569 A.2d 242
90 A.L.R.4th 135
(Cite as: 117 N.J. 450, 569 A.2d 242)

Supreme Court of New Jersey.

STATE of New Jersey, Plaintiff-Respondent,
v.
Andrew DOWNIE, Daniel Matthews, Martin J. Marotta, and Charles F. Carroll, Defendants-Appellants.

Argued Feb. 27, 1989.
Remanded March 23, 1989.
Reargued Oct. 23, 1989.
Decided Jan. 31, 1990.

SYNOPSIS

During unrelated drunk driving prosecutions in various municipal districts, before same judge and where defendants were represented by same attorney, the Superior Court, Law Division, Monmouth County, permitted municipal court judge to hear arguments relating to admissibility of breathalyzer evidence. State appealed. The Superior Court, Appellate Division, 229 N.J.Super 207, 550 A.2d 1313, reversed and remanded. Defendants appealed. The Supreme Court, Garibaldi, J., held that courts would continue to take judicial notice of reliability of breathalyzer evidence of per se violations of driving while intoxicated statute.

Affirmed.

Stein, J., dissented and filed opinion.

****242 *450** Michael R. Speck, Stephen M. Pascarella and Francis X. Moore, for defendants-appellants (Francis X. Moore, Red Bank, attorney; Michael R. Speck, on the brief).

***451** Mark P. Stalford, Asst. Prosecutor, for plaintiff-respondent (John Kaye, Monmouth County Prosecutor, attorney).

Boris Moczula, Deputy Atty. Gen., for amicus curiae, Atty. Gen. of New Jersey (Peter N. Perretti, Jr., Atty. Gen., attorney).

E. John Wherry, Jr., submitted briefs on behalf of amicus curiae, Nat. Ass'n of Criminal Defense Lawyers (Voorhees, Bennet & Wherry, Pennington, attorneys).

The opinion of the Court was delivered by

GARIBALDI, J.

This appeal involves yet another challenge to the scientific reliability of breathalyzers by defendants charged under *N.J.S.A.* 39:4-50. Specifically, defendants challenge the accuracy of the breathalyzer test results based on partition--ratio variability.

Defendants are charged with violating *N.J.S.A.* 39:4-50(a), which makes it unlawful for a person to operate "a motor vehicle with a blood alcohol concentration of 0.10% or more by weight of alcohol in the defendant's blood ...". This provision enacted by 1983 amendment defines the *per se* violation of driving while intoxicated. ("DWI"). The breathalyzer, the machine the State employs to ascertain blood alcohol, measures the amount of alcohol in the breath and multiplies that by 2100 to arrive at the level of alcohol in the arterial blood supplying alcohol to the brain. This 2100:1 partition ratio presumes that every 2.1 liters (2100 milliliters) of expired alveolar air (or air expired in the last 1/3 portion of a deep breath) contains approximately the same quantity of alcohol as one milliliter of blood. If a person's actual blood-breath ratio is lower than 2100:1, the breathalyzer will overestimate blood alcohol, and vice-versa.

Defendants assert that because people have broadly divergent ratios of breath alcohol relative to blood alcohol, the 2100:1 ***452** partition ratio is inaccurate and the breathalyzer-test results premised on that partition ratio are scientifically unreliable.

****243** We reject this challenge to the breathalyzer, and continue to deny admissibility of extrapolation evidence to refute the breathalyzer's results. We find that breathalyzer testing is a practical and reasonably accurate way of fulfilling the Legislature's intent to punish drunk drivers.

I

A. Background Procedural History and Facts

Downie sought a pretrial hearing, pursuant to *Rule* 3:13-1(b), in order to present expert testimony regarding the scientific unreliability of breathalyzer-test results. To economize on the costs of presenting that testimony, Downie moved to consolidate his case with the drunk-driving cases of three other defendants also represented by his attorney. The other defendants are Mr. Matthews, Mr. Marotta and Mr. Carroll. The cases arose in four different municipalities, all served by the same municipal court judge, who consolidated the four actions with regard to common questions of law and fact and granted a pre-trial conference.

The Monmouth County Prosecutor filed a motion to appeal *nunc pro tunc* the municipal court's consolidation order. The Law Division found that consolidation was improper but permitted the municipal courts to consider evidence regarding the admissibility and competency of breathalyzer-test results. The State appealed from the Law Division's Order.

The Appellate Division, relying on this Court's order in *Romano v. Kimmelman,* 96 *N.J.* 66, 474 *A.*2d 1 (1984), that judicial notice "shall" be taken of the scientific reliability of breathalyzers, ***453** subject to few limited exceptions not at issue in this case, [FN1] reversed the Law Division and held that evidence regarding the scientific reliability and accuracy of the breathalyzer-test results based on partition-ratio variability was inadmissible. 229 *N.J.Super.* 207, 212, 550 *A.*2d 1313. The Appellate Division considered this Court's decisions in *State v. Tischio,* 107 *N.J.* 504, 506, 527 *A.*2d 388 (1987), *app. dism.,* 484 *U.S.* 1038, 108 *S.Ct.* 768, 98 *L.Ed.*2d 855 (1988) (*N.J.S.A.* 39:4-50 mandates a conviction for DWI based solely on the breathalyzer reading in excess of .10% taken within reasonable time of arrest even if reading at time of operation would have been lower), and *State v. Johnson,* 42 *N.J.* 146, 171, 199 *A.*2d 809 (1964) (testimony disputing the accuracy of the breathalyzer device has negligible probative value in the present state of knowledge of the scientific and medical community), as reflecting this Court's strong belief in the accuracy and reliability of the breathalyzer.

> FN1. The *Romano* Order states that judicial notice "shall" be taken of the scientific reliability of breathalyzers, with freedom from radio frequency interference being the only qualification, and with the only issues subject to proof being the working nature of the particular machine, the qualification of the operator, and the method of administration of the test. None of these issues are in question on this appeal. No defendant alleges any fault in the operation of the breathalyzer used in his case, but all challenge the accuracy of the partition ratio.

The Appellate Division also decided that the Monmouth County Prosecutor had standing to represent the State, 229 *N.J.Super.* at 209 n. 1, 550 *A.*2d 1313, and that the Municipal Court lacked authority to consolidate cases in different municipal courts. *Id.* at 210 n. 2, 550 *A.*2d 1313. On the other hand, the court found no impediment to the presentation of common proof or argument on similar matters pending before the same court in more than one jurisdiction in the interest of judicial economy. *Ibid.*

This Court granted the defendants' motion for leave to appeal and the Attorney General's motion for leave to appear as *amicus curiae.*

***454** B. Factual Record on Limited Remand

This Court remanded the four consolidated cases to the Law Division for a hearing, at which the defendants and the State were instructed to present "evidence to develop a factual record on the allegation that partition ratio variability compromises the scientific reliability of breathalyzer test results [and] which hearing shall address the following issues. One: The nature and ****244** extent of the variability of the partition ratio. And, two, the effect, if any, of such variability of the partition ratio on the reliability of breathalyzer test results."

The experts who testified before the trial court were Drs. Borkenstein, Hlastala, Payne,

Jones, Dubowski, and Simpson, Messrs. Shajani, Lucas, and Harding, and Sgt. Gullburg. Dr. Borkenstein, who invented the breathalyzer, commented on its scientific reliability. Dr. Hlastala outlined potential physical variables that could affect the blood-breath partition ratio. Drs. Jones, Dubowski, and Payne commented on their blood-breath experimental studies. Messrs. Shajani and Lucas, Harding and Sgt. Gullberg explored their own field work and laboratory studies. Dr. Simpson analyzed the works of others from a statistical perspective, but presented no experimental or field work of his own.

After hearing the experts' interpretation of the physiological data, the lower court found the seven following conclusions of fact: [FN2]

> FN2. The trial court also prepared a synopsis of each expert's testimony and a written overview of the issue, including a detailed description of the basic theory of the blood/breath ratio.

1. The breathalyzer, Models 900 and 900A, is a scientifically reliable and accurate device for measurement of the alcohol content of a person's breath (assuming proper functioning of the instrument and a qualified operator).

***455** 2. In converting at a ratio of 1 to 2100 the breath-alcohol concentration present in the person's blood, the breathalyzer reading is not scientifically accurate.

3. Calculated blood-breath ratios are worthless for forensic purposes. They are subject to so many variables as to be unuseable except for gross estimates of a person's true lung partition ratio, and then only at a particular moment. (Borkenstein, Dubowski, Payne, Jones, Lucas).

4. In a prosecution for drunk driving, the breathalyzer calibrated at 2100 to 1 is biased in favor of the accused. (A) It under-reads the average person's [blood alcohol] by some 9% or 10%, compared to a venous whole-blood sample that might be simultaneously taken. (B) Its truncated readings give the accused the benefit of anywhere from .001% to .009% on a given test reading. (C) The start line set on the breathalyzer scale gives the subject the benefit of another . 003% on any test reading. (All experts agree on the foregoing.) (D) The lower value of two consecutive readings taken fifteen minutes apart is used for proof.

5. The breathalyzer gives a correct reading of alcohol in the breath at a particular moment. It does not distinguish between pre-peak "absorptive" or post-peak "post-absorptive" stages in the intake and elimination of alcohol in the blood. Those terms are of value only to the scientist.

6. The breathalyzer does not overestimate alcohol in the blood at the .10% level to the detriment of the accused. That is clearly so in the post-peak stage. In the pre-peak stage the breathalyzer reading is more accurate in predicting the amount of alcohol affecting the brain than is a venous blood sample and it cannot be empirically

demonstrated that it is in error, so long as two breath readings are taken within fifteen minutes of each other, do not differ by more than .01%, and the lower of the two is used for proof purposes. (Jones, Shajsni, Dubowski, Lucas).

7. For the breathalyzer to give readings that can be used with confidence, the operator must be sure that at least twenty ***456** minutes have expired since the last ingestion of alcohol to avoid the presence of "mouth" alcohol, which can give a falsely high reading.

The parties and *amici* filed exceptions to the trial court's Conclusions of Fact. [FN3] The Monmouth County Prosecutor's Office as well as the Attorney General generally agree with the trial court's findings. Their ****245** exceptions relate primarily to their concern that the conclusions of fact are so terse and brief that without further explanation they will be misinterpreted.

> FN3. The Offices of the Monmouth County Prosecutor and the Attorney General submitted exceptions. The Attorney General's Office also submitted Proposed Findings of Fact. The attorney for the defendants submitted exceptions and Proposed Findings of Fact in which Amicus Curiae, National Association of Criminal Trial Lawyers (NACTL), joined.

Accordingly, the Attorney General suggests that Conclusions of Fact # 2 and 3 be expanded to read as follows:

Finding # 2

2. The Breathalyzer is calibrated at a breath/blood conversion ratio of 1 to 2100 in determining the amount of alcohol in an individual's system. Use of a 1 to 2100 ratio in the conversion of measured breath alcohol concentration to venous blood alcohol concentration is scientifically inaccurate in that it results in an underestimation of venous blood alcohol concentration. The more scientifically acceptable conversion ratio is 1 to 2300. However, the forensic scientific community, aware that a 1 to 2100 ratio benefits a defendant, has retained this ratio for law enforcement purposes.

and that the following sentences be added to Finding # 3:

For this reason, a comparison of the *actual differences* between breath test and venous blood test results is the only valid form of analysis of the accuracy of breath testing instruments calibrated at a 2100:1 ratio to determine venous blood alcohol concentration. Reliable empirical evidence demonstrates that these actual differences are very small.

We agree with the Attorney General that the suggested versions of conclusions of fact # 2 and 3 are helpful in understanding the Law Division's findings of fact.

Defendants allege that the Court can consider only conclusions of fact # 2 and # 3, and that we are constitutionally precluded from considering conclusions of fact # 1, 4, 5, 6, and 7, because they were outside the scope of the remand and the ***457** defense did not have a fair opportunity to present its side of those issues. We find no merit in that position. The conclusions of fact are based on the experts' testimony and address the two issues the Court specifically directed the Law Division to consider on its remand.

Aside from a specific exception to conclusion # 6, the defense exceptions are not related to any specific conclusions of fact but consist instead of general allegations that the Legislature's intent was to base DWI convictions on the blood-alcohol level of the driver and that the Law Division "erroneously concluded that the breathalyzer does not overestimate alcohol in the blood to the detriment of the accused."

II

[1] Based on our examination of the voluminous scientific evidence and the exceptions and proposed findings of fact filed by the parties and *amici,* we agree with the trial court's conclusions of fact.

As the evidence demonstrates, the use of the partition ratio has been the subject of discussion and debate in the scientific community for years. Scientists have performed many studies, stemming from as far back as 1930, to determine the various factors that might affect the range of the partition- ratio variability. Hence, we find no merit to the defense's contention that the variability of the partition ratio represents a new scientific development.

Experts generally agreed on the physiological process triggered by the ingestion of alcohol. A relatively small percentage of ethyl alcohol (the alcohol contained in alcoholic beverages) is absorbed directly through the stomach into the blood that carries it to the brain. The remaining alcohol is absorbed through the intestinal tract. The alcohol reaches the brain via the carotid arteries. The amount of alcohol present in the water in the brain is what affects the driver's ability to operate a motor vehicle. After passing through the brain, the ***458** blood travels back through the venous system to the liver, the heart and back into the arterial system and lungs. The liver metabolizes the alcohol. Once absorbed, the alcohol will continue to affect the brain until it is completely metabolized.

The body undergoes at least two metabolic phases following the ingestion of alcohol. The absorptive (pre-peak) phase lasts from the initial ingestion of an alcoholic ****246** drink to the point of the peak-alcohol blood level. The rate of absorption depends on variables such as the amount of food in the stomach, the amount of pure alcohol ingested, and the rate of drinking. That initial phase is followed by the post-absorptive (post-peak) phase, which witnesses a decline in alcohol-blood levels.

During the post-absorptive phase, most experts agree that venous blood, arterial blood, and breath are all good indicators of the amount of alcohol in the brain. During the absorptive phase, however, arterial blood, which takes the alcohol to the brain, is the most accurate measure of alcohol in the brain. Venous blood may underestimate the amount of alcohol in the brain during the absorptive period because it does not circulate close to the brain and is entirely dependent on the amount of alcohol derived from the intestines. Thus, during the absorption period arterial blood may reflect a much higher percentage of alcohol than venous blood.

Ideally, arterial blood, drawn from the carotid artery, would furnish the most accurate estimate of alcohol in the brain. Yet, a complicated, painful, and potentially dangerous procedure is necessary to draw arterial blood. The arterial blood does carry the alcohol to the lungs where it diffuses into the alveolar air space and is exhaled in the breath. Because of that, many experts consider alveolar air, or air expelled from the lungs at the end of a deep breath, as the best practical measure of alcohol in the brain during the absorptive phase. Capillary blood, drawn from the fingertip and emanating from the shunt between the arterial and venous systems, is also a sound measurement of alcohol during the absorptive phase.

***459** For law enforcement purposes, the drawing of capillary blood and venous blood are a more intrusive and burdensome test than the breathalyzer. They require puncturing the body of a suspected drunk driver by experienced medical personnel who can and must take meticulous care that blood samples not become contaminated. Capillary blood drawn from the fingertip is small in amount and the alcohol it contains easily evaporates when exposed to the air. Extraction of venous blood, while not posing a problem with evaporation, is an invasive procedure requiring trained medical personnel. Moreover, venous blood is unreliable in reading the amount of alcohol affecting the brain during the absorptive phase.

In contrast, the breathalyzer may be administered by a trained police officer, and requires only that the suspect exhale deeply into the machine. Assuming the machine is in working order and the test is properly administered, all experts agree the breathalyzer can read the amount of alcohol in the breath with a great deal of accuracy. The operative inquiry is then whether the breathalyzer may overestimate blood alcohol to the extent that some drivers would be erroneously convicted.

The 2100:1 partition ratio, in its absolute simplicity belies the fact that each subject's partition ratio is affected by a host of complex physiological variables. Henry's law, in physical chemistry, states that when a liquid that contains a volatile substance, such as alcohol, makes contact with air in a closed container and at a known temperature, a certain amount of alcohol will escape into the air space above in the form of vapor. The rate at which the alcohol vaporizes will depend on the concentration of the alcohol in the liquid and on the temperature. The higher the temperature, the more alcohol will escape to the vapor. When there is a fixed temperature and concentration of alcohol, a state of equilibrium will result in which the amounts of alcohol in air and liquid are static.

The breathalyzer applies Henry's law to the blood which courses through the lungs carrying alcohol. As the arterial ***460** blood passes through the lungs, some of the alcohol will become vaporized in the alveolar air and expelled in the breath. The breathalyzer is calibrated to presume that at 34<<degrees>> Celsius, a solution of .121 grams of alcohol per 100 milliliters of water will give off alcohol to the vapor of .10 grams per 210 liters of vapor. Thus, we arrive at the current 2100:1 partition ratio.

Dr. Dubowski found that individual partition ratios vary greatly. In one experiment, ****247** Dubowski paired blood and breath samples from experimental subjects. He

found that the partition ratio of samples from different people ranged from 1706:1 to a high of 3063:1 despite each having ingested the same amount of alcohol. A person's partition ratio may vary from time to time. Moreover, it may be that no two people have the exact same partition ratio. Thus, the 2100:1 partition ratio is merely an estimate that roughly approximates most people's ratio and that is calibrated to give the benefit of the doubt to the subject in most instances.

Expert witnesses generally agreed that the breathalyzer, using a 2100:1 partition ratio, will usually underestimate the amount of alcohol in the blood. That is due to a variety of factors. First, most people's partition ratios may be closer to 2300:1 than to 2100:1. Second, the breathalyzer results are truncated, or the third decimal position is dropped when read. If a person reads .099 on the breathalyzer, the results will be shortened to read .09, thereby underestimating the breath alcohol. Third, a suspect may not provide enough deep breath to register all of the alcohol present in the alveolar air. Fourth, the breathalyzer's scale is set .003 below the start line and this gives suspects an added benefit. Finally, under current procedures, law-enforcement officials will count only the lower of two breathalyzer results, obtained fifteen minutes apart, as evidence against a suspect. These, among other less-significant factors, cause the breathalyzer to render many more results on the low side than on the high side.

***461** Dr. Borkenstein testified that a 2300:1 partition ratio would probably result in more accurate breathalyzer readings. He estimated that 9% of breathalyzer readings indicate a lower amount of alcohol in the blood than blood-test readings would indicate. In contrast, he estimated that only three persons in a thousand might be convicted as a result of an erroneously-high breathalyzer reading. He adduced that breathalyzer researchers and members of the National Safety Council adopted the 2100:1 partition ratio instead of the more accurate 2300:1 ratio because they wanted to err on the low side and have almost no errors on the high side.

Dr. Borkenstein's statements were echoed by almost all the witnesses. Mr. Harding estimated that the breathalyzer readings were, on average, 11% lower than the alcohol present in the blood. Dr. Jones, who conducted in-depth empirical studies for Sweden, indicated that 1.8% of the population has a partition ratio of less than 2100, while 98.2% have a higher partition ratio in the post-absorptive phase. Dr. Payne estimated the mean partition ratio to be 2271:1. In a study he conducted in 1966, he had estimated an even higher partition ratio of 2470:1.

The trial court found Dr. Dubowski to be the most impressive expert witness. Likewise, prior New Jersey courts have relied on Dr. Dubowski, recognizing him to be a leading authority on the scientific reliability of the breathalyzer. *State v. McGinley,* 229 *N.J.Super.* 191, 200, 550 *A.*2d 1305 (Law Div.1988) (cited in *State v. Downie, supra,* 229 *N.J.Super.* at 211, 550 *A.*2d 1313). Therefore, it is essential to dispel any prior misconceptions of his scientific position. In *McGinley,* the trial court stated that according to Dr. Dubowski there was a 14% overestimation and that "every breathalyzer reading should be reduced by .055%." The Appellate Division in this case also relied on this mistaken reading of Dr. Dubowski's position. 229 *N.J.* at 211, 550 *A.*2d 1313.

At the remand hearings, Dr. Dubowski stated that he never testified that .055 should be deducted from each breathalyzer ***462** result. Moreover, with respect to the 14% overestimation figure he said that at the time he testified at a trial in Alaska on which the *McGinley* court relied, he did not have the statistical data analysis he now has and that his previous simplified testimony does not fairly and correctly reflect the facts.

Dr. Dubowski also testified that the breathalyzer underestimates blood alcohol much more frequently than it overestimates it but is generally highly accurate in reading breath-alcohol content. He based ****248** his conclusion in part on the results of a study in which he compared the results obtained using the breathalyzer with results obtained using sophisticated laboratory equipment in 709 pairs of breath samples.

In another study of subjects in the post-absorptive phase, involving 388 paired venous blood/breath samples, Dr. Dubowski found that in 86% of cases, the breathalyzer underestimates the blood-alcohol level. In 14% of the cases, it did not underestimate the blood-alcohol level. Of that 14%, in 2.3% of cases the breathalyzer states exactly the blood-alcohol content. In 9.4% of the cases, the breathalyzer overestimates the blood-alcohol level at the third decimal level, where it has no impact on the subject's breathalyzer reading. In only 2.3% of cases does the breathalyzer materially overestimate the blood- alcohol level potentially to the detriment of the accused. Even the 2.3% figure is subject to question inasmuch as it involves separate pairs from the same subject. It is not established that 2.3% of the people would have a higher breathalyzer reading than the actual percentage of alcohol in their blood.

Still, despite the evidence that the breathalyzer could potentially wrongfully convict less than 2.4% of suspected drunk drivers, some scientists still pose objections to the test based on the infinite physical factors that affect the blood-breath ratio. Biological factors such as mouth temperature, gender, body temperature, medication, menstrual cycle, and oral contraceptives may have some theoretical effect on breathalyzer readings. In addition, hematocrit, or the ratio of the volume of ***463** blood cells to the total volume of blood, expressed as a percentage, may have some theoretical effect. Women have generally lower hematocrit meaning a lower percentage of their blood is comprised of cells, and therefore a higher percentage is comprised of water. No scientist during the remand hearing could establish that these theoretical effects were sufficiently concrete as to be significant. Moreover, these factors would not always inflate breathalyzer readings. Even defense witnesses admitted that some of these factors would actually lower breathalyzer readings.

III

Our review of the record on remand is in conformity with the conclusions of fact determined by the trial court. We are satisfied that the breathalyzer is a reliable and indispensable tool for law-enforcement purposes.

It is important to note the legislature's statutory pronouncement on drunk driving.

N.J.S.A. 39:4-50(a) states that "[a] person who ... operates a motor vehicle with a blood alcohol concentration of 0.10% or more by weight of alcohol in the defendant's blood" is guilty and subject to punishment. *N.J.S.A.* 39:4-50.2 states that drivers on public roads consent to the taking of breath samples for the purpose of ascertaining their blood-alcohol levels (provided the test is administered according to statutory standards). Finally, *N.J.S.A.* 39:4-50.3 provides that the Attorney General has the authority to promulgate breath-testing procedures and standards governing the qualifications and competence of those who administer the test.

Those statutory pronouncements give rise to certain ambiguities. *N.J.S.A.* 39:4-50(a) refers to .10% as measured by the weight of alcohol in the defendant's blood. It does not explicitly refer to a particular measure of alcohol in the breath as constituting the *per se* infraction of drunk driving. *N.J.S.A.* 39:4-50.2, the "implied consent" statute, does refer to breath samples explicitly, but also mentions the ascertaining of blood***464** - alcohol levels as the ultimate purpose of breath testing. The statutes give rise to the ambiguity of whether a .10% breathalyzer reading was intended to be sufficient to convict someone, even when the breathalyzer may have a maximum 2.3% chance of overestimating blood alcohol.

It is an accepted principle of statutory construction that an ambiguous statute should be interpreted in light of the statutory purpose. *Accountemps Div. of Robert Half of Philadelphia, Inc. v. Birch Tree Group, Ltd.,* 115 *N.J.* 614, 560 *A.*2d ****249** 663 (1989); *Horwitz v. Reichenstein,* 15 *N.J.* 6, 8, 103 *A.*2d 881 (1954); *In re Petition of Battle,* 190 *N.J.Super.* 232, 236, 462 *A.*2d 1291 (App.Div.1983). We must search for indications of legislative intent or for the inferences that may be drawn from the structure and purpose of the statute. *State v. Maguire,* 84 *N.J.* 508, 514, 423 *A.*2d 294 (1980) ("In resolving ... questions of statutory construction, we are mindful that our task is to effectuate the legislative intent in light of the language used and the objects sought to be achieved."). Moreover, we should make reference to legislative history not only where statutory language is ambiguous but also where literal interpretation would thwart the overall statutory scheme. *State v. Tischio,* 107 *N.J.* 504, 509, 527 *A.*2d 388 (1987), app. dism. 484 *U.S.* 1038, 108 *S.Ct.* 768, 98 *L.Ed.*2d 855 (1988); *Exxon Corp. v. Hunt,* 97 *N.J.* 526, 481 *A.*2d 271 (1984).

The legislative hearings on *N.J.S.A.* 39:4-50.2 provide some insight into whether it is reasonable to assume that the statute's mention of breath was an acknowledgement by the legislature that breath, not blood, would be the final measure of intoxication. The then-Attorney General, Arthur J. Sills, told the Senate Committee on Law and Public Safety that inebriation would be ascertained through "the use of a breath test." *Public Hearings on Senate Bill No. 8 [Driving While Impaired] and Senate Bill No. 9 [Implied Consent],* February 28, 1966, at 39. In addition, the Attorney General commented on how there had been a process of "gradual acceptance of chemical test laws which provide statutory standards for interpreting ***465** the results of chemical tests performed on persons charged with the offense of driving while under the influence of intoxicating liquor." *Id.* at 32. The Attorney General's statements attest to the acceptance, progressive over time, of the breathalyzer as the ideal chemical measurement of degree

of inebriation.

Others who testified before the Senate Committee echoed the Attorney General's reliance on the breathalyzer. The Director of the Division of Motor Vehicles spoke of scientific testing as being definitive of the individual's level of impairment. *Id.* at 51. The president of the New Jersey Licensed Beverage Association referred to "the approximate number of cocktails one would need to consume" so that "the scientific reading to discover the alcohol content would be .10%." *Id.* at 31A. The then-Superintendent of the State Police summarized the tenor of the hearings when he stated that the chemical test, or "drunkometer" (analogous to our present breathalyzer), "is the best method of separating the innocent from the guilty." *Id.* at 12A. Although chemical tests may refer to a broader class than just the breathalyzer, comments regarding the reliability of the breathalyzer pervaded the hearings. There was an assumption underlying the hearings that a breathalyzer reading of .10% should be sufficient to establish impairment.

New Jersey enacted the .10% *per se* law partly in response to federal standards and incentive programs. Legislative history reveals that those federal statutes also presumed the reliability of the breathalyzer. See Assembly Judiciary, Law, Public Safety and Defense Committee Statement to Senate Bill No. 1833, *L*.1983, *c*. 129; 23 *U.S.C.A.* Sec. 408, 23 *C.F.R.* Ch. 111, Part 1309; 3 U.S.Code Congressional and Administrative News, 97th Congress, Second Session (1982) 3367 at 3370. Thus, federal standards appear to have been formulated with the presumption that the breathalyzer would be one of the the preferred measures of intoxication.

***466** We have previously held the New Jersey statutory language to presume the validity of breathalyzer test results. In *State v. Tischio, supra,* 107 *N.J.* at 522, 527 *A.*2d 388, we held that "the statute prescribes an offense that is demonstrated solely by a reliable breathalyzer test administered within a reasonable period of time after the defendant is stopped ... which test *results* in the proscribed blood alcohol level." (Emphasis added.) In *State v. Johnson,* 42 *N.J.* 146, 199 *A.*2d 809 (1964), and *Romano v. Kimmelman,* 96 *N.J.* 66, 474 *A.*2d 1 (1984), we also declared our conviction in the accuracy and reliability of the breathalyzer.

****250** In light of the scientific and legislative evidence, we find unpersuasive the argument that blood should be the sure and ultimate measure of inebriation. Blood, itself is not monolithic. Venous blood differs from the arterial blood, which actually takes alcohol to the brain. Venous blood may be far less accurate as an indication of the amount of alcohol affecting the brain than breath in the absorptive phase. [FN4] Given the fact that the legislature desired to bar driving while intoxicated, it appears logical that the blood contemplated was the arterial blood, which takes alcohol to the brain. Because arterial blood is practically unobtainable, then breath, not venous blood, is the most consistently accurate reflection of the concentration of alcohol affecting the brain. Thus, the legislative and judicial reference to "blood" is not an intended concession that blood tests are the preferred method for ascertaining inebriation. The dissent alleges that we are, in fact, converting a blood statute to a

breath statute. *Post* at 252. Instead, we are reflecting the legislative intent that "blood," inasfar as it refers to arterial blood, is best represented by breath samples.

> FN4. Although it is recommended that people not be tested within twenty minutes after they ingest their last drink, the absorptive period may be much longer than twenty minutes in most individuals.

***467** Other states have acknowledged the breathalyzer to render results that are conclusive of the defendant's guilt or innocence. In *State v. Rucker,* 297 *A.*2d 400 (1972), the Delaware Supreme Court addressed the defendant's claim that possible error in breath testing might indicate that his blood-alcohol level was below the level proscribed by statute. The court rejected that claim, holding that the test result, rather than the proscribed blood-alcohol level, was the essential element of the offense:

> Under the terms of the statute the trier of fact must determine whether the test results show the required percentage of alcohol in the blood. The trier of fact is not free to disregard the mandate of the statute or to question the wisdom of the General Assembly in providing that test results constitute proof of that element of the crime.
>
> The possible variance in results between various types of tests ... may be an inherent weakness of the statutory provisions. The General Assembly could have considered these possible variances when it enacted the legislation but the legislation is so worded as to preclude these factors from being considered as issues of fact.
>
> If there had been evidence that the test was improperly administered, such evidence could cast such doubt on the result as could be considered by the trier of fact in determining whether the statutory requirement had been met. But, as indicated, evidence that the type of tests already approved by the General Assembly when properly conducted are still subject to possible variations in results is not a matter which is here left to the trier of facts. [*Id.* at 402-03.]

In light of *Tischio* and other New Jersey precedent, the breathalyzer should receive similar deference in this state as in jurisdictions such as Delaware. See, *e.g., Cooley v. Municipality of Anchorage,* 649 *P.*2d 251, 254 (Alaska Ct.App.1982) (breathalyzer is accurate in vast majority of cases despite possible variations in converting breath-alcohol concentration to blood-alcohol concentration); *People v. Capporelli,* 148 *Ill.App.*3d 1048, 103 Ill.Dec. 864, 868, 502 *N.E.*2d 11, 15 (1986) (legislative provision that breathalyzer is an available measure of intoxication is based on sufficient scientific data as to be rational); *Heddan v. Dirkswager,* 336 *N.W.*2d 54, 62 (Minn.1983) (breathalyzer, if administered correctly, is highly accurate); *State v. Brayman,* 110 *Wash.*2d 183, 751 *P.*2d 294 (1988) ("While the record may establish that breath is a less direct measure of blood-alcohol levels, it does not establish a lack of ***468** reasonable and substantial relationship between breath alcohol and impairment."). In many of these states a breath- alcohol reading of .10% is explicitly cited in the statutory language, without any reference to blood ****251** alcohol, as being sufficient evidence of the defendant's guilt, assuming the machine is operated correctly and is in good working order.

We believe that the legislature intended the breathalyzer to be a measure of inebriation and not just blood alcohol. It is not necessary for there to be "unanimity of opinion or

universal infallibility ... for judicial acceptance of generally recognized matters." *State v. Johnson, supra,* 42 *N.J.* at 181, 199 *A.*2d 809. Judicial notice serves "to provide a speedy and efficient means of proving matters which are not in genuine dispute." V. Biunno *Current N.J. Rules of Evidence,* Comment 1 to *Evid.R.* 9 (quoting *RWB Newton Assocs. v. Gunn,* 224 *N.J.Super.* 704, 711, 541 *A.*2d 280 (App.Div.1988) (hereinafter *Biunno*). When a scientific device has been held to be reliable, it is no longer necessary for there to be expert testimony on that issue at every trial. *Biunno, supra,* Comment 12 to *Evid.R.* 9. We are convinced that as long as proper procedures are followed, the breathalyzer should remain a subject of judicial notice.

The breathalyzer reads alcohol with unimpeachable accuracy. Breath, in turn, is the best measure of alcohol in the arterial blood, which feeds alcohol to the brain. The 2100:1 partition ratio does combine with other physiological factors to underestimate blood alcohol in a significant number of cases. This results, however, only in giving suspects an added benefit of the doubt. Every method of ascertaining blood alcohol carries inherent problems. No method is 100% accurate. We hold that the breathalyzer, with a maximum overestimation error margin of 2.3%, is not only the best practical tool, but the tool the legislature intended to carry out its will. *Romano v. Kimmelman, supra,* 96 *N.J.* 66, 474 *A.*2d 1.

***469** We are confident that continued use of the breathalyzer will not lead to unjust convictions. The scientific evidence is more conclusive now than ever that the chances of overestimation are extraordinarily small. We must construe legislative intent in cases in which statutory language is ambiguous. The legislature wanted drunk drivers off the road. As a measure for determining a motor vehicle violation, a scientific test that produces predictably accurate results in 97.7% of the cases is not unreasonable. Because of this we also continue to reject the admissibility of extrapolation evidence. *State v. Tischio, supra,* 107 *N.J.* 504, 527 *A.*2d 388.

[2] In conclusion, we hold that the breathalyzer fulfills legislative policy and intent to provide a reliable and fair measure of alcohol in the brain. Breathalyzer results can continue to be used in prosecution of the *per se* offense of drunk driving. The reliability of breathalyzer results will continue to be the subject of judicial notice in drunk-driving prosecutions. Extrapolation evidence will also continue to be inadmissible.

The breathalyzer is unsurpassed in its combined practicality and usefulness. It errs on the low side in a significant number of cases, in order not to overestimate blood alcohol in the greatest possible number of cases. We are convinced this is justifiable in order to further the legislature's will and maintain efficiency in our system of justice.

The judgment of the Appellate Division is affirmed and the four matters are remanded to the municipal courts for separate trials to be held consistent with this opinion.

STEIN, J., dissenting.

The Court is afflicted with a severe case of institutional amnesia. It has either

forgotten, or has unaccountably ignored, the most basic distinction between the legislative and judicial branches of government.

***470** Underlying this litigation was the premise, acknowledged by all parties and this Court, that New Jersey's drunk-driving statute is based on *blood*-alcohol content. *N.J.S.A.* 39:4-50. The single issue was whether the breathalyzer, which measures *breath*-alcohol content, inaccurately converts breath alcohol to blood alcohol because the conversion ratio at which the breathalyzer is calibrated exceeds the so-called partition ratio of a portion of the population. This Court ordered a remand ****252** hearing "to develop a factual record on the allegation that partition-ratio variability compromises the specific reliability of breathalyzer-test results * * *." 114 *N.J.* 498, 555 *A.*2d 618 (1989). Evidence adduced at the remand hearing demonstrates that the breathalyzer is highly reliable, underestimating blood-alcohol content in most cases, but materially overestimating blood-alcohol content in approximately 2.3% of all subjects tested.

Confronted with such evidence, the Court today "construes" our drunk- driving statute as proscribing .10% or more of alcohol in the *breath* as well as in the blood. *Ante* at 249-251. That interpretation enables the Court to sustain the use of the breathalyzer as a device for proving violations of the drunk-driving statute even in that small number of cases in which the breathalyzer materially overestimates blood alcohol. At the same time, the Court disregards not only the unmistakably plain statutory language, but also its own opinions that have repeatedly and consistently characterized the statutory violation in terms of a prohibited amount of alcohol in the *blood.* See *State v. Tischio,* 107 *N.J.* 504, 506, 510, 516, 517, 522, 527 *A.*2d 388 (1987); *Romano v. Kimmelman,* 96 *N.J.* 66, 72, 78, 82, 474 *A.*2d 1 (1984); *State v. Johnson,* 42 *N.J.* 146, 151, 158, 169, 172-73, 199 *A.*2d 809 (1964).

Although the Court's resourcefulness is doubtless well-motivated, the taint on the judicial process is ineradicable. It is also totally unnecessary. Evidence in the record suggests that a relatively minor adjustment in the partition ratio at which breathalyzers are calibrated would eliminate all material overestimates of *blood* alcohol, and a further remand would permit ***471** testimony to be elicited on the extent of the required adjustment. Moreover, the Legislature's concern over the ravages of drunk driving is well- documented. Guided by the Attorney General, who has participated as *amicus* in this appeal, it is a virtual certainty that the Legislature would act swiftly to amend the drunk-driving statute to provide specifically that the prohibited quantity of alcohol in either the breath or blood constitutes a violation. [FN1] But if an amendment to the statute is required, that is the business of the Legislature. It is not the function of this Court.

> FN1. *See, e.g., Cooley v. Municipality of Anchorage,* 649 *P.*2d 251, 252 (Alaska Ct.App.1982) (reflecting amendment to Anchorage DWI ordinance to define violations in terms of blood alcohol or breath alcohol); *People v. Capporelli,* 148 *Ill.App.*3d 1048, 103 Ill.Dec. 864, 867, 502 *N.E.*2d 11, 14 (1986) (describing Illinois DWI statute that defines violations in terms of blood-alcohol or

breath-alcohol content); *State v. Brayman,* 110 *Wash.*2d 183, 751 *P.*2d 294, 296 (1988) (reflecting amendment to Washington DWI statute to define violations in terms of blood-alcohol or breath-alcohol content); *Okla.Stat.Ann.* tit. 47, § 11-902A1 (West 1989) (defining violation of Oklahoma DWI statute in terms of blood alcohol or breath alcohol).

For affirmance and remand--Chief Justice WILENTZ, HANDLER, POLLOCK, O'HERN and GARIBALDI--5.

For reversal--Justice STEIN--1.

569 A.2d 242, 117 N.J. 450, 90 A.L.R.4th 135

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