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Scientific Evidence in the Law

By James R. Richardson

Introductory Statement

Recognizing the inherent weaknesses, inaccuracies and even the occasional uselessness of definitions, we, nevertheless, as a fundamental premise for discusional purposes, may define evidence as testimonial or physical data deemed judicially competent to demonstrate the existence or nonexistence of facts in issue. As to scientific evidence, the term may properly be regarded as referring to asserted facts which have been established or disestablished, through the application of physical or social science techniques, to a high degree of certainty, if not conclusively so.

With a working definition of scientific evidence at his command, the analyst, in striving to ascertain the legitimate impact of scientific evidence on our judicial institutions, and consequently upon society as whole, must be aware of certain operational factors which have been inculcated into our legal processes. These factors are based upon well-established principles, and perhaps upon well-considered thought, in the seeking of judicial truth by a democratic society. These factors may be manifestly tangible in nature, and on the other hand, in some aspects, may partake of the intangible. They may in some respects refer to purely mechanical application of factual findings, while yet again the controlling factor in the utilization of scientific evidence may be some recognized philosophical tenet or doctrine.

Specifically, the problem of investigating the true functions of scientific evidence makes it incumbent upon the investigator to consider methods of ascertaining facts, the methods of applying factual data, and the relative weight to be given factual evidence.

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in the light of desired objectives of our society. This means that
in evaluating the projection of scientific evidence into all justici-
able controversies one must be cognizant of:

1) The evolution of fact-finding processes,
2) Distinctions between law and fact,
3) Techniques of ascertaining facts,
4) Judge and jury as fact-finding media,
5) Principles of a fair trial.

Briefly recapitulated, in determining the ultimate value to be
had from scientific findings of fact it is essential that we determine
how facts will be ascertained, what agency will apply the facts
to an issue, how they will be applied and to what extent accepted
as a verity under the broad and general concept of due process of
law.

It is beyond the scope of this paper to attempt an investiga-
tion of fact-finding processes and the role that judge, jury and
science play in the over-all development of evidentiary concepts.
The purpose, in limited space, is to examine certain recent sci-
entific developments in the law of evidence, in the light of recog-
nized objectives of the law, and, if possible, to determine what
weight may be legitimately accorded to scientific evidence by our
legal institutions.

Science has made rich contributions to the law in the adminis-
tration of justice, both in rationalizing legal processes and in
furthering the attainment of desired ends. Legal institutions on
their part have generally not been slow in adopting the fruits of
scientific research as an adjunct to their fact-finding processes.

In this adoptive procedure, however, the law must proceed by
intelligent selection and discriminating caution. The social sci-
ences can through tested techniques develop controlled method-
ology; and the pure sciences through the perseverance of almost
endless trial and error can eventually certify certain findings.

As for the law, it has no laboratory aside from the courtroom
for testing its theories. Hence, it seeks a high degree of certainty
and predictability in most fields as a necessary expedient in avoid-
ing experimentation in the application of legal sanctions. Science
and the law differ not only in methods but in objectives as well.
That is, the objectives differ if the law is conceived as part of the social process rather than as natural phenomena.

Science, through its analytical and investigatory procedures, seeks to resolve the whole into parts; the organism into organs; the obscure into the known. Science does not inquire into the social values and ideal possibilities of things as does the law; it is content to show their present actuality and operation. Science narrows its gaze resolutely in regarding the nature and processes of things as they are; the scientist is as impartial as the forces of nature.

But, the law, as an institution for controlling human conduct and regulating human relations, must go beyond the scientifically determined fact as such; it must seek to determine its relation to society in the light of experience and determine its worth and reliability as an operative fact in jurisprudential thought. The law combines fact and experience in interpretive correlation; the law is philosophic as opposed to scientific, in that it coordinates wisdom and desire in the light of experience as a way of life. Science through nuclear fission releases the pent up forces of nature. Science tells us how to kill and how to save life. The law as part of the social process tells us through enlightenment when to kill and when to save life. Science is objective, while the law is subjective, and the law must ever accept scientific truths to be weighed in the scales of justice as determined by the experience of life.

Considering these preliminary remarks as something in the nature of orientation, it is proposed to examine certain developments in scientific evidence with emphasis on their competency, the weight to which they are entitled and the weight which they are actually accorded.

1. Blood Alcohol Levels as Evidence of Intoxication.

The Swedish scientist, Widmark, demonstrated in 1932 by experimental work that blood alcohol determinations are valuable indices of intoxication. A chemical analysis of the blood itself shows what percent or proportion of alcohol is in the blood. Following this experimentation, devices variously known as "drunko-

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1 For practical aspects of the question see Ladd and Gibson, Legal-Medical Aspects of Blood Tests to Determine Intoxication, 29 Va. L. Rev. 749 (1943).
"Meter", "Intoximeter" and "Breathalyzer" were developed for the purpose of ascertaining blood alcohol content through various breath tests. The basic theory of the Harger or "Drunkometer" breath test is that the breath of a suspect will reveal the extent to which the blood is saturated; it is a calculated proportion. The conclusion reached after exhaustive tests was that with 0.15 alcoholic blood content a person is definitely intoxicated and unfit to safely drive a car. The middle zone of 0.05 to 0.14 is stated to be in effect the twilight zone where many are actually intoxicated, but established as non-intoxicated for those who "can carry their liquor better". But, Dr. Harger believes anyone whose blood is 0.10 percent saturated is unfit to drive an automobile.2

The drunkometer test was first used in 1936 and is now used by police in thirty-eight states and in twelve foreign countries. This is not to be taken as indicative of unanimity in acceptance by the courts, though a majority have let the results of such tests go to the jury. One court in admitting such evidence, over objection, was of the opinion that the fact that there is a lack of unanimity in the medical profession as to whether intoxication can be determined by testing the breath held that this issue goes to the weight of the testimony and does not destroy its admissibility.3 The court in substantiating its decision pointed out that medical science recognizes at least sixty pathological conditions which produce symptoms similar to those produced by alcohol, yet the law permits non-expert testimony of lay witnesses to testify to objective symptoms commonly associated with alcoholic intoxication on the theory that sobriety or intoxication are matters of common knowledge. The court's argument on this point is not convincing. A witness testifies as to facts observed and recorded by his senses and on the basis of this is permitted to testify, "in my opinion the defendant was intoxicated". But the drunkometer, so to speak, makes an examination and then testifies "the defendant was intoxicated". In view of such "testimony" and the weight it can be expected to carry with the jury such evidence should be generally accepted by science as reliable before it is regarded as competent.

2 People v. Kovacik, 128 N.Y.S. 2d 492, 205 Misc. 275 (1954). This being a case of first impression in New York, it carries diagrams and formulae in detail about the Drunkometer, and testimony of the inventor, Dr. Harger, of Indiana University.
In yet another case expert witnesses, on cross-examination, admitted there was disagreement among scientists as to the Harger breath test for intoxication; nevertheless, the court held that such objection goes to the credibility and not to the admissibility of the evidence.\(^4\) Attaching “credibility” to a scientific testing device is novel in itself, and the court in effect permits an unqualified expert to testify. Proper recognition must be given to reliable scientific evidence if cases are to be decided by a preponderance of the evidence rather than a preponderance of the perjury, but a test becomes a scientific test only when it is accepted by science. As a minimum requirement a test should “fairly show” the guilt or innocence of an accused.

In still another case the defendant appealed from a conviction of negligent homicide, assigning as error the admission of testimony concerning the result of a test voluntarily taken by him on the Harger Drunkometer.\(^5\) The state relied on proof of it being generally accepted by the medical profession that:

a) chemical analysis of a specimen of the blood or other body fluid will accurately disclose the percentage of alcohol contained in the blood.

b) when the blood alcohol concentrate of a subject is 0.15 per cent or more, by weight, he is under the influence of intoxicating liquor to the extent of impairing his ability to operate a motor vehicle.

On the basis of such general scientific recognition, the question before the court was whether the breath test applied by the Harger Drunkometer would furnish an accurate index of the alcoholic content of the blood. Two policemen trained by the inventor, Harger, and a doctor who had once been a student assistant of the inventor testified that it would. Their testimony included a complex explanation of the underlying theory and modus operandi of the machine. To the contrary, however, five physicians testified that the device was no more reliable than a slot machine, and that the medical profession did not consider the device reliable.\(^6\) Swayed by such expert testimony, the court


\(^5\) People v. Morse, 325 Mich. 270, 38 N.W. 2d 322 (1949).

\(^6\) The views of the five doctors testifying for the defendant finds direct support in a report appearing in 26 Journ. Crim. L. and Crimin. 512 (1936).
held that the evidence supplied from the drunkometer findings should not have been admitted, there being insufficient evidence of general scientific recognition of the tests. The state interposed the ingenious argument that the rule as to admission of "lie detector" tests was not applicable to the drunkometer as the one related to a mental state and the other to a physical condition. The court found it unnecessary to answer this distinction, as it was of the opinion that both the lie detector and the drunkometer were devices involving scientific tests, the accuracy of which could scarcely be determined by a jury on the basis of complicated, scientific testimony concerning the theory and operation of the devices, in the face of a difference of scientific opinions as to their accuracy.7

If it be conceded for discussional purposes that breath testing devices are reliable and generally accepted, then police officers trained to operate the drunkometer could competently testify as to the taking of the test and under what circumstances and the results, but their testimony that the result indicated intoxication would be hearsay. It would be necessary for a foundation to be laid by medical experts as to what per cent of alcohol in the blood indicated intoxication, in the absence of a statute arbitrarily adopting a percentage.8 On this general issue, it may be stated as a realistic proposition that where a scientific advancement has been made in the field of medicine or related fields, to the degree where, with some accuracy under proper circumstances, certain reasons may be excluded as the producing cause of a resultant condition, and that fact has enjoyed legislative sanction as a proper evidential aid to the courts, but does not admit of that degree of infallibility or preciseness as to be a conclusive determination thereof, such evidential aid should be employed with

7 On the basis of general acceptance by the medical profession that a blood analysis will reveal alcoholic content, it is held that evidence of the taking of such specimen at or near the time in question, of its chemical analysis, and of the alcoholic content of the blood as determined by such analysis, together with expert opinion testimony as to what the presence of such alcoholic content in the blood indicates with respect to the subject's sobriety or intoxication are admissible. 20 Am. Jur. (1948 Supp.); Evidence Sec. 875 (1948 Supp.); Annot. 127 A.L.R. 1513; 159 A.L.R. 209; State v. Duguid, 50 Ariz. 276, 72 P. 2d 435 (1937); State v. Mokrid, Iowa, 286 N.W. 412 (1931); Kuroske v. Aetna Life Insurance Co., 234 Wis. 394, 291 N.W. 384 (1940).

the utmost caution and only to the degree expressly sanctioned by the legislature which endorsed it.

2. **Physiological and Psychological Truth and Deception Tests.**

Tests employed to determine the truth or falsity of statements made by the subject fall into three groups:

a) the association-reaction test in which the length of time the person being examined takes to think of words associated with those in a list given him, some of which are neutral and some of which may evoke a guilty association, is carefully measured and compared.

b) the respiratory test, which is based upon the hypothesis that the breathing of the subject varies in rapidity according to whether he is telling the truth or falsifying.

c) the systolic blood pressure test through the use of mechanical means.

The last named test is discussed at some length in this section inasmuch as it is the most commonly used and widely known. In 1921 the scientist Larson began work on truth and deception tests. He constructed a portable "polygraph" known as the "lie detector" for recording relative changes in pulse, blood pressure and respiration. It is the underlying theory of this test that the so-called guilt reaction, due to anxiety, produces physiological changes which may be measured and accurately evaluated. Professor Inbau and Dr. Keeler of Northwestern University have done much pioneering and developmental work in the field. The instrument they use is similar to an ordinary blood pressure cuff. It is placed on the arm and pressure from the artery is carried to an attachment that registers with a pen based on a pivot which leaves a graph on paper being wound at a rate of six inches per minute. Another attachment likewise registers respiration, based on the assumption, or fact, that most people who deliberately make false statements will show physical reaction, that is a rise and fall in blood pressure and a subconscious block in respiration.

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Objections to the use of lie detectors in judicial proceedings may be classified as:

1) objections resulting from either a misunderstanding of the machine or its proposed place in the trial,

2) objections, which although directed at the lie detector, apply equally to all expert testimony based upon scientific investigation, and

3) valid objections arising from the unusual nature of the lie detector.

Critics fear that conscious faking or emotional reactions other than fear of deception, such as nervousness, excitement or fear of the test may cause a wrong diagnosis. Proponents say that conscious faking is foiled by the recording of involuntary physical reactions, change in blood pressure, pulse rate and electrodermal response. Dr. Keeler points out that the examination procedure is designed to discount irrelevant factors and that, in order that the effects of existing environment, the present emotional state, and the physical condition of the subject may be determined, a polygraph recording is made for some minutes during which no questions are asked. Whatever the existing physiological and emotional condition might be, the resulting polygraph curves indicate the "norm" for the period of the test. After this "norm" has been established, two or three irrelevant questions are asked, then questions pertaining to the crime, intermingled with other irrelevant questions. Each question is worded briefly and must call for a "yes" or "no" answer. The examiner's mode of asking questions must be uniform as to rate, volume and inflection of speech throughout the test.\footnote{Keeler, Debunking the Lie Detector, 25 JOURN. CRIM. L. AND CRIMIN. 153 (1934).}

From the foregoing it will be seen that the lie detector tests must be given by an expert. And the experts ascribe from 85 per cent to 94 per cent accuracy to the lie detector.\footnote{Summers, Science Can Get the Confession, 8 FORDHAM L. REV. 334 (1938); Inbau, The Lie Detector, 40 SCL. MON. 81 (1935); Keeler, Methods of Detection of Deception, 1 AM. J. POL. SCI. 42; Marston, Psychological Possibilities in the Deception Test, 11 J. CRIM. L. AND CRIMIN. 551 (1939).} It is doubtful that any eye-witness in an honest attempt to relate past events could be quite so accurate. Any given witness may be affected by
factors that will, consciously or unconsciously color his testimony. These factors could be: 1) Predispositional traits or characteristics, 2) Environmental developments of personality, 3) Physical deficiencies of perception or other senses, 4) Errors inherent in even the average retention span, 5) Coercion or undue influence.

The previously listed objections to lie detector evidence may tend to lose strength in the light of the weaknesses to be accredited to other evidence generally held admissible in trials, civil and criminal. The fear or distrust of lie detectors is in part due to the conception that the machine itself will become a “witness”, and that the testimony of the expert based thereon will not be the real issue. This objection can be voiced to other scientific evidence. In evaluating the lie detector it must be borne in mind that it is not properly used to establish any independent fact in issue; its primary, indeed its sole purpose, is to demonstrate the worth of a witness’ testimony through tending to sustain or discredit his credibility. Perhaps the fault in this respect is that lie detectors are commonly thought to have no other function than that of establishing guilt or innocence.

Perhaps the most deep-rooted prejudice to the lie detector, which is also based on misunderstanding, is due to the belief that the lie detector may replace the fact finding function of the jury. So long as the issue on which evidence adduced by a lie detector is submitted to a jury this cannot happen. Should the time come when a lie detector is regarded as infallible in its findings, then to the extent used it will replace the jury.

Courts are reluctant to admit evidence based on lie detectors for what it is worth, to be evaluated by the jury. However, scientific evidence is used in many ways to connect a defendant with a crime: to show that he committed the act or his presence at the scene; and it is used to show mental and physical condition. But, a lie detector’s findings are “testimonial” in character in that it is

13 As early as 1938 over 100 police departments used the lie detector in detection of crime. Trovillo, A., History of Lie Detection, 29 J. Crim. L. and Crimin. 848 (1939). One police department reports use of the machine in 4,000 cases investigated over a three-year period and in those cases where deception was indicated 55% later confessed and a substantial percentage of the remaining 45 was subsequently convicted, 161 Scientific 8 (1930). The chief value of the lie detector at present is in investigation of crime and pointing to competent evidence. See McEvoy, The Lie Detector Goes Into Business, 38 Readers’ Digest 69 (1941).
directed at the testimony of a witness. Judicial thought is not yet oriented to have an inanimate machine attack the credibility of a witness. Wigmore once remarked, “If there ever is devised a psychological test for the evaluation of witnesses, the law will run to meet it.” Still later, however, he wrote, “Looking back at the range of possibilities for experimental psychometric methods of ascertaining concrete data for valuing testimonial evidence, it will be seen that thus far the only new psychometric method that has demonstrated any utility is the blood pressure method, which detects lies; . . . the record of psychometric achievement with testimony is still meager . . . The conditions required for truly scientific observations and experiments are seldom practicable. The testimonial mental processes are so complex and variable that millions of instances must be studied before safe generalizations can be made.”

This last observation, in general, reflects the attitude of courts to lie detectors. In one case it was said that the systolic blood pressure deception test for determining the truthfulness of testimony has not yet gained such standing and scientific recognition as to justify the admission of expert testimony deduced from tests made under such theory and in the absence of testimony that indicates there is a general scientific recognition of such tests in that it is established that reasonable certainty follows from such tests, it would be error to admit the test in evidence. In another case a defendant had favorable findings by a lie detector rejected by a court in stating that just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.

14 Wigmore, Evidence, Sec. 875 (2nd ed. 1923).
However, not all of the cases are negative in regard to use of the lie detector. A New York court admitted findings based on a pathometer or psychogalvanometer (lie detector) test over the objection of the state’s attorney. The court reviewed the fact that scientific evidence is admitted in other fields for the jury to evaluate, though experts differ as to their findings. The court then concludes that the time has come for the courts to recognize the efficacy of lie detectors where the testimony, as that before the court, of experts showed laboratory tests in excess of ninety per cent accuracy, and that in cases of those actually accused of crime the emotions and reactions would be more intense with results approaching one hundred per cent accuracy.18 So far as has been ascertainable, no appellate court has held that a lie detector can be used on an accused without his consent and the evidence so attained being considered competent.19


Such drugs as scopolamine and the barbituates (sodium pentothol and sodium amytal), acting as a central nervous system depressant to relieve tension and produce relaxation in a subject, are commonly used in psychiatric examinations. Perhaps the layman is of the impression that the “truth serum” is an infallible producer of truth from a suspect unable to offer conscious resistance. Actually it is not a serum at all and the subject does not always tell the truth. In brief, experimental findings demonstrate that only those persons who have a conscious or subconscious desire to reveal the truth will affirmatively respond to interrogation under the influence of a “truth Serum”. The principal value of narcoanalysis is found in its use by psychiatrists who seek to make full examinations of patients’ personality structures for future treatment.20

210 Wis. 651, 246 N.W. 314 (1933); People v. Forte, 279 N.Y. 204, 18 N.E. 2d 31 (1931); State v. Lowry, 163 Kan. 625, 185 P. 2d 147 (1947); State v. Cole, 354 Mo. 181, 189 S.W. 2d 541 (1945). See, Anno. 119 A.L.R. 2d 1198.


19 People v. Sims, 395 Ill. 69, 69 N.E. 2d 336 (1946).

The cases on narcoanalysis are few. In one case on the subject it was held that the defendant's motion to have a psychiatrist appointed to examine him under the influence of sodium penathol was properly rejected. The court stated that such proof would be hearsay, self-serving and conjectural since the truth thereof would depend entirely on the psychiatrist's opinion which conceivably might conflict with the opinion of another psychiatrist. On the basis of the reasons stated by the court, objections to "truth Serum" evidence can be expected to be categorized as a mental trepanning amounting to an illegal search and seizure of the defendant's mind. This would be a valid objection if the drug were administered involuntarily.

4. **Blood Grouping Tests.**

Forensic Immunology, identification by human blood groups: Landsteiner made the first observations regarding differences between bloods of normal human beings in 1900. This ushered in the important blood grouping determinations, primarily used as evidence of non-paternity.

The Landsteiner or Bernstein blood-grouping test is rather widely used by courts in paternity cases. This test is predicated upon the established medical theory that the red corpuscles in human blood contain two affirmative agglutinating substances, and that every individual's blood falls into one of four classes and remains the same throughout life. According to the Mendelian law of inheritance, this blood individuality is an hereditary characteristic which passes from parent to child, and no agglutinating substance can appear in the blood of a child which is not present in the blood of one of its parents. So, it follows, for example, that if according to expert testimony the blood of a child contains the agglutinogen "B" which is not present in the blood of the

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mother, then it must be present in the blood of the father. And, if the defendant, and alleged father, does not have this substance, he is not the father. Science accepts the test as conclusive.

The most celebrated case involving a blood-grouping test to determine non-parentage also demonstrates the supposed right of a jury to disregard conclusive scientific evidence.\(^2\) Despite exclusionary evidence of non-parentage, the case was allowed to go to the jury, which capriciously disregarded conclusive scientific evidence in finding the defendant the legal father of an unwed mother’s illegitimate child, as opposed to a biological father which he was not. The jury’s fact finding prerogative was preserved through its right to determine the qualifications of the experts who made the test and their impartiality, though these were not in issue.

Can such a verdict be justified? Did the jury reach objectives of society in a proper manner? These inquiries imply that perhaps such a verdict has social aspects. Apparently the jury’s verdict was based on evidence that it was mere chance, rather than the exercise of restraint or discretion, which excluded the defendant from parentage; and also upon the belief that the defendant had a moral duty to contribute to the support of the child, as he had contributed to the moral delinquency and consequent unwed motherhood of the plaintiff through persons unknown. The modest verdict, relatively so in view of the wealth of the defendant, indicates that the jury in fixing a sum for the care and education of the infant was penalizing a philanderer and assisting an innocent child victim of a clandestine assignation, rather than appropriating a share in the estate to an actual daughter and potential heir. Is the jury’s fact-finding function so sacred that it should be guaranteed to the extent of overriding scientifically established facts?

5. TRAFFIC CONTROL DEVICES, RADAR.

Radar equipped cars for speed zoning can accurately record the speed of motor vehicles at given points. Such devices are

becoming widely used and it is claimed that they can become a decisive factor in the reduction of highway accidents. The present problem is one of carrying on the tests in a manner to make the results admissible in evidence.25

Few cases involving conviction for traffic violations based solely on radar detection have come before state appellate courts for review. Of those which have been up for review not one sustaining a lower court conviction has been found. Under radar detection, a passing car on the highway breaks a beam of electrical energy which actuates a needle on a dial in the parked "radar car", registering the speed of the passing vehicle. In a case rejecting and reversing a conviction based on such radar detection the court stated,

Law enforcement should keep in stride with the advances of science and courts should receive scientific proof when presented in accordance with the established rules of evidence. These rules have safeguarded our lives, our freedoms and our property since the establishment of the common law, and should not be lightly set aside in the name of convenience. It may be that these electronic devices will become a great and much needed weapon in the armory of law enforcement. The science which embraces electronics is wonderful and mystifying. It brings into our homes voices from the far side of the world. On the screens of our television sets we see the images of events occurring many hundreds of miles away. With searching eye it peers into the heavens, alert to detect the approach of a foe by air. It guides giant missiles at supersonic speed into outer space, probing its mysteries and from great height detects an enemy target selected for destruction. In a hundred other ways it touches our lives today. In the not too distant future this science may bring civilization the horrors of a push-button war, but it must not bring push-button justice unless and except such justice is surrounded by the long-established rules of evidence.26

25 People of City of Rochester v. Torpey, 128 N.Y.S. 2d 864, 204 Misc. 1023 (1953). (Requiring evidence to establish the fact that radar is scientifically recognized as an accurate means of measuring speed).
26 People v. Offerman, 125 N.Y.S. 2d 179, 204 Misc. 759 (1953). Scientific evidence generally: Elaborate scientific investigation to reveal the sender of a bomb through the mail, Magnuson v. State, 187 Wis. 122, 203 N.W. 749; a strikingly similar case, State v. Clark, 156 Wash. 543, 257 P. 18 (1930); Identification of hit and run driver by button impression and print of fiber on car, from clothing of the victim, People v. Wallace, 353 Ill. 95, 186 N.E. 540 (1933); Particles of strangled victim's lipstick found in the pores of the murderer's hands,
In reversing convictions based upon radar detection of speed violations, the courts have relied upon one or more of three points:

a) lack of qualification of the "radar car" operators as experts,

b) lack of proof that radar speed detection equipment is a scientifically accepted method of accurately measuring the speed of motor vehicles, or

c) the hearsay character of the evidence, in that the testifying officer relied on information relayed to him by his co-ordinating colleague.

It is not too far-fetched to envision a well taken objection to the validity of the arrest in such cases. The misdemeanor, speeding, is not committed in the presence of the arresting officer, who acts in reliance on information relayed to him.

6. **Scientific Test for Pregnancy.**

In a prosecution for murder by abortion, the issue was whether or not the deceased was actually pregnant, pregnancy being an essential element of abortion in Colorado. The deceased had shortly before her illness and death taken a specimen of urine to a doctor for analysis. (His testimony was based on hearsay as he relied on the deceased's statement that the specimen was from her body). The so-called "rabbit test" for pregnancy was used requiring injection of the urine into the blood stream of: a) a virgin female rabbit, b) that had not been in proximity to a male, c) which was from four months to seventeen weeks old, d) and weighed approximately four pounds.

For the test to be made properly all four of the above conditions must exist concurrently, and in such case the test is described as ninety percent accurate.

Conviction was reversed for the reason that pregnancy had not been proven, based in part on the fact that the doctor could not state from his knowledge the source of the body fluid, and in part on failure to prove the age, weight and spotless reputation of the

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rabbit. The decision serves to illustrate that some scientific developments may strain the credulity of the court, if not the jury as is usually the case.

**SELF-INCrimINATION UNDER SCIENTIFIC EVIDENCE**

The issue of self-incrimination or violation of due process of law under the types of scientific evidence discussed in this paper is most frequently raised in situations involving the taking of body fluids as evidence. This is not to say that the problem is not present in the lie detector cases, but the cases in point are relatively few. Where the question of the admissibility of evidence as to chemical analysis, or lack thereof, of a body fluid is presented, it will come within one of three factual situations: (1) when the test is voluntarily submitted to, (2) when there is a refusal to undergo the test, or (3) when the test is involuntary, or "consent" of the subject is lacking.

As to the first category it may be stated as a general rule governing the testing of body fluids with relation to intoxication that from the cases it is apparent that subject to compliance with conditions as to relevancy in point of time, tracing and identification of the specimen, accuracy of the analysis, and qualification of the witness as an expert in the field, there is rather general agreement that when the prosecution in a criminal case seeks to establish the intoxication of the accused, evidence as to the obtaining of a specimen of his body fluid at or near the time in question, evidence as to the alcoholic content of such specimen, as determined by scientific analysis, and expert opinion testimony as to what the presence of the ascertained amount of alcohol in the blood, urine, or other body fluid of an individual indicates with respect to the matter of such individual's intoxication or sobriety, is ordinarily admissible as relevant and competent evidence upon the issue of intoxication, at least where the accused voluntarily furnished the specimen for the test, or submitted without objection to its taking.28

28 Anno. 159 A.L. 210; 127 A.L.R. 1514. Constitutional rights in taking a drunkometer test are not violated where the evidence shows that the accused freely and voluntarily consented thereto, under conditions where he was mentally and physically able and free to make a choice, and with full knowledge that the results of the test might later be used for or against him. Ray v. State, 120 N.E. 2d 176 (Ind. 1954); Logan v. State, 269 P. 2d 380 (Okla. 1954).
As to refusal to take a blood test for chemical analysis, it is held that where one arrested for intoxication refuses to take an intoxication test, the fact of refusal may be introduced in evidence, and this though the defendant at all times denies his guilt.29 And one court stated that to hold to the contrary would further the confusion between the admissibility of a circumstance in evidence and its weight when admitted; it is for the jury to say if fear of the result dictated the defendant's refusal, or determine if he had some other reason for the failure to cooperate.30

The question of the admissibility of evidence of refusal to take an intoxication test is related to a field containing two well established types of cases:

1) those in which, by statement or by silence when confronted by an accusatory statement, the defendant is deemed to have made an admission that tends toward establishment of guilt,31

2) those in which by some positive action the defendant causes an inference of some consciousness of guilt to arise; illustrative of such cases is evidence of the flight of the accused, generally held to be relevant.32

Refusal of an accused person to take a test for intoxication would seem to fall within this second grouping. It is not what the defendant says or refuses to say that is significant, but rather what he does or refuses to do that may give rise to a presumption. There is a close analogy to be drawn between the circumstances of flight from the scene or the use of an alias and that of refusal to submit to a harmless scientific test as constituting a fact which is indicative of a consciousness of guilt.33

Issues of a grave nature are raised in the third classification of cases where results of tests are offered in evidence though the defendant did not give his "consent" to the test being given.

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29 States that have by statute made intoxication tests competent evidence generally provide, as does Kentucky, that the accused may refuse to take such a test, but such refusal may be commented on by the prosecutor. Ky. Rev. Stat. 189.520 (1955).
31 People v. Simmons, 28 Cal. 2d 699, 172 P. 2d 18 (1946), and cases cited.
33 Following the general rule that evidence of one's refusal to take a blood test when arrested for drunkenness is admissible. State v. Benson, 230 Iowa 1168, 300 N.W. 275 (1941).
Consent may be lacking for any one of three reasons: (1) the test was given compulsorily, (2) the accused was unable to give consent due to unconsciousness or other cause, or (3) the accused misunderstood the purpose of the test through trick, ruse or other cause. Such facts may give rise to either a claim of self-incrimination or of violation of due process of law.

The Fifth Amendment to the Federal Constitution, its counterpart being found in most state constitutions, states that, "... no person shall be compelled in any criminal case to be a witness against himself nor be deprived of ... liberty ... without due process of law." The issues arising hereunder give rise to several pertinent inquiries: Does being a "witness against himself" apply to oral testimony or does it include real evidence? Is a different construction to be drawn if the provision is, cannot be "compelled to give evidence against himself" as contained in Section 11 of the Kentucky Constitution? With respect to "compelled" in the light of the due process clause, does "compel" imply force or coercion of an irresistible nature? On the other hand, can "consent" be predicated on the mere failure to protest, or resist; or will not ignorance of the right to resist, or fear under the distress of arrest or confinement lead a prisoner to be passive, or even to comply with a request to bare his body or submit to a blood test under a sense of compulsion? Is it enough to show that the defendant was a docile prisoner and failed to resist or protest? Can there be a mental resistance as well as physical or vocal resistance? Or must it be shown that the defendant voluntarily consented under a voluntary expression of a free will? The foregoing are some of the inquiries which should be borne in mind while examining the possibilities of self-incrimination or violation of due process in the taking of body fluids or applying other tests to an accused.

The most generally accepted concept in regard to the constitutional privilege against self-incrimination is that in history and principle the doctrine seems to relate to protecting the accused from the process of extracting from his own lips against

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34 The constitutions of all the states of the Union, with the exception of New Jersey and Iowa contain provisions against self-incrimination. The protection is from "testifying", or "furnishing evidence", or from "being a witness". The distinction as to wording has not been significant with respect to decisions on self-incrimination. 8 Wigmore, EVIDENCE, Sec. 2252 (3d ed. 1940).
his will an admission of guilt, and in the better reasoned cases, so it is argued, it does not extend to the exclusion of his body or of his mental condition as evidence when such evidence is material and relevant, even when such evidence is obtained by compulsion. Consequently, it has been held that evidence secured by a drunkometer, blood analysis, or urinary test is not properly classified with confessions but rather is comparable with such scientific tests for identity as fingerprints, footprints, shoeprints, or even the disclosure of bodily scars, birthmarks, abnormalities or dentures. For, as once stated by Mr. Justice Holmes, "but the prohibition of compelling a man in a criminal case to be a witness against himself is a prohibition of the use of physical or moral compulsion to extort communication from him, not an exclusion of his body as evidence when it may be material." Following through on this premise, it is held that an accused may be required to "furnish evidence" by doing many things without having his constitutional rights against self-incrimination invaded.

On this point, distinction is made by some courts between the admissibility of evidence of the result of a prisoner's affirmative act or acts under compulsion, and the result accomplished without his active participation, but against his will. The proposition is well illustrated in a case involving two questions:


41 For purposes of identification the accused may be required to stand up in court, to appear at the scene of the crime, 3 WHARTON, CRIMINAL EVIDENCE, Sec. 1141 (11th ed. 1935); to put on a jacket to see if it fits, Holt v. United States, 218 U.S. 245, 31 S. Ct. 2 (1910); to place a handkerchief over his face, Ross v. State, 204 Ind. 281, 182 N.E. 865 (1932); to expose body scars, State v. Oschoa, 49 Nev. 194, 242 P. 582 (1926); and may be fingerprinted, photographed and measured under the Bertillion system, Downs v. Swann, 111 Md. 53, 73 A. 653 (1909); Conners v. State, 134 Tex. Cr. Rep. 278, 115 S.W. 2d 681 (1938).

1) Was the testimony of the sheriff admissible to the effect that he compared the shoe of the defendant with the tracks in the potato patch, and that it fitted, when it appeared that he had forced the defendant to remove her shoe and make the adjustments herself?

2) Was the testimony of the sheriff admissible to the effect that he compelled the defendant to put her foot in the track and that she would not do it in the right way?

The first question was answered by the court in the affirmative for the reason that in such instance the defendant was not being treated as a witness, the shoe and the comparison of the shoe with the track were not the testimony of the defendant, but of the sheriff, distinct from anything she may have said or done; the shoe was obtained from her control without the use of any process against her as a witness; she was not necessary to establish its authenticity, identity or origin, which facts were established by the testimony of the sheriff. In answer to the second question presented the court held that testimony as to the sheriff compelling the defendant to put her foot in the track and her conduct in doing so was inadmissible for the reason that the defendant was required to do an affirmative act, and if the conformity had been perfect that fact would have appeared from the enforced conduct of the defendant, clearly testimonial compulsion. This seems a rather tenuous distinction. Does it mean the sheriff could knock the defendant out, remove her shoe and place it in the track, but should not force the defendant at gun point to place her shod foot in the track? In any event it is apparent that if a defendant has not given his "consent" to the taking of body fluid for chemical analysis, objection to the evidence thereof must be made under lack of due process, if at all, and not as self-incrimination. This is so though lack of "consent" in a given case of this type is synonymous with "compulsion."

43 This is the "Wigmore doctrine" not limiting the Constitutional prohibition against self-incrimination to "testimonial utterances", but extending it to protect the individual "from any disclosure sought by legal process against him as a witness", Wigmore, Evidence, Sec. 2263 (3d ed. 1940).

44 This position is stated to be the weight of authority, State v. Cram, 176 Or. 577, 160 P. 2d 283, 164 A.L.R. 952 (1945).

45 It is clear that the "compulsion" contemplated by the Constitution does not refer to hope or fear brewed in the secret places of a person's mind, but to external forces inducing such hope or fear. Compulsion is the keynote of the prohibition
The issue of due process is raised in cases of the third category discussed above wherein the taking of blood or other body fluid is under circumstances of compulsion or lack of consent. The cases are in conflict in situations where a blood sample is taken from one who has "passed out" or who has been knocked unconscious in a motor vehicle accident. The cases are not rare where an unconscious motorist while in the emergency room of a hospital has a blood sample taken by an interne at the instance of a police officer who suspects intoxication. A number of cases have held that in prosecutions for manslaughter arising out of an automobile collision, admission in evidence of the results of a blood test to show intoxication did not violate due process of law under the fourteenth amendment to the Constitution, though the blood was withdrawn while the defendant was unconscious after the accident. One reason given is that while compulsory or involuntary testimony from a defendant may and should be excluded, the rule should not be extended to cover real evidence where not secured in a "brutal and shocking manner". Thus the state is permitted to make fortune out of misfortune. Fortunately for the state the defendant is unconscious as a result of the accident, for it would not be permitted to "blackjack" him into insensibility and secure evidence in a "brutal and shocking manner". Such reasoning, based solely on the exigencies of the situation, is utterly defenseless. In another case which involved taking blood without the consent of the individual it was held that such an act was an assault and battery and clearly an invasion of personal privacy. The court felt that if such an encroachment on the person were permitted it would be difficult to determine a

and to render evidence inadmissible on the ground that the defendant was compelled to produce it against himself it must appear that such compulsion was used as to rob him of volition in the matter. People v. Corder, 244 Mich. 274, 221 N.W. 309 (1928). Annot. 18 L.R.A. (N.S.) 768 (1909). Breithaupt v. Abram, 271 P. 2d 824 (N.M. 1954). See also, People v. Block, 240 P. 2d 412 (Colo. 1952). The constitutional privilege would not bar the use, in the prosecution of a defendant, of the results of a body fluid test even though taken when he was so drunk as to be confused or unconscious or otherwise in such a condition that it may not be said that he voluntarily consented thereto. State v. Cram, 176 Or. 577, 160 P. 2d 283, 164 A.L.R. 952 (1945); People v. Tucker, 88 Cal. App. 2d 333, 198 P. 2d 941 (1945); State v. Ayers, 70 Idaho 18, 211 P. 2d 142 (1949); State v. Sturtevant, 96 N.H. 99, 70 A. 2d 909 (1950); People v. Spears, 114 N.Y.S. 2d 659, 201 Misc. 666 (1952); Bovey v. State, 93 N.Y.S. 2d 580 (1949); People v. Defore, 242 N.Y. 13, 150 N.E. 583 (1928).
rational stopping point. It explored the supposition that in the future medical science evolved a technique whereby the truth could be infallibly secured from a witness by trepanning his skull; it observed that no one would insist that such a dangerous operation be undergone in the interests of justice, but inquired as to where the line is to be drawn between this extreme and the relatively simple extraction of blood; yet is it not after all the degree of risk involved but rather the invasion of a constitutional right to personal security and privacy by whatever means that is controlling?  

At this point in the discussion the case of Rochin v. California is brought squarely into focus. When accosted by officers in his room, the defendant, Rochin, swallowed capsules in his possession. He was handcuffed and rushed to a hospital where a doctor, at the direction of the officers, forced him to swallow an emetic. The defendant vomited two capsules of morphine, and on the basis of this evidence was convicted of possession of narcotics under state law. The case eventually reached the United States Supreme Court where it was held that Rochin had been denied due process of law. Mr. Justice Cardozo, in the course of the opinion, stated that the conviction was obtained in a manner that “shocked the conscience and approached the rack and the screw.” (Query: 1. Would the result be different if the emetic had been treatment necessary to save life? 2. Would the result be different had the man been insensible by the time the hospital was reached?)

The Supreme Court has agreed to take under consideration the cases involving the involuntary extraction of blood for


chemical analysis. Will the Court draw a line of distinction between "compulsion" and "involuntary", thus establishing a matter of degree in criminal prosecutions where a defendant should not be required to furnish a single link in the chain of evidence that convicts him. The Court admitted that the confines of due process cannot be rigidly defined, but left an opening for future consideration of blood tests and similar techniques with the observation:

We therefore put to one side the cases which have arisen in the state courts through use of modern methods and devices for discovering wrongdoers and bringing them to book.

When the decision comes it should be to the effect that to extract blood by means of a hypodermic needle from a person accused of crime, without his consent and while he is unconscious, for the purpose of obtaining evidence to aid in his conviction shocks the judicial sense of justice and decency; that it scraps concepts of due process of law for law enforcement with a vengence; that it will engender fear and disrespect for law, law as applied in a police state; and that such action constitutes law enforcement based upon violation of the law, and that no court should place its judicial stamp of approval on such police methods.

**Weight and Conclusiveness of Scientific Evidence**

If it be conceded that, under proper conditions, the recent scientific developments in the law of evidence, which have been discussed, are admissible in evidence, the compelling issue then is what weight they are to be accorded under our system of trial by jury. The problem must be examined in the light of mutual objections:

1. that legal institutions as structured cannot and do not fully utilize scientific evidence.
2. that judicial acceptance of a scientifically established fact invades the province of the jury.

Briefly stated, a review of the cases reveals three threads of judicial thought which can be untangled and identified with respect to the weight and conclusiveness of scientific evidence:
(1) The jury as triers of facts may reject uncontradicted and unimpeached expert evidence.

(2) The jury may not disregard scientific evidence, but should consider it along with all the other evidence in a case and attribute to it the weight to which it is entitled.

(3) When matter in issue, peculiarly within the knowledge of experts alone is established by scientific investigation, the finding is conclusive and no issue of fact is presented for the jury.

From the foregoing, it is apparent that the heart of the problem concerns the function of the trial jury in relation to state objectives. It may be framed as the case of "strict law" v. "individualized justice", or "scientific evidence" v. "the general verdict".

Disregarding the thought-provoking philosophical observations, such as law being a power process to bend the will of the masses, and its corollary that morality is an invention of the weak to restrain the strong; it may be stated for present purposes that law is an institution by means of which society seeks to materialize its demands and expectations through bringing the "good life" to the most people commensurate with its resources and existing value concepts. Stated thus idealistically, society seeks the ultimate in the shaping and sharing of values for the community as an entirety. Realistically, self-interests inevitably clash with legitimate objectives either over-emphasized or temporarily cast aside, but basically the ideal pattern remains an ever present potential in a democratic society. Objectives necessarily change with eventual developmental complexities of a formalized society, nevertheless, the maintenance of peace and order remains the fundamental objective upon which the realization of all other objectives of a politically organized group depends. In our jurisprudential thought and practice the trial jury is accepted by many as the judicial keystone for maintaining security of the person and property as opposed to the perils of "official justice".

Experience has proven that trial juries can give to their verdicts an elasticity and flexibility not possible, and possibly not desirable, in the decisions of trial judges. Stare decisis is unknown to the trial jury, which as a body tries one case only, speaks from the anonymity of the twelve and is then dissolved.
Can we reasonably assume that this so-called elasticity of "jury law" was a planned state objective under determined efforts to make trial by jury a part of the organic law through specific incorporation in State and Federal constitutions? If so, having progressed from "magic" to "science" in manifestations of proof, to what extent is the fact-finding prerogative of juries to be legitimately exercised through disregarding scientific proof in maintaining "elasticity"?

As a generalization, an acceptable proposition is one to the effect that the function of the jury is to find the facts as rational men would be led to believe by the evidence and to apply the law, as submitted by the court, to the facts so found. Rational men sitting as trial jurors may often reach conclusions on conflicting testimony of lay observers, called as witnesses, which may be debatable at least, but concerning which no strong disagreement will be forthcoming. However, in cases where lay testimony is in direct conflict with scientific proof, and the jury's verdict is contrary to the conclusions of men of science, quite a different problem is presented. Such an unscientific result is not fully countered or set at rest by labeling trial juries as unreliable fact finders. Actually, important issues of policy are presented whereby it becomes necessary to examine and determine the over all objectives of law and society. The trial jury is not to be condemned and scrapped as an anachronistic governmental whimsey without first determining the standards of predictability or elasticity which society demands of its legal institutions.

Two possible extremes as determinants for jury action are suggested:

1) The jury should rationally determine the facts in an abstract or vacuum-like manner and dispassionately apply the law to these facts in reaching a verdict; i.e., Facts x law = verdict.

40 Georgia v. Brailsford, 3 Dall. 1 (1794). Mr. Chief Justice Jay in the first jury trial before the U.S. Supreme Court charged the jury in part as follows, "... but it must be observed that by the same law which recognizes this reasonable distribution of jurisdiction, you nevertheless have a right to take upon yourselves to judge of both, and to determine the law as well as the facts in controversy". Note: This view was later strongly repudiated in Sparf & Hansen v. United States, 156 U.S. 51, 15 Sup. Ct. 273 (1899).

50 "Scientific proof" may be taken as evidence upon which accepted modern scientific theory unequivocally implies the existence of a fact upon which the law will act. Mumford, Disregard of Scientific Proof by Juries, 41 JOUR. OF CRIM. LAW & CRIMIN. 320 (1951).
2) Regardless of the law and the evidence the jury should render its verdict for the party it thinks should win; i.e., jury caprice or sympathy = verdict.

If the first hypothesis is accepted as the proper functional process of trial juries; then, as juries are known to succumb to emotion and sympathy at the expense of rules of law, they should be supplanted by fact-finders of another variety, the judiciary, possibly more accurate in that they are trained to judge the affairs of men with cold dispassion.\textsuperscript{51} Under the second hypothesis the trial jury would constitute an irresponsible, dictatorial device for usurping democratic principles. Somewhere in between the two extremes lies the answer to the jury's function if the trial jury is to be retained; if the apparent intent of our constitutional guarantees is to be carried out; if government by men is not to bow irretrievably to government by law; if equity is at times to achieve ascendency over the letter of the law.

It is obvious that no hard and fast line can be drawn between the two extremes under consideration. Perhaps this means individual cases must receive individual treatment. But, society reasonably expects some degree of certainty and predictability in the verdicts of juries. On the other hand, are unanticipated situations or individual equities to be sacrificed through the application of unyielding legal sanctions. We possibly feel that "strict law" gives predictability in the administration of justice. Likewise it seems inescapable that rules of law are made for general application and thus may become impersonal and arbitrary, lagging behind social needs and changing concepts of justice.

Legal institutions formally express society's self-imposed standards of right and wrong, and institutions designed to effectuate society's ever changing code of conduct should have a means of acting in response to special circumstances as well as in reacting to rules of law. This concept of moral justification in law is, of course, shocking to exponents of a "strict law" theory which is an outgrowth of immutable natural law concepts. Hence, it is timely to forego the abstract at this moment for practical inquiries. Is it the policy of the law that a "mercy killer" receive the same pun-

\textsuperscript{51} Frank, Law and the Modern Mind, 179 (1930). Query: will a judge, if he is honest and a man of stature, tend to decide cases on hunch and fairness?
ishment as one who kills in the process of robbing a bank? Under the rule of law they are equally guilty. Which actor commits the greater crime against society? Which actor, if unconfined, presents the greater menace to society? Can a legal wrong and a moral right co-exist, where rules of conduct have not been changed to fit new social norms? Is one who “could” have been the father of an illegitimate child not to pay for his indiscretions merely because science proves he is not the father? Is it desirable that verdicts in personal injury actions constitute a guide to future conduct to the extent deemed necessary in commercial transactions and cases involving the transmission and devolution of property?

Reflection on the above inquiries may cause one to emphasize “justice” at the expense of “law”, and such seems to be the current trend of much legal thought. If so it be, then legal thought is only beginning to catch up with the trial jury which has always been the law’s “escape valve” from the arbitrary administration of justice. Is such flexibility in fact a state objective? If the objection is that such an objective is invalid when it ignores scientific proof, then it must be remembered that science seeks to establish certain discovered truths while the law seeks to control human behaviour.