Denver Law Review

Volume 17 | Issue 8 Article 2

July 2021

Liquor, the Servant of Man

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An Address given before the Kansas City Bar Association on "When Is a Person Drunk? Or Some Medico-Legal Aspects of Acute Alcoholic Intoxication."

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Mr. Chairman, Members of the Kansas City Bar Association, Gentlemen:

In addition to discussing the question assigned to me in your bulletin, I have been asked by Mr. Whitebook to say a few words about our book, "Liquor, the Servant of Man." In the time allotted it is impossible to give more than a fragmentary outline and perhaps mention some of the sidelights of the writing of the book.

I first became interested in the subject of alcohol as a boy. My father, who was a physician, frequently said that many of the horrible effects which drinking was alleged to have upon the human body were pure myths. At the age of thirteen, following my father's death, I went to live with my grandparents and in our family was my grandmother's older sister. All three of these older people were staunch advocates of total abstinence. During my youth I heard from them many harrowing tales about the dire pathologic effects of liquor on all the body organs. My suspicions regarding the accuracy of these "scientific" observations began to increase, however, as I observed many men in our town whom I knew to be moderate or steady drinkers living to a ripe old age and seeming to thrive and prosper in spite of dire predictions to the contrary. In medical school I got my first opportunity to observe the insides of men who had been heavy drinkers and also of many who had died as a result of too much liquor. The resident physical properties of these groups were surprisingly free of organic disease. Moreover, such diseases as cirrhosis of the liver, hardening of the arteries, Bright's disease and the

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like that have been attributed to alcoholic indulgence were just as often, in fact many of them were much more frequently found in the bodies of teetotalers. These observations continued until I began to practice medicine and when my own grandmother died with classical liver cirrhosis my worst suspicions were confirmed. I had always been told that it was impossible to rule out alcohol in many instances of alleged total abstainers, but in the case of my own grandmother there would be no controversy, and as time went on innumerable examples of similar character came to my attention.

One night the co-author of our book, Walton Hall Smith, who has written a number of novels and who has a native interest in medicine, and I were having dinner together. During the dinner the conversation turned to the question of alcohol being instrumental in the causation of coronary artery disease. I stated that in my experience it was not a factor but that quite the converse was true. Some similar casual remarks seemed to surprise Mr. Smith a great deal and we decided to make further investigations of the alcohol literature. We were both greatly surprised in the amount of confirmation we found and as we dug more deeply into the subject we discovered much scientific data which we believed might deserve recording in lay language in the form of a book. Practically all of the adverse criticism that we have received of the book has come from people who have not read it. The book neither advocates nor defends alcohol. It is neither a Bible nor an encyclopedia. It comprises the evidence on both sides of the question. In a way I might say that the book is a temperance lecture, that it is an advocate of temperance and not total abstinence because once many of the alleged evils of drink have been exposed as untrue, a little of the wickedness is taken out of moderate drinking, and a great many people drink because they think it is just a little bit wicked.

The book is divided into six chapters and starts out by mentioning to whom it is written, specifying it is not written for the problem drinker, the psychopathic drunkard or for the rabid temperance crusader, but is addressed to the great audience who take a drink now and then and wonder if it is going to cause irrevocable damage to their bodies and intellects. Beverage alcohol in one form or another has been consumed in all parts of the world for about 30,000 years, and any custom that has been so widespread and continuous must have a meaning. Beer was found in the stone-age man's jugs. The earliest written records of Egypt, China and Babylonia mention its use.

In the first chapter, "The Background of Drinking," the use of alcohol as a beverage is traced down to modern times. Chapter 2 takes up the physiology and pathology of alcohol. Here we discuss the action of alcohol on the body and its effects. In chapter 3, the medicinal action

of alcohol is gone into and the beneficial results obtained in many diseases in which it was heretofore considered harmful is given considerable space. The chapter on sex and the effect of alcohol on the race is backed up by far-reaching and exhaustive experimental investigations which affect a large number of popular conceptions. In the chapter on psychology or the reasons why people drink we have attempted to outline the reasons why alcohol alleviates monotony and lightens the burden of existence. The last chapter takes up a group of typical case histories, summarizes points previously referred to and brings out new data to prove these points.

When Is a Person Drunk? After this brief outline I would now like to discuss the subject published in your bulletin, "Some Medico-Legal Aspects of Acute Alcoholic Intoxication or When Is a Person Drunk?" This question would seem to be extremely simple, as I have never met anyone who didn't have at least fifty answers to it, all different and all frequently wrong. I believe there is a correct answer and will herewith try to set it forth. When is a person clinically and legally drunk? Even legal definitions are variable. Thus, the following was handed down by a Texas court: "It is difficult to draw the line on a drunk: There are the stages of being vivacious, foxy, tipsy and on a high lonesome. It is about as difficult to determine when a young lady gets to be an old maid as to tell when a man has taken enough alcoholic stimulant to pass the line between jolly sober and gentlemanly drunk." Many years ago when Mr. Bowker and Mr. Moonface, two characters in a Surtees novel, were debating the question before the Sublime Society, their social club, the definition stood somewhat as follows:

Mr. Bowker: "It is enacted that no human shall be considered drunk or liable to the pains and penalties contingent upon intoxication, if he can lie still without holding."

Mr. Moonface: "Now after he is incapacitated from walking, if he can lie still on the floor, is he considered sober?"

Mr. Bowker: "He is not considered drunk."

On the other side we have the opinion of a medical witness before a court-martial who stated that "anyone who had taken a drink" even though it be but a thimblefull of beer, was "under the influence."

British law has some humorous angles, such as the heavier penalties imposed on an individual when in charge of "any horses, carriage cattle or steam engine, etc.," one writer mentioned the arrest of a circus employee who was drunk while in charge of a camel and a soldier who was "drunk on the line of march while employed as a trombone player." Thus, I suppose that a camel is a carriage animal and a trombone is related to a steam engine.

Many Variables in Clinical Diagnosis There are a great many variables in the clinical diagnosis of intoxication and it may be too heavy a burden to impose upon a medical examiner, since the observations of the police and lay witnesses may be more important than the medical examination, because what happened on the spot is extremely pertinent. Again, the demeanor and attitude of an intoxicated individual at times are quite variable. Moreover, the emotional effect of arrest in some mysterious way seems often to produce a redistribution of alcohol in the body. Some eighteen years ago when I was an assistant police surgeon in Kansas City, I saw men brought in to the station who seemed to be sober or at most only on the border of intoxication. After incarceration they might go promptly to sleep, which to say the least is unusual in one who is sober. This emotional effect of arrest upon alcoholic intoxication is explained by some investigators as being due to an increase of adrenalin in the blood brought on by the shock. Animals whose adrenal glands have been removed are much more susceptible to alcohol than normal ones and we know that adrenaline produces constriction of blood vessels and raises blood pressure. The blood vessels of the viscera are dilated and there is decreased rate of flow of alcohol-laden blood through the brain, while even moderate alcoholic indulgence will cause visceral vaso-constriction and an increase of blood containing alcohol in the brain.

An unconscious individual may be drunk and yet unconscious from some other cause. On the other hand, he may not be drunk but has taken a drink and be unconscious from a wide variety of conditions which may require a very careful and accurate scientific medical examination to disclose the cause of his unconsciousness. The staggering gait is clasically construed as the sign of drunkenness, yet there is a surprisingly long list of neurological disorders unrelated to alcohol which will produce disturbances in the gait. One's ability to walk a strait line and other simple tests of balance and coordination may likewise be due to a wide variety of nervous disorders. We should also realize that the only legal implication of muscular incoordination is that the subject is incoordinated. On the other hand, I have not once but several times seen a perfectly sober individual who under arrest became so excited and upset that he talked incoherently, was unable to sign his own name or even remember it. As a result of this variation in clinical behavior and the difficulty of accurate evaluation, a great deal of work has been done in the elaboration of chemical tests of body fluids in order to determine the correct degree of clinical intoxication.

It is obvious from the outset that an analysis of the stomach content is worthless because alcohol in the stomach isn't really in the system and alcohol has to get to the brain before it produces any symptoms.

Annual Convention—Colorado Springs, September 27-28, 1940

The Breath Test The breath test or an analysis of the alcohol content of the expired air is being used in many places as a criterion of the degree of alcoholic intoxication. This test is subject to considerable variation which may destroy its accuracy, the cooperation of the exhalor, the depth of inspiration, the fact that the subject tested has been hiccoughing, regurgitating, or vomiting and whether the subject has very recently had a drink may all give false results. Moreover, the breath test even if accurate will only give the alcohol concentration of the blood and as will be shown later, although the blood concentration is closest to the spinal fluid examination in scientific accuracy, it too is not entirely fool proof.

Chemical examination of the urine is unsatisfactory because we do not know when the urine was excreted from the kidney into the bladder. There is also controversy among investigators as to the amount of alcohol excreted by the kidneys and the bladder urine concentration of alcohol can give us no uniformly accurate estimation of the brain concentration at the time of the alleged legal infraction. Moreover, there is scientific controversy as to whether alcohol, per se, is a true diuretic or whether the congenerics contained therein, such as the lupulin in hops, the volatile oils of gin and tannins, higher alcohols and other congenerics of whiskey may not be the actual diuretic agents.

Chemical analysis of the sputum is also not trustworthy since it contains other oxidizable products and the increase in alcoholic content of the sputum is often greater than that of the blood.

The blood concentration of alcohol has been used as an index of clinical intoxication and has been so accepted in certain courts. In a consideration of the blood test as well as all the tests just outlined we must take cognizance of the question of individual susceptibility or tolerance to a given quantity of alcohol. Vahlmering has shown that alcohol is uniformly distributed rather rapidly to the visceral organs but that its distribution to the brain is much slower and finally the quantity of alcohol in the brain exceeds that of the other viscera.

Pringsheim habituated animals to alcohol and observed that they oxidized alcohol 33 per cent faster than non-habituated animals, while non-habituated animals would reach a 66 per cent higher blood alcohol level than the habitues. He also observed that the liver, heart and brain all burned alcohol in the habituated animal while in the non-habituated, the liver alone took over the major task of burning up the alcohol.

Schweisheimer has conducted similar tests and made similar observations in the human and he showed similar findings for teetotalers and seasoned drinkers to those observed by Pringsheim in animals.

It has also been shown that the average non-user of alcohol shows the early symptoms of intoxication when the blood alcohol level reached

.15 per cent while in the habitue these same symptoms do not become apparent until the blood level has reached .25. Thus the blood test, although closest in scientific accuracy to any we have previously mentioned, still falls short of being perfect and all that it can prove is that the disturbed faculties of an individual could have been due to the ingestion of alcohol.

The One Correct Test At the outset I stated that I thought there was one correct answer to the question of when is a person clinically and legally drunk and I will now attempt to set it forth. Gettler and Tiber carefully analyzed a perfectly huge series of brains, 6,000 in all. They determined the alcohol content of the spinal fluid, the brain and the blood and had accurate records of clinical behavior on all of the individuals whose brains were studied. From this unbelievably large series of carefully controlled chemical and clinical observations they showed conclusively that the degree of drunkenness depends on the amount of alcohol present in the brain and that it is the same for chronic drinkers and total abstainers alike. In other words, regardless of the previous alcoholic habits of an individual, the degree of clinical intoxication depends on the percentage of alcohol present in the brain. Investigation further revealed that there is a constant ratio between the alcoholic content of the spinal fluid and the quantity present in the brain. Therefore, by using a simple arithmetical formula a chemical examination of the spinal fluid can give the alcohol concentration in the brain, while the blood-brain ratio is not constant.

Thus in closing it appears that the diagnosis of borderline alcoholic intoxication is subject to many pitfalls. There are many clinical and psychological variables that must be taken into consideration and none of the standard tests for analyzing body fluids except chemical analysis of the spinal fluid can be used with uniform accuracy to determine the brain alcohol content. The brain alcohol content is a true index of clinical intoxication and is the same in both novice and seasoned drinker. A spinal fluid examination requires the services of a skilled physician, hence such a test will never be brought into general use because it cannot be carried out routinely without certain dangers.

May I express my sincere appreciation of the privilege and the honor that has been accorded me to appear before this Association.

Following Dr. Helwig's address a spontaneous barrage of questions came from the floor and thereafter for over an hour Dr. Helwig in an impromptu manner answered same. A few typical questions and answers are as follows:

Q. It has been stated that it is more harmful to take a drink before a meal than after, while others have stated that it is more harmful to drink after a meal than before. What is your opinion of this?

A. Alcohol is absorbed more rapidly by an empty stomach. It gets into the blood much faster. Any food will absorb a certain amount of alcohol and some foods, fats in particular, and cream especially, absorb alcohol to a more striking degree than any other foods known. When cream is taken, and this is followed by a drink, for some unaccountable reason a portion of the alcohol seems to vanish and cannot be recovered. The stronger the content of alcohol in the beverage, the more apt it is to produce an increased secretion of mucus in the stomach, thus, it acts as a mild irritant when alcohol is taken in concentrated form on an empty stomach. Furthermore, such concentrated solutions produce symptoms of intoxication much more rapidly. If alcohol is taken after the stomach is filled with food the alcohol will be absorbed more slowly and will not cause intoxication as readily since it does not accumulate in the brain as rapidly.

Q. Is it true that olive oil taken before drinking will keep one from becoming intoxicated?

A. Any edible oil, such as cream, butter, olive oil, etc., taken into the stomach decreases the rapidity of absorption of alcohol.

Q. Which is the best for one to drink, old or young whiskey?

A. The main difference between old and young whiskey is the taste, odor and the character of the congenerics. These latter substances are non-volatile acids, esters, tannins, glycerine, etc. There is a tendency to an increase in these congenerics as whiskey grows older and the congenerics are the substances which tend to produce stomach irritation. The charcoal in the barrel slowly absorbs the disagreeable odors of young whiskey but it does not decrease the production of irritating congenerics. Most whiskey men believe that four or five-year-old whiskey is sufficiently aged and that further aging does not improve its taste or quality. Moreover, toxicologists have shown that further aging will tend to increase the irritating congenerics.

Q. What is best for one to drink, Scotch or bourbon whiskey?

A. All straight bourbon whiskey contains congenerics. There is also a greater amount of alcoholic content of bourbon whiskey over Scotch as a rule. Although alcohol is the main toxin in any whiskey, the congenerics come next. Practically all Scotch whiskies are blended, or in other words cut with neutral spirits, therefore there is not only a decreased amount of alcohol but a similar, even more marked decrease in the congeneric content of Scotch because neutral spirits are practically free of congenerics.

Q. What amount of whiskey is necessary to produce intoxication?

A. There are so many variables which include individual toler-

ance, size and weight of the individual, previous alcoholic habits, general physical condition at the time of ingestion, contents of the stomach at the time of ingestion and the amount and character of the dilutents with which the beverage is consumed, that such a question is almost impossible to answer. We all know heavy drinkers who have built a very high tolerance for alcohol over a period of years. Suddenly their tolerance vanishes. These drinkers were previously known as "two-bottle men" and for some strange reason they suddenly became incapable of oxidizing alcohol. I have known several such instances wherein two small drinks would produce symptoms of intoxication in a man previously able to hold large amounts without any demonstrable symptoms. This phenomenon may be explained on the theory that not infrequently chronic alcoholics fail to eat and use chiefly the energy supplied by alcohol as food. Due to this obvious dietary deficiency with concomitant vitamin deficiency, certain fatty changes take place in the liver. Therefore, the liver becomes incapable of burning alcohol rapidly.

Q. Is it true that chronic drunkards are more apt to have pneumonia than moderate or non-drinkers?

A. I think it true that men who are intoxicated have a much lower resistance to infection by the pneumococcus, which is the organism causing pneumonia. Recently, some very elaborate scientific investigations have shown that animals who are intoxicated with alcohol have a much lower resistance to infection from the bacteria causing pneumonia. On the other hand, the animals used were kept in a state of alcoholic stupor. Such a renowned physician as Joseph Miller of Chicago has stated that small amounts of alcohol in doses insufficient to produce intoxication may add comfort and provide food to a patient suffering with pneumonia.

Q. Does alcohol stimulate one?

A. In our book we state that "you can't do anything better after drinking, from the crudest muscular effort to the most delicate thought process. Alcohol is a relaxer. If you are doing a good job of something after a couple of drinks you are doing it in spite of them."

Q. How would you define intoxication?

A. I have stated already that the definitions of intoxication are quite variable, but I think a good definition would be that intoxication is a state in which an individual is so much under the influence of alcohol as to have lost control of his faculties to the extent that it has rendered him unable to perform properly the occupation at which he is employed at the material time and as a result he may become a menace to himself or to others.