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Fit to be Fryed: Frye v. United States and the Admissibility of Novel Scientific Evidence

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Fit to be *Fryed*: *Frye v. United States* and the Admissibility of Novel Scientific Evidence

**INTRODUCTION**

The law cannot ignore the power of science as a tool for the finding of facts. Thus it must strive to develop a technique that can both comprehend and appreciate. As the foundation of both law and science is logic, no less can be demanded of the bridge that unites them.¹

With the current pace of technological developments, use of scientific instruments and techniques is increasing in courtrooms across the country.² Since the 1970s, litigants have forced judges and juries to consider a never-ending variety of scientific evidence including polygraphs,³ sound spectrometry,⁴ neutron acti-

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vation analysis, bite mark comparisons, gunshot residue tests, and electrophoretic methods of genetic marker bloodstain typing.

Given this increased use of scientific evidence in the courtroom, courts must decide whether to apply the general standards of logical relevancy or to develop special rules. Normally, when a court determines admissibility of expert testimony, it must make two preliminary determinations. The first determination is whether the expert testimony will aid the trier of facts in understanding the evidence or determining a fact in issue. The second determination the court must make is whether the witness is properly qualified to give the testimony sought. But some


10 There are, of course, the initial relevancy requirements also. Relevancy is defined in FED. R. EVID. 401 ("[E]vidence having any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence.").


12 Id. See FED. R. EVID. 702 advisory committee's note ("Whether the situation is a proper one for the use of expert testimony is to be determined on the basis of assisting the trier.").

13 Graham, supra note 11, at 51. FED. R. EVID. 702 says that a witness may be qualified as an expert by "knowledge, skill, experience, training, or education . . ."
commentators believe that when a court is faced with a "novel form of expertise which has not yet received judicial sanction, an initial inquiry is in order: [I]s this new technique or principle sufficiently reliable\textsuperscript{14} so that it will aid the jury in reaching accurate results\textsuperscript{15}?" Others believe that no special rule should be made for a novel form of evidence;\textsuperscript{16} they argue that the traditional rules of expert testimony and relevancy are sufficient.\textsuperscript{17}

An additional requirement for the admission of scientific evidence was introduced by the United States Court of Appeals for the D.C. Circuit in\textit{Frye v. United States}.\textsuperscript{18} That court held that the scientific content of an expert's testimony had to have achieved general acceptance within the relevant scientific community in order to be admissible.\textsuperscript{19} The\textit{Frye} test was accepted almost universally by American courts in the 1970s.\textsuperscript{20} This test has been "\textit{Fryed} to a crisp,"\textsuperscript{21} however, by commentators and recent courts.\textsuperscript{22}

\textsuperscript{14} One commentator has noted:

The reliability of evidence derived from a scientific principle generally depends on the following factors: (1) the validity of the underlying scientific principle; (2) the validity of the technique or process that applies the principle; (3) the condition of any instrumentation used in the process; (4) adherence to proper procedures; (5) the qualifications of the person who performs the test; and (6) the qualifications of the person who interprets the results.

Graham, \textit{supra} note 11, at 51.

\textsuperscript{15} See supra notes 10-11 and accompanying text. For examples of the different viewpoints that writers and courts have taken on the issue of admissibility of scientific evidence, see M. McCormick, \textit{supra} note 16, at 879 n.1.


\textsuperscript{17} See supra notes 10-11 and accompanying text. For examples of the different viewpoints that writers and courts have taken on the issue of admissibility of scientific evidence, see M. McCormick, \textit{supra} note 16, at 879 n.1.

\textsuperscript{18} 293 F. 1013 (D.C. Cir. 1923).

\textsuperscript{19} \textit{Id.} at 1014.

\textsuperscript{20} Imwinkelried, \textit{supra} note 2, at 556-57 ("Indeed, at one point in the mid-1970's, Frye seemed to be the controlling test in at least forty-five states." (citing Note, \textit{Changing the Standard for the Admissibility of Novel Scientific Evidence: State v. Williams}, 40 Ohio St. L.J. 757, 769 (1979))).


\textsuperscript{22} E.g., \textit{Williams}, 583 F.2d at 1198; State v. Williams, 388 A.2d 500, 501-04 (Me. 1978). See generally E. Cleary, Mccormick ON Evidence § 203, at 608 (3d ed. 1984);
This Note emphasizes the need for a change in the standard of admissibility of novel scientific evidence from the overly-conservative *Frye* test to a rule that encourages admissibility of relevant evidence and, thus, ultimately comes closer to aiding in the discovery of the "truth" in litigation. This Note first discusses the problems associated with novel scientific evidence; next, this Note presents the *Frye* standard and alternative standards for testing the admissibility of new scientific evidence. Third, this Note questions whether the Federal Rules of Evidence have helped courts to determine a standard of admissibility for novel scientific evidence or whether those Rules merely have muddied the admissibility waters. Next, this Note discusses the current status of the law in Kentucky regarding scientific evidence. Finally, this Note proposes a standard for the admission of scientific evidence that will eliminate many of the problems that the *Frye* rule has created.

I. SPECIAL PROBLEMS PRESENTED BY NOVEL SCIENTIFIC EVIDENCE

One writer has suggested that there are three basic reasons why the "trend is unmistakably toward increased use of scientific evidence at trial": the increased pace of technological change, the breaking down of evidentiary barriers to the admission of scientific proof, and the fact that lay jurors expect scientific evidence.  


23 *See infra* notes 29-62 and accompanying text.

24 *See infra* notes 74-175 and accompanying text.

25 *See infra* notes 176-96 and accompanying text.

26 *See infra* notes 197-209 and accompanying text.

27 *See infra* notes 210-19 and accompanying text.

28 *See infra* notes 224-38 and accompanying text.

29 Imwinkelried, *supra* note 2, at 554-55.

30 *Id.* at 555 ("This increase in the number of scientific techniques is understandable for it has been estimated that ninety percent of all the scientists who have ever lived are alive today." (citing W. BROAD & N. WADE, BETRAYERS OF THE TRUTH 83, at 53 (1983))).

31 Imwinkelried, *supra* note 2, at 556 (concurring with Dean McCormick that "[t]he manifest destiny of evidence law is a progressive lowering of the barriers to truth." (quoting C. McCormick, HANDBOOK OF THE LAW OF EVIDENCE 165 (1954))).
proof. While the use of scientific evidence has undoubtedly helped judges and juries to determine the truth in many cases, this evidence has not been without problems.

Perhaps the greatest concern associated with the use of scientific evidence at trial is the impact on the jury. As one court noted, "scientific proof may in some instances assume a posture of mystic infallibility in the eyes of a jury of laymen." Opponents of scientific evidence have argued that the jury may not be able properly to assess forensic evidence, and that, therefore, special rules should be used to assure the proper use by the jury.

Other criticisms of scientific evidence include the high level of error in forensic analysis, resulting confusion of the jurors and excessive consumption of time. These fears have led courts to reject admission of novel scientific evidence based on cons-

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32 Id. at 559. Imwinkelried declared that this cause "may be the most important catalyst." See Giannelli, supra note 8, at 1199-1200 for other factors contributing to the rising use of scientific evidence at trial.

33 United States v. Addison, 498 F.2d 741, 744 (D.C. Cir. 1974) (Spectrographic identification not admissible in criminal trials because not accepted by scientific community as a whole.).

34 Imwinkelried, supra note 2, at 560; see also United States v. Amaral, 488 F.2d 1148, 1152 (9th Cir. 1973) ("Scientific or expert testimony particularly [carries the danger of undue prejudice, confusing the issues or misleading the jury] because of its aura of special reliability and trustworthiness."). Some writers stress the fact that "an expert witness communicates with the jury on two levels: a message level and a paramessage level." Note, The Frye Doctrine, supra note 8, at 1773. The message is the actual words and the paramessage is all the factors not part of the actual words. Id. at 1771. For example, the "paramessage includes physical gestures made during the testimony, the experience and background of the witness, and his or her general reputation or prestige." Id. The fear of Frye doctrine advocates is that the jurors will not be able to handle the message without significant negative impact from the paramessage. Id. at 1774. One writer cited State v. Holt as an illustration of this problem, wherein the court stated that the jury placed too much weight on a witness's opinion because of his "educational background and his apparent prestige." Id. at 1773 (quoting State v. Holt, 246 N.E.2d 365, 368 (Ohio 1969)).

35 Imwinkelried, supra note 2, at 560. Imwinkelried points to studies, such as blood alcohol and drug analysis studies, that indicate a high level of error. Id. at 560-61.

36 3 J. WEINSTEIN & M. BERGER, supra note 15, at 702-43. For example, the jury may have difficulty comprehending the foundations of expert testimony. Note, Expert Testimony Based on Novel Scientific Techniques: Admissibility Under the Federal Rules of Evidence, 48 GEO. WASH. L. REV. 774, 777-81 n.21 (1980).

vative rules of admissibility such as the Frye test. But many argue that such fears either are unsubstantiated or can be remedied by less restrictive means than the current tests of admissibility of novel scientific evidence. Courts and writers have argued that juries properly can handle scientific evidence without assigning too much weight to the evidence. As one court stated, "Judges and juries must be presumed to have average intelligence at least, and no assumption to the contrary can be made for the purpose of excluding otherwise admissible testimony." And as one commentator wrote, "[T]here is little or no objective support for the assertion [that jurors attach too much weight to scientific evidence] and ... almost all the available data points to the contrary conclusion." Also, one commentator has noted that, while there is a certain degree of inevitable error in scientific evidence, "the error in eyewitness testimony is at least as frequent and less controllable than error in scientific testimony."

No doubt, there are numerous problems associated with scientific evidence. However, arguably, there are less restrictive means of curing or mitigating those problems than rejection of the evidence. "Arguably, cross-examination, voir dire, limiting instructions, or opposing expert [sic] can reduce the chance that jurors will have problems understanding the message component of expert testimony." One writer suggests five safeguards that

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38 See, e.g., United States v. Alexander, 526 F.2d 161 (8th Cir. 1975); Addison, 498 F.2d 741; Reed v. State, 391 A.2d 364 (Md. 1978).
39 See, e.g., infra notes 45-53 and accompanying text.
40 Shanks v. State, 45 A.2d 85, 90 (Md. 1945); Imwinkelried, supra note 2, at 566-71; Comment, supra note 21, at 69.
41 Shanks, 45 A.2d at 90.
42 Imwinkelried, supra note 2, at 566. Imwinkelried points to the Chicago Jury Project as support for this proposition. The Chicago Jury Project is a study funded by the Ford Foundation and conducted by the University of Chicago Law School that examined the dynamics of criminal jury trials. Id. at 566 n.83. This "most intensive study ever conducted on the ability and behavior of American jurors," id. at 567, led to two important conclusions set forth in Professors Kalven and Zeisel's work, The American Jury: (1) The jury understands the facts and "get[s] the case straight," id. (quoting H. Kalven & H. Zeisel, The American Jury 149 (1966)); and (2) the verdict of the jury "moves with the weight and direction of the evidence," id. (quoting H. Kalven & H. Zeisel, at 149).
43 See supra note 35 and accompanying text.
44 Imwinkelried, supra note 2, at 565.
45 Note, The Frye Doctrine, supra note 8, at 1786 (footnotes omitted).
may be used at trial to aid jurors in understanding and dealing with scientific evidence.\textsuperscript{46} First, the court can appoint impartial experts to educate the jury in the form of a lecture or instructional guidance.\textsuperscript{47} Second, the court can allow the jurors to ask questions of the expert witness during the trial.\textsuperscript{48} The third proposed technique is to permit jurors to take notes while an expert is testifying.\textsuperscript{49} This safeguard can give jurors "a way of checking details, allowing them to better organize information, and assisting in their decision making."\textsuperscript{50} Fourth, courts can give periodic summaries of expert testimony to foster juror knowledge.\textsuperscript{51} A fifth procedure a court can employ is to give reading material to jurors before the trial to help familiarize them with the scientific evidence they will observe at trial.\textsuperscript{52} "[T]his procedure [can] encourage juror involvement . . . and juror knowledge."\textsuperscript{53}

An additional way to rebut the difficult aspects of admitting scientific evidence is to emphasize its positive attributes and

\textsuperscript{46} Id. at 1787-90.
\textsuperscript{47} Id. at 1787. The author points out that Federal Rule of Evidence 706 allows a court to bring in an expert. The author says that the independent expert could, before the trial, offer guidance on the fundamentals of the scientific testimony to be presented at trial. "Alternatively or additionally, the court could have the independent expert summarize the import of the novel scientific testimony periodically during the trial." Id. But some would argue that even these "independent" experts could acquire "an aura of infallibility." Id. at n.129.
\textsuperscript{48} Id. at 1788. See id. at n.130 for a list of courts allowing this technique. This technique could "increase juror knowledge by permitting jurors to ask for clarification of confusing or obscure aspects of the testimony," id. at 1788, and "allow them to take a more active role in the communication of the testimony . . . ." Id. However, opponents say that such a technique is not consistent with the adversary system because interruption of a presentation may affect the impact of the information or create unfair consideration of the evidence. Id. at n.131.
\textsuperscript{49} Id. at 1788-89. See id. at n.133 for jurisdictions allowing this procedure. The author points to studies showing that juror notetaking aids in factfinding and increases juror interest. Id. at 1788 & nn.135-36.
\textsuperscript{50} Id. at 1789 (quoting Silas, Juror Notes, 72 A.B.A.J. 20, 21 (1986)). Critics could argue that notetaking could "disrupt the factfinding process by reducing concentration on oral testimony and increasing the power of the written word. In a sense, the most efficient notetaker could control the deliberations." Id. at n.138.
\textsuperscript{51} Id. at 1789. Opponents of this procedure might argue that periodic summations might invade the jury's fact-finding responsibilities if the expert tells the jury what it should believe. Id. at n.140.
\textsuperscript{52} Id. at 1789.
\textsuperscript{53} Id. But one might argue that this procedure could "detract from the impact of equally significant oral testimony." Id. at n.144.
conclude that those attributes outweigh the unfavorable ones. Scientific techniques can be utilized to reconstruct important evidence in both civil and criminal cases. For example, scientific evidence can help to identify a criminal defendant with a material piece of evidence. United States v. Stifel provides a useful illustration. That case dealt with the admission of neutron activation analysis results. The defendant, Orville Stifel, was indicted for murdering a man by sending a bomb to him through the mail. The explosion occurred when the decedent opened the package containing the bomb. The Government’s expert witness testified regarding his study of fragments of the bomb package via neutron activation analysis. He testified that, by the use of neutron activation analysis, he could identify the fragments of the bomb as being from the same manufacturer and same batches of cardboard, tape, a metal top, and a paper gummed label as taken from the defendant’s place of employment. On appeal, the Sixth Circuit Court of Appeals held that the admission of that testimony was not reversible error. The court said that neutron activation analysis had met the Frye “general acceptance” test.

In short, scientific evidence can be crucial to the proof of a case or to a defendant’s exculpation. In light of the potential significance of scientific evidence, it is easy to understand the importance of developing a functional and flexible standard for the admission of novel scientific evidence. As early as 1940, Professor Wigmore understood the import of scientific evidence:

In earlier practice, the marks attending a criminal act . . . were limited chiefly to circumstances observable by the naked

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54 Comment, supra note 21, at 72.
56 “Neutron activation analysis is a method of identifying the composition of small particles by bombarding them with nuclear particles, usually neutrons, produced by a nuclear reactor.” M. McCormick, supra note 16, at § 90 n.69 (citing A. Moenssens & F. Inbau, Scientific Evidence in Criminal Cases § 9.04 (2d ed. 1978)).
57 Stifel, 433 F.2d at 431.
58 Id. at 434.
59 Id.
60 Id. at 438.
61 Id. at 441.
eye. . . . But by the use of the microscope, the photographic enlargement of microscopic data, the employment of chemical agents, and the invocation of specialists' knowledge in many branches of science . . . data are now perceivable and obtainable which were formerly beyond imagination.62

II. THE STANDARDS FOR ADMISSIBILITY

A proponent of scientific evidence must prove the reliability of that evidence.63 Three factors determine the reliability of scientific evidence: "(1) the validity64 of the underlying principle, (2) the validity of the technique applying that principle, and (3) the proper application of the technique on a particular occasion."65 The first two factors are only important with a new scientific technique;66 a court can remove from the proponent the burden of producing evidence on these factors by taking judicial notice67 of a principle and technique once it is established.68 For example, courts have taken judicial notice of radar detectors, intoxication tests, and fingerprints.69

It is rare for a court to take judicial notice of a scientific technique the first time it is offered at trial; therefore, the validity of novel scientific evidence normally is proved through expert testimony.70 Today when a court is faced with determining the admissibility of novel scientific evidence, it first must decide

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62 Strong, Questions Affecting the Admissibility of Scientific Evidence, 1970 U. Ill. L.F. 1, 2 (quoting 2 J. Wigmore, Evidence 400 (3d ed. 1940)).
63 Note, Admissibility of Electrophoretic Methods, supra note 8, at 778.
64 Validity and reliability are not synonymous. "‘Validity’ refers to the ability of a test procedure to measure what it is supposed to measure—its accuracy. ‘Reliability’ refers to whether the same results are obtained in each instance in which the test is performed—its consistency. Validity includes reliability, but the converse is not necessarily true." Giannelli, supra note 8, at 1201 n.20.
65 Id. at 1200-01 (footnotes omitted).
66 Id. at 1202.
68 Id. at 1202-03.
70 Giannelli, supra note 8, at 1203.
upon a proper standard to use. Currently, the two most commonly used standards are the *Frye*\textsuperscript{71} standard and the relevancy\textsuperscript{72} standard.\textsuperscript{73}

A. *The Frye Standard*

The most famous and commonly used\textsuperscript{74} standard for the admissibility of innovative scientific evidence was developed in 1923 in *Frye v. United States*.\textsuperscript{75} The United States Court of Appeals for the D.C. Circuit, in rejecting evidence obtained from the use of a systolic blood pressure deception test (a predecessor to the polygraph),\textsuperscript{76} created a new standard for determining the admissibility of scientific evidence:

> Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in the twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.\textsuperscript{77}

In its two-page opinion,\textsuperscript{78} the *Frye* court in effect created an independent requirement, in addition to the prerequisites of relevancy and helpfulness to the trier of fact. The court added that for scientific evidence to be admissible the principle or technique also must have achieved general acceptance in the relevant scientific community.\textsuperscript{79} While the *Frye* test was adopted without

\textsuperscript{71} See infra notes 74-175 and accompanying text.
\textsuperscript{72} See infra notes 176-80 and accompanying text.
\textsuperscript{73} Giannelli, supra note 8, at 1203.
\textsuperscript{75} 293 F. 1013 (D.C. Cir. 1923).
\textsuperscript{76} Id. at 1013-14.
\textsuperscript{77} Id. at 1014 (emphasis added).
\textsuperscript{78} "[T]he *Frye* court neither cited authority nor offered an explanation for adopting the general acceptance standard." Giannelli, supra note 8, at 1205.
\textsuperscript{79} *Frye*, 293 F. at 1014.
much discussion by numerous courts, and became "not only the majority view . . . [but] the almost universal view," the test recently has been vigorously criticized, changed, and sometimes rejected.

Advocates of the Frye "general acceptance" standard argue that a separate requirement for the admissibility of novel scientific evidence is necessary for several reasons. First, the general acceptance test assures that "a minimal reserve of experts exists who can critically examine the validity of a scientific determination in a particular case." Second, the standard requires the approval by the "scientific community," which assures that those best qualified resolve the validity of scientific evidence. Third, the standard "may well promote a degree of uniformity of decision" by assuring that judges rest their decisions of the admissibility of a novel technique on general agreement among scientists. The fourth argument for the Frye test suggests that it protects the jury from the "unwarranted impact caused by the misleading aura of certainty that frequently surrounds new discoveries." Fifth, the standard does not require lengthy hearings on the validity of novel forms of scientific evidence. Sixth, if an appellate court accepted a scientific technique, it could create binding precedent so long as the scientific community still "generally accepted" the technique.

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80 M. McCormick, supra note 16; see also Giannelli, supra note 8, at 1206 ("Unfortunately in most instances judicial adoption of the general acceptance standard has not been accompanied by a supporting rationale.").

81 Imwinkelried, supra note 2, at 556.

82 M. McCormick, supra note 16, at 883. See infra notes 105-59 & 107-20 and accompanying text.

83 United States v. Addison, 498 F.2d 741, 744 (D.C. Cir. 1974) (holding inadmissible spectrographic voice identification which was not generally accepted).

84 M. McCormick, supra note 16, at 883 (citing Addison, 498 F.2d at 744).


86 M. McCormick, supra note 16, at 883.

87 Id.

88 Giannelli, supra note 8, at 1207.

89 M. McCormick, supra note 16, at 883. See Note, The Admissibility of Electrophoretic Methods, supra note 8, at 779 ("The Frye standard also insures that the admissibility question is not reexamined in each subsequent case in which the technique is introduced into evidence.").
Despite its commendable attributes in theory, the Frye doctrine has received much criticism by courts and commentators. Most of the important criticisms can be grouped into one of five major points. First, courts have been inconsistent in characterizing proof as scientific evidence that must meet the Frye test.90 Second, courts have had difficulty in defining the relevant scientific field.91 One writer noted, "Many scientific techniques do not fall within the domain of a single academic discipline or professional field. Consequently, selecting the proper field may prove troublesome. More importantly, selection of the appropriate field may be dispositive."92 Third, the phrase "general acceptance"93 makes the test ambiguous94 and "remarkably
vague.”

As one commentator posed the problem, “[T]he courts have not been consistent in determining whether the appropriate subject of the ‘general acceptance’ test is the technique, the scientific premises underlying the technique, or the ability of the technique’s practitioner.”

Also, the decisions have not specified what percentage of the people in the relevant scientific community must have accepted the technique, a determination which would promote consistency in results. The fourth, and “most compelling,” criticism of the Frye doctrine is that it results in a deprivation of reliable and often outcome-determinative evidence.

“The test ensures that the courts will constantly lag behind the advances of science while the courts wait for novel scientific techniques to win ‘general acceptance.’” Professor Charles McCormick agreed that the “general acceptance” test erected too high a hurdle: “General scientific acceptance is a proper condition for taking judicial notice of scientific facts, but it is not a suitable criterion for the admissibility of scientific evidence.”

A fifth criticism is that the Frye test, “by focusing parameters, subverting the uniformity of decision paradigm for which Frye has been hailed.” (citing United States v. Downing, 753 F.2d 1224, at 1236 (3d Cir. 1985) (allowing testimony from an expert in perception and memory, concerning eyewitness reliability)))

92 C. WRIGHT & K. GRAHAM, supra note 22, § 5168, at 87.
96 Note, supra note 36, at 779-80 (1979-80) (footnotes omitted).
97 Giannelli, supra note 8, at 1210-11.
98 Note, Admissibility of Electrophoretic Methods, supra note 8, at 780.
99 See Imwinkelried, supra note 74, at 265; see also Hall, 297 N.W.2d at 84 (“Such a rule imposes a standard for admissibility not required of other areas of expert testimony . . . .” (citing C. MCCORMICK, supra note 16, § 203, at 488-89)); Giannelli, supra note 8, at 1224 (“[T]he critical issue is whether other approaches can better achieve the Frye objective of ‘prevent[ing] . . . the introduction into evidence of specious and unfounded scientific principles or conclusions based upon such principles.’” (quoting Strong, supra note 62, at 1, 14)); Note, Admissibility of Electrophoretic Methods, supra note 8, at 780 (“The most compelling criticism, however, is that the Frye standard results in the exclusion of valuable scientific evidence while the courts wait for the techniques to gain general acceptance.” (citing Imwinkelried, supra note 74, at 265))
Note, supra note 90, at 841 (“Finally, Frye has been criticized for impeding the search for truth by precluding relevant evidence.” (citing Downing, 753 F.2d at 1236-37)); cf. Giannelli, supra note 8, at 1224 (“The critics who argue that the Frye standard is too conservative are saying, in effect, that the general acceptance standard works too well—it excludes much that is reliable along with that which is unreliable. Interestingly, many commentators have overlooked instances in which Frye does not work.”).
100 Imwinkelried, supra note 68, at 265.
101 E. CLEARY, supra note 22, § 203, at 608; see also 3 D. LOUISELL & C. MUELLER,
attention on the general acceptance issue, ... obscures critical problems in the use of a particular technique."102 For example, one writer illustrates this criticism with cases addressing the admissibility of neutron activation analysis.103 The commentator notes that concentrating on the general acceptance of neutron activation analysis "conceals the most critical aspect of NAA [neutron activation analysis]—whether, as interpreted, the results of the test are relevant to the issues in dispute."104

Because of these and other criticisms revealing the inadequacies of the Frye test, several courts, state and federal, have ignored, modified, or rejected the test.105 This departure from the conservative "general acceptance" test has been based on three theories: (1) statutory construction; (2) constitutional interpretation; and (3) changing common-law rules.106

One method by which courts have strayed from the "general acceptance" test is via statutory construction of the Federal Rules of Evidence.107 This method is discussed separately later in this Note.108 A second way of abolishing the Frye test is by challenging its validity on constitutional grounds. In State v. Dorsey,109 a New Mexico court held that a criminal defendant had a right to introduce the results of a polygraph examination because of the due process clause of the Constitution.110 In State
v. Sims, an Ohio court said that, based on the compulsory process guarantee, the defendant has an implied right to present polygraph evidence. In 1987, the United States Supreme Court held in Rock v. Arkansas that a "per se rule excluding all posthypnosis testimony infringes impermissibly on the right of a defendant to testify on his or her own behalf." In Rock, the defendant, charged with manslaughter for shooting her husband, underwent hypnosis to help her remember the details of the shooting.

The trial court limited the defendant's testimony at trial to "matters remembered and stated to the examiner prior to being placed under hypnosis." The defendant was convicted and the Arkansas Supreme Court denied defendant's claim that her constitutional rights were violated. The U.S. Supreme Court disagreed, holding that a state cannot use a rule that allows a witness to testify, "but arbitrarily excludes material portions of his testimony." The Court noted that the inaccuracies that hypnosis introduces could be diminished by the use of procedural safeguards. Wholesale inadmissibility of a defendant's testimony is an arbitrary restriction on the right to testify in the absence of clear evidence by the State repudiating the validity of all posthypnosis recollections. The State would be well within its powers if it established guidelines to aid trial courts in the evaluation of posthypnosis testimony and it may be able to show that testimony in a particular case is so unreliable that exclusion is justified. But it has not shown that hypnotically enhanced testimony is always so untrustworthy and so immune to the traditional means of evaluating credibility that it should disable

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112 Id. at 33-47; see Giannelli, supra note 8, at 1230-31. For other possible constitutional limits of the Frye test, see M. McCormick, supra note 16, at 902-04.
114 Id. at 2714-15.
115 Id. at 2706.
116 Id. at 2707.
117 Id. at 2707-08.
118 Id. at 2711.
119 Id. at 2714 (noting the possible safeguards of taping interrogations, cross-examination of the defendant, and jury education through cautionary instructions and expert witnesses).
a defendant from presenting her version of the events for which she is on trial.\textsuperscript{120}

The third way courts have departed from Frye is by changing common law rules. One of the first cases to stray from the Frye test by altering common law rules was Coppolino v. State in 1969.\textsuperscript{121} The court upheld a trial court's ruling that evidence of a scientific technique was admissible despite rejection by several defense expert witnesses. The court based its decision on the theory that "the trial judge enjoys wide discretion in areas concerning the admission of evidence."\textsuperscript{122} Soon thereafter many more courts began re-evaluating the Frye standard.\textsuperscript{123}

Although approximately forty-five states followed the Frye standard at one point in the mid-1970s,\textsuperscript{124} a number of state courts began to modify or reject the "general acceptance" test after Coppolino was decided.\textsuperscript{125} Some courts decided that the Frye test affected the weight, and not the admissibility, of expert testimony dealing with scientific evidence.\textsuperscript{126} Other courts "engage[d] in an independent consideration of the scientific validity of the new technique."\textsuperscript{127} Several other courts held that the Frye standard required a showing of the reliability of the principle or technique.\textsuperscript{128} Still other courts have modified Frye by narrowly

\textsuperscript{120} Id.

\textsuperscript{121} 223 So. 2d 68 (Fla. Dist. Ct. App. 1968), appeal dismissed, 234 So. 2d 120 (Fla. 1969), cert. denied, 399 U.S. 927 (1970); see Imwinkelried, supra note 74, at 265 ("The first slippage away from Frye occurred . . . . in Coppolino v. State . . . .").

\textsuperscript{122} Coppolino, 223 So. 2d at 70.

\textsuperscript{123} See M. McCormick, supra note 16, at 890 ("The case [Coppolino] became a rallying point for those who opposed the Frye standard.").

\textsuperscript{124} Imwinkelried, supra note 2, at 557.

\textsuperscript{125} See M. McCormick, supra note 16, at 892-95, 897-902.

\textsuperscript{126} See id. at 892 (citing People v. Marx, 126 Cal. Rptr. 350, 355 (Ct. App. 1975) (allowing bitemark evidence); Jenkins v. State, 274 S.E.2d 618, 620 (Ga. Ct. App. 1980) (allowing palmprints)).


defining the "relevant scientific community." For example, in Commonwealth v. Lykus, the court limited the scientific community to "those who would be expected to be familiar with its use." Another group of courts avoided this Frye dilemma by ignoring it.

Federal courts also have found ways to modify the Frye standard in order to admit reliable scientific evidence. For example, in United States v. Stifel, the Federal Court of Appeals for the Sixth Circuit, while referring to Frye, held that the criticisms of the defendant's expert witnesses went to the weight of the evidence, not to its admissibility. Two 1975 federal courts of appeals' decisions, United States v. Franks and United States v. Baller, added to this wave of Frye doctrine modification. In Franks, the Court of Appeals for the Sixth Circuit held that "general acceptance . . . is nearly synonymous with reliability. If a scientific process is reliable, or sufficiently accurate, courts may also deem it 'generally accepted.'" In Baller, 470 (Colo. 1976) (test using sodium amytal); State v. Saia, 372 A.2d 144, 147 (Conn. 1975) (polygraph evidence); State v. Chambers, 239 S.E.2d 324, 325-27 (Ga. 1977) (polygraph evidence); see also State v. Washington, 622 P.2d 986, 991 (Kan. 1981) (multisystem method of blood analysis).


Id. at 677; see also Hodo, 106 Cal. Rptr. at 553.


Federal courts relying on the Federal Rules of Evidence to modify or reject the Frye test are discussed later in this Note. See infra notes 197-209 and accompanying text.

433 F.2d 431 (6th Cir. 1970), cert. denied, 401 U.S. 994 (1971) (expert testimony regarding neutron activation analysis of bomb package fragments). For additional discussion of this case, see supra notes 55-61 and accompanying text.

Stifel, 433 F.2d at 438.


Franks, 511 F.2d at 33 n.12.
the Court of Appeals for the Fourth Circuit upheld the trial court's admission of spectrographic results, saying, "[I]t is better to admit relevant scientific evidence in the same manner as other expert testimony and allow its weight to be attacked by cross-examination and refutation." More recently, the Court of Appeals for the Fourth Circuit altered the applicable standard of admissibility of scientific evidence by requiring "substantial acceptance in the relevant discipline." As one commentator noted, "As applied, distinguished, or ignored in these federal and state cases, the Frye standard has undergone substantial implicit modification."

While some courts have found it sufficient to modify the Frye doctrine, others have gone the extra step and rejected it. Wisconsin was the first state to reject the Frye doctrine. In Watson v. State, the Wisconsin Supreme Court held that scientific opinion opposing a technique merely framed a credibility issue for the jury to decide. In 1978 the Supreme Judicial Court of Maine followed suit in State v. Williams. The Maine court adopted a rule which allowed the judge "a latitude, which the Frye rule denies, to hold admissible . . . proffered evidence involving newly ascertained, or applied, scientific principles which have not yet achieved general acceptance . . . if a showing has been made which satisfies the Justice that the proffered evidence is sufficiently reliable to be held relevant." Several other state court cases have rejected the Frye standard of "general acceptance" as well. For example, in 1983, the Ohio Supreme Court

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139 See supra note 4 for a definition and a list of cases concerning spectrographic evidence.

140 Baller, 519 F.2d at 466.

141 United States v. Gould, 741 F.2d 45, 49 (4th Cir. 1984). The court recognized this standard as "less stringent" than the Frye test. Id. at n.2.

142 M. McCormick, supra note 16, at 894.

143 Id. at 897 ("The earliest rejection of the Frye standard occurred in Watson v. State . . . ").

144 219 N.W.2d 398 (Wis. 1974).

145 Id. at 403; M. McCormick, supra note 16, at 897.

146 388 A.2d 500 (Me. 1978).

147 Id. at 504.

rejected the Frye test saying that the court would not "engage in scientific nose-counting for the purpose of deciding whether evidence based on newly ascertained or applied scientific principles is admissible."¹⁴⁹

Several federal courts also have rejected the Frye test.¹⁵⁰ In United States v. Williams,¹⁵¹ the Court of Appeals for the Second Circuit applied a traditional relevancy approach in admitting spectrographic evidence.¹⁵² The court discussed only the reliability of the evidence and the tendency to mislead, since the pro-

(Ga. 1982) (determination of whether a truth-serum had "reached a scientific stage of verifiable certainty"); Hall, 297 N.W.2d 80 (if reliability of bloodstain analysis can be otherwise established, Frye does not apply); Brown v. Commonwealth, 639 S. W.2d 758, 760 (Ky. 1982), cert. denied, 460 U.S. 1037 (1983) (allowing any relevant testimony of a qualified expert to be admitted); State v. Catarese, 368 So. 2d 975, 980-82 (La. 1979) (excluding polygraph evidence because its probative value was outweighed by its possibility for misuse); People v. Young, 308 N.W.2d 194, 196-97 (Mich. Ct. App. 1981), remanded, 340 N.W.2d 805 (Mich.), rev'd, 391 N.W.2d 270 (Mich. 1983) (allowing admission of test comparing blood samples where defendant could offer no evidence to dispute the expert's reliance on the test); People v. Daniels, 422 N.Y.S.2d 832, 837 (Sup. Ct. 1979) (holding that decision to admit polygraph evidence should be based on same criteria as other evidence); State v. Kersting, 623 P.2d 1095, 1101-02 (Or. Ct. App. 1981), aff'd, 638 P.2d 1145 (Or. 1982) (court allowed admission of microscopic comparison of hair samples because the test was reliable); Utah ex rel. Phillips v. Jackson, 615 P.2d 1228, 1226-38 (Utah 1980) (court refused admission of blood test in a paternity suit since proponent did not provide a sufficient foundation and therefore did not establish reliability); see also M. McCormick, supra note 16, at 895 ("New Mexico and Wyoming decisions reach the same result without expressly rejecting Frye.") (citing State v. Dorsey, 539 P.2d 204, 205 (N.M. 1975) (requiring establishment of operator's expertise and test's reliability in order to admit polygraph evidence); Cullin v. State, 565 P.2d 445, 458-59 (Wyo. 1977) (court found that if polygraph evidence "will assist the trier of fact" it should be admitted)).

¹⁴⁹ State v. Williams, 446 N.E.2d 444, 448 (Ohio 1983) (refusing to allow admission of spectrographic evidence based upon criteria set forth in the Fed. R. Evid.).

¹⁵⁰ See, e.g., United States v. Gwaltney, 790 F.2d 1378, 1381-82 (9th Cir. 1986), cert. denied, 479 U.S. 1104 (1987) (allowing admission of sperm test despite lack of "general acceptance" because court found test to be reliable); United States v. Sample, 378 F. Supp. 44, 53 (E.D. Pa. 1974) (allowing admission of voice print because it was relevant evidence, expert was qualified, and defendant failed to offer any evidence challenging test's reliability); see also Barefoot v. Estelle, 463 U.S. 880, 898-99 (1983) (psychiatric testimony addressing future dangerousness of defendant was admissible despite lack of "general acceptance" since it was relevant and its weight could be left to the factfinder); cf. Osburn v. Anchor Laboratories, 825 F.2d 908, 915 (5th Cir. 1987), cert. denied, 108 S. Ct. 1476 (1988) (expert testimony regarding cause of leukemia held admissible despite lack of "general acceptance" since the expert relied upon accepted "method" in reaching his conclusion) (emphasis in original).

¹⁵¹ 583 F.2d 1194 (2d Cir. 1978), cert. denied, 439 U.S. 1117 (1979).

¹⁵² M. McCormick, supra note 16, at 896.
bativeness and materiality factors were not disputed.\textsuperscript{153} The opinion listed five indicators of reliability: "(1) potential rate of error in use of the technique, (2) existence and maintenance of standards among its users, (3) care with which the technique was employed in the case, (4) analogy of the technique to others whose results are admissible, and (5) presence of safeguards in the characteristics of the technique."\textsuperscript{154}

In 1985, the United States Court of Appeals for the Third Circuit rejected the Frye test in \textit{United States v. Downing}.\textsuperscript{155} That court instead adopted a reliability approach which "occupies the middle ground between the more liberal and conservative approaches to the admission of novel scientific evidence."\textsuperscript{156} It held that three factors should be considered when determining the admissibility of novel scientific evidence:

\begin{quote}
(1) the soundness and reliability of the process or technique used in generating the evidence, (2) the possibility that admitting the evidence would overwhelm, confuse, or mislead the jury, and (3) the proffered connection between the scientific research or test result to be presented and particular disputed factual issues in the case.\textsuperscript{157}
\end{quote}

The court also listed several factors to be considered in determining the reliability of a scientific technique, including the "novelty" of the technique, whether there is specialized literature on the technique, the qualifications and professional stature of the witnesses, the non-judicial uses of the technique, the frequency of error, and expert testimony offered in earlier cases regarding the procedure.\textsuperscript{158} This approach did allow for a determination of the degree of acceptance in the relevant scientific community as well, but did not require it.\textsuperscript{159}

\begin{footnotes}
\item[153] Id.
\item[154] Id. (citing Williams, 583 F.2d at 1198-99).
\item[155] 753 F.2d 1224 (3d Cir. 1985). See generally Note, supra note 90, at 844 ("\textit{Downing} . . . marks the first time that a federal court has unequivocally rejected Frye in favor of a reliability approach.").
\item[156] Note, supra note 90, at 839.
\item[157] Downing, 753 F.2d at 1237.
\item[158] Id. at 1238-39; see also Note, supra note 90, at 846.
\item[159] Downing, 753 F.2d at 1238.
\end{footnotes}
Although there is indeed a "discernible trend toward an expansive admissibility standard,"\(^{160}\) many state and federal courts have refused to abandon the *Frye* doctrine. As mentioned above, nearly all state courts followed *Frye* at one time.\(^{161}\) The Supreme Court of California adamantly defended *Frye* in 1976 in *People v. Kelly*.\(^{162}\) It found that "there is ample justification for the exercise of considerable judicial caution in the acceptance of evidence developed by new scientific techniques."\(^{163}\) The court justified using the *Frye* test because it "may well promote a degree of uniformity of decision,"\(^{164}\) and because the "existence of 'misleading aura of certainty . . . often envelops a new scientific procedure, obscuring its currently experimental nature.'"\(^{165}\) The *Kelly* court, deciding whether to admit spectrographic evidence, noted that "[e]xercise of restraint is especially warranted when the identification technique is offered to identify the perpetrator of a crime."\(^{166}\) The Maryland Court of Appeals relied on *Kelly* when it accepted the *Frye* test in *Reed v. State*.\(^{167}\) The *Reed* court also found that spectrographic evidence had been erroneously admitted at the trial level.\(^{168}\) It noted,

> If a judge or jurors [sic] have no foundation, either in their experience or in the accepted principles of scientists, on which they might base an informed judgment, they will be left to follow their fancy. Thus, courts should be properly reluctant to resolve the disputes of science. "It is not for the law to experiment but for science to do so."\(^{169}\)


\(^{161}\) For a list of states using the "general acceptance" standard see Reed v. State, 391 A.2d 364 at 368 (Md. 1978); *see also supra* note 124 and accompanying text.

\(^{162}\) 549 P.2d 1240, 130 Cal. Rptr. 144 (1976).

\(^{163}\) *Id.* at 1244, 130 Cal. Rptr. at 148.

\(^{164}\) *Id.* at 1244-45, 130 Cal. Rptr. at 148-49.

\(^{165}\) *Id.* at 1245, 130 Cal. Rptr. at 149 (quoting Huntingdon v. Crowley, 414 P.2d 382, 390, 51 Cal. Rptr. 254, 262 (1966)).

\(^{166}\) *Id.* The court stated that the general acceptance of a technique must be looked at carefully especially when identification of the perpetrator of a crime is based upon an opinion made using an unproven scientific technique (quoting People v. Law, 114 Cal. Rptr. 708, 719 (1974)).

\(^{167}\) 391 A.2d 364, 370 (Md. 1978) (voice prints inadmissible as evidence identifying defendant as speaker of telephone calls to victim); *see also* M. McCormick, *supra* note 16, at 884.

\(^{168}\) *Reed*, 391 A.2d at 377.

Numerous federal courts also have applied the "general acceptance" test. In one of the most frequently cited cases favoring the Frye standard, United States v. Addison, the United States Court of Appeals for the District of Columbia stated that the general acceptance requirement "assures that those most qualified to assess the general validity of a scientific method will have the determinative voice" and "assur[es] that a minimal reserve of experts exists who can critically examine the validity of a scientific determination." The court also noted the importance of the ability to produce expert witnesses to rebut scientific evidence, as such evidence sometimes "assume[s] a posture of mystic infallibility in the eyes of a jury of laymen."

For whatever reason—statutory, constitutional, or common law—courts are re-evaluating the use of the Frye standard of "general acceptance" in determining the admissibility of novel scientific evidence.

B. Alternative Standards

An alternative to the Frye test that is used extensively by the courts is the "relevancy" approach. The relevancy standard
treats novel scientific evidence the same as other evidence—admissible if relevant, not outweighed by undue prejudice, not misleading to the jury, and not requiring an undue consumption of time. Professor Charles McCormick, the individual most often associated with the relevancy approach, discussed it as such:

"General scientific acceptance" is a proper condition for taking judicial notice of scientific facts, but not a criterion for the admissibility of scientific evidence. Any relevant conclusions which are supported by a qualified expert witness should be received unless there are other reasons for exclusion. Particularly, probative value may be overborne by the familiar dangers of prejudicing or misleading the jury, and undue consumption of time. If the courts used this approach, instead of repeating a supposed requirement of "general acceptance" not elsewhere imposed, they would arrive at a practical way of utilizing the results of scientific advances.

Some have argued that the Federal Rules of Evidence codify this relevancy approach.

Other approaches have been advocated by numerous writers and courts. One alternative is the establishment of an expert tribunal to decide the validity and reliability of a novel scientific development. Proponents of this expert tribunal approach assert that an expert tribunal is highly qualified, neutral, and unaffected by the procedural requirements of a trial. The

177 Id. at 1204.
178 Id. at 1203, 1233-35.
179 C. McCormick, supra note 16, § 203, at 491 (footnotes omitted).
180 Giannelli, supra note 8, at 1204 n.39. Pertinent Federal Rules of Evidence are discussed infra notes 211-27 and accompanying text.
181 For a list of some approaches taken, see M. McCormick, supra note 16, at 899 n.1.
182 Id. at 906.
183 Id. "The tribunal could become the forum for taking a survey of scientific opinion. The search for truth would not be affected by the procedural inhibitions inherent in an adversary trial. Presumably, the decision would be made by neutral parties most qualified to make it." Id. "[E]valuation would be conducted by scientists without a financial or professional interest in the technique . . . ." Giannelli, supra note 8, at 1232.
tribunal also may propose new areas of research. Critics of this approach argue that it is inconclusive and time-consuming. Consequently, the proposal never has been adopted.

One writer has proposed that a better alternative to the Frye standard would be an adjustment of the burden of proof. The writer suggests that while civil litigants and criminal defendants should establish the validity of new scientific evidence by a preponderance of the evidence, the prosecution should be forced to prove its validity beyond a reasonable doubt. While this approach "combine[s] the advantages of traditional analysis with emphasis on the need for special care in admitting novel scientific evidence," critics have labelled it "inappropriate and unworkable." 

One commentator suggests that the relevancy test is best, as long as certain modifications in the judicial system are made. He suggests several vehicles for "enhanc[ing] juror knowledge and involvement," such as allowing jurors to take notes during testimony and allowing jurors to ask questions of expert witnesses during the trial.

Another alternative, the "reliability" approach, would allow admission of a new scientific technique only when its reliability is sufficiently established. Under this approach, any unrelia-

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184 Giannelli, supra note 8, at 1232. "A technique that has demonstrated potential but has not yet been sufficiently validated would not receive an unqualified veto, which might stifle future development and research." Id.
185 M. McCormick, supra note 16, at 906.
186 Giannelli, supra note 8, at 1232.
187 See id. at 1245-50.
188 Id. at 1248.
189 M. McCormick, supra note 16, at 908 (citing Giannelli, supra note 8, at 1245-50).
190 Note, supra note 4, at 370. It was so labeled because it would be time consuming, would eliminate the need for a jury, and it would neither give the judge any factors to consider in deciding whether the burden of proof has been met nor present the proponent of the evidence with any guide as to how to prepare and argue the reliability issue. Id. at 370-71.
191 Note, The Frye Doctrine, supra note 8, at 1786-90; see supra notes 45-53 and accompanying text.
192 Note, The Frye Doctrine, supra note 8, at 1787.
193 Id. at 1788.
bility or lack of acceptance of a technique goes to its weight and not its admissibility.\(^{195}\)

One writer proposes a three-prong test as a standard for admissibility of scientific evidence:

First, a proper foundation must be established by showing: 1) qualified expert testimony concerning the validity of the principle upon which the device or method is based; 2) expert testimony demonstrating the ability of the device to reflect that principle; and 3) proper functioning of the device. Second, the probative value of the evidence is to be proved by a showing of logical relevancy and reasonable reliability of the technology in question. Third, important policy factors of the court should be recognized and weighed against the probative value of the evidence.\(^{196}\)

III. THE FEDERAL RULES OF EVIDENCE

As mentioned earlier, the Federal Rules of Evidence, effective July 1, 1975, have been used as a way to reject the \textit{Frye} test.\(^{197}\) But it is unsettled whether the Rules abolish the \textit{Frye} test, or incorporate it. "Rule 702 [ ] fail[ed] to incorporate a general scientific acceptance standard, and the Advisory Committee Note

\(^{195}\) Note, \textit{supra} note 90, at 842 (citing State v. Hall, 297 N.W.2d 80, 85 (Iowa 1980), \textit{cert. denied}, 450 U.S. 927 (1981)).

\(^{196}\) Comment, \textit{supra} note 21, at 75. One additional approach listed a number of factors to be considered within the structure of traditional relevancy and expert testimony standards:

(1) the potential error rate in using the technique, (2) the existence and maintenance of standards governing its use, (3) presence of safeguards in the characteristics of the technique, (4) analogy to other scientific techniques whose results are admissible, (5) the extent to which the technique has been accepted by scientists in the field involved, (6) the nature and breadth of the inference adduced, (7) the clarity and simplicity with which the technique can be described and its results explained, (8) the extent to which the basic data are verifiable by the court and jury, (9) the availability of other experts to test and evaluate the technique, (10) the probative significance of the evidence in the circumstances of the case, and (11) the care with which the technique was employed in the case. These factors require examination of the characteristics of the evidence, the foundation for the proffer, and the context of the proffer.

M. McCormick, \textit{supra} note 16, at 911-12 (footnotes omitted).

\(^{197}\) See \textit{supra} text accompanying note 108.
[ ] fail[ed] to even mention the Frye case." Those who argue that the Federal Rules of Evidence do not implicitly reject the Frye test suggest that, since the Rules were not intended to serve as a comprehensive codification of evidentiary rules, some standards are not addressed therein or are treated only in a general manner. "Therefore, it can be argued that because Frye was the established rule and no statement repudiating Frye appears in the legislative history, the general acceptance standard remains intact." Those who suggest that the Frye test was rejected by the Rules, however, look to the specific language of the Rules to justify their arguments. "Because scientific evidence could be shown to be reliable and thus relevant under Rule 401 without regard to its general acceptance in the scientific community, and because none of the exclusions enumerated in Rule 402 is applicable, the Federal Rules have provided a standard of admissibility inconsistent with Frye." Assumming that the Federal Rules of Evidence do reject the Frye test, a balancing test must be applied in order to determine whether a new scientific technique is admissible. Under Rule 702, the judge first must make certain that the expert testimony will "assist the trier of fact to understand the evidence or to determine a fact in issue." The judge also must determine

198 J. Weisnt & M. Berger, supra note 15, ¶ 702[03], at 702-36.
Rule 702 provides, "If scientifi, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualifi as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion otherwise." Fed. R. Evid. 702.
199 Giannelli, supra note 8, at 1229 n.251 (noting that impeachment by evidence of bias is not covered by the Federal Rules of Evidence).
200 Id.
201 Id. at 1230.
Fed. R. Evid. 401 provides, "'Relevant evidence' means evidence having any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence." Fed. R. Evid. 401.
202 Fed. R. Evid. 402 provides, "All relevant evidence is admissible, except as otherwise provided by the Constitution of the United States, by Act of Congress, by these rules, or by other rules prescribed by the Supreme Court pursuant to statutory authority. Evidence which is not relevant is not admissible." Fed. R. Evid. 402.
203 Giannelli, supra note 8, at 1230.
204 Id. at 1235.
205 Fed. R. Evid. 702, supra note 198. Several proposals have been made to amend
whether the technique is relevant. Next, in accordance with Rule 403, the judge must weigh the probative value of the evidence against "the danger of unfair prejudice, confusion of the issues, [the possibility of] misleading the jury, . . . considerations of undue delay, waste of time, or needless presentation of cumulative evidence."

IV. KENTUCKY

Kentucky courts have vacillated between following the Frye test and rejecting it. In 1960, the Court of Appeals of Kentucky held that the results of a truth serum test were inadmissible because such test had not "attained full scientific acceptance." Subsequently, in 1964, the court of appeals held that the results of a lie-detector test were inadmissible, in part because the test needed "endorsement by a larger segment of the psychological and physiological branches of science . . . ."

However, in 1982, the Supreme Court of Kentucky implicitly rejected the Frye standard in Brown v. Commonwealth. The court, finding that expert testimony regarding a blood-testing
method was admissible, cited McCormick's relevancy standard: "Any relevant conclusions which are supported by a qualified expert witness should be received unless there are other reasons for exclusion." The court noted that "the only valid argument" against the evidence went to its credibility, not to its admissibility. The very next year, 1983, the Supreme Court of Kentucky see-sawed back to the Frye test in Perry v. Commonwealth ex rel. Kessinger. The Perry court cited the "general acceptance" requirement of the Frye test and found that the evidence in question, a blood test, had met that requirement. In 1984, the Supreme Court of Kentucky held polygraph evidence inadmissible, but did not cite to the Frye test. In 1984, the Supreme Court of Kentucky held polygraph evidence inadmissible, but did not cite to the Frye test.

In Bussey v. Commonwealth, the Supreme Court of Kentucky reversed the trial court's admission of testimony concerning the "sexual abuse accommodation syndrome," in part because the record did not show any effort by the prosecution "to establish the credibility of the . . . syndrome as a concept generally accepted in the medical community." No citation was made to Frye. In 1986, the Supreme Court again was faced with testimony regarding the sexual abuse accommodation syndrome. And again the Court noted the lack of "scientific acceptance or credibility among clinical psychologists or psychiatrists." In 1987, the Supreme Court of Kentucky in Commonwealth v. Rose allowed testimony concerning the battered wife syndrome because "the witness provided background information sufficient to demonstrate the scientific acceptability of the . . . syn-

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213 Id. at 760 (quoting C. McCormick, supra note 16, § 203, at 491).
214 Id.
215 652 S.W.2d 655 (Ky. 1983).
216 Id. at 661.
217 Ice v. Commonwealth, 667 S.W.2d 671, 675 (Ky. 1984) ("This court has held repeatedly and consistently that it does not yet consider such evidence scientific or reliable."), cert. denied, 469 U.S. 860 (1984).
218 697 S.W.2d 139 (Ky. 1985).
219 Id. at 141.
220 Lantrip v. Commonwealth, 713 S.W.2d 816.
221 Id. at 817.
drome as a mental condition or entity generally recognized in the medical community.223

V. PROPOSAL

The Frye "general acceptance" test rests on the assumptions that "jurors are in awe of scientific testimony and [therefore] tend to overestimate its probative value"224 and that there is too much error in forensic science.225 These underlying assumptions have been sufficiently refuted,226 however, to warrant a rejection of the Frye standard. Though some fear that an expert can be paid to say anything,227 a less conservative standard needs to be used to allow the admissibility of relevant evidence that will aid in the search for truth. With the addition of a few procedural safeguards, the best standard is the traditional relevancy standard.228 In other words, scientific evidence should be treated like other evidence. The evidence must be relevant and, in accord with Federal Rule of Evidence 403,229 not outweighed by the danger of undue prejudice or consumption of time, or misleading the jury.230 Trial judges have the necessary tools with which to deal with expert testimony relating to scientific evidence. The judge can balance the probative worth of the expert testimony against its prejudicial effect.231 Indeed, this balancing is within the "broad discretion" of the trial judge.232 Therefore, if the expert testimony is too speculative or too prejudicial, the judge has the ability to rule the evidence inadmissible. Also, in deter-

223 Id. at 590-91 ("We agree that, as a general proposition, evidence of this nature is admissible after a proper foundation has been provided by evidence that this is a mental condition constituting a recognized scientific entity and that the witness is qualified to testify about it.").

224 Note, The Frye Doctrine, supra note 8, at 1772.

225 Imwinkelried, supra note 2, at 560-64.

226 See id. at 564-71.

227 See Note, The Frye Doctrine, supra note 8, at 1774 n.26 ("a Ph.D. can be found to swear to almost any 'expert' proposition, no matter how false or foolish") (quoting Huber, Safety and the Second Best: The Hazards of Public Risk Management in the Courts, 85 Colum. L. Rev. 277, 333 (1985)).

228 See supra notes 176-80 and accompanying text.

229 Fed. R. Evid. 403, supra notes 208-09 and accompanying text.

230 Giannelli, supra note 8, at 1204.

231 United States v. Amaral, 488 F.2d 1148, 1152 (9th Cir. 1973).

232 Id.
mining whether to admit expert testimony, the judge determines whether the jury will be "appreciably help[ed]" by the testimony.\textsuperscript{233} This provides the judge with another tool with which he can refuse to admit expert testimony that is too speculative or too prejudicial. If the testimony will not "appreciably help" or, under Federal Rule of Evidence 702,\textsuperscript{234} "assist" the trier of fact, it can simply be excluded. Because of these tools in the judge's hands, an additional requirement of "general acceptance" of novel scientific evidence is not necessary in order to reach the truth in litigation. After all, "rejecting the Frye standard does not automatically signal abandonment of caution."\textsuperscript{235}

With today's liberal discovery rules and skilled attorneys, the adversary process also can provide ample safeguards to justify liberal admissibility standards for novel scientific evidence. As one court said, "Unless an exaggerated popular opinion of the accuracy of a particular technique makes its use prejudicial or likely to mislead the jury, it is better to admit relevant scientific evidence in the same manner as other expert testimony and allow its weight to be attacked by cross-examination and refutation."\textsuperscript{236}

A few procedural safeguards could help the jury to better handle novel scientific evidence. One safeguard that would aid jurors in understanding their role when dealing with scientific evidence is a proper limiting instruction. The jury should be told that they may reject an expert witness' opinion regarding scientific evidence if they find it unreliable.\textsuperscript{237} Increased juror involvement also can assist jurors in effective use of scientific evidence. For example, jurors should be allowed to take notes, ask questions directly to experts, and read materials pertaining to the evidence they will be confronted with at trial.\textsuperscript{238} Yet, with the exceptions of these few changes, which serve to note the potential

\textsuperscript{233} Id.
\textsuperscript{234} Supra note 198.
\textsuperscript{235} M. McCormick, supra note 16, at 914.
\textsuperscript{236} United States v. Baller, 519 F.2d 463, 466 (4th Cir.), cert. denied, 423 U.S. 1019 (1975).
\textsuperscript{237} Such an instruction was used at the trial level in United States v. Williams, 583 F.2d 1194, 1200 (2d Cir. 1978), cert. denied, 439 U.S. 1117 (1979). See id. at n.13 for that instruction.
\textsuperscript{238} See Note, The Frye Doctrine, supra note 8, at 1788-89.
misleading character of scientific evidence, scientific evidence should be accorded no special treatment.

CONCLUSION

In short, with the addition of a few safeguards, novel scientific evidence should be treated the same as non-scientific evidence. No doubt, judges who face issues of scientific evidence properly should understand and note that they are dealing with potentially misleading evidence; but, they should proceed with a normal relevancy and expert testimony analysis. In that analysis, judges will have an opportunity to determine whether expert testimony will assist the trier of fact and to weigh the probative value of the scientific evidence against the potential for misleading the jury, confusing the issues, or creating unfair prejudice. By recognizing that they are dealing with potentially misleading evidence, that factor can be properly balanced in the traditional relevancy manner—the manner that has, as of now, proven to be the best way of arriving at the truth.

John D. Borders, Jr.*

* An appreciation of this topic would have been unattainable without the academic guidance of Professor Robert G. Lawson.