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## MEDICOLEGAL ASPECTS OF CHEMICAL TESTS OF ALCOHOLIC INTOXICATION

Comments on Dr. I. M. Rabinowitch's Paper\*

C. W. Muehlberger

C. W. Muehlberger, Ph. D., has been active in the field of toxicological investigation over the past quarter century, as Wisconsin's first State Toxicologist, later as Assistant Director of Northwestern University's Scientific Crime Detection Laboratory and as Toxicologist to the Cook County (Illinois) Coroner's Office, and presently as Toxicologist of the Michigan Department of Health and the Michigan State Police. For the past twenty years he has made a special study of the quantitative estimation of alcoholic intoxication and has been a member of the National Safety Council's Committee on Tests for Intoxication since its establishment in 1937. His extensive experience in this field has not only included the purely scientific phases of alcohol's action on the organism, but has extended to the application to law enforcement and presentation of testimony on the subject in court cases. An earlier contribution of his "The Scientific Estimation of Alcoholic Intoxication" appeared in this Journal (*Am. J. Police Sci.* 1(2):206 (1930)).—Editor.

As another member of the National Safety Council's Committee on Tests for Intoxication the recommendations of which have aroused Dr. Rabinowitch's ire, I would like to add to Dr. Harger's comments.

First of all may I point out that our Committee has never claimed that chemical tests for intoxication are "foolproof". Obviously they are subject to all those errors which are characteristically human. Specimens may be taken in an improper manner, analysts can make errors in the chemical laboratory, and "experts" may voice opinions which seem contrary to general experience. What our Committee has maintained was that when properly conducted, chemical analyses of blood, urine, breath, or saliva for their alcohol content give values which reliably reflect the degree of alcohol influence within the limitations of the Committee's recommended interpretation.

1. If there was at that time five hundredths (.05) per cent or less by weight of alcohol in the defendant's blood, it shall be presumed that the defendant was not under the influence of intoxicating liquor.

2. If there was at that time in excess of five hundredths per cent but less than fifteen hundredths per cent by weight of alcohol in the defendant's blood, such fact shall not give rise to any presumption that the defendant was or was not under the influence of intoxicating liquor, but such fact may be considered with other competent evidence in determining the guilt or innocence of the defendant.

3. If there was at that time fifteen hundredths (0.15%) per

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cent or more by weight of alcohol in the defendant's blood, it shall be presumed that the defendant was under the influence of intoxicating liquor.

This does not mean that all persons having 0.14 per cent alcohol in their blood are stone sober, nor does it imply that all having 0.15 per cent are staggering drunk. Our Committee has not concerned itself with common drunkenness or "clinical intoxication". It has long been recognized by the entire medical world, including our friends in the British Commonwealth, (1) that alcohol produces a marked deterioration of automobile driving ability long before one reaches the stage which is ordinarily classified as "drunk". Much of the confusion in the scientific and quasi-scientific literature concerning the value of chemical tests for intoxication stems from this confusion of the terms "drunk", "intoxicated", "inebriated", and "under the influence of intoxicating liquor". These terms are not synonymous.

In most of our states a motorist is "under the influence of intoxicating liquor" when, as a result of drinking liquor there is any deterioration of those mental or physical faculties which are essential for the safe and prudent operation of a motor vehicle upon the public highway. As Newman (2) has pointed out, some legislatures such as California have concocted definitions which are so cluttered up with complex verbiage, that they are difficult for any jury to interpret.

The National Safety Council's Committee, as well as the similar Committees of the American Medical Association (3) and the American Association of Chiefs of Police, have not recommended these chemical tests as the *sole* criterion of intoxication but have suggested that they be employed to assist the law enforcement officer and the clinician in interpreting and evaluating those signs and symptoms which might be due to excessive use of liquor. Police officers do not conduct haphazard searches for motorists who are under the influence of alcohol. Before a motorist attracts the attention of an officer he must have done something overt, such as driving dangerously, passing another car on a hill or a curve, weaving all over the surface of the highway, or perhaps has been involved in an accident. Under such provocative circumstances the police officer conducts his routine investigation and very properly inquires in his own mind as to whether or not alcohol may have been a causative or contributing factor. If the driver's behavior and speech suggest any alcohol influence the officer gets close enough to detect the odor of alcoholic liquor, if any, on the subject's breath. If

the appearance, behavior, and speech of the subject suggest alcohol influence and the definite odor of intoxicating liquor is detectable on his breath, the officer then proceeds to inquire as to the subject's drinking, when, where, and how much. If the statements of the subject seem palpably out of line with his apparent condition (as with the frequent admission of "two beers"), the officer may invite the subject to clarify the situation by submitting to a chemical test. Contrary to the inference of Dr. Rabinowitch, the prosecution does not hinge on the test tube reaction, but rather upon the sum total of the officer's observations *together with* the results of the chemical test.

It will be noted that under the Committee's recommendation, the finding of 0.15% or more of alcohol in the respondent's blood sets up a presumption that he was "under the influence of intoxicating liquor". Now I submit that there is a vast difference between the term "presume" as used by our Committee and the term "conclusive" as employed by the court in the Weir vs. Dickson case as cited by Dr. Rabinowitch (page 225). The word "presume" in legal terminology merely sets up a presumption that certain things are true and correct. Such a presumption is not necessarily "conclusive" of any fact and may be rebutted by other testimony. For example, if the officer's observations were palpably contrary to the findings of the chemical test, that fact of itself might be sufficient to rebut the result of the chemical tests in the judgment of the court or jury.

In any criminal case the defendant goes into court with a presumption of innocence and the representatives of society are required to establish proof of his guilt beyond a reasonable doubt. What the chemical test laws (Indiana, New York, Maine, and Oregon) do is to take cognizance of the well established medical fact that all persons who have 0.15% or more alcohol in their blood (or equivalent quantities in their urine, breath, or saliva) are too far under the influence to operate a motor vehicle in a safe manner, and for this reason to reverse the presumption of innocence of the charge. This would seem to be only a matter of applying common sense to a serious situation. In any event, the presumption of guilt set up by chemical tests can be overcome by contrary evidence if it is available.

As for Dr. Rabinowitch's other objections, many simply hinge on a question of fact.

A. Contrary to Dr. Rabinowitch's statement (case #1, page 228) the use of alcohol for sterilizing the skin surface prior to the taking of a blood specimen does not introduce any appreci-

able error into the results of the blood analysis. My own experience is that the error is usually less than 0.01% alcohol in the blood and never has been known to be above 0.02%. This confirms the statement of Elbel (cited by Dr. Rabinowitch as his reference #21) 98% of Dr. Rabinowitch's own experiments confirm this position. The odd case showed 0.12% alcohol in the blood. One wonders how this one aberrant value crept into the other 49 regular ones. Did Miss Wilen get hold of a dirty test tube or was not the subject as alcohol-free as Dr. Rabinowitch supposed?

In Dr. Rabinowitch's Case #1 it would appear that he contributed to a gross miscarriage of justice by giving baseless testimony. Any chemist worth his salt can determine alcohol in a clotted blood sample. I do it routinely and have repeatedly established the accuracy of the results by actual trials.

B. Errors due to putrefaction of blood as cited by Dr. Rabinowitch in his Case #2 (page 230) are not as great as he suggests. If the analysis were properly conducted by double distillation so as to remove sulphides, aldehydes, and other interfering products of putrefaction, certainly 0.18% is far too much alcohol to be accounted for by post-mortem changes, and again I strongly suspect that Dr. Rabinowitch should be credited with an assist in a miscarriage of justice by testifying as he did. Why Dr. Rabinowitch should give credence to reports which were palpably made for the purpose of defending a lawsuit and in which the analyses were made by chemists of no toxicological training, and ignore contrary reports of old established workers such as Nicloux (4), is difficult to understand.

C. In discussing errors arising from the inaccurate analysis of urine, Dr. Rabinowitch points out that only by rendering the urine alkaline prior to distillation can one obtain accurate alcohol values (pages 231-232). He comments further on the fact that none of the writers in the United States seem to be aware of this fact, or at least fail to mention it. As the author of the work cited in Dr. Rabinowitch's reference #35, I would suggest that the reason this "fact" was not mentioned is because it is not true. The only occasion in which a person runs into difficulty in distilling alcohol from normally acid urine specimens is in instances where the subject has been taking methenamine. The resulting elimination of formaldehyde in acid urine may give rise to error unless double distillation is resorted to (5).

D. Dr. Rabinowitch goes to considerable length in discussing the relative merits of brain, blood, urine, breath, and saliva analysis for the purpose of determining the extent of intoxica-

tion, and in so doing, he perpetuates a fallacy, which carries back to Gettler's paper in 1927. May I say categorically that there never has been any scientific evidence that the alcohol concentration of the brain parallels intoxication. That this is true seems a reasonable inference, but it is nevertheless an inference and not a scientifically established fact. On the other hand, there have been at least a half dozen extensive, thorough, and quantitative studies which have shown that the alcohol concentration of the blood does run parallel to the degree of intoxication. One of the most recent and best controlled of these is the report of L. Goldberg (*Acta Skand. Physiol.* Vol. 5 Supplement #16 (1943) ).

It appears that the blood alcohol concentration furnishes the most reliable chemical criterion of intoxication, but because of the ready availability of urine, breath, and saliva, obtainable without transporting the subject to a physician or a hospital, these furnish valuable substitutes for blood in estimating the extent of intoxication. While they are slightly less reliable than blood as an index of the degree of alcohol influence, they are very useful in instances where a blood specimen cannot readily be obtained, or where the subject balks at having a hypodermic needle thrust into his vein.

There is some merit in Dr. Rabinowitch's contention that under ideal circumstances one should have a complete medical examination by a competent physician to augment the chemical tests for intoxication. But, persons who are in contact with actual police activity will quickly realize how impractical this often is. Most arrests for so called "drunk driving" are made late at night, and the average physician is not very enthusiastic about having his sleep disturbed just to test some errant drunk. Furthermore, the average physician hesitates to take the witness stand and testify to the facts on behalf of the "people." By testifying they make enemies in the community in which they have to earn their living. Close friends and relatives of the respondent carry a grudge against the physician who testifies for the prosecution. Physicians are also required to waste much valuable time in court when they are called as witnesses. It is needless to point out that a physician should be public-minded enough to overlook these things, but like the rest of us, physicians are human and subject to the same shortcomings. Speaking from practical experience, the summoning of a practicing physician in such cases just does not work out.

From a reading of Dr. Rabinowitch's paper it is difficult to determine just what he thinks about chemical tests for intoxica-

tion. In one place (page 240) he states that the chief value of such tests is to tell whether or not a person has been drinking alcoholic liquor, a question which one's nose should be able to settle without resort to a laboratory test. However, elsewhere (page 227) he states that "one of the great advances in the diagnosis of alcoholic intoxication has been the development of chemical methods."

Perhaps he would be willing to subscribe to the statement made eighteen years ago by the late Wilfrid Derome who was Professor of Legal Medicine and Toxicology at the University of Montreal and Director of the Laboratory of Legal Medicine and Police Technique in Dr. Rabinowitch's home city of Montreal, when he said (6) that "the quantitative procedure for the determination of alcohol in the human organism constitutes one of the best methods which Science has ever put into the hand of Justice," a conclusion with which the vast majority will agree.

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