors tends to slow digestion. Continued or heavy drinking may cause gastric catarrh and other stomach disorders. and rarely. ulcers.

ALCOHOL AND THE LIVER

Long continued or heavy drinking may cause fatty degeneration or "hobnailed" liver.

HEALTHY LIVER

A "HOBNAILED" LIVER OF A BEER DRINKER

ALCOHOL AND THE HEART

HEALTHY HEART

A FATTY AND DILATED HEART OF A BEER DRINKER

Alcohol is not a stimulant but a depressant.[1] Continued or heavy use may cause permanent injury to the heart or blood vessels.[1]

ALCOHOL AND THE KIDNEYS

Continued or heavy use of alcoholics is liable to cause fatty degeneration, granular kidneys or Bright's disease.[1]

HEALTHY KIDNEY

A GRANULATED KIDNEY DUE TO DRINK

"While alcohol is not the only poison causing Bright's disease, it is a very noticeable one, and *it is the only one taken into the body that can easily be avoided.*"—*Bureau of Public Health Education Dept. of Health, New York City*

1. Sir Victor Horsley: Alcohol and the Human Body, 1920
2. Dodge and Benedict: Psychological Effects of Alcohol, 1915

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age, the death-rate from cerebral hemorrhage and apoplexy, organic diseases of the heart, pneumonia and Bright's Disease was about twice the normal, and from cirrohsis of the liver, three times the normal.

In a study made by the Prudential Life Insurance Company[30] of the mortality in men engaged in twenty occupations, seven occupations in which there was an excessive death-rate from alcoholism lost proportionately nearly twice as many as the average from liver diseases. The saloonkeepers' rate was nearly four times the average, and in other digestive diseases the saloonkeepers had the highest rate of the twenty occupations. In urinary diseases saloonkeepers also led with a mortality percentage of 16.1 as against the average proportion of 12. "The high mortality from liver and urinary diseases in saloonkeepers and bartenders is an indication of the influence of occupation upon the mortality," said the official report.

71. ALCOHOL SIDES WITH GERM ENEMIES

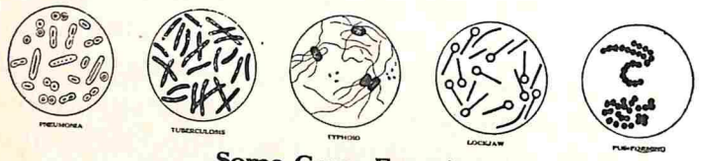
The blood is known to have certain qualities or constituents designed to protect against infection by disease germs and against the toxins which they generate. The presence of alcohol in the blood tends to make the drinker more susceptible to germ diseases.[31]

Fillinger found the resistance of the red blood cells much reduced after giving champagne to healthy human subjects. Weinburg confirmed the results showing that 20 per cent of the red cells lose their resistance after the administration of 450 c.c. of champagne.

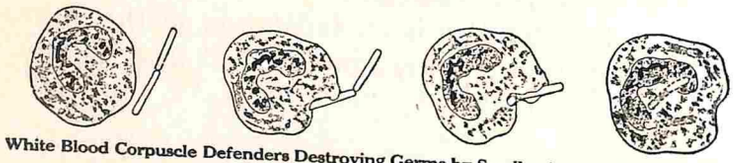
Laitinen infected with typhoid specimens of blood furnished by 11 abstainers and 19 drinkers. Cultures were made after 1, 2, 6, and 24 hours. Each

WHY AMERICA WENT DRY

ALCOHOL SIDES WITH GERM ENEMIES



Some Germ Enemies



White Blood Corpuscle Defenders Destroying Germs by Swallowing and Digesting Them

Certain chemicals develop in the blood, which also help destroy the germs and their poisons.

Even Wine and Beer Weaken these defenses against disease.

1. Horsley: "Alcohol and the Human Body"
Cut of Corpuscles from "Primer of Sanitation," World Book Co.

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test showed that more bacteria colonies developed on the average in the drinkers, showing lower resistance. In another experiment he tested the defensive power of the blood in six abstainers and again 63 days later after they had taken daily 30-40 c.c. of wine of 10 per cent alcoholic strength,[41] and found that in the second case the defensive power of the blood was reduced 30 per cent.

Muller, Wirgin, and others have shown that alcohol in the blood restricts the formation of "antibodies" in the blood of rabbits. The function of these "antibodies" is to resist infection. Rubin showed that alcohol injected under the skin made rabbits more susceptible to streptococcus (blood poison) and to pneumococcus (pneumonia) infection. Stewart found that alcohol in small amounts lowered resistance to tuberculosis and streptococcus infection. Parkinson found that large doses or continuous moderate doses tended to impair the capacity of white blood cells to destroy bacteria. Kern found that in guinea pigs inoculated with tuberculosis, the disease proved fatal much more quickly with alcoholized animals than with the "control" non-alcoholized animals. When pneumonia occurred among the animals it was much more fatal among the alcoholic than in the non-alcoholic animals.

"Chronic poisoning (by alcohol), by devitalizing the tissues, lowers the defences of the body against microbial invasion; consequently specific germs, such as those which cause pneumonia and tuberculosis, as well as the ordinary microbes of septic inflammation and blood-poisoning find a suitable soil. A slight general depressing influence—a chill or local injury—which would have no harmful effect upon a healthy individual, even if micro-organisms were present, be-

WHY AMERICA WENT DRY

Alcohol Prepares the Bed For Tuberculosis

¶ It often robs the drinker of proper food, shelter and clothing.

¶ It intensifies the effects of unhealthful living or working conditions.

¶ It makes the drinker careless about exposure; lowers his resistance to germs.

"Intemperance is known to be a very important factor in Tuberculosis."
---U. S. Government Investigation, 1910-12 in New England Cotton Mills.

1. U. S. Document, 645, 61st Congress, 2nd Session
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cause the vital reaction of the living tissue would prevent a general infection, may be most dangerous to a chronic alcoholic." [38]

72. ALCOHOL PREPARES THE BED FOR TUBERCULOSIS

Tuberculosis is caused, of course, by tubercle bacilli. But in order for them to gain a foothold in the human organism and to develop they must find a favorable physical condition.

Alcohol may so impair the vital processes of the drinker that he becomes susceptible to infection by the tubercle bacilli. But the drink habit may also lead indirectly to tuberculosis. The money spent for liquor often takes from the drinker and his family money needed for a healthful home in healthful surroundings, or for abundant, healthful food; and lacking these, the drinker or his wife and children may become susceptible to tuberculosis.

In the United States a remarkable decrease in the tuberculosis death-rate occurred within the period covered by war restrictions on the liquor traffic and national prohibition. The Metropolitan Life Insurance Company includes about 15,000,000 industrial policyholders—nearly one-seventh of the population of the United States and Canada. Its records show that the death-rate from all forms of tuberculosis dropped between 1913 and 1918 from 206.7 to 189.0, or 17.7 per 100,000 insured. Between 1918 and 1924 it dropped to 104.7 or a decrease in this period of diminishing liquor traffic of 84.3 per 100,000 insured. Prohibition was not responsible for all the decrease. Something must be allowed for the effect of the systematic campaign for the prevention and care of tuberculosis, but Dr. Haven Emerson, formerly Com-

missioner of Health of the City of New York, has this to say of the relation of abolishing the legal liquor traffic to improved chance for health as concerns tuberculosis:[34]

"Minute analysis of the phenomenal drop in the death-rate from tuberculosis in this city and in many other parts of the country during the past decade, and in particular during the past two years, has convinced me that one of the potent factors in this reduction has been the ability of the wage-earner to maintain a reasonable and sufficient standard of living, including housing, clothing, food, and opportunity for rest and recreation for himself and his family, chiefly because the five or ten per cent. of his income which used to be spent regularly for the purchase of alcoholic liquors, now is applied to the decencies, comforts and necessities of life."

Since this paragraph was written by Dr. Emerson the tuberculosis death-rate has continued to decrease phenomenally.

56. DRINK BOOSTS DEATH-RATES

Forty-three of the leading life insurance companies in the United States and Canada supplied records on 2,000,000 lives for study by the Actuarial Society of America, and the Association of Life Insurance Directors. The object was to determine from past experience the types of lives among which the companies had a higher mortality than the average.

The insured were grouped into many classes among which the chief included (1) those in dangerous occupations; (2) those who had a family history of tuberculosis; (3) those who had had some personal health defect; (4) those whose physical condition was not normal as shown by a high pulse, irregular pulse, albumin in urine, etc.; (5) those whose habits with regard to the use of alcoholic drinks were not satisfactory in the past, or who used liquor steadily at the time of application for insurance; (6) those who were distinctly overweight or underweight.

In order to determine the relative mortality, a

standard was prepared representing the average mortality among insured lives, based on the experience of the 43 companies among all their insured policyholders. When a class is said to have 10 per cent extra mortality, it means that where the experience of the companies would have resulted in 100 deaths among their insured as a whole, there were 110 deaths in the specified class.

The investigation covered the period between the years 1885 and 1908. In the groups studied as to alcoholic habits, all individuals were excluded from consideration except those who were in sound average condition when insured; all other extraneous influences such as overweight, underweight, impaired personal or family health history were excluded.

The results showed that individuals who, when insured, were in the habit of taking daily two glasses of beer, or a glass of whisky, or their alcoholic equivalent in some other kind of liquor, had a mortality 18 per cent in excess of the average.

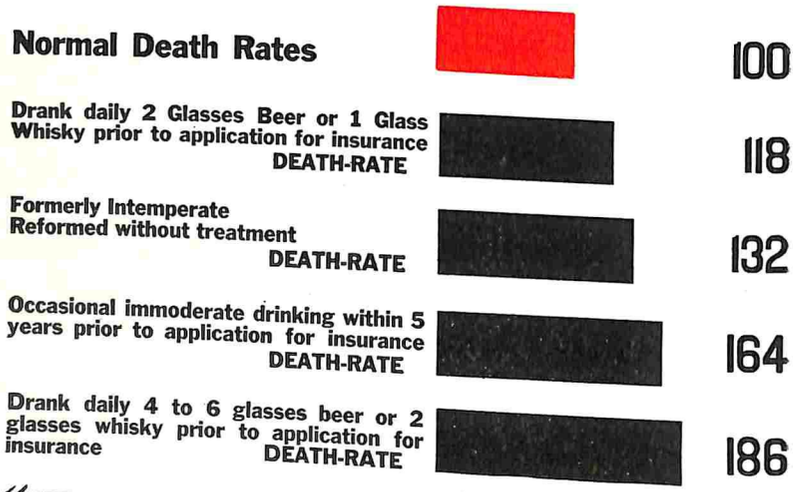
Those who had formerly been intemperate but who had reformed without treatment before becoming insured had a mortality 132 per cent higher than the average. The death rates from suicide, pneumonia and Bright's disease were higher than the normal.

Those who had indulged in occasional immoderate drinking within five years prior to application for insurance had a mortality 64 per cent higher than the average.

The rate for those who gave a history of occasional immoderate drinking at any time before becoming insured was 50 per cent above normal. This was equivalent to a reduction in the average length of life of these men of over four years.

DRINK BOOSTS DEATH RATES

Death Rates of Policyholders in 43 American and Canadian Life Insurance Companies



"IT IS CERTAINLY PROVED THAT TOTAL ABSTAINERS ARE LONGER LIVED THAN NON-ABSTAINERS"

---ARTHUR HUNTER, Actuary, New York Life Insurance Company; Chairman Central Bureau Medico-Actuarial Mortality Investigation.

Statistics of 43 American and Canadian Companies Reported by Medico-Actuarial Mortality Committee 1909-1914

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Steady moderate drinkers who before applying drank daily more than two glasses of beer or a glass of whisky, or the alcoholic equivalent, had a mortality rate 86 per cent in excess of the average.

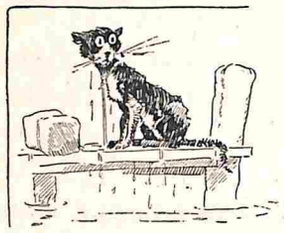
"In my judgment it has been proved beyond doubt," said Mr. Arthur Hunter, Chairman of the Committee which made the investigation, "that total abstinence from alcohol is of value to humanity; it is certain that abstainers live longer than persons who use alcoholic drinks." [15]

73. A CAT HAS NINE LIVES, YOU HAVE ONLY ONE; WHY RISK THAT ONE BY DRINKING?

The comparative death-rate of moderate and heavier drinking mentioned here as 18 per cent above normal in the first case and 86 per cent above normal in the second case were obtained by the study of drink habits and accompanying mortality among 2,000,000 American and Canadian insured persons.[14] (No. 56.)

This heavier mortality among drinkers, so far as alcohol is responsible for it, is not only due to the chemical effect of alcohol on the tissues resulting in organic disease. Alcohol impairs the body's natural powers of resistance to infection (No. 71); in some degree it leads to a more careless manner of living or to other unhygienic habits, especially those resulting in venereal infection. Besides, the so-called moderate drinker is always subject to temptation to increased indulgence and thence to immoderate drinking with accompanying physical impairment.

These mortality figures of insured drinkers, unfavorable as they are when compared with the average insured policyholder of these insurance com-



A CAT HAS NINE LIVES YOU HAVE ONLY ONE

WHY RISK THE ONE BY DRINKING?

The death-rate of men, who, when insured, drank daily two glasses of beer or one glass of whisky *was 18 per cent higher* than the average rate. *It was 86 per cent higher among men who drank more.*—Statistics from 43 American Life Insurance Companies, 1914.

Alcohol Paves the Way for Germ Organic and Vice Diseases.

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panies, are probably more favorable than if they had been compiled from the histories of drinkers in the general population. These drinkers had all been accepted for insurance as in reasonably good health despite their use of alcoholic beverages. "A policyholder admitting an indulgence of three glasses of beer daily would show a lighter mortality than the average man in the population indulging to the same degree." [32]

Dr. Oscar H. Rogers, after examining the experience of insurance companies in Europe, Australia, and North America, with respect to the effect of drinking upon mortality, said:[33]

"There appears to be no limit within which alcohol may be entirely harmless. It is as if there were a direct relation between the amount of alcohol used and the amount of damage done to the body. The evidence is strong also that the damage done persists a long time after it has been discontinued. Anyone who uses alcohol now or has used it in the past, is a less desirable risk, all other things being equal, than a total abstainer, and his undesirability is in proportion to the freedom with which he has used the drug."

76. BEER DOUBLED THE CHILD DEATH RATE

The children of whom statistics are given in the accompanying illustration were those of a village in northern Austria where beer was the chief drink. Wine was but little used, and spirits for the most part were used only by a few notorious topers. The people in this village were living under similar conditions as to food, housing, clothing, were of the same race, and were farmers who also worked in mines and salt works. Two hundred and thirty families of uninterrupted strain were investigated, consisting of 675 men and 635 women with 1,328 children. Twenty-two families were childless.

The families were divided into eight groups: (1) Healthy, with no tendency to disease or any es-

WHY AMERICA WENT DRY

Beer Doubled The Child Death-Rate

IN THE FIRST FIVE YEARS OF LIFE

All in the same village. Beer practically the only drink used by the parents and not always immoderately.

Children of Sober Parents 23% DIED

(18.6% in first year)

Children of Beer Drinkers 45% DIED

(36% in first year.)

Alcohol whether in Beer or in Whisky is an Enemy to Child Life.

120 Sober Families with 650 Children.
18 Beer-Drinking Families with 125 Children.
All strictly comparable and free from hereditary disease.

Adolph Kickh: Alcohol and Child Mortality in Durrenberg, Austria
Scientific Temperance Journal, Dec. 1914

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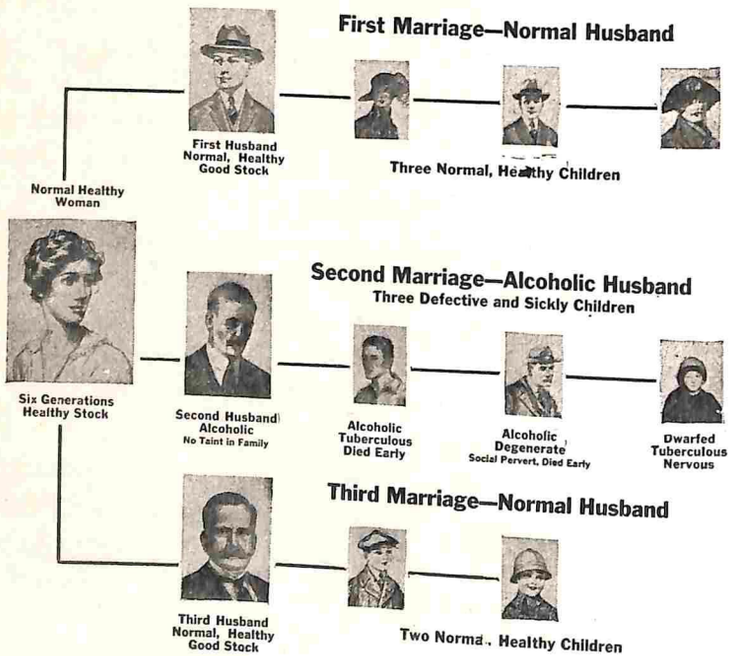
sential germ injury that would have any weight in an alcohol investigation; (2) slight hereditary taint mostly of tuberculosis without mortality from tuberculosis; (3) families in which the father had syphilis; (4) families in which the fathers or grandfathers had taken part in military campaigns and might have suffered impairment by hardship; insufficient diet, or syphilis; (5) families in which one-third at least of the known causes of death was cancer, with no other organic disease present; (6) families in which mortality from tuberculosis was pronounced; (7) families of drinkers who did not have tendencies to cancer, tuberculosis, or syphilis; the extent of drinking varied; (8) miscellaneous families, those who did not belong to any of the groups; these eleven families contained one syphilitic who was also alcoholic; the remainder were drinkers and tuberculous.

The investigation showed that the drinkers' families (group 7) lost 36 per cent of their children under one year of age; the healthy families (group 1) lost but 18.6 per cent. Under five years of age, drinkers' families lost 44.8 per cent of their children; healthy families, 23.5 per cent. In each case the child mortality in these drinkers' families in a beer drinking community was two to one as compared with the healthy families. The mortality in the drinkers' group was the same as in the syphilitic group for children under one year of age; it was 10 per cent higher than in the syphilitic groups for children less than five years old, and at both age periods was higher than in any other group. With the exception of the syphilitic group, which was small, the drinkers' group showed the highest rate of childlessness.

WHY AMERICA WENT DRY

ALCOHOL AND HEREDITY

Comparison of Children of One Mother by an Alcoholic Father and by Two Sober Fathers



This study is only one of several authentic cases. Animal experiments have shown similar results.

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77. ALCOHOL AND HEREDITY

The effect of alcohol upon the children of the drinker is subject to many conditions. Experiments with animals indicate quite clearly that an alcoholized animal parent is more liable to have defective offspring or a higher mortality in the young. This extra mortality may be pre-natal or post-natal or both. In human families conditions are not subject to control by which experimental evidence can be obtained. Not all drinkers are equally susceptible to alcohol; in many cases, their children are born before the drink habit has become fixed or heavy. Consequently no hard and fast statements can be made concerning the effect of alcohol on human offspring, beyond the fact that in many cases there appears to be reduced viability and vigor. Some illustrations of possible effects of drinking habits of parents upon the physical or mental condition of their children are given in the following cases.

Dr. Josef Schweighofer, for a long time head of a hospital for the insane in Salzburg, set himself the task of investigating the causes of mental disease from the records at his disposal.

In studying the various influences capable of affecting the offspring, Dr. Schweighofer found what seemed to him indications in some cases of an injurious influence resulting from the use of alcohol by a parent.

He described three types of families.

In families of the first type one or both parents became more alcoholic as years went on. An example given was a drinking inn-keeper whose first child was very nervous; the second, epileptic; the third, never healthy, died at 36 years of age. The

fourth, fifth and sixth all died soon after birth, and the seventh was still-born.

In the second type of families there had been hard drinking before marriage, but afterwards reformation or improvement with corresponding improvement in the condition of the children. An example given was that of a commercial traveler who after his marriage to a healthy woman stopped drinking. The first child was mentally unbalanced; the second had some mental disorder but was cured; the third was normal.

In the third type there were changes in drink relations midway of the reproductive period with changes at the same time in the health of the children. An example of this type of family is given in the illustration. It represents the children of a strong and healthy mother known to have been of healthy ancestry for six generations. Her first husband was sober, and her three children by this husband were all normal, strong and healthy. Her second husband was an alcoholic. Their three children were all abnormal; two were alcoholic and died in early life; the third was a nervous dwarf.

By the third husband, a sober man, she had again strong, healthy children.

In summing up his history of individual families of which the foregoing are but a few, Dr. Schweighofer said:

"The study shows that the children of drinkers develop mental disease much oftener than the children of parents who are themselves mentally diseased but not alcoholic. That is, an existing tendency to mental weakness becomes fixed under the effects of alcohol; while without it there may be recovery."

74. PROHIBITION BROUGHT PROSPERITY

The use of alcoholic beverages in very many cases not only takes from the family the money spent for the drink, but eventually it further reduces the family's needed income because the father's earning ability is impaired. The drinker who is irregular at his work because of his drink habit or who becomes less skillful so that he earns lower wages, or who loses unnecessary time through sickness or accident due to alcohol, in these ways may reduce the family income. This often results in compelling the wife to become a wage earner to eke out the husband's inadequate support; the children may have to leave school and go to work too early, perhaps as unskilled workers, so that as adults they, in turn, have to try to bring up a family on a lower scale of living than would have been necessary had they received more education. Back of all these economic conditions lies the physical effect of alcohol in impairing physical or mental health or working ability. Partly responsible, too, is the drug effect of alcohol which in many drinkers requires more and more alcohol for its satisfaction, with the result that the drinker spends more and more money to buy his liquor. The following statements[34] of the gains in family prosperity resulting from prohibiting liquors are typical of many:

Samuel R. Van Sant, Banker, Minneapolis, Minnesota: "Savings bank deposits show that the people are now saving their money; their children are better fed and clothed and being better educated."

Charles J. Hauck, The Selby Shoe Company, Portsmouth, Ohio: "Those who formerly patronized the saloon are providing for their families not only in the necessities but in the way of pleasure. There are more who are buying their own homes, have sav-

WHY AMERICA WENT DRY

Prohibition Brought Prosperity

Banks Instead of Saloons are Crowded Saturday Nights.

Prohibition brought More and Larger Bank Accounts; More Sales of Luxuries and Necessities, More Home Building.

Alcohol, Even in Wine and Beer, Cuts Down Health and Ambition, Earnings and Savings

Denver Labor Bulletin, etc.
W. J. Johnson: The Question answered, 1917

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WESTERVILLE, OHIO

ings accounts, and own automobiles than there were when the saloon was open."

William J. Faux, President of Logan Coal Company, Pittsburgh, Pa.: "The families of the working class are better fed and clothed. Children who formerly were barefooted wear shoes and stockings. Where formerly stood two saloons now stand two National Banks with deposits of about $2,000,000."

75. LESS DRINK, MORE HOMES

"After state prohibition came into effect the savings banks began to find an increase in their deposits; people began buying their own homes and merchants to buy their business establishments; jails were being emptied; a general air of prosperity became increasingly apparent, and what was more important, comfort and good will began to be plainly apparent. Then prices of real estate began to advance." . . .

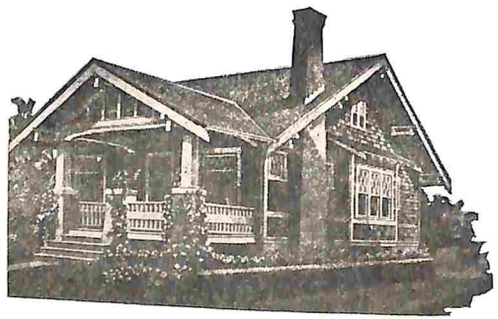
"Many elements enter into the present ever-increasing demand for more and better houses. Let no one say that it is absurd that prohibition had a dominant part. John Workingman has more money today than he ever had in the history of the country, and probably in the history of the world. My opinion is that prohibition has created, through its success in saving money, a tremendous impetus in the mind of the possible home-seeker as to the desirability of investing his savings in a place where he knows he will be sheltered without the drag of the payment of rent. He wants, too, more room. He has the money to pay for it, and he is getting it. The tremendous demand for houses is universally known. There were never so many seeking for homes as now, never so many purchasers." (Felix Isman in The Saturday Evening Post, Philadelphia, Pennsylvania, March 1, 1924.)

WHY AMERICA WENT DRY

LESS DRINK MORE HOMES

Henry living in a wet State, found it easy to spend a dollar a week for beer. After 25 years all there was to show for his money was a pile of empty beer kegs—and he did not own those.

John, living in a dry State, found it easy to put a dollar a week into the Building Loan Association. After 25 years he owned a *good home.*



Sobriety Fosters the Clear Brain, the Steady Hand, the Thrift Habit

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41 For exactness in reporting experiments the amounts of alcohol used in experiments are for the most part given in the text in cubic centimeters as employed by experimenters. The following table indicates approximately the amounts of beer or wine containing the doses of alcohol measured by volume.

Alcohol used equivalent to	Beer Containing 3½% alcohol	Wine Containing 10 per cent. alcohol
10 c. c.	3/5 pt.	1/5 pt.
25 c. c.	1 1/2 pts.	1/2 pt.
30 c. c.	1 4/5 pts.	3/5 pt.
40 c. c.	2 2/5 pts.	4/5 pt.
50 c. c.	3 pts.	1 pint
60 c. c.	3 3/5 pts.	1 1/5 pints
80 c. c.	4 4/5 pts.	1 3/5 pts.

Many wines are stronger in alcohol than the 10 per cent of table above which represents about the strength of champagne, claret and the Rhine red and white wines. Analyses made by the British Government Chemist gives the strength of port wine at 20 per cent., sherry at 18.9 per cent., Madeira at 19.5 per cent., Italian red wine at 11.8 per cent, French Burgundy (white) at 14.3 per cent., Bordeaux red, and white at 11.5. Malt liquors ranged from 3.2 per cent. to 6 per cent. by volume.[38]

The stronger the alcoholic content of the beverage the smaller the quantity which would have to be consumed to consume the number of centimeters of alcohol used in the experiments. Beer containing 3½ per cent. alcohol by volume is practically the same as "2.75 per cent." by weight.