The Constitutionality of Chemical Testing in the United States for Determination of Alcohol Concentration

We are living in an age in which science is progressing with unbelievable rapidity and increasing certainty in the solution of many problems and conditions which have long defied solution. The development of chemical testing in the area of traffic regulation on the streets and highways is an outstanding example. For some years alcohol intoxication has been a significant cause of traffic accidents in the United States. Recent accident records attest that one out of every six drivers involved in a fatal motor vehicle accident and one out of every four pedestrians killed by a motor vehicle had been drinking. The problem of coping with the drinking driver-pedestrian has been an important factor contributing to the development of chemical testing. It has come into increasingly wide use for the dual purpose of detecting persons under the influence of intoxicating liquor and of protecting the innocent person unjustly accused of being intoxicated.

I

The Problem Background

Until the advent of chemical testing there were few, if any, reliable means by which a state of intoxication within the meaning of the law could be identified with surety. For the most part, law enforcement officials had to rely upon various "traditional" identification methods many of which had been used from a time "when the memory of man runneth not the contrary". Among these traditional means are the following: testimony of witnesses who had observed the appearance and actions of the accused, testimony of police surgeons and private physicians based upon examination of the accused, and the findings of incriminating real evidence at the scene of the accident or arrest. Nearly always, such evidences stem from particular actions, conduct and appearance of the accused: for example, that he was boistrous, quarrelsome, gibberish, incoherent, dull, sodden, cried and was sentimental; that his eyes were glassy, his clothes were disheveled and soiled with vomit; that he reeked with the stench of intoxicating liquor; that he drove recklessly, sigzagging, crowded other cars of the highways, slumped at the wheel, was unable to stand erect, etc. Perhaps the accused was seen to drink, or liquor was found in his vehicle, or he was known to have been drunk before the action in question, or was drunk shortly thereafter. These are some of the traditonal tech-
niques of identification used for many years as principal means of proving alcohol intoxication.

Such means have failed to supply that accuracy and reliability of proof required in the prosecution of criminal cases for many important reasons. In the United States a high degree of proof is always required in criminal cases to assure that no innocent person shall be found guilty of a crime he did not commit. In criminal cases the prosecution always has the burden of proving the defendant guilty beyond a reasonable doubt. "Reasonable doubt" is difficult to define. Among many statements one finds the following: "It is not mere possible doubt; because anything relating to human affairs, and depending on moral evidence, is open to some possible or imaginary doubt. It is that state of the case which, after the entire comparison and consideration of all the evidence, leaves the minds of jurors in that condition that they can say they feel an abiding conviction, to a moral certainty, of the truth of the charge." Various courts have defined the measure of proof in many ways. They all say in effect that an accused person is presumed innocent until proved guilty.

In drinking driving-pedestrian cases the problem of proof is a difficult one for many reasons. For one thing an apparent state of intoxication caused by liquor may actually have been caused by some other non-alcohol factor. The fact is well known that there are many pathological conditions which produce symptoms similar to those produced by alcohol. Cerebral concussion, brain laceration, fractured skull, extradural hemorrhage and subdural hematoma, and extremely high blood pressure, may evoke behaviors similar to those produced by intoxicating liquor. Opium, barbital derivatives and other sedatives, even mushroom poisoning, may leave a person in a state of dizziness, faintness, sickness, weakness and the like, which might suggest inebriation from liquor. The same is true with regard to an overdose of insulin in diabetics, while lack of insulin may cause the breath of the diabetic to simulate a noticeable intoxication odor. Because it is possible that an apparent state of intoxication may be caused by any of a number of factors the state must be prepared to prove in all drinking violations that the intoxication resulted from the drinking of liquor. Otherwise the moment a defense attorney points out that there are very few symptoms of alcohol intoxication that cannot be simulated by some other pathological condition, he has instilled doubt in the mind of judge and jury. This is tantamount to acquittal. The fact that causal identification cannot be accomplished by the traditional methods of determining alcohol intoxication is the first of many fundamental reasons why they do not suffice and why chemical testing evidence must be used in many cases to prove that intoxication was due to alcohol.

Problems of proof in the field of traffic accidents have been complicated by the further fact that it is not the drunken person but the less than totally inebriated person who is the chief trouble-maker on the highways. Many accident investigations have shown that it is not the driver or pedestrian who is in an advanced state of inebriation who is the principal traffic hazard. The majority of drivers in a drunken condition go to sleep or get off the highways before an accident occurs. Nor is the drunken pedestrian a prime difficulty in the traffic stream. Rather, the problem is caused by those who have had
enough to drink so as to impair their judgement, but not enough to affect their appearance markedly. These are the persons who will take chances which they normally would avoid and who fail to exhibit discretion which they otherwise would have demonstrated.

Because it is the judgement-impaired individual rather than the drunken one who is the chief source of traffic hazard, the problem of proof has been complicated accordingly. Impairment of judgement is the first of the faculties to be affected by alcohol. Often, impairment occurs before the individual has reached a point of intoxication where intoxication becomes noticeable by his appearance and actions. Here, then, is a situation of critical significance. How is it possible to prove by the traditional observatory method that the judgement of a violator is impaired when the violator is not sufficiently intoxicated to demonstrate it by his behavior and appearance? In many such borderline cases no arrest is made because the arresting officer cannot be sure of the intoxication nor can he obtain reliable lay testimony to support the amount of proof required by law.

The time element dilemma is another problem confronting the law enforcement official. It is well known that alcohol is expendible, that the effects of alcohol will wear off. The average 150-pound person can burn about one-third fluid ounce of pure alcohol per hour. Thus, any pronounced interval between the accident and the time of examination is usually fatal to the prosecution. Nor should it be forgotten that the shock of accident may bring about an appearance of sobriety. The fact is that qualified medical examination are made in only a very small proportion of the traffic accident cases where intoxication may be involved. Hence, in the great majority of violations, law enforcement officials have had to rely upon the testimony of lay witnesses.

Such problems as these (and there are many others) account for the increasing interest in chemical testing use. How rapidly chemical testing will come to be employed in traffic accident prevention and how extensively it will be used by law enforcement officials continges in many respect upon the judicial acceptance accorded it. Experiences in the use of other scientific evidences (fingerprint identification and ballistic proof are good examples) have demonstrated that if the courts will admit such evidence progress in their use will be rapid. But if such evidences are not admitted they will fade rapidly from the scene. It is important, therefore, to take stock of the present judicial situation and to determine in basic terms the constitutionality of chemical testing at the present time.

Our high courts (both federal and state) have held to the general proposition that before real evidence attained as a result of a scientific measure would be admitted in court, the scientific principle upon which is based had to cross the line from the twilight zone of experimentation to a demonstrable stage. Which is another way of saying that experimental evidence will not be admitted, but that evidence based upon a recognized principle of reliability will be admitted. At what point of change from the experimental to the demonstrable state scientific evidence will be admitted was expressed some years ago by the court in the case of Frye v. United States:1 "Just when a scientific principle or discovery crosses the line between the experimental and de-

1 293 Fed. 1013.
monstrable stage is difficult to define. Somewhere in this twilight zone the evidential forces 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 to which it belongs.

II

Transitions from the Experimental to the Demonstrable Stage in Chemical Testing

Chemical testing for alcohol concentration is now almost a century old, for it dates from the middle years of the last century. But only within the last twenty five years has the science of chemical testing made important strides forward in the United States. The accident problem on the streets and highways has had an all-important effect in stimulating research on alcohol as a causal factor of traffic accidents. In many respect the increasing use of chemical testing by law enforcement officials may be attributed to the extensive research conducted by scientists. Within the last decade, in particular, such research explorations have disclosed a number of basic facts about alcohol and its influence on accident cause to which the courts are extending increasing credence.\(^1\) Attention should be directed to some of the major scientific conclusions for they have caused significant shifts in judicial attitudes about the admissibility of chemical test evidence. The first may be stated as follows: The intoxicating effect of alcohol is produced by the amount of alcohol accumulated in the brain, not the quantity and kind of liquor imbibed. Such a conclusion has tended to shift matters of proof away from evaluation of the traditional external manifestations to identification of the amount of alcohol in the brain. This shift has been an important boon to law enforcement officials. Quite often in drinking driving cases determination of guilt or innocence has hinged upon how much the defendant drank and what kind of liquor was imbibed. How often the defense has adopted this stereotyped defense: "Your honor, the defendant only had a couple of beers!" Conversely, the prosecution has had to rely upon evidence of heavy and prolonged drinking in convincing judge and jury. That the kind and quantity of

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beverage drunk should be the *sin qua non* of whether a person is intoxicated or not is an outstanding example of the fallacy of traditional methods of proof. When medical science demonstrated out of its extensive research that the effect of alcohol is produced by the amount of alcohol accumulated in the brain, not the quantity and kind of liquor imbibed, it went far in providing the kind of proof required in criminal cases: measurable proof. For, in all the definitions of the elements constituting drunken driving, it is not the drinking *per se* which is the offense. Rather, it is drinking to an extent that has affected the individual sufficiently to cause him to be "under the influence" of intoxicating liquor. Typical of the legislative provisions governing the offense of drinking driving is the following:

"It shall be unlawful . . . for any person, whether licensed or not, who is a habitual user of narcotic drugs or any person who is under the influence of intoxicating liquor or narcotic drugs, to drive any vehicle upon the highways within this state."

Clearly, being "under the influence" is the crux of the offense.

A second conclusion which the scientists have disclosed is that fundamentally the *degree of alcohol effect is fairly proportionate to the percentage of alcohol in the brain*. Here is another conclusion of outstanding importance. For the first time, opportunity was given to establish a degree scale of intoxication—one that would cast aside the "either sober or drunk" philosophy—thereby providing a means of measuring the relative degree of intoxication. Of important significance is the prediction of various zones of alcohol concentration which serve as a barometer by which the degree of intoxication can be gauged. At the present time, three broad zones of alcohol concentration in the blood are generally recognized in this country. Illustrative are the zones recognized and approved by the American Medical Association's *Committee on Street and Highway Accidents*, and the National Safety Council's *Committee on Tests for Intoxication*.

Zone 1. *Blood alcohol from 0.0 to 0.05 per cent*. Experiments have shown that almost no one having an alcohol concentration in the blood within these limits will be affected. Recommendations are that such findings shall be prima facie evidence that a person was *not* under the influence. Herein is an avenue which permits screening out of suspected persons and their release from suspicion.

Zone 2. *Blood alcohol from 0.05 to 0.15 per cent*. Considered conclusions are that some persons will be under the influence but not all persons. Usually, the number affected will rise as the per cent of alcohol concentration increases. Recommendation is that these chemical test results shall be considered as relevant but not prima facie evidence that the person is under the influence. Here the primary value is to provide *corroborative* facts to witness and other real evidences.

Zone 3. *Blood alcohol above 0.15 per cent*. Recommendations are that alcohol concentration in the blood of over 0.15 per cent be considered as prima facie evidence that a person is under the influence.

Utilization of such zonal evidence of intoxication is of inestimable value in determining whether or not arrest should be made and are of exceptional worth in supplying evidential proof.

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1 J. Amer. med. Ass. 112: 2179 (1939), and 117: 653 (1942); National Safety Council, Committee on Tests for Intoxication, 1938 Report, pp. 7—12, and 1939 Report, p. 5.
Beginning with the case of *State v. Duguid*¹ (decided in 1937), many courts of appellate or final jurisdiction have recognized that the results of chemical tests are of definite probative value in establishing impairment of a person's driving ability. Some of the leading cases in which the validity of the principles of chemical testing are recognized are cited in the footnote.² Said the court in *Lawrence v. City of Los Angeles*:³ "It appears to be the consensus of the medical profession that when the blood concentrate of the driver of an automobile is 0.15 per cent (by weight) such fact is conclusive evidence that the driver is under the influence of alcohol." Said the court in the case of *People v. Tucker*:¹ "Cases involving the

¹ 72 P. 2d 435 (1937).
⁴ State v. Cash, 15 S.E. 2d. 277 (1941).
⁵ Commonwealth v. Capalbo, 32 N.E. 2d. 225 (1941).
⁶ State v. Haner, 1 N.W. 2d. 91 (1941).
⁷ Lawrence v. City of Los Angeles, 127 P. 2d. 931 (1942).
⁸ Halloway v. State, 175 S.W. 2d. 258 (1943).
⁹ State v. Werling, 13 N.W. 2d. 318 (1944).
¹² Kirschwing v. Farrar, 166 Pac 2d. 154 (1946).
¹⁴ State v. McQuilkin, 193 P. 2d. 433 (1948).
¹⁷ 127 P. 2d. 931 (1942).

admissibility of evidence as to scientific analytical tests for intoxication... are correlated in 127 A.L.R. p. 1513. It would appear that upon the laying of proper foundation such evidence is admissible." Said the court in *State v. Koenig*:¹ "The test (i.e. the Heise test) is well established and recognized and defendant's contention that it is unreliable is without support in the record." And, said the court in *State v. Hunter*:¹ "Settled medical opinion is that any person is unfit to drive when his blood alcohol concentration is at or in excess of fifteen-hundredths of one per cent. When the concentration is less than this, a person may or may not be unfit to drive depending upon individual characteristics and reaction to alcohol.

A third conclusion which the scientists have reached is to be found in the principle that *there is a basic relationship between alcohol concentration in the brain, and in the blood, urine, breath and spinal fluid*. Continued re-statement of the principle has opened up an entirely new vista in the practical determination of intoxication, for it has made possible the development of a variety of means of chemical testing: testing of the alcohol concentration in the blood, urine, breath and spinal fluid. It is in the testing of these various substances that one finds major differences in use and in judicial acceptance. Sometimes the courts will admit such evidences; other times chemical evidences is declared non-admissible. We shall now discuss some of the problems involved.

With respect to testing of the blood or spinal fluid there are, of course, very definite limits to the extensiveness of their use. Any testing of these bodily fluids taken from living persons must be done
with extreme caution. Nearly always, securing of the substances for test purposes involves an invasion of the body of the individuals. Such an invasion cannot be done unless voluntary consent of the individual has been secured. Any invasion of the body without the owner's consent will not be countenanced by the courts and would subject the invader to serious penalties of the law. Moreover, we are by no means sure whether a person under the influence of intoxicating liquor is legally capable of giving consent. Such problems as these suggest why law enforcement officials are most cautious in their use of either blood or spinal fluid as a base for testing. Urinalysis is being used to some extent. But in the field of traffic accidents it is the breath test which is most commonly employed. Reports are that the Harger Drunkometer is the most widely used of the breath testing devices. As yet, however, many of our courts frown upon its use and will not admit evidence secured from a breath test. Why?

One reason for judicial disapproval is exemplified in the case of People v. Morse. The defendant had been convicted of negligent homicide for killing another with an automobile while driving in the City of Detroit under the influence of intoxicating liquor. A sample of the defendant's breath taken from him shortly after his arrest had been chemically analyzed by a drunkometer. Two police officers and a physician testified for the state by explaining the theory and operation of the drunkometer and expressed their opinion that the defendant was drunk within the meaning of the law. Thereupon, the defendant produced a number of witnesses (one was a chemist, several were physicians) who testified that many members of the medical profession did not regard the drunkometer as a reliable means of determining intoxication. Such a battle among the experts was bound to raise serious doubt in the minds of Supreme Court members as to the credibility of evidenced deduced from a breath test. Consequently the court held that admission of drunkometer evidenced by the Lower court was in error and that such evidence, because of conflicting evidence of reliability should not have been admitted.

That the courts are not yet ready to accept evidence of intoxication obtained by breath tests is made obvious by the reasoning of the court in the case of State v. Hunter. Said the court in remanding the case back for re-trial: "The Harger test is rooted in a technology seemingly not fully understood at the present time by any except the technician who developed it and certainly having the flavour of the esoteric to the uninitiated." Here is a court that regards breath testing as still in the experimental stage. It should be said that breath testing has not yet gained general judicial acceptance in the particular field to which it belongs.

In a number of states the problem of providing proof is being overcome to an observable degree by the enactment of legislation interpreting test results in terms of the degree of impairment of the accused. The significance of legislative interpretation should not be underestimated and for a number of reasons. Consider in the first place that when the results of a test are introduced in court to prove

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1. This is a small portable chemical laboratory developed by Professor R. N. Harger, Professor of Biochemistry, the University of Indiana Medical School.

2. 38 N.W. 2d. 322 (1949).
intoxication, necessarily the test must be interpreted. If, for example, a test result is introduced in court showing that there was 0.18 per cent of alcohol by weight in the blood of the defendant at the time the test was taken, then further evidence will be required by the court to explain what is the impairing effect of such an amount of alcohol on the accused. Today, interpretation is made in several ways. One is the use of expert opinion testimony, the other by statutory elaboration. In the absence of a statutory provision expert testimony must be used. In order for a person to qualify for purposes of testifying about a test result he must have a thorough and competent knowledge of the subject. Usually this requires that he must have had good training in the chemical testing field, must have conducted and observed many testing experiments. In a word, the courts usually require that the person to be qualified as an expert must be a chemist, a technician, or a doctor having broad knowledge of the effects of alcohol on the human being. Problems in obtaining expert testimony are obvious. In many areas of the country such experts are not available. Often the cost of using expert testimony confines its use to only the more serious offenses.

To an increasing degree these difficulties are being offset by the enactment of legislation in some of the states which defines by law a given test result. This use of legislative is relatively new. Statutory provisions of the 12 states which have enacted such legislation differ materially. One of the more comprehensive provisions is the Indiana Act of 1939, Article V, sec. 54 (2):

"If it is alleged in the indictment of affidavit, or upon the trial, that the defendant was under the influence of intoxicating liquor when he committed reckless homicide, or that he was under the influence of intoxicating liquor when he drove a vehicle, the court may admit evidence of the amount of alcohol in the defendant's blood at the time alleged, as shown by a chemical analysis of his breath, urine, or other bodily substance. Such evidence may be accompanied by other relevant evidence such as eyewitness testimony about the defendant's appearance, speech and conduct at the time alleged. Evidence that there was, at that time, five hundredths per cent, or less, by weight of alcohol in his blood, is prima facie evidence that the defendant was not under the influence of intoxicating liquor sufficiently to lessen his driving ability within the meaning of the statutory definition of the offenses. Evidence that there was, at the time, from five hundredths per cent to fifteen hundredths per cent by weight of alcohol in his blood is relevant evidence, but is not to be given prima facie effect in indicating whether or not the defendant was under the influence of intoxicating liquor within the meaning of this act. Evidence that there was, at the time, fifteen hundredths per cent, or more, by weight of alcohol in his blood, is prima facie evidence that the defendant was under the influence of intoxicating liquor sufficiently to lessen his ability within the meaning of the statutory definitions of the offenses."

From evaluation of the above legislative provision it will be observed that legislative interpretation may not serve as an absolute or final determinant. Such legislative interpretation is only prima facie evidence. According to American rules of criminal procedure, a prima facie case is one which is established by sufficient evidence and can be overthrown only by rebutting evidence adduced on the other side. Observe, also, that such prima facie statutes as the one above permit but do not require a judge to admit chemical testing evidence.
III

Other Constitutional Issues

(A) Requirements of exactness in test methods and techniques.

As in any other criminal case in which evidence of the results of a scientific chemical test of any substance is involved, the prosecution must prove that a chemical test to determine blood alcohol concentration has been conducted with the highest degree of exactness and that the possibility of error has been eliminated or reduced to the minimum. Some of the reported cases of the various courts of appeal in which this subject of exactness and possibility of error in test methods or techniques used in chemical tests to determine intoxication has been involved directly are listed in the footnote. In respect to a blood test, for example, the prosecution must be prepared to prove that the skin surface of the area from which the sample was taken was not sterilized with an alcohol-containing antiseptic solution, that the instruments or containers used were clean and sterile and that approved antiseptics not containing alcohol were employed, that the chemicals used were pure, that they were fresh and not subject to deterioration because of age, and that the test was properly conducted in every way. Moreover, proof must be shown that the sample was properly safeguarded, analyzed and identified.

1 State v. Weltha, 292 N.W. 148 (1940).
   State v. Werling, 13 N.W. 2d 318 (1944).

The case of Natwick v. Moyer illustrates how exacting are judicial requirements: The plaintiff had sued to recover for the death of the decedent resulting from injuries received in an accident involving a truck driven by the defendant. Two hours after the accident the defendant had a blood sample taken from him by an officer at the camp where the defendant was stationed. The next day, another officer made a chemical analysis of the blood. Apparently the only evidence to show the sampled blood was blood taken from the defendant was a notation in the hospital record. The officer who took the test did not know of his own knowledge from whence the blood was taken. The court held that there was not clear proof that the sampled blood was the defendants. Hence, the chemical evidence should not have been admitted. Judgement for the plaintiff rendered in a lower court was reversed.

(B) Search and seizure.

Two cases will serve to illustrate judicial attitudes. In the case of State v. Weltha, the defendant had been convicted in the lower court of manslaughter by means of an automobile while driving it while under the influence of intoxicating liquor. After the accident the defendant, who had been injured and rendered unconscious a doctor took a sample of the defendant's blood. Chemical analysis disclosed a high alcohol content. Thereupon, the coroner ordered that the defendant be placed under arrest. The high court of Iowa reversed the conviction, holding as follows: "We have here then a situation where a volunteer, with-

1 13 P. 2d. 936 (1945).
2 292 N. W. 148 (1940).
out legal warrant and without express or implied assent, intrudes himself into an operating room and takes from an unconscious patient a blood sample to be used to make or sustain possible future criminal prosecution. We cannot bring ourselves to approve such a course; and we find no authority which requires us to do so." On the other hand, in Novak v. District of Columbia,¹ where a blood sample was taken after the driver was arrested, the court held: "It is elementary that evidence obtained from a person under legal arrest is admissible over an objection grounded on illegal search and seizure." Generally, a person lawfully arrested may have his person searched and any incriminating evidence thus found and seized will be admissible, the search and seizure under such circumstances being lawful. Thus, if the taking of a sample of blood, urine or breath of such a person for chemical analysis should be held to raise the issue of search and seizure, it clearly would come within the principle of lawful authority.

(C). Self-incrimination.

In the Fifth Amendment to the Constitution of the United States is found this statement: "No person shall be compelled in any criminal case to be a witness against himself." All of the states, either by statute or constitutional provision, have similarly preserved the privilege in substantially the same words or by providing that no person in a criminal case shall be compelled to "testify against himself", "give evidence against himself", or "furnish or give evidence against himself". In criminal prosecutions against persons whose sobriety while driving a motor vehicle is an issue, the objection that the defendant's privilege against self-incrimination has been violated, is one of the most common points of defence raised. This is particularly true where chemical testing evidence is submitted at trial since the very nature of chemical testing involves some possible or actual invasion of the bodily security in obtaining the bases for examination. With respect to the scope and meaning of the privilege, John H. Wigmore, a world-renowned student of evidentiary law had this to say: "Looking back at the history of the privilege and the spirit by which its establishment came about, the object of the protection seems clear. It is the employment of legal process to extract from a person's own lips an admission of his guilt, which will thus take the place of other evidence."¹ Our courts have on numerous occasions held that the privilege was not designed to afford protection from compulsory physical examinations conducted for the purpose of establishing identity or for ascertaining facts of a physical nature indicative of the guilt or innocence of the person. Reference to several cases will illustrate judicial attitudes in relation to chemical testing.

In State v. Duquid² a police officer noticed that a driver appeared to be under the influence of intoxicating liquor. The officer took him into custody and told him he was taking him to a doctor's office. The defendant said, "All right." At the doctor's office the doctor handed the defendant a bottle and told him to urinate in it. Nothing was said to the defendant about the reason for taking the sample.

² 72 P. 2d. 435 (1937).
The high court held that the respondent acted under compulsion but freely and voluntarily, hence there was no violation of his privilege against self-incrimination. In *Spiliter v. State*\(^1\) a traffic officer arrested the defendant at the scene of an accident. There the officer asked him if he would submit to the drunkometer test. He replied that he would do so because he was not drunk. When test results proved damaging he challenged their admissibility on the ground that his privilege against self-incrimination had been violated. The court held against him saying in effect that where a defendant voluntarily submits to a chemical test, he thereby waives his privilege.

The courts hold, also, that it is not necessary to warn a defendant that the results of an analysis may be used against him. In *City of Columbus v. Van Meter*\(^2\) the court held that there was no evidence of compulsion or deceit incident to the taking of the specimen and that there was no error incident to the admission of test results. In *State v. Gatton*\(^3\) the issue arose as to whether a defendant's refusal to submit to a chemical test could be shown in court. Evidence at the trial disclosed that after the defendant's arrest and confinement in jail on a reckless driving charge, request was made of him by a deputy sheriff that he submit to having either a blood test or a urinalysis made, to determine the amount of alcohol in his system. This evidence was admitted over objection of the defendant. Said the high court in reviewing the case: "We are unable to observe any merit in the defendant's claim that the introduction of such evidence violated his constitutional rights, and we believe, and hold, that the constitutional inhibition against self-incrimination relates only to disclosure by utterance. The evidence offered was admissible, and the right of the prosecutor to comment thereon, within reasonable limits, invaded none of the defendant's constitutional rights.

Finally, note the interesting case of *State v. Cram*.\(^1\) The defendant had been convicted of manslaughter by means and use of an automobile while driving it under the influence of intoxicating liquor. Defendant was rendered unconscious by the accident impact and remained in that condition for 48 hours. While he was unconscious he was arrested and taken into custody for manslaughter when one of the victims of the accident died. At the request of the arresting officer a Dr. Manning, a physician, extracted a sample of blood from the defendant to analyze it for alcohol content. This sample was taken by the officer to a Dr. Beeman, who made a chemical analysis of it. Dr. Beeman testified that the sample contained 260 milligrams of alcohol per one hundred cubic centimeters. This evidence was objected to by the defendant on the ground that permitting testimony of this sort to be introduced would constitute a violation of the defendant's privilege of self-incrimination. Said the court: "The defendant was not deprived of any of his constitutional rights by the admission of the testimony here in question. He was not compelled to testify against himself. Evidence of the result of the analysis of the blood sample was not his testimony but that of Dr. Beeman, distinct from anything the defendant may have said or done. The blood sample was obtained without use of any process against him as

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\(^1\) 46 N.E. 2d. 591 (1943).
\(^2\) 89 N.E. 2d. 703 (1949).
\(^3\) 20 N.E. 2d. 265 (1938).

\(^1\) 160 P. 2d. 283 (1945).
a witness. He was not required to establish the authenticity, identify or origin of the blood; those facts were proved by other witnesses."

IV

Conclusions

There is substantial evidence that the use of chemical testing is developing rapidly. Last year reports from municipal police departments indicated that almost one thousand departments had one or more test taken. So far as can be ascertained, about 20,000 tests are being taken annually. Chemical testing has become sufficiently well established in the United States to state with confidence that tests of bodily substances to determine alcohol concentration are here to stay. They have now reached a stage of scientific development and reliability that many courts consider such evidence of value in determination of guilt or innocence. Such tests have shown that they serve the important dual purpose of protecting the innocent as well as convicting the guilty. With increasing frequency the police, the prosecution and the courts need not rely solely upon the guesswork of witnesses as to whether or not an accused driver or pedestrian was under the influence of intoxicating liquor within the meaning of the law. To an every-increasing extent law enforcement officials are being freed from the dilemma of proving intoxication by evidence of a defendant's appearance, conduct and actions. Rather they may now proceed to procure definite proof that the cause of traffic misbehavior is caused by alcohol.

With respect to the constitutional issues involved, it may be said that the courts require no more proof in respect to chemical tests than is required in the introduction of any other type of scientific evidence. The accused have all the benefits of all the great rights which democracy affords the individual. Yet the forces of law and order are given broad authorities to use chemical tests so long as the principles of justice are followed. If samples of body substances are taken properly, if they are safeguarded, if they are identified, if they are accurately analysed, if the methods used in making the analyses be accurate and reliable in establishing the blood alcohol content, if the tests be conducted by competent, trained, experienced, and dependable personnel, then the courts almost without exception affirm that chemical test evidence is admissible and may be used to support the charge of guilt or innocence.