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## Scientific Investigation of Intoxication

Bernard J. Conley\*

THE IMPACT OF THE AUTOMOBILE on the economic and sociological aspects of our society, and the wide acceptance of social drinking of alcoholic beverages, have resulted in the confrontation of our authorities with many new problems. Outstanding of these are the many violent deaths, the critical and crippling injuries to persons, and the costly damages to property arising from the combination of the automobile and alcohol.

Prior to the early thirties authentic medical testing for ethyl alcohol as a poisoning was recognized by the medical profession. In 1813 J. M. B. Orfila introduced experimental chemical methods into Toxicology;<sup>1</sup> in 1835 J. Liebig described the oxidation of ethanol by acid dichromate;<sup>2</sup> F. E. Anstie reported in 1874 by using the Anstie Method, 0.66%  $K_2Cr_2O_7$  in conc.  $H^2SO_4$  as the ethanol reagent for the analysis of body material, a breath/urine alcohol excretion ratio of 1: 2;<sup>3</sup> C. Binz in 1877 reported the excretion of ethanol by the lungs; in 1883 G. Bodlander varied the Anstie's Method to measure ethanol excretion through the lungs; in 1896 N. Grehart demonstrated the ethanol distribution to all organs following injection into the blood stream; in 1905 Fitzgerald and Haldane noted the approximately constant  $CO_2$  concentration of normal alveolar air as 5.5% by volume;<sup>4</sup> in 1910 A. R. Cushing showed the application of Henry's Law to the distribution of volatile substances between blood and alveolar breath; in 1927 A. O. Gettler and A. Tiber recommended the use of alcohol levels in the brain as a true index of the degree of intoxication and suggested that it be stated in a four stage classification.<sup>5</sup>

In 1938 W. W. Jetter reported the controlled study of the correlation of clinical diagnosis of intoxication with chemical testing on 1150 subjects;<sup>6</sup> and R. N. Hager introduced the "Drunko-

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<sup>1</sup> Orfila, *Trait De Toxicologie* (1813).

<sup>2</sup> Liebig, *14 Am. Pharm.* 131 (1835).

<sup>3</sup> Anstie, *13 Practitioner* 15 (1874).

<sup>4</sup> Fitzgerald & Haldane, *32J. Physiology* 486 (1905).

<sup>5</sup> Gettler & Tiber, *3 Archives of Pathology & Laboratory Medicine* 218 (1927).

<sup>6</sup> Jetter, *196 Am. J. Medical Science* 475 (1938).

meter," a breath testing apparatus.<sup>7</sup> The Committee to Study Problems of Motor Vehicle Accidents recommended a three stage interpretation of blood alcohol levels: 0.0 to 0.5 sober; 0.05 to 0.15 under the influence and 0.15 up as intoxicated. It may be mentioned here that there is considerable authority today calling for a very definite decrease in these figures.

In 1941 L. A. Greenberg introduced the "Alcometer," an automatic electric breath apparatus and G. C. Forrester brought out the "Intoximeter" a portable breath apparatus.

In 1953 the first "Implied Consent Alcohol Test Statute" was enacted, New York Vehicle and Traffic Laws, Sec. 71a.

Before the early thirties, the only evidence permitted for determining intoxication was the oral testimony of lay witnesses, if based on observation. That such evidence is admissible must be conceded without directly citing the extensive authority. This testimony was based on observation of the amount consumed, the appearance and actions of the suspect, his sense of balance, his conversation, and the odor of intoxicants on his breath. Such evidence can be very reliable depending on the ability of the witness to observe, and his previous experience with intoxicated persons. However it can also be very unreliable, due to prejudices of the witness to alcohol, to the suspect in question, or to a personal interest. In addition, an experienced layman may be misled by one of the numerous pathological conditions which may accompany many of the symptoms of intoxication. In some cases expert testimony was produced by a physician, from an examination of the suspect, relevant in time, and based on his professional experience with intoxicated persons. This examination would sometimes be accompanied by clinical observations, such as reaction tests, subject to the rule of self incrimination due to compulsion.

In 1936 because of progressively increasing fatalities, extensive injuries to persons and costly damages to property resulting from automobile accidents on the highways, The National Safety Council, suspecting intoxicants to be a factor in a large percentage of these accidents organized a Committee on Test for Intoxication. This committee reviewed the medical research on ethanol and together with the American Medical Association made the following recommendations for utilization by various legal institutions:<sup>8</sup>

<sup>7</sup> Hager, 110 J. A. M. A. 779 (1938).

<sup>8</sup> 112 J. A. M. A. 2164 (1939).

1. Where there is less than 0.05 percent alcohol in the blood, or equivalent amounts in the other body fluids or breath, the subject shall be presumed to be not under the influence of alcohol, so far as the operation of a motor vehicle is concerned.

2. Where there is 0.15 percent or more alcohol in the blood, or equivalent amounts in the other body fluids or breath, the subject shall be presumed to be under the influence of alcohol.

3. Where there is 0.05 to 0.15 percent alcohol in the blood, or equivalent amounts in the other body fluids or breath, the results of such tests may be received along with other tests and observations for the consideration of the court or jury, as bearing on the question of alcohol influence.

Medical authorities are agreed<sup>9</sup> that the degree of intoxication is dependent upon the amount of alcohol absorbed into the subject's blood stream and carried to the brain, thus affecting his mental and physical faculties. Since it is impossible, in most cases, to take brain tissue for examination and impractical to take spinal fluid for legalistic purposes, the best substitute for determining intoxication is the blood since it faithfully discloses the alcoholic content of the brain. There is also a constant relationship<sup>10</sup> between concentrations of alcohol in the blood and in the urine, so that urine may be calculated to a blood factor and thus to the concentration in the brain. Professor Newman reports in this text the theory of retention of alcohol in the bladder over a long period of time which may show a higher alcoholic content, since at the time the specimen is taken there may have been a falling level of blood alcohol. This theory was the result of experimentation in post mortem cases, and does not hold in experimentation on the living body.

Where competent personnel and laboratory facilities are available blood or urine specimens are the most reliable; however because of the lack of personnel and facilities, most law enforcement agencies use breath testing devices. Commonest of these are the "Drunkometer," (introduced by R. H. Hager), the "Alcometer" and the "Intoximeter," all of which were evaluated in a report of the Committee on Tests for Intoxication, National Safety Council (1951) as follows: Assuming competent analytical techniques, the methods studied indicated a satisfactory per-

<sup>9</sup> Newman, Proof of Alcoholic Intoxication, 34 Ky. L. J. 251 (1946).

<sup>10</sup> Heise, 4 Am. J. Clinical Pathology 182 (1934).

centage of alcohol recovery. When these devices for the determination of alcohol concentration in the blood, measured by the analysis of the breath, were used in a manner recommended by the authors, the results obtained were in close agreement ( $\pm 0.015$ ) with results obtained by direct analysis of the blood, which differences, it is believed, are not significant to the problem under discussion.

The reliability and authenticity of the above tests are attested to by the volumes published on this medical research, by their acceptance by the American Medical Association and various medical societies, and by the fact that the above recommendations of the A. M. A. and the National Safety Council, as to these tests, have been incorporated into the statutes of so many states. Even though there is some disagreement in the medical profession as to the reliability of such tests, unanimity is never the test of judicial recognition. Lack of unanimity goes to the weight and not to the admissibility of the evidence.<sup>11</sup>

As in all chemical tests they are dependent on the qualification, integrity and technique of the person conducting the tests. In the examination of blood and urine the expert is usually a qualified technician or chemist. Groundwork of qualification must be laid by the prosecution as to education, experience, number of tests conducted, knowledge of the procedure and reagents, and the cautions to be taken in testing. Where the expert is expected to testify to the relation of the results of such testing to the degree of intoxication, a proper groundwork of his knowledge, experimentation and correlation of such results with actual subjects submitted to such tests.<sup>12</sup>

The qualification of the expert in breath tests is even more crucial for usually the examiner is not a technician nor a chemist but a regular police officer who has received training only in the operation of the machine. Here the examiner must be precise and meticulous in his procedures in order to maintain the mathematical standard required. They must be supervised regularly by a competent technician or chemist to see that the chemicals are always properly compounded and preserved; that the operation and the machine are periodically checked, and that the witness is able to calculate and translate the reading of the machine into percentage of alcohol in the blood.<sup>13</sup>

<sup>11</sup> *People v. Bobczyk*, 343 Ill. App. 504, 99 N. E. 2d 567 (1951).

<sup>12</sup> *Marx v. State*, 161 Tex. Cr. 401, 277 S. W. 2d 914 (1955).

<sup>13</sup> *Hill v. State*, 158 Tex. Cr. 313, 256 S. W. 2d 93 (1953).

The prosecutor should make every effort to bring to the court or the jury all the qualifications of the expert, particularly his experience in the field and his experimentation in correlating the test results with the symptomology of the subject. In this manner he lays the groundwork for the expert to arrive at, and to express, an opinion as to a hypothetical question based on the testified-to facts.<sup>14</sup>

The general rule<sup>15</sup> as to the admissibility of intoxication tests is that such tests have received wide scientific and judicial acceptance, and the results are admissible in the case, for or against the accused. Expert opinion as to what the amount of alcohol indicates with respect to intoxication generally is competent, at least where the accused voluntarily submitted to the test, or submitted without objection, or where undue force or coercion was not exercised in obtaining the specimen of the test.

The prosecution must: show that at the time of taking the test was relevant; it truly represents or can be calculated to the blood level at the time in question; properly trace and identify the specimen, must properly qualify the participating experts, and must show that proper testing conditions and testing procedures were maintained.

As to consent of the subject to take the test the general rule is that self incrimination is confined to testimonial compulsion, and therefore the constitutional guaranty is not violated. The constitutional privilege against self incrimination in history and principle seems to relate to protecting the accused from the process of extracting from his own lips, against his will, an admission of guilt and in the better reasoned cases it does not extend to the exclusion of his body or of his mental condition as evidence when such evidence is not obtained by compulsion.<sup>16</sup>

When defendant charged with driving under the influence of alcohol refused to give a specimen (blood or urine), evidence of such refusal was admissible and the prosecutor could comment upon it to the jury under provisions of the Ohio Constitution.<sup>17</sup>

<sup>14</sup> *State v. Koenig*, 240 Iowa 592, 36 N. W. 2d 765 (1949); *City of Columbus v. Thompson*, 89 N. E. 2d 604 (Ohio, 1949); *City of Columbus v. Van Meter*, 89 N. E. 2d 703 (Ohio, 1949).

<sup>15</sup> Annot., 159 A. L. R. 210 (1945).

<sup>16</sup> Annot., 164 A. L. R. 967 (1946). See also *State v. Grayson*, 239 N. C. 453, 80 S. E. 2d 387 (1954).

<sup>17</sup> *State v. Gattton*, 60 Ohio App. 192, 20 N. E. 2d 265 (1938).

While refusal of defendant charged with driving under the influence of alcohol to submit to chemical test is admissible, refusal of the defendant to submit unless his own doctor is present is a conditional refusal, unless unavailability of the doctor is shown by the prosecution. In case of such qualified refusal, testimony of an expert witness in the prosecutors case, as to the nature and effectiveness of chemical tests is not probative evidence of the guilt or innocence of the defendant, but evidence of a collateral matter concerning an issue that never was made and is therefore irrelevant, prejudicial and inadmissible.<sup>18</sup>

Evidence of the unconditional refusal of a defendant charged with driving while under the influence of intoxicating liquor to submit to a chemical test (urine) and testimony of an expert witness as to the nature and effectiveness of chemical tests was admissible.<sup>19</sup>

### Conclusion

The thirty years in which chemical testing for intoxication has had its inception and development has coincided with the thirty years in which the protection of the rights of the accused has almost obliterated the rights of our society to protect itself from persons bent on mischief. Despite this trend the courts have seen fit to encourage the advancement of the presentation of scientific evidence to enable the courts, both civil and criminal, to arrive at intelligent and just decisions. Scientific evidence, qualified by the ability and integrity of the expert, is the result of intelligent, systematized and skillful experimentation and research to discover the truth, whether it be used for or against the accused.

Such tests are admissible as evidence because their reliability and authenticity have been attested to, subject to the qualifications of the technician or chemist conducting the test; subject to the fact that undue force or coercion was not used in obtaining the specimen; and that the specimen can be properly traced and identified.

The expert when properly qualified may express an opinion as to the degree of intoxication indicated by the results of such tests.

The prosecutor, in Ohio, may comment on the unqualified refusal of the defendant to submit to such test.

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<sup>18</sup> *City of Columbus v. Mullins*, 162 Ohio St. 419, 123 N. E. 2d 422 (1954).

<sup>19</sup> *City of Columbus v. Waters*, 124 N. E. 2d 841 (Ohio, 1954).