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The Admissibility of Scientific Evidence: The History and Demise of *Frye v. United States*

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The Admissibility of Scientific Evidence: The History and Demise of *Frye v. United States*

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I. INTRODUCTION

The realm of science has contributed greatly to the law. Courts have long recognized that the specialized knowledge base of the scientific community is a valuable source of information and, consequently, often admit scientific evidence and testimony in court proceedings.

Because a court's decision to admit or exclude scientific evidence can be outcome determinative, courts must make well-reasoned and just decisions regarding the admissibility of this evidence. Admitting unreliable, unproven data can be as prejudicial as excluding sound evidence that is merely unfamiliar to the courts and society in general. Distinguishing between sound and unreliable evidence is especially problematic given the rapid developments in scientific knowledge and the possible appearance to those not educated in the area that scientific results are infallible. To keep pace with such a progressive area, the courts must be dynamic in their approach and accept new developments in these specialized areas.

The principles of relevancy and the standards governing all expert testimony contained in the Federal Rules of Evidence apply to the

admissibility of scientific information as well.¹ But courts have applied special rules when determining the admissibility of scientific information.² Various standards have been suggested and applied by the courts throughout the years, but no standard has enjoyed the longevity of that espoused in *Frye v. United States*:³ to be admissible as evidence, a scientific technique must have gained general acceptance in the scientific community.⁴

The *Frye* rule has been applied by most courts but has been limited, modified, and rejected by others. Some courts have stated their support for the *Frye* rule but have then allowed evidence that failed the *Frye* test to be admitted on the ground that general acceptance of the techniques goes to weight, not admissibility.⁵ Other courts have applied the *Frye* rule only to "the underlying principles or methodology rather than the particular studies or results based on those principles or that methodology."⁶ Still other courts have equated the *Frye* rule with the requirements of showing the technique is valid, accurate, and reliable,⁷ ignored the *Frye* rule,⁸ or rejected it and applied the traditional principles of relevancy and helpfulness to the trier of fact.⁹

Argument surrounding the need for a new standard for admitting scientific evidence focuses on two areas. The first area of concern is that the *Frye* rule is too restrictive and conservative and fails to readily adapt to and acknowledge new developments in scientific knowledge.¹⁰ This results in courts excluding relevant evidence until enough time has passed for the newly-developed technique to be generally accepted by the scientific community. Those who have their day in court in the meantime suffer the consequences of having their evidence excluded.

The second area of concern is the courts' frequent willingness to admit "scientific" evidence that is unproven, unreliable, or irrelevant to support a given proposition.¹¹ Critics fear that this "junk science" is

1. FED. R. EVID. 702.

2. See Paul C. Giannelli, *The Admissibility of Novel Scientific Evidence: Frye v. United States, A Half-Century Later*, 80 COLUM. L. REV. 1197, 1203 (1980).

3. *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).

4. Scientific evidence must also satisfy the traditional elements of relevancy and helpfulness to the trier of fact. See *infra* note 9.

5. See, e.g., *State v. Olivas*, 267 P.2d 893, 894 (Ariz. 1954); *People v. Marx*, 126 Cal. Rptr. 350, 355 (Cal. Ct. App. 1975); *Jenkins v. State*, 274 S.E.2d 618, 619 (Ga. Ct. App. 1980); *Commonwealth v. Cifizzari*, 492 N.E.2d 357, 364 (Mass. 1986).

6. *United States v. Williams*, 583 F.2d 1194, 1198 (2d Cir. 1978).

7. CHARLES T. McCORMICK, *McCORMICK ON EVIDENCE* § 203, at 872 n.30 (John W. Strong ed., 4th ed. 1992).

8. *Id.* § 203, at 871.

9. *Id.* § 203, at 872 n.31; *United States v. Downing*, 753 F.2d 1224, 1226 (3d Cir. 1985).

10. See Giannelli, *supra* note 2, at 1223.

11. *Id.* at 1224-25.

given too much weight by juries, who lack the foundation to question the methodology, results, or applications of experiments or the expertise of testifying witnesses who the court has presented as "experts."¹²

Addressing both of these concerns in one standard is difficult because they fall at opposite ends of the spectrum: one argues that *Frye* is too restrictive and the other argues that the courts are too lenient in admitting evidence. Basically, the goal is to readily admit relevant, reliable scientific evidence immediately after its initial development, while insuring that unreliable, unproven "junk" science is excluded. Balancing these conflicting demands is not a simple task because opinions differ regarding what evidence fits into each of these categories.

In June 1993, the United States Supreme Court put some of the debate to rest in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*¹³ The Court held that the Federal Rules of Evidence superseded the *Frye* rule.¹⁴ The opinion, however, does permit the *Frye* standard of "general acceptance" to have some bearing on the inquiry into the admissibility of scientific evidence.¹⁵ The *Daubert* decision did not provide a new rigid standard of admissibility but left much discretion in the hands of the trial judge.¹⁶ Thus, new problems will emerge in future cases in defining the boundaries of that discretion.

This Comment discusses the special problems encountered in determining the admissibility of scientific evidence, the evolution of the *Frye* admissibility standard, its strengths and problems, the merits and drawbacks of other suggested admissibility standards, and the impact of the *Daubert* case on the ongoing debate.

II. *Frye v. United States*

A. *Outline of the Frye Decision*

*Frye v. United States*¹⁷ has been the dominant rule for admissibility of scientific evidence since its decision in 1923 by the Circuit Court of Appeals for the District of Columbia.¹⁸ The *Frye* rule requires that for the results of a scientific test to be admissible, the test "must be sufficiently established to have gained general acceptance in the particular field in which it belongs."¹⁹

12. See Giannelli, *supra* note 2.

13. 113 S. Ct. 2786 (1993).

14. *Id.* at 2794.

15. *Id.* at 2797.

16. *Id.* at 2799.

17. 293 F. 1013 (D.C. Cir. 1923).

18. McCORMICK, *supra* note 7, § 203, at 868-73; Giannelli, *supra* note 9, at 1200.

19. *Frye*, 293 F. at 1014.

In *Frye*, counsel for the defendant attempted to have an expert testify to the results of the systolic blood pressure deception test²⁰ that he had administered to the defendant prior to trial.²¹ The test operates on the theory that lying requires conscious effort, which can be observed as a rise in blood pressure.²² The government's counsel objected to the testimony, and the trial court sustained this objection.²³ Defense counsel's subsequent request to have the expert witness conduct the test in the presence of the jury was also denied.²⁴

The court recognized that a problem existed in determining exactly "when a scientific principle or discovery crosses the line between the experimental and demonstrable stages."²⁵ The court reasoned that the evidentiary value of the principle must be recognized somewhere between these two stages, 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."²⁶ The court, affirming the lower court, held that the systolic blood pressure deception test had not yet gained sufficient standing and scientific recognition to justify admitting expert testimony with respect to it.²⁷

The *Frye* rule requires courts to determine the status of the scientific principle in the relevant scientific community, the validity of the technique applying the principle, and the application of the technique under the specific circumstances involved.²⁸ General acceptance can be shown "by surveying scientific publications, judicial decisions, or practi-

20. The systolic blood pressure deception test was a form of "lie-detector" test used before the polygraph test was developed.

21. *Frye*, 293 F. at 1014.

22. *Id.*

23. *Id.*

24. *Id.*

Defense counsel outlined the basis of its argument that the testimony should be admissible as follows:

The rule is that the opinions of experts or skilled witnesses are admissible in evidence in those cases in which the matter of inquiry is such that inexperienced persons are unlikely to prove capable of forming a correct judgment upon it, for the reason that the subject-matter so far partakes of a science, art, or trade as to require a previous habit or experience or study in it, in order to acquire a knowledge of it. When the question involved does not lie within the range of common experience or common knowledge, but requires special experience or special knowledge, then the opinions of witnesses skilled in that particular science, art, or trade to which the question relates are admissible in evidence.

25. *Id.*

26. *Id.*

27. *Id.*

28. Giannelli, *supra* note 2, at 120.

cal applications, or by presenting testimony from scientists as to the attitudes of their fellow scientists.”²⁹

B. *Practical Problems with the Frye Rule*

The *Frye* rule has endured despite strong criticism about its restrictive nature. Professor Paul C. Giannelli has identified many of the difficulties that occur in applying the *Frye* test.³⁰

Rigid application of the *Frye* rule requires a court to await the passage of time until a new technique develops to the point that it becomes generally accepted.³¹ Giannelli argues that this waiting period causes a “cultural lag” while the technique is being developed, and the lag results in reliable evidence being excluded during the interim.³²

In addition, vague terms used in the rule, such as “scientific community” and “general acceptance,” have enabled courts to define the terms to suit their purposes in particular situations.³³ For example, when a court wants to admit evidence, it is free to define the scientific community narrowly to include only those experts who employ the scientific technique in question.³⁴ The term “general acceptance” has been defined as everything from “widespread; prevalent; extensive though not universal”³⁵ to agreement by a “substantial section of the scientific community.”³⁶

Professor Giannelli also raises the possibility that, under the *Frye* rule, courts may admit the results of a scientific technique merely because it meets the requirement of general acceptance, even if it is unreliable or inaccurate.³⁷ *Frye* operates under the assumption that the

29. McCORMICK, *supra* note 8, § 203, at 870; *see, e.g.*, State v. Superior Court, 718 P.2d 171, 180 (Ariz. 1986); Hammond v. State, 569 A.2d 81 (Del. 1989); Commonwealth v. Mendes, 547 N.E.2d 35, 39 (Mass. 1989); People v. Castro, 545 N.Y.S.2d 985, 995 (N.Y. Sup. Ct. 1989).

The *Frye* rule has been applied to testimony or evidence in numerous areas including “[p]olygraph, graphology, hypnotic and drug induced testimony, voice stress analysis, voice spectrograms, ion microprobe mass spectroscopy, infrared sensing of aircraft, retesting of breath samples for alcohol content, psychological profiles of battered women, and child abusers, post traumatic stress disorder as indicating rape, astronomical calculations, and blood group typing.” McCORMICK, *supra* note 14, § 203, at 869-70.

30. Giannelli, *supra* note 2.

31. *Id.* at 1223.

32. *Id.*

33. *Id.* at 1208-28.

34. *See, e.g.*, People v. Williams, 331 P.2d 251, 253-54 (Cal. App. Dep’t Super. Ct. 1958) (ruling that the *Frye* rule was satisfied by general acceptance of the Nalline test for narcotics use by those physicians involved in drug treatment, despite the prosecution’s concession that the technique was not generally accepted in the medical profession as a whole).

35. United States v. Zeiger, 350 F. Supp. 685, 688 (D.D.C.), *rev’d*, 475 F.2d 1280 (D.C. Cir. 1972).

36. United States v. Williams, 443 F. Supp. 269, 273 (S.D.N.Y. 1977).

37. Giannelli, *supra* note 2, at 1224-26.

scientific community will extensively test new scientific techniques before applying them—an assumption that will not always hold true.

While acknowledging *Frye*'s shortcomings, many courts continue to apply the rule for lack of a superior standard. Perhaps this is because a rigid standard may be best suited to protect the rights of criminal defendants and to prevent requiring them to defend themselves against unreliable evidence that carries undue authority and believability.³⁸ This argument fails, however, where it is the defendant who wants to introduce novel scientific techniques as exculpatory evidence and the *Frye* rule denies admissibility. In these circumstances, an issue may arise as to whether the defendant is being denied the ability to present a defense, especially if the reason for denying the admission of the defendant's evidence is merely because the scientific technique has not yet achieved general acceptance in the scientific community even if the evidence is not considered unreliable for any other reason.

III. FEDERAL RULE OF EVIDENCE 702

A. Generally

The Federal Rules of Evidence do not distinguish between the admissibility standards for scientific information and those for other expert testimony.³⁹ Rule 702 requires that a two-part test be met before expert testimony is admissible.⁴⁰ First, the court must determine whether the witness possesses the "knowledge, skill, experience, training, or education"⁴¹ in the relevant field. Second, the court must decide

Giannelli points to several other problems in applying the *Frye* rule including: the selectivity among courts in determining whether evidence derives from "novel" principles; the inadequacy of expert testimony on many scientific issues; an uncritical acceptance of prior judicial, rather than scientific, opinion as a basis for finding "general acceptance"; and the narrow scope of review by which some appellate courts review trial court rulings.

United States v. Downing, 753 F.2d 1224, 1236 (3d Cir. 1985) (citing Giannelli, *supra* note 2, at 1208-21).

38. A courtroom is not a research laboratory. The fate of a defendant in a criminal prosecution should not hang on his ability to successfully rebut scientific evidence which bears an "aura of special reliability and trustworthiness," although, in reality the witness is testifying on the basis of an unproved hypothesis in an isolated experiment which has yet to gain general acceptance in its field.

United States v. Brown, 557 F.2d 541, 556 (6th Cir. 1977).

39. Rule 702 of the Federal Rules of Evidence, Testimony by Experts, reads: "If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise." FED. R. EVID. 702.

40. Coleman v. Parkline Corp., 844 F.2d 863, 865 (D.C. Cir. 1988).

41. *Id.*

that the testimony offered by the expert will assist the trier of fact.⁴² Rule 104(a) is the standard used to make these decisions.⁴³ Rule 703, Bases of Opinion Testimony by Experts, allows an expert to base her opinion or inference on facts or data not otherwise admissible in evidence, if they are of a type reasonably relied upon by experts in the particular field.⁴⁴ The standard of reasonable reliance is a different threshold than that of general acceptance required by *Frye*.

The evidence rules appear to support a relevancy approach to the admissibility of scientific evidence.⁴⁵ The requirement that evidence must assist the trier of fact illustrates a liberal approach to admissibility.⁴⁶ But Rule 403 still can be used to exclude expert testimony if its probative value is outweighed by the likelihood that its admission would cause undue prejudice.⁴⁷ This determination is made pursuant to the trial court's broad discretion under Rule 104.⁴⁸

The Federal Rules of Evidence do not directly provide for *Frye* or any other test. But some support for this approach can be shown by the wording of Rule 702. The terms "scientific, technical or other specialized knowledge" may imply by definition that the evidence be reliable. The terms may also lend support for the *Frye* rule if they are read to imply that scientific knowledge, for example, refers to the *overall* knowledge of the field of science (that is, generally accepted ideas). If the Federal Rules of Evidence were intended to provide for *Frye* or a different admissibility test, they should be amended to support it clearly.

B. Proposed Amendments to Rule 702

In August 1991, proposed amendments to the Federal Rules of Evidence were published.⁴⁹ The preliminary draft contained the following proposed amended version of Rule 702:

Testimony providing scientific, technical, or other specialized infor-

42. *Id.*

43. Preliminary questions concerning the qualification of a person to be a witness, the existence of a privilege, or the admissibility of evidence shall be determined by the court, subject to the provisions of subdivision (b). In making its determination it is not bound by the rules of evidence except those with respect to privileges.

FED. R. EVID. 104(a).

44. FED. R. EVID. 703.

45. *Andrews v. State*, 533 So. 2d 841, 846 (Fla. 5th DCA 1988) (the Florida Evidence Code is based on the Federal Rules).

46. *Id.*

47. *United States v. Schmidt*, 711 F.2d 595, 599 (5th Cir.), *reh'g denied*, 716 F.2d 901 (5th Cir. 1983), *cert. denied*, 464 U.S. 1041 (1984).

48. *See supra* note 43.

49. COMMITTEE ON RULES OF PRACTICE AND PROCEDURE OF THE JUDICIAL CONFERENCE OF THE UNITED STATES, PRELIMINARY DRAFT OF PROPOSED AMENDMENTS TO THE FEDERAL RULES OF CIVIL PROCEDURE AND THE FEDERAL RULES OF EVIDENCE (August 1991).

mation, in the form of an opinion or otherwise, may be permitted only if (1) the information is reasonably reliable and will substantially assist the trier of fact to understand the evidence or to determine a fact in issue, and (2) the witness is qualified as an expert by knowledge, skill, experience, training, or education to provide such testimony. Except with leave of court for good cause shown, the witness shall not testify on direct examination in any civil action to any opinion or inference, or reason or basis therefor, that has not been seasonably disclosed as required by Rules 26(a)(2) and 26(e)(1) of the Federal Rules of Civil Procedure.⁵⁰

Although the Standing Committee eventually withdrew it, proposed Rule 702 was intended to "limit the use, but increase the utility and reliability" of scientific opinion testimony.⁵¹ The amendments included requirements that expert testimony be "reasonably reliable" and "substantially assist" the trier of fact.⁵² Rule 104(a) is used to determine whether the testimony is reasonably reliable, whether it will substantially assist the trier of fact, and whether the expert is sufficiently qualified to render the opinion.⁵³

Unfortunately, the term "reasonably reliable" is one subject to a multitude of interpretations and, as such, does not clarify the admissibility standard for scientific evidence. Even while consciously trying to escape *Frye*'s influence, the Committee ultimately defined "reasonably reliable" by deferring to the opinions of the expert community: the Committee notes specify that the revision is not a return to the *Frye* rule, and then oddly state that "the court is called upon to reject testimony that is based upon premises lacking any *significant support and acceptance within the scientific community*, or that otherwise would be only marginally helpful to the fact-finder."⁵⁴

Regardless of the Committee's desire to depart from *Frye*, requiring a degree of acceptance within the scientific community is a variation of the *Frye* rule. Perhaps the standard is more relaxed than *Frye*'s "general acceptance" requirement, but this definition still requires that the court define the relevant scientific community and determine the scientific technique or principle's acceptance level in that community. Reliance on the expert community's wealth of knowledge may be inevitable. But this reliance also means that many of the concerns regarding *Frye*'s shortcomings are not answered by the proposed amendments.

The goal of the proposed amendments was to curtail the use of

50. *Id.* at 83.

51. *Id.*

52. *Id.* at 84.

53. *Id.*

54. *Id.* (emphasis added).

expensive expert testimony with low marginal utility.⁵⁵ In civil cases, proposed Rule 702 would have required that the court limit the use of expert testimony before trial by balancing the "utility of the testimony against the time and expense involved."⁵⁶ These proposed amendments were an attempt to combat the perceived overuse of expert testimony in the courtroom—the "battle of the experts"—where each side produces an expert to testify in direct contradiction to the expert for the opposing party on every conceivable topic, whether necessary for the jury's understanding of the case or not. The Committee's task was difficult because the dual goals of reducing the use of expert testimony and easing the restrictive nature of the *Frye* rule are not easily reconciled.

IV. OTHER ADMISSIBILITY STANDARDS

A. United States v. Downing

In *United States v. Downing*,⁵⁷ the United States Court of Appeals for the Third Circuit rejected the *Frye* rule as "an independent controlling standard of admissibility."⁵⁸ The court held that the degree of acceptance of a particular scientific technique in the professional community is merely one factor the trial judge should consider in determining the admissibility of scientific evidence, but that it is not a necessary or sufficient condition to grant admissibility.⁵⁹

In *Downing*, the court held that the district court erred in refusing to admit the testimony of a psychologist offered by a criminal defendant regarding the reliability of eyewitness identification.⁶⁰ The court stated that the admission of this type of expert testimony "is not automatic but conditional. First, the evidence must survive preliminary scrutiny in the course of an in limine proceeding conducted by the district judge"⁶¹ The appeals court derived this requirement from the helpfulness standard of Rule 702.⁶² During the in limine proceeding, the judge is to balance two factors in making her determination: 1) the reliability of the scientific principles upon which the expert testimony is based; and 2) the likelihood that the admission of the testimony will mislead or overwhelm the jury.⁶³

55. *Id.* at 83, 84.

56. *Id.* at 84.

57. 753 F.2d 1224 (3d Cir. 1985).

58. *Id.* at 1237.

59. *Id.*

60. *Id.* at 1226.

61. *Id.*

62. *Id.*

63. *Id.*

Second, admission depends upon the "fit,"⁶⁴ that is, the direct applicability of the offered evidence to the specifics of the case at hand. The judge determines whether the "fit" of a particular piece of evidence is adequate by considering counsel's specific proffer showing that scientific research has established that particular features of the evidence involved support the inference for which the evidence is being offered.⁶⁵

The court also held that reliability should be the determining factor in the decision to admit evidence.⁶⁶ This approach is more flexible than the *Frye* rule because the court is not forced to wait until a scientific technique is sufficiently established before it is admissible.⁶⁷ In the case of novel scientific techniques with no proven "track record," a court may "look to other factors that may bear on the reliability of the evidence."⁶⁸ These factors include the qualifications and professional stature of expert witnesses, non-judicial uses of the scientific technique, the technique's relationship to more established modes of scientific analysis, and the existence of specialized literature dealing with the technique.⁶⁹

The factors identified by the court were to guide the district court judge in his or her ruling on the admissibility of expert testimony under Rule 702.⁷⁰ The court, however, did not provide concrete guidance regarding exactly how reliable evidence must be to be admissible and how exact a "fit" is required. Other courts that attempt to follow *Downing* likely will reach varied conclusions.

In reaching its decision, the court analyzed the different positions that courts have taken in dealing with the admission of novel scientific evidence.⁷¹ The court indicated that many courts follow *Frye* in requiring the underlying scientific technique to be generally accepted in the relevant scientific community.⁷² Other courts have sought to vary the *Frye* rule slightly to that of "reasonable scientific acceptance" or acceptance when the test's "accuracy and reliability have become established and recognized."⁷³ Another group of courts has argued that the Federal Rules of Evidence require a generalized relevancy approach similar to

64. *Id.*

65. *Id.*

66. *Id.* at 1238.

67. *Id.*

68. *Id.*

69. *Id.* at 1238-39.

70. The court further held that the district court's decision is reviewable under an abuse of discretion standard and that the district judge still retains discretionary authority to exclude the evidence under Rule 403 on the grounds that it would waste time or cause undue confusion. *Id.* at 1243.

71. *Id.* at 1232-33.

72. *Id.*

73. *Id.* at 1233.

the balancing test of Rule 403.⁷⁴

The court agreed with Professor Giannelli's position that adherence to *Frye* requires a court to make a preliminary determination regarding the status of the underlying scientific principle in the relevant scientific community, the validity of the technique employed to apply the principle, and the application of the technique in the particular circumstances in question.⁷⁵ Once the scientific technique has gained sufficient acceptance over a period of time, the court can proceed without the preliminary determination regarding the status of the scientific technique.⁷⁶

B. *McCormick Test*

Professor McCormick would judge the admission of scientific evidence by the "traditional standards of relevancy and the need for expertise—and nothing more."⁷⁷ This method can be referred to as 401/403 balancing because, in effect, it merely applies Rule 401, Definition of Relevant Evidence, and Rule 403, Exclusion of Relevant Evidence on Grounds of Prejudice, Confusion, or Waste of Time. In applying these rules, a court must determine, first, that the evidence is relevant⁷⁸ and, second, whether it should nonetheless be excluded on the specific grounds identified in Rule 403.⁷⁹

The McCormick view rejects the general acceptance standard as an unsuitable criterion for admissibility of evidence.⁸⁰ General acceptance by the scientific community would support the court taking judicial notice of scientific facts but is too rigid a threshold to be used to exclude evidence from the jury's consideration.⁸¹ Relevant conclusions supported by a qualified expert witness should be admissible unless a clear reason for exclusion exists, such as prejudicing or misleading the jury or consuming excessive time.⁸²

McCormick's test is advantageous because it avoids the *Frye* rule's awkward determinations of exactly when a scientific technique has

74. *Id.*

75. *Id.* at 1234. See Giannelli, *supra* note 2, at 1201.

76. *Downing*, 753 F.2d at 1234.

77. MCCORMICK, *supra* note 7, § 203, at 873-74.

78. With respect to scientific evidence, the relevance requirement appears to imply that the evidence must have scientific validity. See Brief for a group of American Law Professors as Amicus Curiae at 11-13, *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 113 S. Ct. 2786 (1993) (No. 92-102).

79. See *id.* at 13-14. Rule 403 provides: "Although relevant, evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence."

80. MCCORMICK, *supra* note 7, § 203, at 874-75.

81. *Id.*

82. *Id.* § 203, at 875.

become "generally accepted," how widespread the acceptance must be, what exactly must be generally accepted (the underlying principles or the technique itself), and to which "particular field" the technique belongs.⁸³ The McCormick test is more liberal than *Frye* because it does not require any particular level of consensus of scientific opinion before a particular scientific technique is admissible.⁸⁴ But the degree of consensus within the scientific community regarding the scientific technique or its application can still be used as one indicator of the scientific value of the evidence.⁸⁵ Professor McCormick believed that "the traditional balancing method focuses the court's attention where it belongs—on the actual usefulness of the evidence in light of the full record developed on the power of the scientific test."⁸⁶ Further, unlike *Frye* and other standards, McCormick's view considers the possibility for undue prejudice and excessive expense involved with the admission of the scientific evidence and requires balancing this with the probative value of the technique.⁸⁷

Some have deemed the relevancy approach an adequate standard for civil cases, while rejecting it for criminal cases in favor of the more rigid *Frye* rule.⁸⁸ The reason for the variance is that an erroneous verdict in a criminal trial may exact a greater social cost than in a civil case. Thus, application of the more lenient relevancy approach may increase the risk of admitting unreliable evidence into the decision making process.⁸⁹

Under the relevancy test, the party opposing admissibility (normally the defendant in a criminal case) bears the burden of showing unreliability, instead of the proponent (normally the prosecutor) carrying a significant burden of proving the reliability of a novel scientific technique.⁹⁰ Because scientific evidence often carries with it the "aura of infallibility" and can be sufficient to sway the jury's verdict, the increased burden for the accused is not acceptable to some.⁹¹

C. Substantial Acceptance

Many support relaxing the rigidity of the *Frye* rule and allowing

83. *Id.* § 203, at 874 (footnote omitted).

84. *Id.* § 203, at 875-76.

85. *Id.* § 203, at 876.

86. *Id.*

87. *Id.*

88. Giannelli, *supra* note 2, at 1246.

89. *Id.*

90. *Id.*

91. *Id.*

scientific evidence to be more readily admitted.⁹² Specifically, they suggest that the general acceptance standard of *Frye* be replaced by a substantial acceptance test.⁹³ The courts still would need to identify the relevant scientific community and then determine whether the particular technique had gained substantial acceptance by that community. "The difference between the 'general acceptance test' and the 'substantial acceptance test' is that while general acceptance implies acceptance by a majority if not a significant majority of those experts in the particular field, substantial acceptance clearly permits admissibility when acceptance is by a recognized minority segment."⁹⁴

The substantial acceptance standard was applied in *United States v. Torniero*⁹⁵ in determining that the defendant's compulsive gambling disorder was not relevant to his insanity defense.⁹⁶ The United States Court of Appeals for the Second Circuit recognized that because a professional consensus on mental health issues is rare, even a majority acceptance standard should not be required.⁹⁷ Instead, "[i]n fashioning its preliminary decision on relevance, a court must make a discretionary determination that the hypotheses relied upon have substantial acceptance in the discipline, as a basis for a finding that the disorder is relevant to the insanity defense."⁹⁸

The United States Court of Appeals for the Fourth Circuit reached a similar conclusion in *United States v. Gould*.⁹⁹ The court held that "the proper test of foundational relevance is whether the general scientific hypothesis of a putative causal relation between specific disorder and specific conduct has *substantial acceptance* in the relevant discipline."¹⁰⁰

Modifying the *Frye* rule into the substantial acceptance test would preserve the reliance on the scientific community's knowledge and opinions in determining the value of the evidence but would allow a more liberal approach to admissibility more in harmony with the Federal Rules of Evidence. Minority positions could still be recognized and considered and novel techniques would be accepted more quickly because the courts would not have to wait for general acceptance to be achieved. The substantial acceptance test would allow for a more uni-

92. MICHAEL H. GRAHAM, MODERN STATE AND FEDERAL EVIDENCE: A COMPREHENSIVE REFERENCE TEXT 329 (1989); MCCORMICK, *supra* note 7, § 203, at 873.

93. GRAHAM, *supra* note 92, at 329; MCCORMICK, *supra* note 7, § 203, at 873.

94. GRAHAM, *supra* note 92, at 329.

95. 735 F.2d 725 (2d Cir. 1984), *cert. denied*, 469 U.S. 1110 (1985).

96. *Id.* at 732.

97. *Id.* at 731.

98. *Id.* (footnote omitted).

99. 741 F.2d 45 (4th Cir. 1984).

100. *Id.* at 49.

form approach to admissibility because the test could be applied to both "hard" (forensic) science and "soft" (social) science, where general consensus is more rare. The same test could also be used in criminal and civil courts, eliminating any need for dual standards of admissibility.

D. *Impact of Other Standards on Frye*

The McCormick, *Downing*, and substantial acceptance tests have all had an impact on *Frye*. McCormick has increased the focus on the traditional notions of relevancy and the fact that they apply to novel scientific evidence as they do to any evidence.¹⁰¹ *Downing* provided for the admissibility of novel scientific evidence with no established "track record" if other indicia of reliability are present.¹⁰² Substantial acceptance has identified the fact that many scientific communities are unable to reach consensus regarding the validity of certain principles but that this should not exclude the entire profession's expertise from courts of law.¹⁰³

Although each new test addressed a weakness of *Frye*, each created other new problems of their own. *Frye* has likely endured because the opinion of the scientific community is the most reliable indicator of a scientific principle's validity.¹⁰⁴ After all, the reason for having expert testimony is that certain areas are outside the body of knowledge possessed by lay persons and a qualified person must serve as educator.¹⁰⁵ The experts, therefore, are the ones who are qualified to judge the information's validity before it is presented to lay persons for their consideration.

V. PROBLEM AREAS

A. *Reliability of the Laboratory*

Professor McCormick argued that, regardless of the standard of admissibility applied to scientific evidence, significant attention must be paid to arguments regarding the weight that scientific evidence should be given.¹⁰⁶ The value of scientific evidence can be undermined by many factors, including poor collection and analysis of data, introduction of subjective judgment in the scientific process, errors in cataloging

101. See *supra* notes 77-91 and accompanying text.

102. See *supra* notes 57-76 and accompanying text.

103. See *supra* notes 92-100 and accompanying text.

104. Those trained and knowledgeable in the specific area of expertise being testified to are the people best qualified to judge the value of the testimony.

105. FED. R. EVID. 702.

106. MCCORMICK, *supra* note 7, § 203, at 876-77.

and indexing information, and breaches in security of samples.¹⁰⁷

Errors in processing or interpreting results of scientific tests can be devastating. In fact, cases have been noted where admitted fingerprint evidence, which helped obtain murder convictions, was later found to be false.¹⁰⁸ Studies have revealed that the competency of many laboratories is surprisingly low.¹⁰⁹

DNA evidence has been heralded by TIME magazine as "foolproof,"¹¹⁰ and, indeed, many courts have admitted DNA evidence.¹¹¹ But a commercial laboratory which analyzes DNA samples, Cellmark, admitted making a false identification in a proficiency test and in another instance Cellmark and Lifecodes (another commercial laboratory) came to different conclusions using the same DNA sample.¹¹²

The reliability and acceptance level of scientific techniques are of little significance if laboratories do not employ safeguards to offer some assurance that their results are accurate. Rapid advancements in technology and the high cost of scientific equipment, combined with the limited resources of law enforcement agencies, laboratories, and defend-

107. *Id.* § 203, at 877.

108. *Imbler v. Craven*, 298 F. Supp. 795, 909-10 (C.D. Cal.), *aff'd*, 424 F.2d 631 (9th Cir. 1969), *cert. denied*, 400 U.S. 865 (1970); *see also* *State v. Caldwell*, 322 N.W.2d 574, 587 (Minn. 1982).

109. In 1978 the results of a Laboratory Proficiency Testing Program sponsored by the Law Enforcement Assistance Administration were reported. Over 200 crime laboratories participated in this program, which involved such common forensic examinations as firearms, blood, drug, and trace evidence analyses. The Report concluded: "A wide range of proficiency levels among the nation's laboratories exists, with several evidence types posing serious difficulties for the laboratories. . . ." Thus, although some laboratories performed exceptionally well, the performance of others was disturbing: "65 percent of the laboratories had 80 percent or more of their results fall into the acceptable category. At the other end of the spectrum, 3 percent of laboratories had less than 50 percent of their responses considered acceptable."

Paul C. Giannelli, *The Admissibility of Laboratory Reports in Criminal Trials: The Reliability of Scientific Proof*, 49 OHIO ST. L.J. 671, 688-89 (1988) [hereinafter Giannelli, *Laboratory Reports*] (footnotes omitted). Seventy-one percent of the crime laboratories tested provided unacceptable results in a blood test, 51.4% made errors in matching paint samples, 35.5% erred in a soil examination, and 28.2% made mistakes in firearms identifications. Similarly, a review of five handwriting comparison proficiency tests showed that the document examiners at best were correct 57% of the time and were incorrect 43% of the time. Paul C. Giannelli, *Criminal Discovery, Scientific Evidence, and DNA*, 44 VAND. L. REV. 791, 795 (1991) [hereinafter Giannelli, *Criminal Discovery*] (footnotes omitted). Unacceptable proficiency was most often attributed to: (1) misinterpretation of test results due to carelessness or inexperience; (2) failure to employ adequate or appropriate methodology; (3) mislabeling or contamination of primary standards; and (4) inadequate data bases or standard spectra. Giannelli, *Laboratory Reports*, *supra* at 688-89.

110. *DNA Prints: A Foolproof Crime Test*, TIME, Jan. 26, 1987, at 66.

111. *Andrews v. State*, 533 So. 2d 841 (Fla. 5th DCA 1988); *see also* *People v. Castro*, 545 N.Y.2d 985, 987 (N.Y. Sup. Ct. 1989).

112. Giannelli, *Criminal Discovery*, *supra* note 109, at 796-97.

ants and a lack of regulation of examiner qualifications, can only add to the problem. The trier of fact should be informed that a laboratory's procedures are an important consideration in judging the reliability of the outcome of a scientific process because of the possibility of erroneous test results.

B. Application of *Frye* to "Soft" Science

Frye seems to work best when dealing with forensic scientific information in a criminal court setting. Here, its conservative approach is often beneficial to the criminal defendant by preventing the state from admitting novel evidence alleged to link the defendant to the crime charged.¹¹³

Outside the criminal setting and forensic science application, *Frye* loses some of its appeal. Areas of mental health and various social sciences are less likely than forensic areas to reach the level of consensus required to meet *Frye*'s general acceptance requirement.¹¹⁴ Because the law should recognize the value of expertise in areas such as human behavior and other "soft" sciences, a more relaxed standard such as substantial acceptance, which would provide for the admissibility of minority positions in the community, seems better suited to screen evidence of this nature.

In *Bird v. State*,¹¹⁵ a capital murder case, the Alabama Court of Criminal Appeals held that the *Frye* rule was not applicable when a test applied by an expert is in the nature of a physical comparison rather than a scientific test or experiment. In *Bird*, a podiatrist sought to testify regarding his theory of shoeprint identification based on a comparison of shoe impressions found at the crime scene with shoes belonging to the defendant.¹¹⁶ The court shared the views of other jurisdictions when it determined that general acceptance in the scientific community is not required for testimony, such as shoeprint identification, which is neither based on advanced technology nor sophisticated scientific methods that are beyond the comprehension of the layperson.¹¹⁷

California state courts have distinguished between different types of scientific evidence and applied different standards of admissibility to them. In *People v. McDonald*,¹¹⁸ the California Supreme Court held that

113. *United States v. Brown*, 557 F.2d 541, 556 (6th Cir. 1977); Giannelli, *supra* note 2, at 1246.

114. *United States v. Torniera*, 735 F.2d 725, 731 (2d Cir. 1984).

115. 594 So. 2d 644, 649 (Ala. Crim. App.), *rev'd on other grounds*, 594 So. 2d 676 (Ala. 1990).

116. *Id.* at 646-47.

117. *Id.* at 649-50 (citing *State v. Hasan*, 534 A.2d 877, 881 (Conn. 1987)).

118. 690 P.2d 709 (Cal. 1984).

expert psychiatric opinion testimony and expert testimony regarding generalized factual information is not subject to the *Kelly-Frye* rule.¹¹⁹ The court reasoned that the rigidity of the *Kelly-Frye* rule was not necessary for testimony that could be considered the expert's personal opinion because jurors are naturally more skeptical of an opinion than they are of a scientific test or device, which carries with it the aura of infallibility.¹²⁰ Similarly, the *Kelly-Frye* rule is inapplicable where an expert merely testifies to published factual information because this is not an expert opinion that is beyond the common experience of the layperson.¹²¹

In determining when the *Kelly-Frye* rule is to be applied, the California courts distinguish between pure opinion testimony, as in *McDonald*, and opinion testimony based on a psychological profile or syndrome, as in *People v. Bledsoe*.¹²² The *Kelly-Frye* rule is not applicable to pure opinion testimony, but it is applicable if the opinion is based on a psychological profile or syndrome.

VI. PROGRESS SINCE *Frye*

A. *Andrews v. State*

*Andrews v. State*¹²³ involved the question of the admissibility of "genetic fingerprint" evidence.¹²⁴ In *Andrews*, the state admitted DNA print identification evidence to link the defendant to a sexual battery.¹²⁵ The test compared the defendant's DNA found in his blood with the DNA found in a vaginal swab taken from the victim shortly after the attack.¹²⁶ A corporation specializing in this technology ran the test and a doctor from the corporation testified to the results at trial.¹²⁷ The doctor testified that the two samples matched and stated that the percentage of the population that would have the DNA bands indicated by the sam-

119. *Id.* at 724. The California courts have referred to the *Frye* rule as the *Kelly-Frye* rule since the decision in *People v. Kelly*, 549 P.2d 1240 (Cal. 1976), where the California Supreme Court applied the *Frye* rule to voiceprint evidence.

120. *McDonald*, 690 P.2d at 723-24.

121. *Id.* However, the California Supreme Court still stands by its decision in *People v. Bledsoe*, 681 P.2d 291 (Cal. 1984), made six months prior to *McDonald*, where it held that the lower court had erred in allowing the prosecution to admit opinion evidence that a rape victim was suffering from rape trauma syndrome because it did not meet the *Kelly-Frye* rule.

122. 681 P.2d 291 (Cal. 1984); see *Flanagan v. Florida*, 586 So. 2d 1085, 1110 (Fla. 1st DCA 1991).

123. 533 So. 2d 841 (Fla. 5th DCA 1988), *reh'g denied*, 542 So. 2d 1332 (Fla. 1989).

124. The genetic fingerprint is a test in which strands of coding found in the genetic molecule of deoxyribonucleic acid (DNA) from tissue or body fluid samples taken from a crime scene are compared to the DNA molecules of the defendant for the purpose of identifying the defendant as the perpetrator of the crime. *Id.* at 842.

125. *Id.* at 843.

126. *Id.*

127. *Id.*

ples would be 0.0000012% or one in 839,914,540 people.¹²⁸

Because *Andrews* was a case of first impression with regard to the admissibility of DNA fingerprint results, the Fifth District Court of Appeal of Florida analyzed the test as a new scientific technique.¹²⁹ The court, however, was unsure regarding the standard for admissibility of new scientific techniques.¹³⁰ The court reiterated the *Frye* rule that scientific tests must be sufficiently established to have gained general acceptance in their field.¹³¹ But the court pointed out that although many courts still apply the *Frye* rule, others have criticized it for being too inflexible and inconsistent with modern evidence rules.¹³² The court cited as an example Chief Judge Ervin's commentary in *Hawthorne v. State*,¹³³ suggesting that *Frye* be rejected as a precondition to the admissibility of evidence relating to novel scientific techniques.¹³⁴

The court eventually concluded that the relevancy approach adopted in *Downing* should be applied.¹³⁵ The court stated that *Frye*'s main flaw was that its application could result in the exclusion of reliable evidence.¹³⁶ The relevancy approach was considered superior because it recognizes that relevancy is the crucial factor in determining the admissibility of any evidence and ensures "that only reliable scientific evidence will be admitted."¹³⁷

The *Andrews* court thought that the DNA results would be helpful to the jury and that the expert witnesses were qualified in molecular genetics.¹³⁸ The main issue the court addressed was the Rule 403 test: whether the probative value substantially outweighed the potential prejudicial effect of admitting the evidence.¹³⁹ The court then examined indicia of reliability from *Downing*. The court found that DNA technology had been used for a decade for various purposes in nonjudicial applications, much literature was published in the area, the technique had already been admitted in civil matters, the technique employed a long

128. *Id.*

129. *Id.*

130. *Id.*

131. *Id.*

132. *Id.* at 844.

133. 470 So. 2d 770 (Fla. 1st DCA 1985).

134. *Andrews*, 533 So. 2d at 844 (citing *Hawthorne*, 470 So. 2d at 783 (Ervin, C.J., concurring)).

135. *Andrews*, 533 So. 2d at 846-47.

136. *Id.*

137. *Id.* at 846.

138. *Id.* at 849. The court rejected the defendant's argument that the state's experts should not testify because they were biased by the fact that their careers and reputations were dependent upon the very DNA technology to which they were testifying. The court rejected this argument stating that neither *Frye* nor the rules of evidence require expert witnesses to be impartial. *Id.* at 849 n.9.

139. *Id.* at 849.

accepted statistical method of calculating probabilities, control samples were also used, and the error rate appeared low.¹⁴⁰ These significant indicia of reliability enabled the court to hold that the trial court did not abuse its discretion in allowing the DNA results admitted.¹⁴¹

B. Stokes v. State

In 1991, the Florida Supreme Court in *Stokes v. State*¹⁴² compared the *Frye* rule with other admissibility standards. The court concluded that *Frye* is still the superior admissibility standard and applied the test to exclude a witness's hypnotic and post-hypnotic statements.¹⁴³ The court specifically criticized the Rule 403 balancing test as being too flexible. By its nature, the Rule 403 balancing test would have to be applied on a case-by-case basis entailing a lengthy, expensive, and time-consuming process for the trial court every time admission was sought.¹⁴⁴ In addition, no guidelines were offered to apply the test properly.¹⁴⁵

VII. *DAUBERT V. MERRELL DOW PHARMACEUTICALS, INC.*

On June 28, 1993, the United States Supreme Court held in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*¹⁴⁶ that the *Frye* rule was superseded by the adoption of the Federal Rules of Evidence. In *Daubert*, two children, along with their parents, sued Merrell Dow Pharmaceuticals, Inc. in California state court alleging that the children's birth defects had been caused by their mothers' ingestion during pregnancy of an anti-nausea drug called Bendectin which was marketed by the defendant.¹⁴⁷ Merrell Dow removed the suits to Federal District Court in Los Angeles on diversity grounds.¹⁴⁸

Merrell Dow moved for summary judgment contending that Bendectin does not cause birth defects in humans and that the plaintiffs had no admissible evidence to prove that it does. Merrell Dow's motion included an affidavit from Dr. Steven H. Lamm, a physician and epidemiologist who is a respected expert on the risks associated with exposure to various chemicals.¹⁴⁹ Dr. Lamm conducted a review of all the

140. *Id.* at 849-50.

141. *Id.* at 850.

142. 548 So. 2d 188 (Fla. 1989).

143. *Id.* at 195.

144. *Id.* at 194-95.

145. *Id.*

146. 113 S. Ct. 2786 (1993).

147. *Id.* at 2791.

148. *Id.*

149. *Id.*

literature on Bendectin and birth defects and concluded that maternal use of Bendectin during the first trimester of pregnancy has not been shown to increase the risk of human birth defects. Not one in the more than thirty published studies involving more than 130,000 patients had found Bendectin to be a human teratogen.¹⁵⁰

The plaintiffs responded to the motion with the testimony of eight experts who had conducted their own tests and analysis and concluded that Bendectin can cause birth defects. Their conclusions were based on three areas of inquiry: 1) "in vitro" and "in vivo" animal studies that found a link between Bendectin and malformations; 2) pharmacological studies of the chemical structure of Bendectin, which purported to show similarities between the structure of the drug and that of other substances known to cause birth defects; and 3) the "reanalysis" of previously published epidemiological studies.¹⁵¹

The District Court granted Merrell Dow's motion for summary judgment after refusing to admit the plaintiffs' evidence for failure to meet the *Frye* rule of general acceptance in its field.¹⁵² The Court held that, given the quantity of epidemiological data regarding the effects of Bendectin, evidence that is not based on epidemiology is not admissible to show causation.¹⁵³ None of the plaintiffs' evidence was sufficient to raise a genuine issue of material fact regarding causation and the "reanalysis methodology" evidence was not admissible because it had not been published or subjected to peer review.¹⁵⁴

The United States Court of Appeals for the Ninth Circuit affirmed the lower court's ruling because the plaintiffs' evidence was not generally accepted in the relevant scientific community.¹⁵⁵ The Court of Appeals stated that the unpublished reanalyses are "particularly problematic in light of the massive weight of the original published studies supporting the defendant's position, all of which had undergone full scrutiny from the scientific community."¹⁵⁶

The plaintiffs appealed and the United States Supreme Court granted certiorari on October 13, 1992, "in light of sharp divisions among the courts regarding the proper standard for the admission of expert testimony."¹⁵⁷ The Court heard arguments on March 30, 1993.

150. *Id.* A human teratogen is "a substance capable of causing malformations in fetuses." *Id.*

151. *Id.* at 2791-92.

152. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 727 F. Supp. 570 (S.D. Cal. 1989), *aff'd*, 951 F.2d 1128 (9th Cir. 1991), *vacated*, 113 S. Ct. 2786 (1993).

153. *Id.* at 575.

154. *Id.*

155. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 951 F.2d 1128, 1129-30 (9th Cir. 1991), *vacated*, 113 S. Ct. 2786 (1993).

156. *Id.* at 1130.

157. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 113 S. Ct. 2786, 2792 (1993).

The defendant argued that no conflict exists between *Frye* and the Federal Rules of Evidence and that the two co-exist.¹⁵⁸ Merrell Dow pointed to Rule 104(a), which clearly delegates to the trial court the task of deciding all preliminary admissibility questions regarding scientific evidence and specifically states that the court is not bound by the rules of evidence in making its determination.¹⁵⁹ The defendant also stressed that Rule 403 authorizes the exclusion of relevant evidence on the grounds of unfair prejudice, confusion, or danger of misleading the jury.¹⁶⁰ The *Frye* rule merely insists upon evidence meeting a threshold of reliability before being admitted.¹⁶¹ The *Frye* rule supplies "the analytical tools for evaluating proffered scientific evidence pursuant to the mandate of Rules 104(a) and 403."¹⁶²

The plaintiffs argued that the adoption of the Federal Rules of Evidence superseded *Frye*. They argued that Rule 402 "carries out Congress's central goal of bringing uniformity and coherence to federal evidence law."¹⁶³ Further, *Frye* could not have survived the enactment of the evidence rules even if it had been universally accepted previously because the courts should not be permitted to enact a "judicial amendment to the Federal Rules of Evidence."¹⁶⁴

The Court agreed with the plaintiffs' arguments calling Rule 402¹⁶⁵ the "baseline" of the Federal Rules of Evidence.¹⁶⁶ The Court further reasoned that the Rule's standard of relevancy is liberal because Rule 401 defines relevant evidence as evidence that has "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."¹⁶⁷

The Court cited its earlier decision in *United States v. Abel*.¹⁶⁸ In

158. Respondents' Brief in Opposition at 11, *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 113 S. Ct. 2786 (1993) (No. 92-102).

159. *Id.*

160. *Id.*

161. *Id.*

162. *Id.*

163. Petition For Writ of Certiorari at 20, *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 113 S. Ct. 2786 (1993) (No. 92-102).

164. *Id.* at 22-23.

165. "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.

166. The Court vacated the judgment of the Court of Appeals and remanded the case for further proceedings. Justice Blackmun delivered the opinion of the Court.

167. FED. R. EVID. 401; *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 113 S. Ct. 2786, 2794 (1993).

168. 469 U.S. 45 (1984).

Abel, the Court considered the role of the common law in interpreting the Rules of Evidence and determined that the Rules occupy the field but the common law could serve as an aid to their application.¹⁶⁹ In *Abel*, however, the Court was considering a common law precept that was consistent with the Rules. But in *Daubert* the Court was confronted with Rule 702, which is not necessarily in harmony with the *Frye* rule on the admissibility of expert testimony.¹⁷⁰ The Court reasoned that given the Rules' liberal approach to admissibility and the existence of a specific rule on expert testimony that does not mention the general acceptance standard, the defendant's argument that the Rules assimilated *Frye* had to be rejected.¹⁷¹ The Court stated:

Nothing in the text of this Rule [702] establishes "general acceptance" as an absolute prerequisite to admissibility. Nor does [the defendant] present any clear indication that Rule 702 or the Rules as a whole were intended to incorporate a "general acceptance" standard. The drafting history makes no mention of *Frye*, and a rigid "general acceptance" requirement would be at odds with the "liberal thrust" of the Federal Rules and their "general approach of relaxing the traditional barriers to 'opinion' testimony."¹⁷²

The Court further stated that the *Frye* rule was incompatible with the Federal Rules of Evidence and should not be applied in federal trials.¹⁷³

The Court then discussed the limitations on the admissibility of scientific evidence and stated that trial judges are obligated, under Rule 702, to screen evidence to ensure that it is relevant and reliable.¹⁷⁴ The Court reasoned that Rule 702's requirement that an expert's testimony be based on scientific knowledge "clearly contemplates some degree of regulation of the subjects and theories about which an expert may testify."¹⁷⁵ Because there are no absolute certainties in science, the subject of scientific testimony need not be known to a certainty. But "in order to qualify as 'scientific knowledge,' an inference or assertion must be derived by the scientific method."¹⁷⁶

Furthermore, the Court stated that Rule 702's "helpfulness" stan-

169. *Id.* at 51-52.

170. "If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise." FED. R. EVID. 702.

171. *Daubert*, 113 S. Ct. at 2794.

172. *Id.* (citing *Beech Aircraft Corp. v. Rainey*, 488 U.S. 153, 169 (1988)).

173. *Daubert*, 113 S. Ct. at 2794.

174. *Id.* at 2795.

175. *Id.* "The adjective 'scientific' implies a grounding in the methods and procedures of science. Similarly, the word 'knowledge' connotes more than subjective belief or unsupported speculation." *Id.*

176. *Id.*

dard (that evidence must “assist the trier of fact”), “requires a valid scientific connection to the pertinent inquiry as a precondition to admissibility.”¹⁷⁷ This requirement was described in *United States v. Downing*¹⁷⁸ as having the proper “fit.”¹⁷⁹ The Court interpreted Rule 702 as a liberal standard giving an expert “wide latitude to offer opinions, including those that are not based on first-hand knowledge or observation.”¹⁸⁰ It assumed that the “expert’s opinion will have a reliable basis in the knowledge and experience of his discipline.”¹⁸¹ The Court stressed that a trial judge’s inquiry should be flexible and focused on the principles and methodology of the technique and not on the conclusions generated.¹⁸²

In addition, the Court discussed the manner in which trial judges are to determine the admissibility of scientific evidence:

Faced with a proffer of expert scientific testimony, then, the trial judge must first determine at the outset, pursuant to Rule 104(a), whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue. This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue. We are confident that federal judges possess the capacity to undertake this review.¹⁸³

The Court identified some of the factors that a judge may consider in making an admissibility determination, including the potential rate of error, whether a theory or technique can and has been tested, and whether it has been subjected to peer review and publication.¹⁸⁴ Publication is not a requirement for admissibility because some new, innovative theories and those of limited interest are often not published but may still be admissible. “The fact of publication (or lack thereof) in a peer-reviewed journal thus will be a relevant, though not dispositive, consideration in assessing the scientific validity of a particular technique or methodology on which an opinion is premised.”¹⁸⁵

In addition, the Court stated that the general acceptance of a theory within its relevant scientific community can be considered in making an admissibility determination. Citing *Downing*, the Court stated that

177. *Id.* at 2796.

178. 753 F.2d 1224 (3d Cir. 1985).

179. *Id.* at 1226. See *supra* part IV.A.

180. *Daubert*, 113 S. Ct. at 2796.

181. *Id.*

182. *Id.* at 2797.

183. *Id.* at 2796 (footnote omitted).

184. *Id.* at 2796-97.

185. *Id.* at 2797.

"[w]idespread acceptance can be an important factor in ruling particular evidence admissible, and 'a known technique that has been able to attract only minimal support within the community' may properly be viewed with skepticism."¹⁸⁶

The Court also addressed some of the concerns regarding the abandonment of the *Frye* rule. Addressing the defendant's concern that abandoning *Frye* would result in a "free-for-all" where ridiculous assertions would be freely admitted and confuse juries, the Court stated that the "traditional and appropriate means of attacking shaky but admissible evidence"¹⁸⁷ are sufficient safeguards.¹⁸⁸ Furthermore, the Court retained the power to grant summary judgment or direct a judgment when necessary. "These conventional devices, rather than wholesale exclusion under an uncompromising 'general acceptance' test, are the appropriate safeguards where the basis of scientific testimony meets the standards of Rule 702."¹⁸⁹

The opposite concern was expressed by the *Daubert* plaintiffs: allowing a judge the discretion to screen evidence and exclude what she considers to be invalid would result in a repressive scientific environment, hostile to innovation.¹⁹⁰ Addressing this concern, the Court recognized

that in practice, a gatekeeping role for the judge, no matter how flexible, inevitably on occasion will prevent the jury from learning of authentic insights and innovations. That, nevertheless, is the balance that is struck by Rules of Evidence designed not for exhaustive search for cosmic understanding but for the particularized resolution of legal disputes.¹⁹¹

Chief Justice Rehnquist, joined by Justice Stevens, concurred in part and dissented in part. They concurred in the decision that *Frye* was superseded by the adoption of the Federal Rules of Evidence but opposed the Court making further "observations" regarding the Rules.¹⁹² The Chief Justice and Justice Stevens believed that the observations were vague and abstract and that the Court should "proceed with great caution in deciding more than we have to."¹⁹³ The two Justices also specifically disagreed with some of the majority's observations, including the Court's conclusion that relevancy and reliability are the require-

186. *Id.* (citing *United States v. Downing*, 735 F.2d 1224, 1238 (3d Cir. 1985)).

187. *Id.* (i.e., cross-examination, introduction of contrary evidence, and careful jury instruction regarding the burden of proof).

188. *Id.* at 2798.

189. *Id.*

190. *Id.*

191. *Id.* at 2798-99.

192. *Id.* at 2799.

193. *Id.*

ments for the admissibility of expert testimony. Rule 402 does address relevancy but does not make reference to reliability.¹⁹⁴ Furthermore, they pointed out that the Court's dicta creates numerous questions when trial judges try to apply it to specific situations, especially when determining whether the dicta applies to technical and specialized knowledge or just to scientific knowledge.¹⁹⁵ While they acknowledged that Rule 702 gives judges some gatekeeping responsibilities, they worried that requiring judges to make determinations regarding the scientific validity of the reasoning or methodology underlying proposed testimony inappropriately and unnecessarily turns them into "amateur scientists."¹⁹⁶

In overruling *Frye*, the *Daubert* decision may have created more problems that it has solved. Although the holding clearly states that meeting the *Frye* rule is no longer a prerequisite for the admission of scientific evidence, trial judges may still consider the acceptance level of a scientific technique within its professional community. Furthermore, a court must view with skepticism those techniques enjoying only minimal support. Therefore, the *Frye* rule can be, and likely will continue to be, given strong consideration by many trial courts. It is more practical for a judge, untrained in the scientific field, to rely on the opinions of experts than to make an independent determination of the scientific validity of "the reasoning or methodology underlying the testimony" and "whether that reasoning or methodology properly can be applied to the facts in issue."¹⁹⁷ Although the Court expressed confidence in federal judges' capacity to undertake this task successfully, the trial courts' failure to effectively and consistently complete this task created the need for the Court's review in the first place. The Court has done little in *Daubert* to provide trial judges with the needed guidance to resolve this special admissibility problem.

Despite the Court's expressed intent to harmonize the admissibility standard with the liberal thrust of the Federal Rules of Evidence, whether courts will now be more receptive to minority positions than they would be with a substantial acceptance standard is unclear. The Court's observation that positions with minimal support in the relevant scientific community "may properly be viewed with skepticism" seems to indicate continued rejection of unpopular techniques.¹⁹⁸

The holding in *Daubert* is very similar to that of *United States v. Downing*,¹⁹⁹ because both allow the *Frye* general acceptance standard to

194. *Id.* at 2800.

195. *Id.*

196. *Id.*

197. *Id.* at 2796.

198. *Id.* at 2797.

199. 753 F.2d 1224 (3d Cir. 1985).

be considered as one factor in the judge's admissibility decision.²⁰⁰ In addition, both suggest as other indicia of reliability the ability of a technique to be tested or used in other applications and peer review and publication of specialized literature.²⁰¹ Both decisions view the reliability of a particular scientific technique to be key to its admissibility, despite the fact that the applicable Federal Rules of Evidence do not address reliability.²⁰² Further, neither court provides a method for trial judges to make such a determination.

Daubert has not resolved the dispute regarding the proper method of determining the admissibility of scientific evidence. In fact, *Daubert* may actually serve to intensify the debate because of the loss of a dispositive standard like the *Frye* rule.

VIII. CONCLUSION

The impact of *Frye v. United States* has been significant. Since the case was decided seventy years ago, *Frye*'s general acceptance test has been the dominant standard for determining the admissibility of novel scientific evidence. Although no longer dispositive, the *Frye* rule will still be considered and relied upon heavily by many courts even after the *Daubert* decision. *Daubert*, however, will now allow some evidence to be admissible where previously its failure to meet the general acceptance standard would have been dispositive.

Critics of *Frye* who argued that a more relaxed standard is required in all cases to avoid the exclusion of relevant evidence should be content with the *Daubert* decision because the degree of consensus in the scientific community (or lack thereof) is no longer dispositive. Genuine innovations in science are likely to be accepted more quickly because a court will not have to wait for widespread acceptance in the community before allowing a technique or testimony to be admissible.

Those who argued that courts were admitting too much "junk science" will no longer have the *Frye* rule to rely on as a screening threshold. They may, however be comforted by the requirement that factors other than general acceptance will have to be considered to justify the admission of purported "scientific" evidence.

The courts and the Federal Rules of Evidence still have not adequately addressed the lack of competency and accuracy that exists in many commercial and public laboratories that process and analyze scientific evidence. A determination of the proper admissibility standard is a moot endeavor if the evidence itself is suspect because of faulty proce-

200. *Daubert*, 113 S. Ct. at 2797; *Downing*, 753 F.2d at 1237-38.

201. *Daubert*, 113 S. Ct. at 2796-97; *Downing*, 753 F.2d at 1238-39.

202. *Daubert*, 113 S. Ct. at 2799; *Downing*, 753 F.2d at 1238-39.

dures. Therefore, validity of the procedures employed by the laboratory (including security of samples, re-testing, and use of control samples) should be a threshold question that must be satisfactorily answered before scientific evidence is admitted. The margin for error in the scientific process has not yet been acknowledged by the courts.

Future cases will likely test the bounds of the trial court's discretion in the admissibility of scientific evidence. If wide disparities continue to occur among courts, the United States Supreme Court will find itself revisiting the admissibility issue once again.

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