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NOTES

THE DEFENDANT'S RIGHT TO INDEPENDENT ANALYSIS OF THE BREATHALYZER AMPOULE: THE PROBABLE VIRGINIA RESPONSE

The use of chemical testing of bodily substances as evidence in criminal prosecutions in the United States has increased markedly in the last two decades. Although many commentators maintain that the availability of scientific testing has facilitated greatly the administration of criminal justice, evidentiary use of such test results has created unique difficulties. One such problem has been the defendant's right to "cross-examine" chemical test results introduced by the prosecution by making an independent analysis of the test material or components of the test machinery. Several recent challenges by criminal defendants have centered around the use of a particular breath testing device, the breathalyzer. Used by law enforcement agencies to determine the blood-alcohol content of a person suspected of drunken driving, the breathalyzer provides test results that will lead to a statutorily mandated presumption of intoxication when the reading exceeds a certain level. For this reason, impeachment of the test results is critical to the defendant's case; defendants have claimed that without the opportunity to run an independent test, they cannot rebut effectively the presumption of intoxication.

The challenge to the admission of breathalyzer results consistently has centered around one small component of the machine, the ampoule. The breathalyzer ampoule is a small, glass vial in

2. Id.
3. "Breathalyzer" is the brand name of a particular breath testing device. The name often is used in the literature and court opinions in its generic form, and will be so used in this article. For a detailed discussion of the machine itself and the breathalyzer testing process, see note 34 infra & accompanying text.
4. The presumption of intoxication derived from breathalyzer test readings above a certain level is discussed at notes 45 & 46 infra & accompanying text.
5. The breathalyzer machine actually has two ampoules: a standardized, reference ampoule that is used as a means of determining the change in the test ampoule when the defendant's breath is introduced; and the test ampoule itself. Although most courts considering the issue have concentrated on the test ampoule, as used in this paper, ampoule applies
which a sample of the defendant's breath is mixed with a chemical solution. The solution will change color depending on the amount of alcohol in the defendant's breath and will cause the machine to register in proportion to this change. Traditionally, law enforcement officers have discarded the ampoule subsequent to administration of the test.

Defendants have challenged the unavailability of the breathalyzer ampoule because it deprives them of the right to analyze independently the contents and construction of the ampoule. Such an analysis, defendants have argued, provides the most effective cross-examination of the breathalyzer results introduced by the prosecution and allows a defendant to impeach those results with his own scientific data. Without the ampoule, a defendant is refused evidence valuable to his defense and denied his due process right to fundamental fairness at trial. Defense counsel usually presents this due process claim in the form of a pretrial motion to suppress breathalyzer test results because the prosecution is unable to furnish the ampoule upon a discovery motion. Additionally, the defense may move to dismiss the drunken driving charge entirely on the basis of the ampoule's unavailability.

6. For a listing of the ways in which independent analysis of breathalyzer ampoules may provide the defendant with evidence to impeach the results of the prosecution's test, see notes 35 & 36 infra & accompanying text.

7. The basis of the due process claim is summarized at note 52 infra & accompanying text.

8. The defense counsel simultaneously may make the motion to discover the ampoules and the motion to suppress breathalyzer test results, if the ampoules prove undiscoverable. Of critical importance for the defense is to make these motions on a pretrial basis, with the hope that the motion to suppress will be successful and thus prevent breathalyzer test results from reaching the jury. For an extensive treatment of procedure for defense counsel in a drunken driving case, see R. Erwin, Defense of Drunk Driving Cases (3d ed. 1971).

9. A court that determines that the unavailability of the breathalyzer ampoule constitutes a violation of the defendant's right to a fair trial can act on that finding in one of two ways. First, if the finding is that the ampoule could establish conclusively the defendant's innocence, then the court may conclude that such evidence is critical to the effectiveness of the accused's defense so that, absent the ampoule, he cannot have a fair trial. In this instance, the court can dismiss the charges against the defendant.

Second, courts have held that dismissal is appropriate when the defense can show that the state's destruction of ampoules was in bad faith. Purposeful, bad faith destruction of the evidence raises an inference that such ampoule could demonstrate affirmatively defendant's innocence. In People v. Hitch, the court noted in dictum that

[a] bad faith failure to preserve the ampoules and their contents is susceptible
In determining what effect the inaccessibility of the breathalyzer ampoule should have on the defendant’s right to due process, the courts have divided into two groups: those courts finding a due process violation based on the ampoule’s destruction and therefore granting the motion to suppress,¹⁰ and those courts finding that the defendant’s lack of an opportunity to perform an independent analysis of the breathalyzer ampoule does not constitute prejudicial error of constitutional dimension and therefore denying the motion to suppress. The California Supreme Court addressed the ampoule-retention controversy more exhaustively than any court thus far in People v. Hitch:¹¹ therefore, the rationale for finding a due process violation will be identified in this Note as the Hitch position. The courts that find no due process violation when ampoules are unavailable to the defendant will be denominated as adhering to the Canaday position, referring to State v. Canaday¹² in which the Supreme Court of Washington denied the defendant’s motion to suppress.

Although the Virginia courts have not considered the due process

of the inference that they were destroyed because the actual test results were different from those reported. Bad faith destruction raises an inference that the ampoules could demonstrate innocence. In such an instance dismissal may well be the proper sanction.

¹⁰ Although the court that finds a due process violation may deem dismissal the appropriate remedy when the facts of the case so require, a more moderate approach would be to retain the case but suppress the breathalyzer test to prevent it from prejudicing the defendant. Both the state and the defendant thus would be required to rely on evidence other than that derived from the breathalyzer test, evidence of the type used in drunken driving cases before chemical tests were utilized. Suppression then would balance the equities between the parties but still permit the case to proceed. As noted by the court in Hitch, because evidence from a breathalyzer is not an essential element of a prosecution or conviction for drunken driving, there is no reason to forbid the prosecution’s reliance on other evidence when test results are suppressed. 11 Cal. 3d at —, 520 P.2d at 977, 113 Cal. Rptr. at 162.


¹² 90 Wash. 2d 808, 585 P.2d 1185 (1978).
implications of the prosecution’s destruction of the breathalyzer ampoule, the case law and statutory treatment\textsuperscript{13} of chemical testing as evidence in drunken driving cases suggest that the courts in Virginia would adopt the Canaday position that “the used breathalyzer test ampoules are not material evidence in a constitutional sense and nondisclosure of the ampoules caused by routine destruction and disposal is not constitutional error.”\textsuperscript{14} To support this prediction of the probable position of the Virginia courts on ampoule retention, this Note examines the general use of chemical test evidence in Virginia, the principle and processes of the breathalyzer machine itself, and the basis of the due process challenge in other courts. Finally, this Note suggests an approach to the ampoule-retention problem that accommodates both the needs of the prosecution and the rights of the defendant in drunken driving cases.

**Chemical Test Evidence**

*Drunken Driving in Virginia*

Recognition of the danger to the public posed by the drunken driver is expressed in section 18.2-266 of the Virginia Code, which states that “[i]t shall be unlawful for any person to drive or operate any motor vehicle, engine or train while under the influence of alcohol.”\textsuperscript{15} In *Mitchell v. Wilkerson*,\textsuperscript{16} the Virginia Supreme Court echoed that sentiment, stating that “[d]riving a motor vehicle under the influence of intoxicants is universally recognized as creating a very serious hazard on the highways.”\textsuperscript{17} In prosecutions for driving while intoxicated, the commonwealth must establish beyond a reasonable doubt that the defendant was operating\textsuperscript{18} the

\textsuperscript{13} Provisions for chemical testing in driving-while-intoxicated prosecutions are codified at Va. Code § 18.2-266 (Cum. Supp. 1979).
\textsuperscript{14} 90 Wash. 2d at 585 P.2d at 1189.
\textsuperscript{15} In Virginia, drunken driving constitutes a Class 2 misdemeanor. Va. Code § 18.2-270.
\textsuperscript{16} 189 Va. 121, 67 S.E.2d 912 (1951).
\textsuperscript{17} Id. at 128, 67 S.E.2d at 916.
\textsuperscript{18} Under Virginia law, “operating” a vehicle carries a broader meaning than driving a vehicle. Operating includes starting the engine or manipulating the equipment of the vehicle even without actually putting it into motion if the defendant had actual physical control of the car and had engaged the machinery that would have activated the vehicle’s motive power. Williams v. City of Petersburg, 216 Va. 297, 217 S.E.2d 893 (1975) (defendant deemed to be operating vehicle although it was not in motion and although defendant was found slumped over the wheel; the motor was running and the automobile was capable of immediate motion). See also Nicolls v. Commonwealth, 212 Va. 257, 184 S.E.2d 9 (1971) (defendant was found
automobile and that while doing so, he was under the influence of alcohol. The accused is not required to offer evidence of his innocence until the commonwealth has excluded every reasonable hypothesis of innocence. The determination of whether the defendant was intoxicated is ultimately one of fact for the jury.

The Virginia legislature approved chemical tests in 1954. Before this codification, chemical tests were admitted into evidence but were accompanied by the court's disclaimer that "we are not called upon to express any opinion relative to the admissibility of evidence obtained by means of chemical test to determine intoxication." The court added the caveat that the results were "not conclusive or binding upon the jury nor do such findings raise any presumption at law of the guilt of defendant, but the jury is to give only such weight to this evidence as they might think it entitled to." During this era, the attitude of Virginia courts to chemical testing was almost casual; one author remarked that as of 1954, "[v]ery few scientific detection methods had claimed the attention of the Virginia courts." Virginia's decision to use chemical tests in

19. Clemmer v. Commonwealth, 208 Va. 661, 159 S.E.2d 664 (1968). Before 1956, the offense of driving "while under the influence of alcohol" had not been defined specifically in Virginia. If the accused were found to be under the influence of alcohol, his ability to drive safely was presumed to have been affected. Owens v. Commonwealth, 147 Va. 624, 136 S.E. 765 (1927). Later statutory refinement, however, required that the effect of alcohol must be "apparent to observation." Gardner v. Commonwealth, 195 Va. 945, 954, 81 S.E.2d 614, 619 (1954). Chemical testing has minimized dependence on evidence obtained from observation alone.


21. Id.


24. Id. at 777, 75 S.E.2d at 498. Omohundro preceded legislation concerning procedural requirements of chemical test administration and of the presumptions to be drawn from test results. The facts of the case indicated that the test had been administered by an officer who made no control test either before or after using the machine and who had only two days of training in its use. The court concluded that because the officer was only reporting the machine reading and was neither offering his opinion nor his analysis, his lack of qualification was immaterial. The court also concluded that the reading had "no meaning" to the jury because it was not explained in the record as requiring any conclusion, and therefore, could be permitted into evidence without prejudice to defendant. Id.

connection with driving-while-intoxicated prosecutions was based on a desire "to remedy the contradictions which developed in the prosecution of cases . . . where convictions were sought on evidence of symptoms of behavior and condition of an accused at the time of his alleged offense. The obvious purpose was to provide a more accurate and definite test." Among the chemical tests that Virginia has adopted for measuring intoxication is the breath test.

to admitting tests for blood alcohol content, Virginia had admitted evidence such as fingerprints, radar speed tests, and analysis of chemicals to determine narcotic substances. Other scientific evidence receiving consideration in Virginia courts, but as yet deemed inadmissible, were the results of polygraph tests and truth serum. Id. at §§ 172-79. On the subject of polygraph test result admissibility in Virginia, see Skinner v. Commonwealth, 212 Va. 260, 183 S.E.2d 725 (1971); Lee v. Commonwealth, 200 Va. 233, 105 S.E.2d 152 (1958).

26. Bowman v. Commonwealth, 201 Va. 656, 660, 112 S.E.2d 887, 890 (1960). In Kay v. United States, the court considered the blood test more objective than the statutorily defined test of intoxication. 255 F.2d 476, 480 (4th Cir. 1958). See also United States v. Gholson, 319 F Supp. 499, 504 (E.D. Va. 1970). The reasoning of the Virginia courts on the utility of chemical tests was employed in jurisdictions across the country. The primary benefit noted was the move away from complete reliance on an officer's opinion as to whether a driver was intoxicated. Policemen have subscribed to indefinite and sometimes misleading terms to describe intoxication such as, "unsteady on feet, glassy eyes, odor of alcohol, incoherent speech, lack of muscular coordination, [and] erratic operation of vehicle." Bellotti, The Preparation and Trial of a Drunken Driving Case Involving a Breathalyzer, 1 Nat'l J. Crim. Def. 131, 132 (1975). Scientific tests for intoxication are particularly useful when what appear to be the objective signs of intoxication are in fact symptoms of a pathological physical condition that is unconnected with intoxication. In People v. Thomas, the officer testified that the defendant's breath smelled of alcohol, and he acted in a confused and disoriented manner. 34 Ill. App. 3d 578, 340 N.E.2d 174 (1975). The court concluded that this did not establish intoxication beyond a reasonable doubt because defendant had sustained an intracerebral hematoma as a result of the accident, and the slurred speech and unsure balance might have resulted from the head injury. For other cases in which courts have examined pathological conditions creating ostensible symptoms of intoxication, see People v. Stanley, 24 Ill. App. 3d 993, 322 N.E.2d 228 (1975) (diabetes); People v. MacPhail, 24 Ill. App. 3d 399, 321 N.E.2d 386 (1974) (prior neck injury); People v. Herzog, 75 Misc. 2d 631, 348 N.Y.S.2d 510 (1973) (concussion) State v. Miracle, 33 Ohio App. 2d 289, 294 N.E.2d 903 (1973) (migraine headache). See generally 1 R. Ewun, supra note 8, at § 11.01, wherein the author enumerates sixty pathological conditions recognized by the National Safety Council as causing symptoms typically identified with intoxication. Finally, courts have adopted chemical testing as a "new and more objective test and definition designed to protect an accused whose faculties are not impaired, while withholding protection from one who, under the sobering influence of accident or arrest, is able to avoid the appearance of intoxication." Kay v. United States, 255 F.2d 476, 480 (4th Cir. 1958). Some commentators believe that the legislators were aware of the fallibility of testing: "By providing for more than one [blood] test the [Virginia] Code implicitly recognized that unavoidable error inheres in any scientific measurement." Carter, Flora, Van Bowen & Myers, Statistics and the Virginia Blood Test Statute, 56 Va. L. Rev. 349, 350 (1970).
Breath Testing

Chemical testing for intoxication became possible when scientists recognized that the amount of alcohol in the brain could be measured to determine the level of intoxication. Although a direct test of alcohol in the brain was impossible, a test of alcohol in the blood was recognized as a useful substitute for a test of brain tissue. The next step in chemical testing for intoxication led to the development of breath testing to gauge the amount of alcohol in the blood; the alcohol diffuses from the blood into the air of the lower lungs when blood circulates through the lungs.

Breath testing has become popular with law enforcement officers because of its ease of administration. Unlike blood tests, breath checks may be performed by anyone with instruction in a simple procedure and do not require a person with extensive medical training. In addition, the subjects view breath testing as less intrusive and physically uncomfortable than a blood test, and therefore are more likely to cooperate with its administration.

Experts disagree concerning the accuracy of breath testing. Some maintain that breath testing does not reach the level of precision of a direct blood test; others contend that modern breath tests surpass both blood and urine tests in the precision and accuracy with which they measure blood-alcohol content. Nevertheless, breath testing has become recognized widely in criminal proceedings as an acceptable test for indicating the level of intoxication.

27. Watts, Some Observations on Police-Administered Tests for Intoxication, 45 N.C.L. Rev. 34, 49 (1966). The author notes that other bodily fluids such as saliva or spinal fluid might also be tested but are of little value due to the impracticality of administration. Id. at 55 n.67.

28. Whether expertise is necessary often is asked when defendant seeks to impeach the credibility of breathalyzer test results. Although jurisdictions differ on the extent of expertise and understanding an operator must demonstrate in the breathalyzer process, the overwhelming majority agree that basic proficiency with the device, as demonstrated by a certificate of training, is a necessary part of laying the foundation for test result admissibility. See Watts, supra note 27, at 65.

29. Other modern intoxication testing devices include sound motion pictures and videotape recordings. See Watts, supra note 27, at 69.

30. I R. Erwin, supra note 8, at §§ 18.01-4.

31. Watts, supra note 27, at 55-56.

The Breathalyzer Process

The most popular breath testing device in use today by law enforcement agencies is the breathalyzer, which was invented in 1954 and has been refined steadily since that time. The breathalyzer operates in three basic steps: the breath sample is collected when the subject exhales into the machine; the breath passes through a solution in the test ampoule; and the loss of color in the test ampoule solution caused by the alcohol in the defendant's breath is measured and a reading is given.

When the subject exhales into the mouthpiece of the machine, only the last 52.5 cubic centimeters of the exhalation are trapped. The breath then is driven by a piston through the ampoule containing potassium dichromate in a solution of sulphuric acid. As the breath moves through the test ampoule solution, the alcohol is extracted from the breath, and the solution loses its original color in an amount relative to the amount of alcohol in the subject's mouth. The amount of color change in the test ampoule solution is measured by photoelectric cells connected to a galvanometer. Initially, the galvanometer is balanced between the test and reference ampoules to assure passage of an equal amount of light through each ampoule. When the test ampoule solution color fades after being exposed to the subject's breath, however, more light passes through the test ampoule than the reference ampoule, and the galvanometer is no longer balanced. The adjustment necessary to reinstate the initial balance between ampoules gives the reading that indicates the amount of alcohol in the subject's breath. Because the alcohol in the breath will register at 2100 times the amount present in the blood, the alcoholic content of the blood can be determined by dividing by 2100.35

33. The breathalyzer is one of several breath-testing instruments used by law enforcement agencies. Other authorized types include the Drunkometer, the Alcometer, the Intoximeter, the Kitagawa-Wright Apparatus, and a variety of preliminary screening tests. For a detailed description of these devices, see Watts, supra note 27, at 56-77.

34. The breathalyzer was developed by Dr. Robert F Borkenstein. Models now available are the 900, 900A, 1000 and 1100. 2 R. Erwin, supra note 8, at 22. The breathalyzer appears on the list of evidential breath measurement devices of the Department of Transportation, National Highway Traffic Safety Administration. 41 Fed. Reg. 41,737 (1976).

35. The 2100:1 ratio and the principle behind breath testing is an application of Henry's Law, which states that when a volatile substance is dissolved, a predetermined percent of the volatile substance will escape into the air surrounding the liquid. When the solution of a volatile chemical is brought into equilibrium with air, a fixed ratio exists between the concen-
This examination of the breathalyzer testing process reveals the importance of the ampoules to the test. While the operation of the breathalyzer machine takes place through its many component parts, "the key to the entire [machine] lies in the ampoules and in the chemical reaction of the materials in the ampoules." The breathalyzer machine requires the use of two ampoules: a sealed glass vial that is broken open and attached to a bubbler tube so that the subject's breath may react with its contents; and an unopened ampoule that is standardized as a reference for comparison with the test ampoule after the latter has undergone the color change.

Each sealed ampoule should contain three cubic centimeters of 50%-by-volume, sulfuric acid solution and distilled water containing 0.75 milligrams, or 0.025% potassium dichromate and an equal amount of silver nitrate catalyst. The sulfuric acid in the ampoule absorbs any alcohol that comes through the ampoule in the breath sample. Next, the potassium dichromate reacts with and oxidizes the alcohol, and then itself is consumed, causing the liquid in the test ampoule to lose its original yellow color. The correct volume of liquid in the ampoule is crucial to test results: "The point truly most critical as to the chemicals in the Breathalyzer is that each ampoule contain the minimum quantity of reagent." Too little reagent will give higher results on the final reading.

Recognizing the viability of the breath test as a means for determining intoxication, the Virginia legislature gave this method statutory status in section 18.2-268 of the Virginia Code.

tration of the compound in the air and its concentration in water. This ratio is constant at a given temperature; as the temperature rises, the ratio in the air increases. The temperature at which breath leaves the mouth is approximately 33.5 degrees centigrade. At this temperature, the blood-to-air ratio in the deep, alveolar lungs is 2100:1. See Bellotti, supra note 26, at 145. The ratio indicates that one volume of arterial blood will contain 2100 times as much alcohol as an equivalent volume of alveolar breath. See Watts, supra note 27, at 57. For further discussion of the chemical principles of the breathalyzer, see Borkenstein & Smith, The Breathalyzer and Its Applications, 2 Med. Sci. & L. 13 (1961); Rabnowitz, Medicolegal Aspect of Chemical Tests of Alcoholic Intoxication, 39 J. Crim. L.C.&P.S. 225 (1948).

36. 2 R. ERWIN, supra note 8, at § 22.03[2][a].

37. The actual breakdown is 0.025% potassium dichromate, 0.025% silver nitrate, and 99.95% sulfuric acid. Id.

38. Id.

39. See Watts, supra note 27, at 89.

40. VA. CODE § 18.2-268 (Cum. Supp. 1979). This provision should be distinguished from § 18.2-267, which also provides for breath testing, but refers to preliminary breath tests that are administered when the accused is stopped, to determine probable alcoholic content as a
is first mentioned in the statute as part of the provision dealing with a driver's implied consent to the test. A subsequent provision, (r1) of section 18.2-268, details the procedures for “chemical analysis of a person's breath to be considered valid.”

basis for the probable cause required to make an arrest. The equipment used for this purpose is far less sophisticated than the breathalyzer, and the results of the preliminary analysis of alcoholic content of the breath are inadmissible in court.

41. Implied consent statutes have been enacted throughout the country and basically provide that a person using the state highways is required to submit to either a blood or breath test when arrested for drunken driving. In Virginia, this consent is deemed neither qualified nor conditional. Deaner v. Commonwealth, 210 Va. 285, 170 S.E.2d 199 (1969). Unreasonable refusal to submit to a chemical test after a drunken driving arrest may cause the accused to lose his license. United States v. Gholson, 319 F Supp. 499 (E.D. Va. 1970). This penalty, however, is a completely separate offense from the drunken driving charge. Id.

42. VA. CODE § 18.2-268(b) (Cum. Supp. 1979).
Any person whether licensed by Virginia or not, who operates a motor vehicle upon a public highway in this State shall be deemed thereby, as a condition of such operation, to have consented to have a sample of his blood or breath taken for a chemical test to determine the alcoholic content of his blood, if such person is arrested for violation of § 18.2-266. Id. (emphasis supplied).

43. VA. CODE § 18.2-268(r1) (Cum. Supp. 1979). Virginia's requirements are as follows:
Chemical analysis of a person's breath, to be considered valid under the provisions of this section, shall be performed by an individual possessing a valid license to conduct such tests, with a type of equipment and in accordance with the methods approved by the Division. Such breath-testing equipment shall be tested for its accuracy by the Division at least once every six months.

The Division is directed to establish a training program for all individuals who are to administer the breath tests, of at least forty hours of instruction in the operation of breath-test equipment and the administration of such tests. Upon the successful completion of the training program the Division may issue a license to the individual operator indicating that he has completed the course and is authorized to conduct a breath-test analysis. Licenses previously issued by the State Health Commissioner shall continue to be valid until the expiration date.

Any individual conducting a breath-test under the provisions of this section and as authorized by the Division shall issue a certificate which will indicate that the test was conducted in accordance with the manufacturer's specifications, the equipment on which the breath-test was conducted has been tested within the past six months and has been found to be accurate, the name of the accused, the date, the time the sample was taken from the accused, the alcoholic content of the sample, and by whom the sample was examined. The certificate, as provided for in this section, when duly attested by the authorized individual conducting the breath test, shall be admissible in any court in any criminal proceeding as evidence of the alcoholic content of the blood of the accused. In no case may the officer making the arrest, or anyone with him at the time of the arrest or anyone participating in the arrest of the accused, make the breath test or analyze the results thereof. A copy of such certificate shall be forthwith delivered to the accused.

Id.
The Presumption of Intoxication Generally

The major significance of the use of breath testing in drunken driving prosecutions lies in the statutory presumption of intoxication that results from a breathalyzer reading above a certain level. The legal presumptions concerning breath test results followed the continued refinement of chemical tests as indicators of an accused's blood-alcohol level. When scientists found that alcoholic content of a subject's blood could be correlated with degrees of intoxication, the American Medical Association recommended a set of legal presumptions based on a standardization of the blood-alcohol/intoxication relationship. These guidelines were adopted by the National Safety Council Committee on Alcohol and Drugs44 and written into chemical-testing statutes by state legislatures across the country.

As initially proposed, the presumptions created three zones of influence. Zone 1 includes those persons having 0.05% or less alcohol in their blood and gives rise to the presumption that the subject is not intoxicated. Zone 2 includes those test subjects with a blood-alcohol content of between 0.05% and 0.15% and indicates that the subject may or may not be intoxicated.45 Test subjects with 0.15% or higher alcohol content in their blood fall into Zone 3 and are subject to the presumption of intoxication. At least twenty-eight states, including Virginia, have reduced the percentage at which intoxication is presumed from 0.15% to 0.10% or higher.46 This nar-

44. See Nat'l Safety Council Committee on Alcohol and Drugs, Uses of Chemical Tests for Intoxication (1964), Subcommittee on Legal Matters, Nat'l Safety Council Committee on Alcohol and Drugs, Ann. Rep. at 1-2 (1965).

45. Although one advantage of the presumption is the elimination of the necessity of expert testimony on the relation between the alcoholic content of the blood and intoxication, in Zone 2 such testimony still might be required; in Zone 2 neither intoxication nor nonintoxication is presumed.

46. 1 R. Erwin, supra note 8, at § 14.02. The Virginia Code provides for the presumptions arising from the alcoholic content of blood in section 18.2-269:

In any prosecution for a violation of § 18.2-266, or any similar ordinance
the amount of alcohol in the blood of the accused at the time of the alleged offense as indicated by a chemical analysis of a sample of the accused's blood or breath to determine the alcoholic content of his blood shall give rise to the following rebuttable presumptions:

(1) If there was at that time 0.05 percent or less by weight of volume of alcohol in the accused's blood, it shall be presumed that the accused was not under the influence of alcoholic intoxicants;

(2) If there was at that time in excess of 0.05 percent but less than 0.10

rows Zone 2 range to between 0.05% and 0.10%, and broadens Zone 3 so that a reading of 0.10% or higher triggers the presumption.

Like the use of chemical tests for assessing levels of intoxication, the use of the legislative presumption derived from scientific findings helps eliminate the guesswork from determinations of intoxication and replaces the opinion of the observing officer with data based on scientific test results. The presumptions supply a fixed standard and eliminate the necessity for expert testimony on the relationship between blood-alcohol content and levels of intoxication.47 Statutory presumptions of this type, however, only eliminate expert testimony concerning the effect of alcohol on the body; experts still may testify as to the operator's qualifications, the test procedure, and the accuracy of a particular machine.48

Statutory presumptions of intoxication derived from breathalyzer test results are rebuttable rather than conclusive.49 Admission of evidence from a breathalyzer test does not preclude the introduction of other evidence of intoxication or sobriety by the defense or by the prosecution. Statutes providing for the presumption of intoxication usually will state that the jury should consider test results and the presumptions attending those results in conjunction with all other evidence presented.50 Similarly, the presumption of intoxication does not change the presumption that the defendant is innocent.51

percent by weight by volume of alcohol in the accused's blood, such facts shall not give rise to any presumption that the accused was or was not under the influence of alcoholic intoxicants, but such facts may be considered with other competent evidence in determining the guilt or innocence of the accused;

(3) If there was at that time 0.10 percent or more by weight by volume of alcohol in the accused's blood, it shall be presumed that the accused was under the influence of alcoholic intoxicants.


The constitutionality of the Virginia statutory presumption was addressed in Kay v. United States, 255 F.2d 476 (4th Cir. 1958). The Fourth Circuit held that because it is rebuttable, the presumption neither restricts the defendant in presenting his defense nor deprives him of the presumption of innocence. Because the jury considers the alcoholic content of the blood along with all other evidence, the defendant is deprived of no protected right when the presumption of intoxication is invoked against him by the prosecution. Id. 47. See Annot., 16 A.L.R.3d 748 (1967).

48. Such experts usually will be called by the defense unless the jurisdiction is one in which experts are required to lay the foundation for the test's admissibility before it can be introduced by the prosecution. The controversy over the feasibility of ampoule retesting itself has created fertile ground for battle by the experts. See notes 88-101 infra & accompanying text.

49. McCormick, supra note 1, at 209.

50. Id.

51. For a discussion of the mandate that an accused must be considered innocent until
until proven guilty, but merely shifts the burden of proof to the defendant and requires him to adduce evidence of nonintoxication to rebut the presumption. The standard of proof for the prosecution’s case thus remains that of guilt beyond a reasonable doubt.

THE DUE PROCESS CHALLENGE TO AMPouLE UNAVAILABILITY

Challenges to the admissibility of a breathalyzer test, which result when the ampoules are unavailable for independent analysis by the defendant, are based on denial of the defendant’s due process rights. Due process guarantees the accused a fair trial, and any violation of fundamental fairness will constitute a denial of that guarantee;52 likewise, a defendant is denied fundamental fairness when evidence favorable and material to his case is unavailable to him.53

The due process implications of ampoule destruction by the state must be viewed as a balancing question. The nature of due process calls for “conform[ity] to fundamental standards of procedure in criminal trials”54 and promises the defendant no more than treatment “in accordance with the criminal procedures established by law.”55 Thus, the requirement that the state only need act reasonably qualifies the defendant’s right to due process. The scope of the defendant’s due process rights does not include unreasonable demands on the government.56 In the ampoule-destruction context, a determination of whether due process has been violated must be made with reference to the defendant’s right and the prosecution’s duty

52. "Due process of law, as a historic and generative principle, precludes defining, and thereby confining, these standards of conduct more precisely than to say that convictions cannot be brought about by methods that offend 'a sense of justice.'” Rochin v. California, 342 U.S. 165, 173 (1952) (Frankfurter, J).


56. The Federal Rules of Criminal Procedure reflect this dual concern. Rule 16, which provides for discovery of evidence from the prosecution, requires first “a showing of materiality of the preparation of the defense” which goes to the defendant’s rights and possible prejudice to him, and then adds “and reasonableness” to condition the defendant’s rights by limiting the burden of the prosecution. Fed. R. Crim. P. 16.
The Rule in Brady

The basis for the due process challenge in ampoule-destruction cases is the United States Supreme Court ruling in Brady v. Maryland\(^57\) that "suppression by the prosecution of evidence favorable to an accused violates due process where the evidence is material either to guilt or to punishment."\(^58\) Courts examining the possible due process violation inherent in the destruction of the ampoules first consider whether information derived from the ampoules could constitute evidence both favorable and material to the defendant. If these questions are answered affirmatively, the court will examine the reasonableness of the demand on the prosecution that the ampoules be preserved. As a result, even if the requisite materiality and favorability of evidence are found, the court may decide that considerations from the prosecution's viewpoint militate against a finding of a due process violation.\(^59\) The court will look to the good faith of the prosecution in destroying the ampoule and to the inconvenience involved in its retention.\(^60\) Several courts have held that a finding of good faith on the prosecution's part will vitiate any potential due process violation. Similarly, upon a factual finding that ampoule retention would be too burdensome on the law enforcement agencies involved, the court may decline to find that the defendant's due process rights have been violated by the ampoule's destruction.

The ruling in Brady that evidence material and favorable to the defendant must not be withheld was based on a situation involving suppression of evidence.\(^61\) In most ampoule-retention cases, the destruction of evidence, rather than suppression of still extant material, is at issue. In order to deal with instances in which evidence cannot be disclosed because of its destruction, the duty to disclose

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57. 373 U.S. 83 (1963). In Brady, the prosecution suppressed evidence which demonstrated that Brady was not guilty of the murder with which he was charged.
58. Id. at 87. The duty to disclose is, in part, a remedial measure designed to protect the defendant from the government's greater capacity to investigate by permitting his acquisition of much of the material relevant to trial.
59. See note 137 infra & accompanying text.
60. Id.
61. See note 57 supra. For cases particularizing the prosecution's duty to disclose, see Levin v. Clark, 408 F.2d 1209 (D.C. Cir. 1967); Barbee v. Warden, Maryland Penitentiary, 331 F.2d 842 (4th Cir. 1964). See also Note, The Prosecutor's Constitutional Duty to Reveal Evidence to the Defendant, 74 Yale L.J. 136 (1964).
enunciated in *Brady* has been extended to include a duty to preserve evidence.\(^6\) This duty applies not only to the prosecution during the trial, but to law enforcement officers operating at earlier stages of investigation; the duty of preservation is imposed from the moment that the evidence is seized.\(^6\)

**Favorability**

Courts therefore have applied the *Brady* rule to ampoule destruction cases by examining the evidence that might be derived from the preserved ampoule and applying the two-pronged test of demonstrating the favorability of the evidence and its materiality.\(^6\) Although courts have agreed that the defendant bears the burden of showing the favorability of the evidence that the ampoule could provide,\(^5\) they have differed on the degree to which favorability must be demonstrated. In *Canaday* and other cases in which courts have refused to find a due process violation when ampoules have been destroyed, a stringent reading of the *Brady* favorability standard has required that the defendant demonstrate that the ampoules would raise "a reasonable doubt [as to defendant's guilt]

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62. United States v. Bryant, 439 F.2d 642 (D.C. Cir. 1971). In *Bryant*, the court mandated the promulgation of rules of procedure to assure preservation of all discoverable evidence. *Id.* at 652. In *State v. Michener*, 25 Or. App. 523, 550 P.2d 449 (1976), the Court of Appeals of Oregon refused to acknowledge any difference in the state's duty because evidence had been destroyed rather than suppressed. The court noted that "[w]hether the evidence remains available to the state, or has been destroyed, is irrelevant to the question of whether the refusal to produce the evidence is violative of the state's duty to disclose." *Id.* at 454.

63. In United States v. Heiden, 508 F.2d 898 (9th Cir. 1974), which involved the seizure of a large amount of marijuana, the court stated in a footnote that "[t]he government is flirting with the danger of reversal any time evidence is lost or inadvertently destroyed. When evidence is seized, the government should take every reasonable precaution to preserve it." *Id.* at 903 n.1. This duty to preserve prevents the state from arguing successfully that the state is under no duty to disclose that which does not exist. *See People v. Godbout*, 42 Ill. App. 3d 1001, 356 N.E.2d 865 (1976). Absent the duty to preserve, the prosecution could destroy evidence and then claim impossibility of compliance. *See People v. Hitch*, 12 Cal. 3d at 650, 527 P.2d at 367, 117 Cal. Rptr. at 15.

64. *See note 57 supra.*

65. 1 R. ERWIN, supra note 8, at § 5B.04A. In *State v. Reaves*, the court indicated that favorability of ampoules is a factual finding to be determined anew in each case depending on whether the defense produces credible evidence of the favorable effect of the ampoule on the defendant's case. *25 Or. App. 745, 550 P.2d 1403 (1976)*, quoting *State v. Michener*, *25 Or. App. 449, 550 P.2d 449 (1976)*. As to whether a case-by-case determination is practical in the context of scientific theory, *see note 152 infra & accompanying text.*
which did not otherwise exist.”

Courts following the *Hitch* rationale, however, have been less demanding in their characterization of the defendant’s burden with respect to the degree of favorability of ampoule-derived evidence necessary to show a due process violation. Precedent exists for this less stringent requirement. In *Griffin v. United States*, the United States Court of Appeals for the District of Columbia mandated disclosure of “evidence that may reasonably be considered admissible and useful to defense.” Similarly, the Third Circuit in *Curran v. Delaware*, stated that the defendant’s due process rights would be violated unless all “pertinent facts relating to defense” were disclosed by the state.

The *Hitch* standard requires only that the defendant show that it was “reasonably possible” that ampoule evidence would be favorable to the defendant’s case. Courts following the *Hitch* precedent have tailored the favorability requirement accordingly. In *State v. Michener*, the Court of Appeals of Oregon required a “reasonable possibility” of favorability, adding the caveat that it be “based on concrete evidence rather than a fertile imagination.” In *State v. Wright*, the Supreme Court of Washington held that the defendant’s rights would be violated if the ampoule evidence “could possibly have been of assistance” in establishing his defense.

In considering the facts necessary for a finding of due process violation when the ampoule is inaccessible to the defendant, courts

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66. State v. Canaday, 90 Wash. 2d at _, 585 P.2d at 1189. The court believed that cross-examination of the test operator could provide the defense with the same information as ampoule analysis. *Id.*
67. 183 F.2d 990 (D.C. Cir. 1950).
68. *Id.* at 993.
69. 259 F.2d 707 (D.C. Cir. 1958).
70. *Id.* at 711.
73. *Id.* at ___, 550 P.2d at 454.
74. *Id.*
75. 87 Wash. 2d 783, 557 P.2d 1 (1976).
76. *Id.* In *Wright*, defendant pointed to nine areas in which evidence from the ampoule might benefit his case. A favorability standard in the spirit of *Hitch* also was applied in *People v. Noonan*, in which the court stated that “it was first the duty of defendant to demonstrate a reasonable possibility that the ampoule could give evidence on the issue of guilt which might result in his exoneration.” 20 Cal. App. 3d 862, 865, 98 Cal. Rptr. 125, 128 (1971) (emphasis supplied).
have used a four-part, building-block analysis: in order to constitute a violation of due process, unavailable evidence must be found to be favorable to the defendant; in order to be favorable to the defendant, such evidence must be admissible; in order for scientific evidence to be admissible, it must be scientifically reliable; and in order for evidence to be scientifically reliable, it must enjoy the general acceptance of the scientific community.

The determination of whether ampoule-derived evidence might be favorable, therefore, begins with an investigation into the scientific reliability of the evidence that the ampoule could furnish. Absent a finding of reliability, the defendant’s due process claim will fail, as will the motion to suppress the results of the breathalyzer test that he would have attempted to impeach. The conclusive effect of the scientific-reliability determination was enunciated by the Court of Appeals of Ohio in *State v. Watson*:

The test ampoule and its solution used in the breathalyzer test may be “material to the preparation of defense.”

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77. The court in *Canaday* was especially concerned about the admissibility of ampoule-derived evidence. It stated that the primary reason for its departure from *Hitch* and its progeny in holding that defendant was not denied due process, despite the destruction of the test ampoule, was that those cases had been decided “without considering the question whether proffered expert testimony based on retesting of the ampoules is properly admissible.” 90 Wash. 2d at ___, 585 P.2d at 1188-89.

78. The court in *Canaday* emphasized that “expert testimony may be permitted to reach a trier of fact only when the reliability of the underlying principles has been accepted by the scientific community.” *Id.* at ___, 585 P.2d at 1188. The court quoted a 1923 case, *Frye v. United States*, 293 F 1013 (D.C. Cir. 1923), deemed by Professor McCormick to be the first clear statement of a special evidentiary rule on scientific evidence. *McCormick*, supra note 1, at § 96. In *Frye*, the defendant sought to have results of a systolic blood pressure deception test admitted as evidence of his innocence of a murder charge. In considering the standard of admissibility of the scientific test results, the court stated:

Just when a scientific principle crosses the line between experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized [but] 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.

293 F at 1014. Although noting that the court refused to admit the results because the test had not gained general acceptance, McCormick observes that a few years after his trial, Frye was exonerated when another person confessed to the crime. *McCormick*, supra note 1, at § 96. On the difficult problem of admissibility as determined by scientific reliability, McCormick suggests that the “general scientific acceptance” test should be the parameter for judicial notice of scientific facts, but not for admissibility. McCormick favors admitting “any relevant conclusions which are supported by a qualified expert witness,” and reserving the weighing of such testimony for the jury. *Id.* at § 203.

and ordinarily excludable from evidence when made unavailable to [defendant], where there is no evidence that the ampoules and solution, if preserved, could be scientifically examined so as to produce conclusive results the results of the breathalyzer test may be admitted. 80

**Scientific Reliability**

Courts arrive at a finding of scientific reliability by examining the ways in which ampoules might be used to derive evidence that would bolster the defendant’s case, such as the impeachment of the breathalyzer test results that establish the statutorily mandated presumption of intoxication. 81 The burden of demonstrating favorability rests squarely on the defendant; therefore, the court rarely will raise possible methods of ampoule analysis *sua sponte* and will address only those methods presented by the defense. 82 The ampoule may be used to impeach the credibility of breathalyzer test results in several ways. Often, however, courts blur the distinctions by assuming that if one method of examining the ampoule cannot provide scientifically reliable evidence, then other methods are similarly defective. The defense could use the ampoules to uncover evidence in four basic ways. The first and most controversial method is the actual retesting of the test ampoule in an attempt to redetermine the subject’s blood-alcohol level at the time the test was administered. 83 In addition, the defendant might attempt to determine what quantity of chemical constituents was present in the test and reference ampoules at the time of testing, given that chemical volume is critical to test results. 84 A third method checks the quality of the test solution in terms of the percentages of chemical required. 85 The final method is a physical examination of the ampoule tube itself as a check on optical defects or imperfections that could have affected test results. 86 Only actual retesting of the ampoule

80. Id. at ___, 355 N.E.2d at 885.
81. See note 44 supra & accompanying text.
82. In Canaday, the court discussed two ways in which used ampoules might be useful, but concluded that the ampoules would not be material evidence in a constitutional sense. Routine destruction and disposal of the used ampoules therefore did not violate due process.
83. See Bellotti, supra note 26; Watts, supra note 27.
84. See 1 R. Erwin, supra note 8, at § 5B.02.
85. Id. The proper breakdown is 0.025% potassium dichromate, 0.025% silver nitrate, and 99.95% sulfuric acid.
86. Id.
would give the defendant a new reading on the blood-alcohol content at the time of testing; the other checks would provide information that could impeach the accuracy of the test results presented by the state, but would not provide an alternate reading.87

The feasibility of an actual redetermination of alcohol content of the blood of the defendant has been a source of conflict among experts. The consensus of the courts on this method of gaining evidence from an ampoule was stated accurately in Canaday: “Although retesting is claimed to be reliable by some scientists, others are not persuaded” and the procedure has not yet achieved general scientific acceptance.88 Similarly, one commentator notes that “[e]xperts are apparently in agreement that it is difficult if not impossible to make a re-run of the breath determination from an ampoule after the completion of the test with any degree of accuracy.”89 Even courts that have granted the defendant’s motion to suppress on the basis of the ampoule’s unavailability have questioned the feasibility of an actual redetermination of blood-alcohol content and ultimately have relied on a finding that ampoule analysis in general will furnish scientifically reliable information.

In Lauderdale v. State,90 the Supreme Court of Alaska found that, although the test and reference ampoules could furnish probative evidence of the propriety of the breathalyzer test in several ways, the retesting method might not be one of these ways because “[a]pparently, at the present time, it is not possible to rerun a test and obtain accurate results.”91 The court, however, found that retesting might be viable in part:

But even now, the test of a used ampoule could be made again, and if the results were less than those originally obtained, the original results would be suspect. The reason for this is that the passage of time, with the chemical changes in the solution in the ampoule, would normally cause the test results to show an increase in blood alcohol.92

87. Evidence that would impeach the credibility of the prosecution’s test results clearly is critical to the defendant’s case; an effective attack on the test’s accuracy will force the prosecution to rely on evidence other than test results, and will weaken significantly its case against the defendant.
88. 90 Wash. 2d at —, 585 P.2d at 1187.
89. 1 R. ERWIN, supra note 8, at § 5B.04A.
91. Id. at 379-80.
92. Id. at 380 (emphasis supplied).
Similarly, in Hitch, the court noted that the original breath test "cannot be duplicated with 100% accuracy."3 As was the Alaska court in Lauderdale, however, the California court was willing to base a finding of scientific reliability of ampoule-derived evidence on two other modes of testing the ampoule: the measurement of the volume of the chemicals in the ampoule; and the analysis of the glass of the ampoule itself.4

In only one recorded case did a court respond more favorably to the defendant's contention that a retest would furnish scientifically reliable evidence. In State v. Michener,5 the Court of Appeals of Oregon announced that "we have found substantial evidence in this record to support the finding of the circuit court that '[i]t is scientifically possible to independently re-test the accuracy of the breathalyzer reading.'"6

Courts holding that the inaccessibility of a breathalyzer ampoule is not a denial of the defendant's due process rights have been even less sanguine about the reliability of redetermining initial test results. In State v. Bryan,7 the Superior Court of New Jersey found that testimony favoring such redetermination was "based upon nebulous theories" which were only in the embryonic stage.8 The pros-

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4. The court in Lauderdale considered a quantity and quality check of ampoule solution and found these two analyses to be viable:

   The test and reference ampoules could be probative evidence of the propriety or impropriety of the breathalyzer test for several reasons. From the witness's testimony, it appeared that it was critical to the results of the test that precisely three milliliters of solution be contained in the ampoules; if the volume was less than three milliliters, the final result would be a falsely elevated level of alcohol. This would be true as to both the test and reference ampoules. After the test is given the quantity of the solution in the reference ampoule can be accurately measured, and the test itself does not materially change the quantity of solution in the test ampoule, which can also be measured.

6. Id. at ___, 550 P.2d at 454 n.11. One subject on which experts have been able to agree regarding ampoule retention is the instability or tendency to react and undergo chemical change when uncovered of the chemical solution in the ampoule. In Michener, however, the court was persuaded by the testimony of the defense's expert that the solution could be kept stable if properly preserved, thus solving the problem that usually makes ampoule retesting impossible: "We conclude that the defendants have made a sufficient showing to support their assertion that had the evidence been available to them, it would have been both favorable and material to the defense." Id. at ___, 550 P.2d at 454.
8. Id. at ___, 336 A.2d at 514.
execution's expert witness in *Bryan* had testified that there was no substance to the theory that chemicals in the test ampoule could be extracted and subsequently used to test the machine reading. Any rebalancing of the instrument would indeed be difficult and would require some expertise. A removal and reinsertion of the ampoule would probably change the reading, and it would be impossible after reinsertion to reproduce the initial results obtained on the breathalyzer. 99

In *State v. Teare*, 100 the New Jersey Court again heard expert testimony on both sides of the issue and concluded that the defendant had not been denied due process based on the fact that

\[\text{[p]reservation of the test ampule [sic] is not feasible or practical since subsequent testing will not give any scientifically reliable results, this being due to the uncontrollable changes that occur in the breathalyzer test ampules after their use in the breathalyzer test. Furthermore, even if these changes or variations could be scientifically accounted for and accurately analyzed, you still could not properly analyze a test ampule subsequent to a breathalyzer test because there is simply no predictable relationship between the changes that occur and the lapse of time.}^{101}\]

In addition to attempts to actually redetermine initial test results, test and reference ampoules can be checked to determine the volume of solution. Courts have been more willing to accept this test as a method of gleaning evidence valuable to the defense. Experts agree that the volume of the solution in the ampoules is critical to test results and the process of checking the solution volume is not as complex or impractical as a simulation of the initial blood-alcohol test run by the police.

Volume testing is based on the requirement that the test ampoule contain exactly three milliliters of the potassium-dichromate/sulfuric acid solution. If the ampoule contains less than this volume, test results could be elevated falsely 103

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99. *Id.* at ----, 336 A.2d at 513.


101. *Id.* at ----, 342 A.2d at 558.

102. See note 94 supra.

103. See generally Watts, supra note 27; DONIGAN, CHEMICAL TESTS AND THE LAW (Fischer ed. 1957).
trial judge, after calling expert witnesses of his own, wrote a lengthy and detailed memorandum opinion of the subject, concluding that "the quantity of three cubic centimeters of solution in the test and reference ampoules is critical to the test because a lesser amount of solution will show an artificially high blood alcohol level while a greater amount will show an artificially low reading."[104]

In addition to measuring the quantity of chemical present in the ampoules, the quality of the chemical solution can be measured: such a test measures the chemical composition of the vial.[105] The presence of 0.025% potassium dichromate, which is critical to test accuracy, can be checked easily in the reference ampoule after the test has been administered.[106] Measurement of the solution in the test ampoule at a later time, however, is more difficult because the solution has been exposed to a subject's breath, and the chemical contents have begun to change in response to this exposure. Nonetheless, in Lauderdale the court accepted expert testimony that retest of the test ampoule solution quality was "probably possible."[107]

The final type of evidence that might be obtained if an ampoule were available to the defendant for independent analysis, is physical inspection of the glass of the ampoule.[108] The glass from which ampoules are manufactured is not optical glass but is of varying thickness and susceptible to optical defects that could affect the accuracy of the test, whether in the test or the reference ampoule.[109] Preservation of the ampoule after testing would offer an opportunity for the defendant to check these properties of the ampoule without the complications involved in the other tests.

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104. 30 Cal. App. 3d 675, 106 Cal. Rptr. 606, 607 (1974). See also Van Halen v. Municipal Court, 3 Cal. App. 3d 233, 83 Cal. Rptr. 140 (1969) (holding that the amount of chemical in a given ampoule may be determined after the test because no material change occurs in the quantity of the solution in the test ampoule as a result of the test).
106. Id. The problem is one of chemical instability, an obstruction both to a retesting of the ampoule and to a check for solution composition. See note 96 supra.
107. 548 P.2d at 379.
108. 12 Cal. 3d at 645 n.1, 527 P.2d at 364 n.1, 117 Cal. Rptr. at 12 n.1.
109. Id. The quality of the glass of which the ampoule is composed may diffuse light going through the ampoule during testing. The galvanometer consequently will make an adjustment that inaccurately indicates the color loss in the test ampoule. Because color loss is related directly to the amount of alcohol in a subject's breath, inaccuracy at this stage of the test will distort the final reading of blood-alcohol content. See Lauderdale v. State, 548 P.2d at 379.
Materiality

In addition to the requirement of proving the favorability of the evidence that the destroyed ampoule would have supplied, the Brady rule requires that the defendant show that such evidence be "material either to guilt or to punishment." The determination of materiality by courts is even less predictable than that of favorability, perhaps because "[t]he United States Supreme Court has not attempted to precisely define 'material evidence' or the degree of prejudice which must be shown by the defendant to make out a [due process] violation." Materiality has been defined variously as evidence which "might have led the jury to entertain a reasonable doubt about guilt" and as evidence which "could possibly result in . . . exoneration."

In Canaday, the court emphatically stated that "[t]estimony to be gained from the ampoules is only tangential to the question of innocence or guilt. The ampoules are therefore not material in a constitutional sense." Destruction of the ampoules, the court concluded, "does not interfere with the defendant's ability to determine the facts or raise a defense of nonintoxication."

The court in Hitch reached the opposite conclusion on the question of the materiality of the ampoule. Acknowledging the necessity of establishing materiality, the Supreme Court of California concluded that "the results of the breathalyzer test by their very nature constitute material evidence on the issue of guilt or innocence upon a charge of drunk driving. The finding of materiality was linked to language in the section of the California Vehicle Code that provided that "if the amount of alcohol in a person's blood at the time of the test as shown by chemical analysis of his breath was 0.10 percent or more it shall be presumed that the person was under the influence of intoxicating liquor."

Breathalyzer test results therefore were deemed to be material to guilt or punishment be-

111. State v. Wright, 87 Wash. 2d 783, ___, 557 P.2d 1, 4 (1976) (involving a first-degree murder charge, not drunken driving).
113. Hitch, 11 Cal. 3d at ___, 520 P.2d at 976, 113 Cal. Rptr. at 160.
114. 90 Wash. 2d at ___, 585 P.2d at 1190.
115. Id.
116. 12 Cal. 3d at 647, 527 P.2d at 365, 117 Cal. Rptr. at 13.
117. Id.
cause they give rise to the presumption of intoxication. The court reasoned that evidence which could affect substantially the credibility of those test results must be disclosed to the defendant, or he would be deprived of the right to a fair trial.\footnote{118} In so stating, the court found that the absence of the ampoules could have a direct effect on the quality of the defense that the accused could prepare.\footnote{119} The Hitch position on the materiality of ampoules conforms to a pronouncement made by the United States Supreme Court in relation to materiality and the government’s duty of disclosure, stating that materiality should be “generously conceived \[to include\] all possible defenses.”\footnote{119.1}

**The Right of Confrontation**

The courts that have refused to accept the defendant’s contention that the unavailability of the breathalyzer ampoule is a denial of due process usually conclude their discussions with the statement that the ampoules are deemed neither favorable nor material to the accused’s defense, without further development of the due process theory. Courts more sympathetic to the motion to suppress or dismiss, and courts that have held that the defendant has met the burden of supplying evidence of the ampoule’s favorability, have particularized the due process violation caused by the denial of independent analysis.

The courts in Hitch,\footnote{120} Lauderdale,\footnote{121} and Michener,\footnote{122} based the finding of a due process violation on the defendant’s inability to cross-examine the breathalyzer ampoule as an aid to impeaching the test results on intoxication introduced by the prosecution. The Supreme Court has recognized that denial of the defendant’s right of cross-examination deprives him of the sixth amendment right to

\footnote{118. Id. at 648-49, 527 P.2d at 366, 117 Cal. Rptr. at 14. An analogous finding was made by the United States Supreme Court in Giglio v. United States: “[w]hen the ‘reliability of a given witness may well be determinative of guilt or innocence,’ nondisclosure of evidence falls within [the Brady rule].” 405 U.S. 150, 154 (1972), quoting Napue v. Illinois, 360 U.S. 264, 269 (1959).}
\footnote{119. This is the converse of the finding in Canaday that “destruction of used breathalyzer test ampoules \[does not interfere with the defendant’s ability to determine the facts or raise a defense of nonintoxication.\]” 90 Wash. 2d at 485 P.2d at 1190.}
\footnote{119.1. Giles v. Maryland, 386 U.S. 66, 98 (1967) (Fortas, J., concurring).}
\footnote{120. 12 Cal. 3d 641, 527 P.2d 361, 117 Cal. Rptr. 9 (1974).}
\footnote{121. 548 P.2d 376 (Alas. 1976).}
\footnote{122. 25 Or. App. 523, 550 P.2d 449 (1976).}
confront the witnesses against him. The right to cross-examine is critical, therefore, because confrontation constitutes "[o]ne of the fundamental guarantees of life and liberty" and is essential to due process.

In finding the absence of the breathalyzer ampoule a denial of the defendant's right of confrontation, courts have compared the ampoule to a witness for the prosecution who is unavailable for cross-examination. More specifically, the court in Hitch likened the ampoule to an informer for the prosecution whose identity the state seeks to withhold. The rule "consistently expounded and applied" in that context is that "[w]hen it appears from the evidence that an informer is a material witness on the issue of the defendant's guilt, the informer's identity may be helpful to the defendant and nondisclosure would deprive him of a fair trial. The People either must disclose his identity or incur a dismissal." Applying the informer rule to the lost ampoule case, the court found that the test results must be suppressed because disclosure of the ampoule is impossible when it has been destroyed rather than merely withheld. This view of the breathalyzer ampoule is one that regards the ampoule as the repository of evidence that is unavailable from any other source.

Other courts have viewed the ampoule as merely providing evidence that is ascertainable from other sources so that its absence is not crucial to the defendant's case. In Canaday, the court found that the defendant had not been denied the opportunity to confront the witnesses against him because the test operator's testimony pro-

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123. Pointer v. Texas, 380 U.S. 400 (1965) (the sixth amendment right to confrontation is applicable to the states under the fourteenth amendment). Adopted in 1787, the sixth amendment requires "that in all criminal prosecutions, the accused shall enjoy the right to be confronted with the witnesses against him." U.S. Const. amend. VI.


125. Chambers v. Mississippi, 410 U.S. 284 (1973). In Chambers, the defendant was not permitted to cross-examine his own witness by virtue of the Mississippi common law theory that one may not impeach his own witness. Reversing, the Supreme Court emphasized that "[t]he right of an accused in a criminal trial to due process is, in essence, the right to a fair opportunity to defend against the State's accusations," id. at 294, and that "[t]he right of cross-examination is more than a desirable rule of trial procedure. It is implicit in the constitutional right of confrontation." Id. at 295.


127. Id. at ___, 527 P.2d at 366, 117 Cal. Rptr. at ___.

128. Id. (citations omitted).

129. Id.
vided the defendant with "adequate opportunity at trial to impeach the credibility of the officer without access to the used ampoule."\textsuperscript{130} Similarly, in \textit{United States v. Sewar},\textsuperscript{131} the Ninth Circuit equated test operator testimony with the information that the ampoule might provide and thus dismissed the question of the necessity of availability of the ampoule:

It is the technician who made the test, not the blood sample, who will be witness against [the defendant]. [The defendant] will be able to cross-examine the technician. The fact that the sample is missing will make cross-examination more difficult, but that does not amount to a denial of confrontation.\textsuperscript{132}

In \textit{Lauderdale}, however, the Alaska court felt that the ampoule could provide information that a test operator could not, and that "[a] denial of the right to make [a scientific analysis of breathalyzer components] that is to say, to 'cross-examine' the results of the test, would be reversible error without any need of a showing of prejudice. It would be a denial of a right to a fair trial."\textsuperscript{133} The court distinguished evidence that is represented at trial by some other evidence or testimony and an ampoule, which might give evidence that can be elicited from no other source. Comparing the destruction of a police officer's notes with the destruction of the ampoule, the court stated that

\[\text{the maker of the notes} \quad \text{testified at the trial and was subject to cross-examination, even though the defense was denied the opportunity to see the notes.} \quad \text{In the instant case, the critical "witness," i.e., the ampoule which established the presumption of [defendant's] guilt, is not available for cross-examination by defense. We believe this difference is of major importance.}\textsuperscript{134}\]

Since the notes were the work product of the policeman himself, he could be cross-examined as to their contents. An ampoule, however, might reveal defects in contents or composition that are not within the test operator's knowledge. The officer, therefore, could not tes-

\textsuperscript{130} 90 Wash. 2d at --, 585 P.2d at 1189.  
\textsuperscript{131} 468 F.2d 236 (9th Cir. 1972), cert. denied, 410 U.S. 916 (1973).  
\textsuperscript{132} Id. at 238.  
\textsuperscript{133} 548 P.2d at 381 (footnote omitted).  
\textsuperscript{134} Id. at 382 n.11. The court distinguished \textit{Wright v. State}, 501 P.2d 1360 (Alas. 1972).
tify to such information even if he were cross-examined effectively and he answered truthfully and completely. Similarly, the certificate of test results would not reflect the data that could be gleaned from the ampoule itself.\textsuperscript{135}

For these reasons, neither the certificate nor the test operator provides the opportunity for complete cross-examination that the analysis of the ampoule would afford. On this basis, the court in \textit{Hitch} dispensed with the argument that an ampoule was demonstrative evidence and thus not analogous to a witness' testimony:

\[ \text{Here, the undisclosed evidence was in a real sense "lost" to the defendant, as effectively as if it had been destroyed. While we deal here with demonstrative evidence rather than with the testimony of living witnesses, we find the difference of no significance since if it were available and disclosed it would normally require the testimony of a living witness to facilitate its introduction and possibly to explain it. Accordingly just as in the instance of the former a defendant seeks a witness who might give favorable evidence on the issue of guilt or innocence, so in the present situation a defendant seeks demonstrative evidence which might be favorable to him.} \textsuperscript{136} \]

\textbf{The Prosecution's Duty}

\textit{Good Faith}

As discussed previously, courts that address the due process aspect of ampoule destruction will look not only to the protected scope of the defendant's rights but also to the prosecution's conduct. The basic proposition of \textit{Brady v. Maryland}, as applied in most states, is that when evidence favorable and material to the defendant's case is suppressed, the good or bad faith of the state is irrelevant.\textsuperscript{137} Courts have made a distinction, however, between the suppression of evidence and the destruction of evidence, ruling that in the latter instance, the good or bad faith of the state will be considered in deciding whether the defendant's due process rights have been violated.\textsuperscript{138} In examining the motivation of the prosecution in destroy-

\textsuperscript{135} For a discussion of breath test result certificates, see notes 180-83 infra & accompanying text.

\textsuperscript{136} 12 Cal. 3d at --, 527 P.2d at 367, 117 Cal. Rptr. at -- (citation omitted).


\textsuperscript{138} United States v. Augenblick, 393 U.S. 348 (1969)(involving the jurisdiction of the
ing evidence, the courts have applied a "surrounding circumstances" test.\textsuperscript{139} The elements of the test are whether the destruction occurred in the normal course of procedure and whether the government can explain the destruction adequately.\textsuperscript{140} If the government can convince the court on these issues, no due process violation will be found.\textsuperscript{141}

The good faith/bad faith distinction has been accepted in cases analogous to the breathalyzer test situation. In \textit{United States v. Sewar},\textsuperscript{142} a test had been run on the defendant's blood, and the technician, who was unaware that the sample should be retained, had discarded it.\textsuperscript{143} The trial court granted the defendant's motion to suppress the blood-alcohol test results because the sample had been destroyed before the defendant could run an independent analysis. On appeal, the Ninth Circuit reversed.\textsuperscript{144} Although nothing was available to represent the lost blood sample, the court held that the inadvertence of the destruction prevented an inference of bad faith and allowed the state to introduce the test results into evidence.\textsuperscript{145}

Several courts have applied the \textit{Sewar} approach to breathalyzer

\begin{footnotesize}
\begin{enumerate}
\item[\textsuperscript{139}] The "surrounding circumstances" test initially was applied in a situation in which the destroyed evidence was not completely lost to the defendant. The notes that formed the background for an officer's testimony had been destroyed, but the testimony itself still could be cross-examined in court. \textit{Id.} The difference is that the notes are considered a vehicle to refresh the officer's memory in court, rather than independent proof of guilt or innocence. In the note-destruction situation, the source of the destroyed notes is present in court; when ampoules are destroyed, however, the independent testimony they could provide becomes totally unavailable to the defendant. For an argument contending that both the destruction-of-notes standard and the suppression standard for determining due process violations are inapposite to situations in which evidence other than notes has been destroyed, see Note, \textit{The Right to Independent Testing: A New Hitch in the Preservation of Evidence Doctrine}, 75 COLUM. L. REV. 1355, 1361 (1975). Some courts have resolved the situation by holding that "in destruction of evidence cases, as in true suppression cases the motive of those destroying the items is not determinative." \textit{State v. Wright}, 87 Wash. 2d 783, ---, 557 P.2d 1, 7 (1976).
\item[\textsuperscript{140}] 393 U.S. at 355.
\item[\textsuperscript{141}] \textit{Id.}
\item[\textsuperscript{142}] 468 F.2d 236 (9th Cir. 1972), \textit{cert. denied}, 410 U.S. 916 (1973).
\item[\textsuperscript{143}] \textit{Id.}
\item[\textsuperscript{144}] \textit{Id.}
\item[\textsuperscript{145}] \textit{Id.} at 237-38.
\end{enumerate}
\end{footnotesize}
situations. The court in Hitch, however, resolved the good faith/bad faith distinction differently. The court refused to find that the mere absence of bad faith would defeat the defendant’s due process argument, yet also declined to find that surrounding circumstances were irrelevant. Instead, the court announced the quasi-legislative mandate that in the future, sanctions would be imposed unless the prosecution can show that the governmental agencies involved have established, enforced and attempted in good faith to adhere to rigorous and systematic procedures designed to preserve the test ampoule and its contents and the reference ampoule used in such chemical tests. The prosecution shall bear the burden of demonstrating that such duty to preserve the ampoules and their contents has been fulfilled.

Hitch thus indicates that good faith plus great vigilance will allow the state to introduce breathalyzer test results without violating the defendant’s due process rights even when the ampoules have been destroyed. Conversely, if the state has not been malicious, but merely negligent in destroying the ampoules, a due process violation will be found, and the breathalyzer test results will not be admitted into evidence. In addition, the Hitch holding suggests that even courts willing to acknowledge the favorability and materiality of ampoules to the defendant’s case will find no due process violation if the prosecution has done all that it possibly could to avoid destruction.

The good faith of the prosecution operates in one additional context. A court that finds that the destruction of ampoules violated due process by depriving the defendant of favorable, material evidence then must decide whether merely to suppress the breathalyzer results in an attempt to balance the inequity of the ampoule’s loss, or whether to dismiss the charge against the defendant. Courts regard a finding of a due process violation and a remedy of suppression of test results as a sanction against the prosecution; therefore, the more reprehensible the behavior of the prosecution, the more stringent the sanction. Although the courts acknowledge that the

146. See, e.g., State v. Watson, 48 Ohio App. 2d 110, —, 355 N.E.2d 883, 885 (1975), in which the court held that malicious destruction of the ampoule is to be considered in deciding whether breathalyzer results are inadmissible when the ampoule is unavailable for independent analysis by the defendant.
147. 12 Cal. 3d at —, 527 P.2d at 369, 117 Cal. Rptr. at —.
148. Id.
ampoules "would merely impeach the test results [rather than] conclusively establish innocence" and that suppression of the test results is a sufficient remedy for the defendant, they have found that bad faith destruction raises the possibility that the ampoules were destroyed because they would show conclusively that the defendant was not intoxicated. In this instance, the proper defendant's remedy/prosecution's sanction is to dismiss the charge, rather than merely to suppress the test results.

Administrative Convenience

In addition to considering the good faith of the prosecution, the courts will examine the administrative inconvenience that might attend the requirement that the prosecution preserve the test ampoule. If the burden upon the prosecution is deemed unreasonable, the court is likely to find the ampoule's preservation to be beyond the scope of the defendant's due process rights. The courts, however, have differed in their evaluations of the difficulty of retaining the ampoule for the defendant's later analysis. In State v. Grose, the defendant was denied his motion to suppress breathalyzer test results despite the unavailability of the ampoule for his independent testing. The Municipal Court of Findlay, Ohio, stated that "to require that the test ampoule be retained is to place an additional burden on the state, not required by the Legislature." Indeed, some expert testimony supports the view that ampoule preservation would be exceedingly cumbersome. In an extended treatment of the defense of drunk driving cases, Richard Erwin points out that to avoid the chemical changes that will render later analysis of the ampoule meaningless, the tube must be sealed her-

149. Id. at ___, 527 P.2d at 370 n.7, 117 Cal. Rptr. at ___.
150. Id.
151. Id.
152. The question often arises when the court is considering the matter of whether the evidence derived from ampoules would be favorable to defendant's case. In discussing the scientific reliability necessary for admission of evidence, courts address the feasibility of ampoule retention thus arriving at a determination of scientific reliability which is, in fact, conditioned by the ease with which ampoules may be kept. Often, however, the matter is one of scientific significance because the question of actual retesting involves assessing the possibility of chemical changes of solution, which, according to some experts, renders retesting not merely infeasible but impossible.
154. Id. at ___, 340 N.E.2d at 443.
matically after use in the first test and stored in an upright position to avoid contact with the atmosphere or other substances that can cause contamination.\textsuperscript{155} He notes that "\textquoteleft\textquoteleft[\textit{w}hile the preservation of the ampoules, as defense evidence, can be of great use to the defendant]. [nonetheless, the retention of ampoules] \textit{is a difficult procedure.}\textquoteright\textquoteright\textsuperscript{156} Removal of the ampoule from the machine, contamination, and spilling of the solution present the primary problems.\textsuperscript{157}

In \textit{State v. Shutt},\textsuperscript{158} the Supreme Court of New Hampshire found hazards in the preservation of breathalyzer test ampoules. The court noted that "\textquoteleft\textquoteleft[a]fter the test, the ampoules are open glass tubes with jagged edges containing a solution of sulphuric acid. The possibility of sealing them is remote, [and] the probability of contamination is great.\textquoteright\textquoteright\textsuperscript{159} Because safety requires that used ampoules be destroyed, operator's directions for administering the breathalyzer test have contained the instruction to discard the ampoule subsequent to testing. The court concluded that this did not deprive the defendant of due process of law.\textsuperscript{160}

Other courts have not accepted the administrative inconvenience theory so willingly. In \textit{Lauderdale}, the court was unpersuaded by the prosecution's arguments of "\textquoteleft\textquoteleft'serious difficulties' and 'tremendous efforts'" required by the preservation of breathalyzer ampoules because it was "certain that the state, with all of its vast human resources, will be able to find suitable methods to preserve the ampoules."\textsuperscript{161} In \textit{Michener}, the court made the affirmative factual finding that "storage of the ampoule is both economically and scientifically feasible and would not place a burden upon the police agencies" because the ampoule could be retained "in an inexpensive laboratory jar and stored in a dark location"\textsuperscript{162} with a modicum of

\textsuperscript{155} 2 R. Erwin, \textit{supra} note 8, at § 22.03[2][i].
\textsuperscript{156} \textit{Id.}
\textsuperscript{157} \textit{Id.}
\textsuperscript{158} \textit{Id.}
\textsuperscript{159} \textit{Id. at} \textit{___}, 363 A.2d at 407. The court in \textit{Shutt} pointed to a difference in the ampoule procedure in the \textit{Hitch} case. In California, the court noted, ampoules are not factory-sealed and thus do not have to be broken open for testing as they do in New Hampshire. The court in \textit{Hitch}, therefore, was not dealing with as pronounced a safety hazard as in \textit{Shutt}, because in California used ampoules would not have jagged glass tops. \textit{Id.}
\textsuperscript{160} \textit{Id. at} \textit{___}, 363 A.2d at 407-08.
\textsuperscript{161} 548 P.2d at 382.
\textsuperscript{162} 25 Or. App. at \textit{___}, 550 P.2d at 451 n.5, 452.
difficulty for the state.\textsuperscript{163}

To bolster the argument that preservation of the ampoule would require too great a burden on law enforcement agencies, the state has pointed to the protection already available to safeguard the defendant’s rights in the same way. One such safeguard is the spot checking required in most states as an indication of ampoule regularity. After they are manufactured and filled, ampoules are given batch numbers by the manufacturer to indicate that all ampoules of the same batch number contain the same chemical compound.\textsuperscript{164}

Spot checking usually is performed by an independent laboratory that takes a representative sampling of ampoules from a given batch, analyzes their contents and construction, and then issues a certificate stating that the selected ampoules are of the required type and chemical strength.\textsuperscript{165} Although several courts have found spot checking sufficient,\textsuperscript{166} others have stated that spot checking is not likely to locate defects and that the only way to guarantee that defects will be detected is to allow the defendant to analyze the ampoule after the test has been given.\textsuperscript{167} The latter procedure gives

\textsuperscript{163} The court in \textit{Michener} made more optimistic findings of the feasibility and reliability of ampoule retention and analysis. Its conclusions were based on acceptance of the testimony of the defense’s expert witnesses to a degree unparalleled in other ampoule retention decision and, therefore, should not be read as representing the position of a majority of courts.

\textsuperscript{164} See \textit{Watts}, \textit{supra} note 27, at 85-86.

\textsuperscript{165} \textit{Id.} at 86.

\textsuperscript{166} \textit{E.g.,} in \textit{State v. Baker}, 56 Wash. 2d 846, 355 P.2d 806 (1960), the Supreme Court of Washington found spot checking an adequate safeguard for defendant and a permissible substitute for an independent analysis of the used ampoule after the test:

\begin{quote}
The fact that the \textit{sealed} ampoules are delivered by the manufacturer of the breathalyzer machine for exclusive use in such machine plus the additional fact or regular spot checking of the ampoules is, in our opinion, sufficient \textit{prima facie} proof that the chemicals in any one ampoule are of the proper kind and mixed to the proper proportion.
\end{quote}

\textit{Id.} at –, 355 P.2d at 811 (emphasis original). The defense in \textit{Hitch}, however, argued that errors can exist even in ampoules delivered sealed from the manufacturer. One commentator notes, however, that this argument has been given little credence, rarely is successful as a matter of law, and is primarily used as a jury argument. \textit{See} \textit{Watts}, \textit{supra} note 27, at 85. \textit{See also} \textit{State v. De Vito}, 125 N.J. Super. 478, 311 A.2d 753 (1973) (evidence admissible where state trooper had tested equipment shortly before, using an ampoule taken at random from among those supplied from the same laboratory).

\textsuperscript{167} Expert testimony of a forensic chemist in the Municipal Court of Beverly Hills emphasized the uncertainty of the effectiveness of spot checking of ampoule batch samples:

\begin{quote}
\textbf{Q:} In your experience, are these random sample tests valid for an entire numbered batch of ampoules?
\textbf{A:} No.
\textbf{Q:} Do you have any factual basis for your opinion?
\end{quote}
the defendant access to the particular ampoule used in his test rather than just general assurance of the regularity of the entire batch.168

Another safeguard that the prosecution may advance as proof that the defendant has adequate assurance that the ampoule used in his test was accurate is the right to independent analysis at the time of the initial test. In State v. Superior Court,169 the Supreme Court of Arizona held that ampoule disclosure was unnecessary because the accused’s opportunity to have independent tests made at the time of his arrest served as sufficient safeguard of his due process rights, and that the state could not be required to recreate conditions at the time of the original test by furnishing the used ampoule.170 Similarly, in State v. Bryan,171 the Superior Court of New Jersey stated that “[t]he State should not be forced to afford the defendant a second chance to check the workability of the machine when defendant has the opportunity to an independent test.”172

The courts’ concern that the prosecution be required to preserve evidence only to a reasonable extent also is demonstrated by the limitations on the prosecution’s duty to lay a foundation173 prior to

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A: Yes. In fact, in one box I checked with the same batch number, some gauged properly and some did not. Some with the same batch number had the right amount of chemical and some did not. Spot checking is not really 100 percent accurate.


Similarly, a March 1979 interview with a law-enforcement officer who has administered hundreds of breathalyzer tests in Hampton, Virginia, revealed that a spot-checked batch of ampoules often will contain a few that are inaccurate as to chemical volume. The officer stated, “When I find one or two like that in a box, I discard the rest of the ampoules in that box.”

168. The court in Lauderdale stated that absent the opportunity to check the particular ampoule used in his test, a defendant is denied important evidence because ampoules in the same batch are not necessarily of the same regularity. 548 P.2d at 381-82.


170. Id. at —, 487 P.2d at 401.


172. Id. at —, 336 A.2d at 514.

173. See 2 R. ERWIN, supra note 8, at § 22.04. When chemical tests were first accepted into evidence, courts demanded expert testimony as to the principle of the test and the approved statutory procedures and correct administration. Now, however, the scientific theory of the breathalyzer is judicially noticed without expert testimony, and questions of relevance are regulated by statute. See People v. Donaldson, 36 App. Div. 2d 37, 319 N.Y.S.2d 172 (1971). See also MCCORMICK, supra note 1, at § 209.
the admission of breathalyzer test results into evidence. The scope of the requirements for laying a foundation reflects how the courts and legislatures balance the defendant’s rights against the requirement that the prosecution’s burden not be excessive.

In states that use breathalyzer tests, the prosecution’s burden may include the following: proof of the test operator’s skill and license to administer the test as required by statute; proof that the machine itself was in proper working order at the time of the test; proof that the ampoules used were mixed properly and that they were part of a batch that was spot checked; and proof that the test was conducted in accordance with approved methods and procedures as determined by the department of health. Depending on the degree to which the particular state seeks to facilitate admission of breath test results, the courts and legislatures might require that

174. As one commentator cautioned, “[a]n effective operator must be something more than a person who merely knows the proper buttons to push or turn in making a test.” Watts, supra note 27, at 91. The author recommended that operators be encouraged to develop as much expertise as possible in chemical testing and to keep those skills updated by classes and periodic examinations. Id. Watts also suggested that close supervision might obviate the need for sophisticated knowledge on the part of every person administering the test. Id. Although the proper working condition of the equipment can be demonstrated by showing that the machine was tested or calibrated at specific intervals before and after the particular test, commentators on the question of defense of drunken driving cases recommend that defense counsel seek discovery of maintenance and repair records. See generally 2 R. Erwin, supra note 8, at § 22.03[3]; Watts, supra note 27.

175. See generally Erwin, supra note 10; Watts, supra note 27.

176. In People v. Todd, 79 Misc. 2d 630, 360 N.Y.S.2d 754 (1974), the Delaware County Court found error in the admission of breathalyzer results when the operator testified that he knew nothing of ampoule condition or the duration of their storage at police barracks, and the prosecution presented no proof of any random sampling of the lot of ampoules. Therefore, no evidence was introduced as to whether the ampoules were of the proper quality of glass or whether they contained the proper quality and quantity of solution. Id. at ----, 360 N.Y.S.2d at 760. Similarly, in Cody v. State, 548 S.W.2d 401 (Tex. Crim. 1977), the Texas Court of Criminal Appeals held that in order to introduce breathalyzer results the state must prove the use of properly compounded chemicals, the existence of periodic supervision of the machine, and an operator who understands the scientific theory behind the machine’s operation. Id. at 404. By so deciding, the court took the position that the proper procedure affects not only the weight, but also the admissibility of the test result evidence.

177. In City of Monroe v. Robinson, 316 So. 2d 119 (La. 1975), the Supreme Court of Louisiana held that the prosecution is not required to provide expert testimony regarding how the ampoules are handled, whether they are tested, or whether the scientific theory behind them is sound. The statutory requirements that the test be authorized by the State Board of Health and the operators be certified were considered substitutes for a showing of accuracy and validity at least as to the issue of admissibility. Id. at 122-23. In Commonwealth v. Sweet, 232 Pa. Super. 372, 335 A.2d 420 (1975), despite the fact that no evidence affirmatively showed proper quality or quantity, test results were admissible.
each of the above proofs be given with varying degrees of detail, or they might permit all of these assertions to be subsumed by the admission of a certificate that records test results and stipulates that the above requirements have been fulfilled.

In jurisdictions permitting admission of duly attested certificates, assertions as to compliance with the requirements of operator’s skill, machine operability, and procedural regularity are deemed prima facie evidence of the facts recited. In such situations, the certificate is self-authenticating and the prosecution faces no burden of proving the averments unless the defendant raises doubt as to the truth of the statements. Two caveats apply when certificates are so admitted: only factual assertions, not matters of opinion, that appear in the certificate are admissible as prima facie evidence; and the truth of the statements is presumed for purposes of admissibility only and is not conclusive as an ultimate showing of procedural regularity.

The use of a self-authenticating certificate as prima facie evidence to lay the foundation of procedural regularity for admission of breathalyzer results usually is accompanied by the rule that, if the defendant demonstrates procedural irregularity, such a showing will go only to the weight accorded to the breathalyzer test results.

178. See State v. Baker, 56 Wash. 2d at ___, 355 P.2d at 809-10, in which the Supreme Court of Washington carefully delineated the necessary foundation for the admission of breath test results using a similar, but slightly different, categorization of admission requirements. In Baker, the court emphasized that prima facie evidence of the fulfillment of these requirements must be introduced before breathalyzer test evidence is admissible. Id. at 810; accord, State v. Sickles, 25 Ohio App. 2d 1, 265 N.E.2d 787 (1970). But see State v. Hayes, 73 Wash. 2d 568, 439 P.2d 978 (1968), in which the court stated that evidence of breathalyzer results introduced prior to the evidence necessary for laying a proper foundation was not prejudicial error. See generally McCormick, supra note 1, at § 209. For an example of exhaustive, direct examination of an expert witness to lay the foundation for the admission of breathalyzer results, see 2 R. Ewun, supra note 8, at § 26.06 n.16 (Supp. 1979), quoting State v. Hendel, 468 S.W.2d 684 (Mo. 1971).


180. Virginia is among these jurisdictions. See note 201 infra & accompanying text.


182. See note 205 infra & accompanying text.
by the jury and will not affect admissibility. Although a showing of irregularity by the defendant would have to be encompassed in an instruction to the jury, the result of a “weight only” provision clearly means that the test results will get to the jury regardless of procedural compliance, and that these states have tipped the due process balance in favor of the prosecution. Even in jurisdictions that grant the motion to strike breathalyzer test results when the defendant demonstrates a material failure to comply with test procedures, that evidence is still before the jury despite the trial judge’s instruction to ignore it.

The prosecution in arguing its side of the ampoule-retention conflict doubtless will marshal all of the above arguments. Administrative inconvenience, legislative intent to facilitate drunken driving tests shown by the minimal foundation that the prosecution must lay, and the safeguards of spot checking and independent testing, all will be central to the contention that to require the prosecution to retain the ampoules is unreasonable. If the prosecution convinces the court of the unreasonableness of this requirement, then the failure to retain the ampoule will not violate due process.

THE VIRGINIA POSITION

Prediction of the Virginia reaction to a constitutional challenge to the unavailability of breathalyzer ampoules requires examination of Virginia case and statutory law concerning the due process issue, and the balancing of the defendant’s rights and the prosecution’s

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183. In Kay v. United States, 255 F.2d 476 (4th Cir.), cert. denied, 358 U.S. 825 (1958), the Fourth Circuit noted that

[the receipt in evidence of the certificate does not foreclose] inquiry into the regularity of the procedure, the freedom of the sample from contamination or the accuracy of the chemical analysis. Such questions, however, go to the weight of the evidence rather than to the initial admissibility of the certificate.

Id. at 480. The Virginia statute on the subject combines the self-authenticating certificate with the weight-and-not-admissibility provision. See note 248 infra & accompanying text. Some courts have held that the defendant’s failure to object to the picture of regularity presented by certificate of test results can constitute a waiver of the right to show irregularity at a later time. In that instance, the certificate is deemed sufficient to uphold a conviction of driving while intoxicated. Kincannon v. State, 541 P.2d 1339 (Okla. Crim. 1975).

184. The striking of the evidence will do little to convince a jury already persuaded by chemical test results to disregard those results, and its effect is likely to be merely technical. For a discussion of the emotional impact of test results on a jury, see notes 233-38 infra & accompanying text.
The Virginia Supreme Court has considered the issue of the suppression of evidence, but few of these decisions would be applicable in the ampoule-destruction situation. The following forecast of the Virginia response to an assertion of the defendant's rights to the ampoule, or suppression of breathalyzer results if the ampoule is unavailable, is predicated from its present position on the extent of the prosecution's burden in introducing chemical test results into evidence. The present attitude of the Virginia court indicates that it will adopt the Canaday position that "destruction of used breathalyzer test ampoules does not interfere with the defendant's ability to determine the facts or raise a defense. Testimony to be gained from the ampoules is only tangential to the question of innocence or guilt. The ampoules are therefore not material in a constitutional sense." A review of Virginia case and statutory law indicates why this reasoning is likely to be adopted by the courts of the state.

The Duty to Disclose

The Virginia Supreme Court has construed section 8 of the Virginia Constitution as compelling the commonwealth to "submit the evidence for and against the accused." In Stover v. Commonwealth, the Virginia Supreme Court quoted the Brady rule that "suppression of evidence favorable to the accused violates due process." Similarly, in Smith v. United States, the Federal District Court for the Eastern District of Virginia required disclosure of "potentially exculpatory evidence" to avoid a violation of the defendant's due process rights.

The framework for a due process challenge to material evidence

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185. 90 Wash. 2d at ___, 585 P.2d at 1190. This position is based on the belief that the "defendant has adequate opportunity at trial to impeach the credibility of the officer without access to the used ampoule." Id. at ___, 585 P.2d at 1189.
186. This section provides that "in all criminal prosecutions, a man hath a right to call for evidence in his favor." Va. Const. art. 1, § 8.
189. Id. at 795, 180 S.E.2d at 509.
190. 364 F Supp. 1145 (E.D. Va. 1973). The court worded the mandate as a "duty" although the case at bar involved post-conviction relief. The court held that the withheld evidence would not have resulted in acquittal; therefore, failure to disclose did not warrant post-conviction relief.
191. Id.
destroyed by the state, therefore, does exist in Virginia. Any attempt to use that framework in an ampoule-destruction context, however, will meet two impediments: the attitude of the courts toward the right-of-confrontation challenge upon which the due process claim would be based; and the firm commitment of the courts and legislature to facilitating chemical testing in drunken-driving prosecutions by minimizing the prosecution’s duty in terms of administration and admission of test results into evidence.

The Right of Confrontation

The right of an accused to confront the witnesses against him operates in Virginia not only through the federal constitutional mandate via the sixth and fourteenth amendments, but also through the state constitution. This constitutional right of confrontation includes the absolute right to cross-examine a witness. A court’s acceptance of a right-of-confrontation argument when the breathalyzer ampoule is unavailable will depend upon whether the court characterizes the missing ampoules as a witness capable of providing testimony other than that attested to by the test operator or in the certificate, or as merely additional evidence, offering information already provided by the certificate. Virginia case and statutory law have recognized that “[t]he right to be confronted with one’s accusers does not operate to exclude proper documentary evidence;” therefore, if the evidence derived from the ampoule is considered incorporated in the certificate of breath test results, the confrontation argument probably will fail.

The Virginia view of the relation between documentary evidence and the accused’s right of confrontation was first addressed in 1908. In Runde v. Commonwealth, the Supreme Court of Virginia held: “The provision of the Bill of Rights, guaranteeing the right of the accused in all criminal prosecutions to be confronted with the accusers and witnesses, has never been interpreted to exclude proper documentary evidence.” The certificate of a breath test consti-

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192. “[I]n all criminal prosecutions, a man hath a right to be confronted with the accusers and witnesses.” VA. CONST. art. 1, § 8.
196. 108 Va. 873, 61 S.E. 792 (1906).
197. Id. at 876, 61 S.E. at 793.
tutes such proper documentary evidence when it is certified by a statutorily authorized public official. The Virginia Supreme Court restated this view of the admissibility of scientific test results by certificate in 1970 in Robertson v. Commonwealth. Citing Runde as precedent, the court held that the admission of a report of test results on vaginal swabs taken from two rape victims did not violate the defendant's right of confrontation.

Section 18.2-268(rl) of the Virginia Code provides for a self-authenticating certificate as follows:

Any individual conducting a breath test under the provisions of this section and as authorized by the Division shall issue a certificate which will indicate that the test was conducted in accordance with the manufacturer's specifications, the equipment on which the breath test was conducted has been tested within the past six months and has been found to be accurate, the name of the accused, the date, the time the sample was taken from the accused, the alcoholic content of the sample, and by whom the sample was examined. The certificate, as provided for in this section, when duly attested by the authorized individual conducting the breath test, shall be admissible in any court in any criminal proceeding as evidence of the alcoholic content of the blood of the accused.

198. See Va. Code § 18.2-268(r) (Cum. Supp. 1979). See also Bracy v. Commonwealth, 119 Va. 867, 89 S.E. 144 (1916). In Bracy the defendant objected to the admission in evidence of a certificate bearing the results of a test to determine the amount of alcohol in a beverage performed by a state chemist on the grounds that such admission denied him his constitutional right to confront his accusers. Citing Runde, the court held that the certificate was admissible. Id. at 869, 89 S.E. at 144-45.


200. Id. at 65, 175 S.E.2d at 262. In Robertson, test results of the vaginal smears were admitted under § 19.1-45 of the Virginia Code. The defendant had objected on the grounds that the admission of the certificate of test results denied him the right to cross-examine the person who had completed it. In refusing defendant's motion to suppress the test results, the Virginia court was willing to apply the documentary evidence exception to a complex set of facts.

201. Va. Code § 18.2-268(rl) (Cum. Supp. 1979). The state need not produce expert testimony about the test; therefore, the defendant must call the test operator as his own witness and face the problem of whether he can cross-examine this expert. In Virginia, as a rule, when a party has called a witness as his own, that party is prohibited from asking leading questions or impeaching the witness; however, the Virginia Code provides for cross-examination of a witness having an adverse interest. Va. Code § 8.01-401(A). See Daniels v. Morris, 199 Va. 205, 98 S.E.2d 694 (1957). If a test operator could be characterized as an adverse witness, the defense could cross-examine as vigorously as if he had been called by the prosecution. The scope of the permission to cross-examine an adverse witness includes situations in which:
Given the position of the Virginia courts concerning documentary evidence, this provision eliminates a right-of-confrontation argument.

Administrative Convenience

The required procedures of section 18.2-268 need not be proven by the testimony of witnesses, because of the self-authenticating certificate. By merely introducing the certificate into evidence, then, the prosecution lays the foundation for the test results recorded therein. Although the assertions of procedural regularity in

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(1) the witness called was a party to the litigation; (2) the witness had an adverse financial interest in the outcome; (3) the witness was closely connected by blood to one party; (4) the party who was surprised at the testimony of his own witness asked leave to cross-examine; (5) there was some additional reason clearly showing that the testimony of the witness was pertinent to the development of the truth before the jury.

Butler v. Parrocha, 186 Va. 426, 434, 43 S.E.2d 1, 5 (1947). Similarly, if the defendant in the drunken driving case can show some reason that the prosecution must defend the validity of the test, the prosecution would have to call the test administrator, and the defense would be able to cross-examine as he could any witness called by the opposing party.


203. Use of radar tests in evidence receives different treatment in the Virginia Code. Section 46.1-198(a) of the Virginia Code provides for checking motor vehicle speed with radio microwaves, or radar. Va. Code § 46.1-198(a). The results of radar tests are accepted as prima facie evidence of speed, and the defendant may not challenge the basic principle behind radar speed detection. Thomas v. Norfolk, 207 Va. 12, 147 S.E.2d 727 (1966). The case law, however, makes a distinction between general viability of the test in theory and the accuracy of a particular test by requiring that the prosecution must introduce evidence tending to show proper setup and recent testing of the machine. Royals v. Commonwealth, 198 Va. 876, 879-80, 96 S.E.2d 812, 814 (1957). In cases where such evidence is not provided by the Commonwealth, the judgment for conviction based on radar results has been reversed. Id. In addition, the certificate stating test results is not self-authenticating. In order to lay the foundation for test admissibility, one officer must testify in court as to the setup procedure and the testing accuracy.

204. In Robertson, the court offered the rationale for authorizing admission of the certificate, noting that it was necessary to obviate the need for summoning as witnesses physicians or technicians whose duty it is to make such scientific and medical findings. "Such a provision is not only expedient and convenient—it prevents the delay that would result if the limited number of physicians, chemists and technicians were forced to testify whenever a report made by them was offered in evidence." 211 Va. at 65, 175 S.E.2d at 262.

The concern with limiting the prosecutorial duty in Virginia is mirrored in Rule 3A:14 of the Virginia Rules of Court. The rule provides for the discovery and inspection of written reports of scientific evidence including "blood, urine and breath tests upon a showing that the items sought may be material to the preparation of his defense and that the request is reasonable." Va. R. Cr. 3A:14(b)(1)-(2) (1979) (emphasis supplied). This rule applies to felony prosecutions only; therefore, in a drunken driving prosecution, a Class 2 misdemeanor
the certificate attach for purposes of admission of test results only, and are not conclusive if the defendant can produce evidence of irregularity,205 such a showing on his part will go to the weight of the evidence only and will not affect the actual presentation of test results to the jury. In this regard, section 18.2-268(s) provides:

The steps herein set forth relating to the taking, handling, identification, and disposition of blood or breath samples are procedural in nature and not substantive. Substantial compliance therewith shall be deemed to be sufficient. Failure to comply with any one or more of such steps or portions thereof, or a variance in the results of the two blood tests shall not of itself be grounds for finding the defendant not guilty, but shall go to the weight of the evidence and shall be considered as set forth above with all the evidence in the case.206

The provision that chemical test irregularities are deemed procedural rather than substantive reflects a change in the legislative intent as to whether these requirements were mandatory or merely directory in nature. Under former section 18.1-55,207 the statute required strict compliance with the stated procedures, and, absent such compliance, convictions were required to be reversed.208 In Kyhl v. Commonwealth,209 the Virginia Supreme Court noted that "the statute itself calls for a strict compliance with every provision in it."210 Rodgers v. Commonwealth,211 another Virginia case, provided precedent for this mandatory reading of the original statute. Faced with the suggestion that the blood used in a test was not the blood of the defendant, the court upheld the lower court's decision stating that "before [the jury] should consider the results of the blood test as evidence against defendant, the Commonwealth must prove beyond a reasonable doubt that the blood analyzed was the blood of defendant."212

in Virginia, the concern with "reasonableness" probably would be more emphatic in such a prosecution.

208. Id.
210. Id. at 243, 135 S.E.2d at 770.
212. Id. at 530, 90 S.E.2d at 259.
The cautious approach of Rodgers and Kyhl and the stringent standards for adherence to statutory prescription of test methods were reduced severely by legislation that codified the procedures and presumptions for blood tests. The legislature clearly intended to minimize the burden imposed on the prosecution, and the case law reflects that shift. In Shumate v. Commonwealth, the Virginia Supreme Court announced that the question of compliance was to be deemed procedural rather than substantive. A compelling reason for the change was the "advance[ment of] the remedy of evils sought to be suppressed [in convicting drunken drivers]." In 1974, the intent of the legislature to lighten the prosecution's burden was expressed directly: "[T]he General Assembly intended to spare the Commonwealth the prosecutorial and financial burdens of calling two public officers to testify in every drunk driving case involving breathalyzer test evidence."

The thrust of legislation on breath testing in Virginia has moved toward minimization of the prosecution's duties, and withdrawal of the defendant's opportunity to prevent test results from reaching the jury even though irregularities in procedure, accuracy, and the operator's qualifications are demonstrated successfully. In forecasting the likely Virginia position on a defendant's motion to suppress breathalyzer results on due process grounds because of the unavailability of the ampoule, this predilection for administrative convenience as manifested in the self-authenticating certificate is important. The concomitant minimization of the prosecution's duty of laying a foundation for test admission and the "procedural only" provision of the chemical test statute especially must be considered.

The Prosecution's Good Faith

As in other states, a determination of the due process implications of ampoule destruction must include a decision as to what effect the good faith of the prosecution's conduct will have on the defendant's claim. Although the court in Stover reiterated the Brady rule that good faith of the prosecution is irrelevant when evidence favorable

and material to the defendant has been destroyed, a strict construction of that ruling makes it applicable to suppression cases but not to instances in which the evidence has been destroyed. In support of this argument, the prosecution could cite *Bellfield v. Commonwealth*,218 in which the Virginia Supreme Court held that the defendant does not have an absolute right to all evidence because "[w]hile we are vigilant to protect the defendant's rights to a fair trial, we must likewise be vigilant in maintaining the confidence of our citizens in the police and prosecuting officers."219 The good faith argument of the prosecution, therefore, would be upheld in Virginia if the ampoules were destroyed, and, as in *Bellfield*, the destruction was nonmalicious and in the normal course of events.

In order to adhere to the philosophy of the legislation on chemical tests for intoxication, the Virginia courts faced with a due process challenge on the basis of the state's destruction of the breathalyzer ampoule doubtless will set high standards for the favorability/materiality showing. Ultimately, the due process claim will fail because ampoules would be deemed, as in *Canaday*, "only tangential to the question of innocence or guilt."220 Additionally, the rejection of the due process challenge will be supported by a refusal to impose upon the prosecution an unreasonable burden in administering breath tests and admitting them into evidence.

**The Wisdom of Virginia's Probable Position**

*The Criminal Standard of Guilt*

Having posited the line of reasoning likely to be taken by Virginia courts on the subject of breathalyzer ampoule retention, the question remains whether a different response should be urged. Other issues should be considered before accepting that the probable Virginia response is the best solution to serve the purposes of both prosecution and criminal defense. Concededly, the requirement of access to the ampoule used in his breathalyzer test must be considered in terms of a reasonable balance between the defendant's rights and the limitation of prosecutorial duties. Indeed, the very nature of due process demands that this weighing take place.

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219. Id. at 307, 208 S.E.2d at 774.
220. 90 Wash. 2d at ----, 585 P.2d at 1190.
After all considerations are balanced, however, the decision must be tipped in favor of the defendant's rights rather than administrative convenience, mainly because the primary goal of due process is to provide the defendant a fair trial. The high standard of proof required of the prosecution in a criminal proceeding indicates that this is the proper resolution between the defendant's rights/state's convenience conflict. The United States Supreme Court enunciated this standard in asserting that the due process clause "protects the accused against conviction except upon proof beyond a reasonable doubt of every fact necessary to constitute the crime with which he is charged." The Court spoke further in Speiser v. Randall:

Where one party has at stake an interest of transcending value—as a criminal defendant his liberty—this margin of error is reduced as to him by the process of placing on the other party the burden of persuading the factfinder at the conclusion of the trial of guilt beyond a reasonable doubt.

Added to this protection for the defendant is the mandate to the jury that he be presumed innocent until proven guilty. Both concepts, traditional to criminal law, stand for the proposition that when doubt persists in the minds of the jury, the defendant, not the prosecution, should receive the benefit of this doubt, and "if a mistake is to be made it should be made in favor of the accused." This weighting of the scales in the defendant's favor suggests that in a criminal proceeding such as a drunken driving charge, the attractive convenience of accepting unquestioningly chemical test

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223. Id. at 525-26. McCormick traces the "reasonable doubt" standard to a 1798 case tried in Dublin, Ireland. McCormick, supra note 1, at § 341 n.88.
224. McCormick, supra note 1, at § 342. McCormick points out that the "presumption of innocence" label is a misnomer and that "assumption of innocence" would be more accurate because the principle is not descriptive of a presumption in the sense of an inference deduced from a given premise but is more akin to a basic premise that exists at the beginning of trial. Id. at n.43, quoting Carr v. State, 192 Miss. 152, 4 So.2d 887, 888 (1941) (Alexander, J.).
225. The view of drunken driving prosecutions as routine, with emphasis on speed and practicality makes an elaborate constitutional defense, such as the ones mounted in Hitch or Lauderdale, seem almost absurd. A constitutional defense appears an academic frivolity in light of the highly practical fashion in which police and courts handle these cases. In Lauderdale, the court acknowledged that there have been many hundreds, if not thousands, of drunk driving cases disposed of where the breathalyzer test has been used. It is fair to assume that in the great majority of these cases, which are misdemeanors, the fines have been
The defendant must be offered every reasonable opportunity to construct his defense, and, for the very reason that he need create only a "reasonable doubt" in the minds of the jury, he must be permitted access to all evidence that might create such a doubt. In the instance of breathalyzer test results, clearly, availability of the ampoule might provide the defendant with such evidence. The predicted Virginia position, therefore, would fail to allow the defendant to benefit from protective concepts basic to criminal law.

Other factors militate against a casual denial of the defendant's right to the ampoule. The myriad possibilities for inaccuracy in breathalyzer tests, the prejudicial impact of introducing test results to a jury despite assurances that such results create "a rebuttable presumption only," and the independent testimony available only from the ampoule all point to the necessity that Virginia require law enforcement agencies to preserve ampoules or be deprived of the opportunity to introduce breathalyzer test results into evidence.

The Potential for Error

Despite the enthusiasm of many experts and commentators concerning the accuracy and ease of administration of the breathalyzer test, great latitude for both human and machine error exists. Consideration of the inherent fallibility of any testing process serves as a reminder of the advisability of merely assuming accuracy. Permitted the necessary tools, a defendant could establish a reasonable doubt as to the test results by locating a particular error in the test or the test equipment. In Virginia, as in many other states, judicial notice has been taken of the reliability of the basic scientific principle of breath testing in general and of the breathalyzer specifically. Accuracy of a particular test result, however, is not synonymous with acceptance of the basic theory, and by showing actual test error, the defense could impeach the credibility of the breathalyzer test.226

548 P.2d at 383. Despite the temptation to regard drunken driving cases as routine, they are criminal in nature and this fact should not be forgotten by the prosecution or the defense. 226. The distinction between the acceptability of basic principles and a showing of particular accuracy of the defendant's own test is recognized in Virginia in provisions of the Virginia Code dealing with vehicle speed testing by radar. See note 203 supra.
Appreciation of the many errors that can occur in breathalyzer testing emphasizes that the ampoule should be recognized as a vehicle for revealing such errors and as critical to the defense of the accused. Errors in machine setup and balancing can prejudice test results and give a higher reading of the alcohol content in the subject's blood than that actually present. Mistakes by the test operator, either because of insufficient training or failure to follow operating instructions, also can result in an inaccurate reading.

In addition to errors of machine setup and operating technique, the physical condition of the test subject is significant. Pathological conditions such as bronchitis, emphysema, or the anxiety provoked by the subject's situation may cause shallow breathing. Any failure to obtain a deep lung sample will cause inaccuracy since the ratio between shallow lung air and the blood is not at the 2100:1 ratio required for test accuracy. Similarly, if the defendant had something in his mouth prior to testing, this can distort the test result because the chemicals in the ampoule are not specific for ethyl alcohol but will respond to any volatile hydrocarbon found in the mouth, throat, or respiratory tract. If these substances are in the mouth or breath, they can cause the potassium-dichromate/sulfuric acid solution to turn from yellow to green, thus giving a higher alcohol reading. Simple substances such as toothache compounds, denture adhesives, gum medications, menthol-based cough drops and medications, breath fresheners, mouthwash, or menthol ciga-

227. If the machine is of the type requiring manual setting, the operator might align the indicator at an initial position to the right of the 0.00 reading, thus causing a final reading above the actual alcoholic content in the subject's blood. See Bellotti, supra note 26, at 139. Careful balancing of the machine is necessary to insure that the galvanometer is centered. If the ampoules are moved subsequent to balancing, this can cause an inaccurate reading. Id.

228. One operator error that can affect the reading is failure to double-test. Also, room air should be flushed through the machine prior to testing. This is especially important in instances in which the test is administered in an unventilated room in which the test is given repeatedly, because room air may be contaminated. The operator's lack of sufficient training or failure to follow a check list could result in errors in final results. Id. at 140-42.

The test operator's competence and conscientiousness in adhering to strict procedure in general is perhaps the most fertile basis for discrediting test results. Authors on the subject urge defense counsel in drunken driving cases to conduct rigorous cross-examination of the operator on these topics. See id. at 149-50. Even in jurisdictions where demonstrated noncompliance goes to the weight of the evidence only and not to its admissibility, cross-examination in front of the jury might establish reasonable doubt.

229. Id. at 141. It is critical, too, that the cylinder be filled in a single exhalation. Id. at 149.
Breathalyzer ampoule test can react with the chemicals in the test ampoule in this way.

Finally, as discussed earlier, irregularities in the ampoule itself can cause inaccurate test results. By testing the ampoule, the defense can reveal errors germane to the ampoule and possibly those from other sources, such as the operator or the machine. In Canaday, the defendant argued that the ampoule, had it been retained, would have contained food particles that would have demonstrated that the subject had something in his mouth that affected test results. This argument should not be regarded as frivolous, given the sensitivity of the test to certain commonly used substances.

The Prejudicialness of Chemical Test Results

Courts often note that the presumption of intoxication created

230. See People v. Navis, 24 Ill. App. 3d 842, 379 N.E.2d 500, 505 (1974); see also 1 R. Erwin, supra note 8, at § 18.03. This problem of contaminants in the mouth may be avoided by the observance of a 15- or 20-minute waiting period during which the operator can assure himself that the subject has not put anything in his mouth. While the breathalyzer instruction manual does not mention a waiting period, training programs usually include it as mandatory for proper test administration. See Watts, supra note 27, at 89. Waiting period observance is thus another step on which the operator should be cross-examined to determine compliance with proper procedure.

Another possible variation involving the physical state of the subject is based on the theory of extrapolation. Because approximately 45 to 90 minutes are required for absorption of alcohol in the blood and for peak effect on the central nervous system, a subject might not be under the influence at the time of vehicle operation, but if tested one or two hours after his last drink, a high percentage will register. See Bellotti, supra note 26, at 142. Nonetheless, at a certain alcohol level, courts will assume that the blood-alcohol content was at least as high at time of driving as at the time of subsequent test, McCORMICK, supra note 1, at § 209, based on the assumption that alcohol is being burned off steadily in the human body. When there is a delay between the operation of the vehicle and the administration of the test, courts will accept the content left in the blood based on an average rate at which alcohol clears from the blood. Id. An Oklahoma court held that with breath and urine tests taken one and one-half hours after collision, the burn-off rate would be gauged as that of an average 150 pound person, approximately one-third of an ounce per hour. Tems v. State, 239 P.2d 812, 820 (Okla. 1952). Bellotti notes that "the burn-off rate of a heavy drinker is 25 percent faster than that of an abstainer." Bellotti, supra note 26, at 146. Also, the "burn-off rate is higher at higher levels" of intoxication. Id.

231. See notes 37 supra & accompanying text. Although one author contended that a "fail safe principle" operates with the breathalyzer which assures that errors resulting from either mechanical failure or operator mistake will produce readings that err on the side of low rather than high inaccuracies, Watts, supra note 27, at 66, loss of liquid volume is one clear exception to this.

232. 90 Wash. 2d at ___, 585 P.2d at 1189.
when breathalyzer test results show a certain level of alcohol content in the blood is a rebuttable presumption.233 The effect of such scientific evidence on the jury, however, may be almost impossible to rebut effectively. In its impact on the trier of fact, the presumption of intoxication is likely to be technically rebuttable but emotionally conclusive. The "exaggerated significance"234 attached to such results creates in the minds of the fact finder an "aura of infallibility which is commonly attributed to scientific testing"235 and which "makes it subject to prejudicial abuse."236 In State v. Hood,237 the Supreme Court of Appeals of West Virginia was attuned to this danger:

There is widespread, if not universal, acceptance without question of the results of scientific and mechanical tests, and undoubtedly the jury in the present case gave great weight to the result of the Breathalyzer test. This would be particularly true where the result of the test is prima facie evidence of being under the influence of intoxicating liquor.238

233. See, e.g., id. at —, 585 P.2d at 1186.
The weight given by the mind to objective scientific testing is necessarily great. Such evidence eliminates the personal and possible errors of judgment of eyewitness testimony to behavior. It appears to have a complete independence from the usual frailties and mistakes of observation and substitute therefore the completely impartial action of scientific testing. We feel this aura of infallibility which is commonly attributed to scientific testing makes it subject to prejudicial abuse.

Id.

Similar concerns have affected the view of the use of polygraph results. "The exclusion seems to rest more upon a judicial estimate of the weight that the trier of fact will give [it] and a demand that [it] will be almost infallible because the trier will think it so." McCormick, supra note 1, at § 207.

The inequity of the prosecution's access to scientific evidence unavailable to the defendant exacerbates the problem of prejudiciality:

Destruction of evidence relevant to the defense in criminal cases raises significant questions in itself. The issue becomes even more troublesome, however, where that destruction occurs after the state has had opportunity to test that evidence, but before the defense has been allowed a similar opportunity of evaluation. [This] puts the defendant at a serious disadvantage, since the opportunity to challenge state test findings will often be largely foreclosed in the absence of testable quantities.

Note, 75 Colum. L. Rev., supra note 141, at 1379.
236. State v. Miracle, 33 Ohio App. at —, 294 N.E.2d at 908.
238. Id. at —, 184 S.E.2d at 338.
Because the prosecution's chemical test results qualify as such scientific evidence, they too would have this effect on a jury, and the best palliative for the prejudicialness of scientific test results on a jury is the defendant's ability to attempt to impeach that evidence with similarly compelling evidence of his own.

The opportunity to perform an independent analysis of the ampoule used in his breathalyzer test allows the defendant to invoke "hard" science in his defense, rather than less persuasive evidence such as the testimony of defense witnesses. Considering this rationale, one court has stated that "scientifically it would be better to allow cross-examination based on scientific re-creation of the reading" than to depend on testimony by the test operator.\textsuperscript{239} The need for the ampoule is bolstered by the fact that cross-examination provides the defense not merely a reiteration of facts gleaned from the test operator's testimony or the certificate, but offers independent evidence otherwise unattainable. In this respect, the ampoule represents an independent source of information and an invaluable cross-check.

The retention of the ampoule is necessary if the prosecution is to comply with one of the few affirmative rights granted the defendant in the Virginia blood-test statute, which requires that the admission of blood test or breath test results

\texttt{shall not otherwise limit the introduction of any relevant evidence bearing upon any question at issue before the court, and the court shall, regardless of the result of the blood or breath test or tests, if any, consider such other relevant evidence of the condition of the accused as shall be admissible in evidence.}\textsuperscript{240}

Clearly, this other evidence includes a challenge to the regularity of test procedures or accuracy of the test by independent analysis of the ampoule. The defendant's right to introduce evidence of this nature is established by the Virginia Code provision requiring that "the defendant shall have the right to introduce evidence on his own behalf to show non-compliance with the aforesaid procedure or any part thereof, and that as a result his rights were prejudiced."\textsuperscript{241} Overall, the statute leans heavily in favor of administrative convenience. Therefore, the rights that are established within this code

\textsuperscript{239} State v. Michener, 523 Or. App. at —, 550 P.2d at 452.


\textsuperscript{241} Id. at § 18.2-268(a).
section are critical to the defendant; he is denied relevant evidence if he is denied the ampoule for independent retesting.

Without an opportunity to examine the ampoule in pursuit of evidence relevant to his case, the defendant's rights under the statute become insignificant. The Ninth Circuit, in United States v. Sewar, noted that this denial could render the statutory guarantee an empty promise:

I'm troubled for whatever precedent this case might make, and I think it would be unfortunate for the word to get out: "All right, make your test. If you have any doubt about it, why, throw the stuff away. The results of the test are admissible anyway." I'm troubled by the situations that might develop in other cases if we acknowledge that the defense has a right to make its own test, but we preclude that right just because we don't have the stuff on hand.

The Legislative Solution

The use of chemical testing as evidence in criminal prosecutions in Virginia has progressed a great deal in the last twenty-five years. In his book, The Law of Evidence in Virginia, Charles Friend states that

the use of scientific methods of investigation and the accompanying use of expert testimony about these methods has reached a significant level, to the point that Virginia cannot fairly be said to lag behind other states in this regard. In fact, Virginia trial courts have displayed a willingness to explore the uses of certain investigative techniques not generally recognized elsewhere.

Although the right of a defendant to demand access to the ampoule or suppression of breathalyzer test results if the ampoule is unavailable has not been addressed in the courts of Virginia, eventually, the constitutional challenge will be made. In response to this challenge, Virginia courts doubtless will adopt the Canaday approach of refusing to find a due process violation.

Despite the probable response of Virginia courts on the issue, this Note asserts that the spirit of due process is served best by requiring the prosecution to retain the breathalyzer ampoule for the defen-

242. 468 F.2d 236 (9th Cir. 1972), cert. dened, 410 U.S. 916 (1973).
243. Id. at 237 (quoting the trial court record).
244. C. FRIEND, supra note 25, at 172.
dant's independent analysis or suffer the sanction of the suppression of breath test results. The most efficient way to incorporate a requirement of ampoule retention into law enforcement proceedings is the approach taken in Hitch in which the Supreme Court of California concluded that

the investigative agency involved in the test has a duty to preserve and disclose [the ampoules]. Accordingly we hold that, where, as here, such evidence cannot be disclosed because of its intentional but nonmalicious destruction by the investigative officials, sanctions shall in the future be imposed for such nonpreservation and nondisclosure unless the prosecution can show that the governmental agencies involved have established, enforced and attempted in good faith to adhere to rigorous and systematic procedures designed to preserve the test ampoule and its contents. The prosecution shall bear the burden of demonstrating that such duty to preserve has been fulfilled.245

Legislation on the question of retention of breathalyzer ampoules would serve both defendants and the prosecution. Deciding the "favorability and materiality" question regarding the ampoules as a matter of law would eliminate the need for determining anew whether a breathalyzer ampoule provides evidence favorable and material to defendant's case, when he attempts to impeach the breathalyzer test results introduced by the prosecution. This question involves basic theory on the nature of ampoules rather than a particular ampoule in each case; therefore, a single definitive answer is an appropriate solution for eliminating expert battles which are costly to the prosecution and the defense as well as time-consuming and confusing to the jury.

Legislating ampoule retention would increase the prosecution's burden, but would do so in a fashion that would give sufficient notice246 of the duty without the risk of the sanction of breathalyzer

245. 12 Cal. 3d at ___, 527 P.2d at 369, 117 Cal. Rptr. at ___. Missouri has required ampoule preservation by statute. See State v. Barker, 490 S.W.2d 263 (Mo. 1973). See also 3 Ohio N.U.L. Rev. 1339 (1976).

246. Some courts are concerned with providing the law enforcement agencies with sufficient notice before imposing requirements for breathalyzer ampoule retention. This was the rationale of the court in Hitch in applying stringent requirements only prospectively. 12 Cal. 3d at ___, 527 P.2d at 370, 117 Cal. Rptr. at ___. In Michener, however, the court refused to adopt the Hitch "prospective only" ruling and included the defendant in its finding that the ampoule must be retained. 25 Or. App. at ___, 550 P.2d at 454.
result suppression as the result of an unexpected, successful due process challenge. When ampoule retention becomes part of the breathalyzer test routine, the administrative inconvenience will diminish. Additionally, the mandate to the prosecution is not absolute; destruction that is neither negligent nor malicious will not prevent introduction of the breathalyzer results in court. To require the state to act without maliciousness or negligence in its handling of evidence important to the defendant falls well within the bounds of reasonability that due process demands of the prosecution's conduct. Legislating the requirement of ampoule retention would provide the defendant with due process protections while affording the prosecution notice of its responsibilities.

**Conclusion**

The legislative approach to the ampoule-retention controversy is an ideal solution but unlikely to be adopted in Virginia in the near future. Until such codification occurs, the best protection for the defendant faced with breathalyzer test results, but no ampoule extant to impeach those results, is to present expert testimony during trial as to the fallibility of the test and the requirement of the ampoule to impeach. Additionally, defense counsel must request a strong jury instruction to counter the prejudice attendant in breathalyzer test result evidence. Erwin suggests the following, taken from the California Administrative Code:

> When a chemical test is given, and testimony concerning the result is admitted into evidence, you are not conclusively bound by the result of such evidence. To determine the reliability of such evidence, you should weigh and consider whether or not the arresting agency and those parties responsible for preserving and analyzing the chemical involved have complied with those safeguards required. If the evidence relating to said test and said result creates a reasonable doubt in your mind as to its accuracy, you can ignore the result of such test.

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247. See generally R. Erwin, supra note 8; Bellotti, supra note 26; Watts, supra note 27.

248. 2 R. Erwin, supra note 8, at § 40.10[5][d]. This instruction emphasizes for the jury the provision of § 18.2-268 of the Virginia Code which states that

[f]ailure to comply with any one or more of such steps [required in giving the test] shall go to the weight of the evidence and shall be considered as set forth above with all the evidence in the case, provided that the defendant shall have the right to show noncompliance with the aforesaid procedure
Including such an instruction would aid the courts in Virginia in supporting the observation of the United States Supreme Court in *Brady* that "society wins not only when the guilty are convicted but when criminal trials are fair; our system of the administration of justice suffers when any accused is treated unfairly."\(^{249}\)

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and that as a result his rights were prejudiced.

Va. Code § 18.2-268(s) (Cum. Supp. 1979). This "weight only" provision should not be interpreted as having no effect on the defendant's case. If the jury is convinced that there has been noncompliance with test procedures, this will discredit the results produced by the prosecution. This may be quite sufficient to cause the jury to find that the defendant was not, in fact, intoxicated though such is not mandated by discrediting of results. In instances where the prosecution relies on test results and introduces no other evidence of intoxication or only evidence which is not persuasive, the "weight only" provision for noncompliance or successful impeachment of breathalyzer results will result in acquittal.

249. 373 U.S. at 87.