SCIENCE IN EVIDENCE: THE EFFECT OF *DAUBERT V. MERRELL DOW* ON ARIZONA'S *FRYE* RULE

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"Blinded by science the masses are duped and deceived..."
—Skyclad[1]

I. INTRODUCTION

Science has a potent, almost arcane significance in the modern world. The mention of its very name can presuppose ultimate truth, accuracy, and magical determination. Science is becoming increasingly important in the courtroom as well. Yet the standards for the admissibility of scientific evidence in different jurisdictions in this country are far from uniform. The various standards also have many flaws and difficulties in application.

In an attempt to settle the confusion in the federal courts, the United States Supreme Court recently decided *Daubert v. Merrell Dow Pharmaceuticals, Inc.*[2] In so doing, the Court explicitly rejected the seventy year-old test for the admissibility of scientific evidence which was established in *Frye v. United States.*[3] Prior to *Daubert,* scholars had criticized the relatively rigid *Frye* standard and courts in some jurisdictions had already ignored or rejected the *Frye test.*[4]

Arizona, however, continues to use the *Frye* rule to determine the admissibility of scientific evidence.[5] In the future, the Arizona Supreme Court or the Arizona Legislature will likely consider whether state courts should continue to adhere to *Frye,* or whether *Daubert* or another standard should replace it. This Note examines the implications of a scientific admissibility standard in civil and criminal litigation.[6] It discusses the recent *Daubert* decision;[7] the benefits and disadvantages of each standard;[8] considers possible alternatives for Arizona;[9] and ultimately suggests a novel approach to the admissibility of

1. SKYCLAD, *The Cradle Will Fall, on* THE WAYWARD SONS OF MOTHER EARTH (Noise Records 1990).
2. 113 S. Ct. 2786 (1993).
3. 293 F. 1013 (D.C. Cir. 1923). The *Frye* test required that to be admissible, scientific evidence must be generally accepted in its relevant scientific field.
4. *See infra* notes 38–47.
5. State v. Bible, 175 Ariz. 549, 858 P.2d 1152 (1993).
6. *See infra* notes 11–49 and accompanying text.
7. *See infra* notes 50–90 and accompanying text.
8. *See infra* notes 91–138 and accompanying text.
9. *See infra* notes 139–54 and accompanying text.

scientific evidence.[10]

II. IMPLICATIONS OF ADMISSIBILITY OF SCIENTIFIC EVIDENCE

The admissibility of scientific evidence is an increasingly important issue because of novel technological advances which can play a vital role in both civil litigation[11] and criminal prosecution.[12] Admissibility is vital because it can often determine the outcome of a judicial proceeding.[13]

A. Scientific Evidence in Toxic Tort Litigation

The admissibility of scientific evidence is an important and hotly contested issue is the area of toxic torts. In toxic tort litigation, the plaintiff must prove the liability of the defendant for an injury as a result of exposure to some toxin. The outcome of this type of litigation often depends on the admission of expert scientific opinion.[14] Causation is one of the major hurdles facing the plaintiff, and this is often proved by expert scientific testimony.[15] Furthermore, these cases involve complex proof and scientific data that are usually beyond the acumen of the average juror or judge. In fact, most states now require that plaintiffs in toxic tort actions prove the element of causation with expert testimony.[16]

Because of this nexus between expert testimony and causation, a stringent test for the admissibility of such expert testimony makes the plaintiff's burden of proof more onerous.[17] The restrictive *Frye* standard, current Arizona law,[18] exemplifies this difficulty for a plaintiff.[19] A more problematic issue is that

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10. *See infra* notes 155–58 and accompanying text.

11. *See infra* notes 14–20 and accompanying text.

12. *See infra* notes 21–30 and accompanying text.

13. The large number of amicus parties in *Daubert* indicates the importance that litigants assign to the standard of admissibility for scientific evidence. *See infra* note 66.

14. Stanley Pierce et al., *Expert Testimony in Technically Complex Litigation*, 7 COOLEY L. REV. 429, 429 (1990).

15. *See, e.g.*, Ayers v. Township of Jackson, 525 A.2d 287, 301 (N.J. 1987) (noting that "[b]y far the most difficult problem for plaintiffs to overcome in toxic tort litigation is the burden of proving causation.").

16. *See, e.g.*, Cottle v. Superior Court, 5 Cal. Rptr. 2d 882, 891 (1992). *See generally*, Alex R. DeSevo, *Rubanick v. Witco Chemical Corp. and Langrigan v. Celotex Corp.: The Admissibility of Expert Testimony in Toxic Tort Litigation*, 10 PACE ENVTL. L. REV. 423, 425 (1992).

17. N. Kathleen Strickland & Leah S. Elkins, *A Current Assessment of Frye in Toxic Tort Litigation*, 446 PLI/Lit 321 (1992), *available in* WESTLAW, JLR database. Strickland and Elkins noted with approval Rubanick v. Witco Chemical Corp., 593 A.2d 733 (N.J. 1991), which rejected the general acceptance test of reliability for toxic tort cases.
"Because to do otherwise would permanently deprive plaintiffs of any recovery. Due to latency...[sic] the high level of proof required before scientists accept a new theory, and the inability of science to fully comprehend carcinogenesis, plaintiffs in toxic cases may never recover." Strickland & Elkins, at *9.

18. The Arizona Supreme Court recently reaffirmed use of the *Frye* standard in State v. Bible, 175 Ariz. 549, 858 P.2d 1152 (1993). The court stated that "[b]oth before and after the adoption of the Arizona Rules of Evidence, we have used the Frye test in determining whether to admit new scientific evidence." *Id.* at 578, 858 P.2d at 1181. For a more detailed discussion of *Bible*, see *infra* notes 107–25 and accompanying text.

19. In *Daubert*, the Supreme Court made it clear that they felt this was the main problem with Frye, stating that "a rigid 'general acceptance' requirement would be at odds with the 'liberal thrust' of the Federal Rules.... That austere standard, absent from and incompatible with

different jurisdictions across the country (and until *Daubert*, different federal circuits) use different standards for the admission of scientific evidence. This creates an inequitable situation where the jurisdiction in which a plaintiff brings his claim may be outcome determinative.[20] Because the standard for scientific evidence is so important to toxic tort cases, it is appropriate that the Supreme Court used such a case to reject the continued use of *Frye*.

B. Scientific Evidence in Criminal Investigations

There has also been controversy over the admissibility of scientific expert testimony in the criminal arena. *Frye v. United States*[21], which formulated the original rule, was itself a criminal proceeding where the defendant sought to introduce the results of a polygraph test.[22] More recent cases have focused on novel identification and prosecutorial techniques. These include DNA testing in murder and sexual assault trials,[23] where scientists can determine the identity of an individual from blood, semen, and hair traces;[24] psychological interpretation of children's behavior in child abuse cases;[25] voiceprints or spectrographic identification;[26] psychological invalidation of confessions;[27] and evidence of chemicals in the body of the victim.[28] The ad-

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the Federal Rules of Evidence, should not be applied in federal trials." 113 S. Ct. at. 2794. For a more detailed discussion of *Daubert* see *infra* notes 50–90 and accompanying text.

20. *See, e.g.*, Rebecca L. Hunt, *The Need for an Appropriate Standard for Admission of Expert Witness Testimony in Toxic Tort Cases*, 16 AM. J. TRIAL ADVOC. 573 (1992) (urging a uniform standard of admissibility).

21. 293 F. 1013 (D.C. Cir. 1923).

22. For example, Watchtower discusses the object of *Frye* in their song "A Dangerous Toy", and in fact succinctly notes the results of unreliable evidence being admissible.

> A physiological change
> Assumes relation to the act of deceit
> Not legally accepted
> Human judgment is considered obsolete
> The slightest glitch proves fatal-if swallowed
> Calculated emotions and expressions
> Claims of accuracy diminish
> Inconclusive evidence left to its discretion

WATCHTOWER, *A Dangerous Toy*, CONTROL AND RESISTANCE (Noise Records 1989).

23. Ricardo Fontg, *DNA Fingerprinting: A Guide to Admissibility and Use*, 57 MO. L. REV. 501, 501 (1992).

24. *See* State v. Bible, 175 Ariz. 549, 858 P.2d 1152 (1993) (a DNA test was used to prove that blood found on the Defendant's shirt was that of the victim). For a further discussion of *Bible*, see *infra* notes 87–97 and accompanying text. *Also see* Fishback v. People, 851 P.2d 884 (Colo. 1993) (holding that DNA typing evidence was properly admitted under *Frye* in a sexual assault case); State v. Vandebogart, 616 A.2d 483 (N.H. 1992) (applying Frye and holding that DNA profiling analysis is generally accepted in its relevant scientific community). For a further discussion, see Joseph G. Petrosinelli, *The Admissibility of DNA Typing: A New Methodology*, 79 GEO. L.J. 313 (1990) and Ricardo Fontg, *DNA Fingerprinting: A Guide to Admissibility and Use*, 57 MO. L. REV. 501 (1992).

25. *See* Solano County Dep't of Social Servs. v. Ron B., 236 Cal. Rptr. 623 (1987) (holding psychological technique of detecting sexual abuse by observing a child's behavior with dolls was a novel scientific method of proof governed by the *Frye* standard).

26. *See* Reed v. State, 391 A.2d 364 (Md. 1978) (holding voiceprints inadmissible in a rape and unlawful use of a telephone prosecution because voice identification had not reached the required Frye standard of acceptance in the scientific community).

27. *See* People v. Burton, 590 N.Y.S.2d 972 (Sup. Ct. 1992) (holding that a psychologist's testimony analyzing Defendant's confession was inadmissible under *Frye*).

28. *See* Jones v. State, 716 S.W.2d 142 (Tex. 1986) (holding that gas chromatography mass spectrometry, used by the prosecution in a murder trial to find poison in a victim's body, had achieved the required general acceptance in the scientific community and thus was

missibility and reliability of scientific evidence is also at issue in DUI prosecutions, where the state uses both chemical analysis and other field sobriety tests[29] to determine blood alcohol levels.[30]

New methods of scientific proof are thus becoming increasingly important in determining the guilt or innocence of persons charged with serious crimes. Admissibility standards may well determine whether innocent people are put at risk of unfair conviction based on unreliable scientific proof, or whether guilty defendants may be set free when there is accurate evidence to convict them based on scientific techniques not yet generally accepted. Arizona's decision to follow *Frye, Daubert*, or another standard will thus have an important impact in these areas.

III. THE FRYE RULE FOR THE ADMISSIBILITY OF SCIENTIFIC EVIDENCE

Frye v. United States,[31] a very brief 1923 opinion from the District of Columbia Court of Appeals, established the traditional standard for the admissibility of scientific evidence. The rule adopted by the *Frye* court requires that the basis of an expert's testimony be generally accepted in the relevant scientific field in order to be admissible.[32] The *Frye* court found that a lie-detector test based on systolic blood pressure had not achieved the general acceptance necessary among experts in the fields of physiology and psychology and was thus inadmissible.[33] Many courts subsequently followed the *Frye* decision, and adopted this general acceptance rule.[34] It has been described by various courts as the majority rule in the states.[35]

Frye imposes a much more stringent requirement for the admissibility of

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admissible).

29. *See* State v. Superior Court, 149 Ariz. 269, 718 P.2d 171 (1986) (holding the Horizontal Gaze Nystagmus test used at the scene of an arrest by officers satisfied the *Frye* test and was thus admissible evidence in a DUI prosecution).

30. *See* State v. Velasco, 165 Ariz. 480, 799 P.2d 821 (1990) (holding that the silica gel method of breath testing to determine blood alcohol content met the general acceptance requirements of *Frye*); State v. Richards, 378 N.W.2d 259 (S.D. 1985) (holding the intoxilyzer breath testing machine met the requirements of *Frye* and was thus admissible); *accord,* People v. Gallagher, 503 N.Y.S.2d 500 (N.Y. 1986).

31. 293 F. 1013 (D.C. Cir. 1923).

32. The *Frye* Court of Appeals of the District of Columbia loosed these oft-repeated words onto the legal landscape:

> Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this 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.

293 F. at 1014.

33. *Id.*

34. MCCORMICK ON EVIDENCE, § 203, at 869 (John W. Strong, et al, eds.) (4th Ed. 1992).

35. *See, e.g.,* People v. Burton, 590 N.Y.S.2d. 972, 975 (Sup. Ct. 1992) ("other courts...still predicate the admission of scientific evidence on the *Frye* standard of general acceptance in the scientific community, and, to this day, it remains the majority rule in both federal and state courts."); State v. Vandebogart, 616 A.2d 483, 488 (N.H. 1992) ("[m]ost courts that have considered the admissibility of novel scientific evidence have adopted the *Frye* test.").

scientific evidence than exists for other expert testimony.[36] Ordinary expert testimony is subject only to the relevancy standard, which requires only that the offered testimony is relevant and not unduly prejudicial or misleading.[37]

The courts of many states have declined to follow the *Frye* decision, including Texas,[38] New Jersey,[39] Oregon,[40] and Delaware.[41] Other states have adhered to the *Frye* standard, including California,[42] Michigan,[43]New York,[44] Utah,[45] and Washington.[46] Until the Supreme Court decided *Daubert*, the federal circuits were split on whether or not the *Frye* general acceptance rule should be applied.[47]

The *Frye* rule has been criticized for its rigidity and lack of logical basis.[48] In fact, the Supreme Court described the debates over *Frye* as a "well-

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36. John W. Strong, *Language and Logic in Expert Testimony: Limiting Expert Testimony by Restrictions of Function, Reliability and Form*, 71 OR. L. REV. 349, 362 (1992).

37. M. Thaddeus Murphy, *The Admissibility of Scientific Evidence in Illinois*, 21 LOY. U. CHI. L.J. 935; *see also* FED. R. EVID. 401 and 403; ARIZ. R. EVID. 401 and 403.

38. Kelly v. State, 792 S.W.2d 579 (Tex. 1990) (noting general criticism of *Frye* in prior Texas cases, and rejecting it in favor of the relevancy standard).

39. Windmere, Inc. v. International Ins. Co., 506 A.2d 834, 839 (N.J. Super. 1986) (holding that "a particular degree of acceptance of a scientific technique within the scientific community is neither a necessary nor a sufficient condition for admissibility.").

40. State v. Brown, 687 P.2d 751 (Or. 1984) (holding that the *Frye* standard of general acceptance was too rigid, and only one factor to be applied within the confines of the basic requirements of their rules of evidence).

41. Nelson v. State, 628 A.2d 69 (Del. 1993) (holding that rather than being governed by the *Frye* rule, scientific evidence must instead satisfy the rules of evidence concerning scientific evidence).

42. People v. Kelly, 549 P.2d 1240 (Cal. 1976) (finding spectrograph testing was a novel method of proof and thus requiring general acceptance). *Accord,* People v. Diaz, 11 Cal. Rptr. 2d 353 (1992).

43. *See* People v. Young, 340 N.W.2d 805 (Mich. 1983); People v. Vettese, 489 N.W.2d 514 (Mich. Ct. App. 1992). *But see* People v. Young, 308 N.W.2d 194 (Mich. Ct. App. 1981) (trial court did not abuse discretion by allowing electrophoresis testing without requiring showing of general acceptance).

44. Department of Social Servs. v. Mark S., 593 N.Y.S.2d 142 (Fam. Ct. 1992) (holding that evidence of facilitated communication for an autistic child was inadmissible because testing was not introduced to satisfy the *Frye* test). *See Also* People v. Burton, 590 N.Y.S.2d 972 (Sup. Ct. 1992) (psychiatric testimony about acute grief syndrome inadmissible).

45. Kofford v. Flora, 744 P.2d 1343 (Utah 1987) (holding that *Frye* is still a valid test for determining the admissibility of scientific evidence, even though it is not necessarily the only valid test.).

46. State v. Cauthron, 846 P.2d 502, 505 (Wash. 1993) ("Although we recognize that several jurisdictions have rejected the *Frye* test in favor of a more liberal test of admissibility based on the relevance standard of the Federal Rules of Evidence, we continue to employ it.")

47. In Daubert v. Merrell Dow Pharmaceuticals, Inc., 113 S. Ct. 2786 (1993), the Supreme Court explained:

> We granted certiorari ... in light of sharp divisions among the courts regarding the proper standard for the admission of expert testimony. *Compare, e.g.*, United States v. Shorter, 257 U.S.App.D.C. 358, 363–364, 809 F.2d 54, 59–60 (applying the "general acceptance" standard), *cert. denied*, 484 U.S. 817, 108 S. Ct. 71, 98 L.Ed.2d 35 (1987), with DeLuca v. Merrell Dow Pharmaceuticals, Inc., 911 F.2d 941, 955...(rejecting the "general acceptance" standard).

Id. at 2792.

48. A leading evidence treatise describes *Frye's* precarious state as follows:

> A drumbeat of criticism of the *Frye* test provides the background music to the movement away from the general acceptance test. Proponents of the test argue that it assures uniformity in evidentiary rulings, that it shields juries from any tendency to treat novel scientific evidence as infallible, that it avoids complex, expensive and time–consuming courtroom dramas, and that it insulates the adversary system from novel evidence until a pool of experts is available to

established part of the academic landscape."[49] Despite this controversy, *Frye* has survived in many states, including Arizona, and until the *Daubert* decision, in the federal courts.

IV. THE *DAUBERT* DECISION AND ITS IMPLICATIONS FOR THE ADMISSIBILITY OF SCIENTIFIC EVIDENCE

A. The History of Daubert

Daubert v. Merrell Dow Pharmaceuticals, Inc.[50] involved two children born with serious birth defects. The plaintiffs, children represented by guardians ad litem, filed suit in federal court in California, claiming that those birth defects were caused by Bendectin,[51] a drug marketed by Merrell-Dow. After discovery, Merrell-Dow moved for summary judgment, claiming that the plaintiffs would be unable to produce any admissible evidence in support of their claim.[52] Merrell-Dow supported its motion with the affidavit of a doctor who had studied the literature and studies on Bendectin and concluded that Bendectin had not been shown to cause any birth defects.[53]

The plaintiffs supported their motion in opposition with the affidavits of eight experts.[54] These experts concluded that the drug had caused birth defects.[55] Nevertheless, the trial court granted the defendant's motion for summary judgment.[56] The court held that the scientific testimony offered by the plaintiffs' experts was inadmissible because it was based on a method not generally accepted in the relevant scientific community.[57]

The United States Court of Appeals for the Ninth Circuit affirmed the district court's entry of summary judgment.[58] It cited *Frye* and relied upon the

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> evaluate it in court.... Most commentators agree, however, that these objectives can be attained satisfactorily with less drastic constraints on the admissibility of scientific evidence.

MCCORMICK ON EVIDENCE, § 203, at 873 (John W. Strong, et al., eds.) (4th Ed. 1992). *See also* Paul C. Giannelli, *The Admissibility of Novel Scientific Evidence: Frye v. United States, a Half-Century Later*, 80 COLUM. L. REV. 1197 (1980).

49. Daubert v. Merrell Dow Pharmaceuticals, Inc., 113 S. Ct. 2786, 2793 (1993).

50. 113 S. Ct. 2786 (1993).

51. Bendectin is a prescription anti-nausea drug that the plaintiffs' mothers had taken during their pregnancies. *Id.* at 2791.

52. Daubert v. Merrell Dow Pharmaceuticals, Inc., 727 F. Supp. 570, 571 (S.D. Cal. 1989).

53. 727 F. Supp. at 573. For a detailed account of the litigation and studies of Bendectin, *see* Joseph Sanders, *The Bendectin Litigation: A Case Study in the Life Cycle of Mass Torts*, 43 HASTINGS L.J. 301 (1992). Sanders explains that so many epidemiological studies were done in the early 1980's because Bendectin was a "hot topic," and publication opportunities, federal funding, and litigation all prompted research. Sanders further explains that the decline in epidemiological studies after this was based on the withdrawal of the drug from the market, and a scientific consensus emerging that the drug was not especially unsafe. *Id.* at 348.

54. 727 F. Supp. at 573.

55. *Id.*

56. Daubert v. Merrell Dow Pharmaceuticals, Inc., 727 F. Supp. 570 (S.D. Cal. 1989).

57. *Id.* The trial court held that only epidemiological evidence was admissible to prove causation because of the vast body of such data existing on Bendectin. As a result, the plaintiffs' evidence of animal cell studies, live animal studies, and chemical structure studies was unacceptable. *Id.* While plaintiffs' experts had done reanalyses of other epidemiological studies, the results of these reanalyses were held inadmissible because they were not subject to peer review, and thus were not generally accepted. *Id.*

58. Daubert v. Merrell Dow Pharmaceuticals, Inc., 951 F.2d 1128, 1131 (9th Cir.

general acceptance standard to hold that the plaintiff's expert's methodology diverged from the accepted procedures of authorities in the field, and thus was not admissible.[59]

In contrast to the Ninth Circuit, other circuit courts have rejected *Frye*.[60] The Supreme Court granted certiorari to examine and try to eliminate this conflict between the circuits.[61]

B. The Daubert Majority Opinion

In a unanimous decision by Justice Blackmun, the Supreme Court in *Daubert* rejected the continued use of *Frye* in the federal courts.[62] Two justices dissented, however, as to what the new standard of scientific admissibility should be.[63]

The Supreme Court held that *Frye* had been superseded by the Federal Rules of Evidence.[64] The Court based its decision on three points. First, the Court noted that Rule 702 speaks explicitly to the requirements of scientific evidence and mentions nothing about general acceptance as a condition for admissibility.[65] Second, the Court pointed out that the drafting history of the rules makes no mention of the *Frye* standard.[66] Finally, the Court found the requirement of general acceptance contrary to the liberal thrust of the Federal Rules and their general goal of allowing broader introduction of opinion testimony.[67]

The Court's most difficult task in rejecting *Frye* was establishing a viable alternative. The new standard for admissibility is rather vague. The Court emphasized that their rejection of *Frye* did not mean that there were no limits on the admissibility of scientific evidence.[68] Rather, the Court stressed that a

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1991).

59. *Daubert*, 951 F.2d 1128. The Court of Appeals reasoned:

> For expert opinion based on a given scientific methodology to be admissible, the methodology cannot diverge significantly from the procedures accepted by recognized authorities in the field. If it does so diverge, it cannot be shown to be "generally accepted as a reliable technique," ... and a district court must exclude it.

Id. at 1130 (quoting United States v. Solomon, 753 F.2d 1522, 1526 (9th Cir. 1985)).

60. *See, e.g.*, Deluca v. Merrell Dow Pharmaceuticals, Inc., 911 F.2d 941 (3rd Cir. 1990). The *Deluca* court was explicit in its criticism: "[W]e explicitly reject[] ... the 'general acceptance' test of admissibility ... because [it is] too vague and malleable to yield consistent results, and because its nose-counting emphasis often led to the exclusion of helpful evidence in contradiction to the spirit of the Federal Rules." *Id.* at 955.

61. 113 S. Ct. 320 (1992).

62. Daubert v. Merrell Dow Pharmaceuticals, Inc., 113 S. Ct. 2786, 2793 (1993).

63. *Id.* at 2799–2800.

64. *Id.* at 2793. The Court held that the Federal Rules made all relevant evidence admissible, except for explicit exceptions in the Rules. Therefore, the Court stated that "[t]he Rule's basic standard of relevance is thus a liberal one." *Id.* at 2794.

65. *Id.* at 2794.

66. *Id.*

67. *Id.* The Court stated:

> Given the Rules' permissive backdrop and their inclusion of a specific rule on expert testimony that does not mention "general acceptance," the assertion that the Rules somehow assimilated Frye is unconvincing. Frye made "general acceptance" the exclusive test for admitting expert scientific testimony. That austere standard, absent from and incompatible with the Federal Rules of Evidence should not be applied in Federal trial.

Id.

68. *Id.* at 2794–95.

district judge must ensure that any admitted scientific evidence is both relevant and reliable.[69]

The Court hinged the new limitation upon a construction of Rule 702 of the Federal Rules of Evidence.[70] The majority stated that the words "scientific," "knowledge," and "assist" in Rule 702 all impose limitations.[71] The Court reiterated that the general scientific propositions that litigants seek to introduce must be based on a valid scientific method.[72] The Court further injected that since the evidence must assist the trier of fact under Rule 702, the scientific evidence must be valid and relevant to the facts in dispute in the case.[73]

The Court further identified some general considerations to assist judges in applying the two-pronged requirement of scientifically valid methodology and relevancy.[74] First, judges may consider whether or not a theory or technique is testable and if it has been tested.[75] Second, the Court cited as another relevant factor whether the proposed methodology has been subject to peer review or has been published.[76] The Court also mentioned that the possible rate of error in a technique should be considered.[77] Finally, perhaps unable to dispose of the *Frye* rule once and for all, Blackmun commented that the general acceptance standard *may* be considered in determining if scientific evidence is admissible.[78] Overall, the admissibility standard in *Daubert* is a very amorphous standard that places great discretion in the hands of trial judges.[79]

The Court tried to strike a balance between competing interests, as evinced by the amici briefs on both sides of this case.[80] Blackmun addressed fears that the abolition of the general acceptance requirement would mean an explosion of unreliable scientific evidence.[81] He reasoned that cross-examination, opposing evidence, and jury instructions were better means of

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69. *Id.* at 2795.

70. FED. R. EVID. 702 states: "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." (emphasis added).

71. 113 S. Ct. at 2795.

72. The Court stated that "[p]roposed testimony must be supported by appropriate validation—*i.e.*, 'good grounds,' based on what is known. In short, the requirement that an expert's testimony pertain to 'scientific knowledge' establishes a standard of evidentiary reliability." *Id.*

73. *Id.* at 2796.

74. Justice Blackmun, writing for the Court, commented: "We are confident that federal judges possess the capacity to undertake this review. Many factors will bear on the inquiry, and we do not presume to set out a definitive checklist or test. But some general observations are appropriate." *Id.*

75. *Id.*

76. *Id.* at 2797.

77. *Id.*

78. *Id.*

79. The Court stated that "[t]he inquiry envisioned by Rule 702 is, we emphasize, a flexible one." *Id.* at 2797.

80. Among those urging broader admissibility were: the American Trial Lawyers Association; the American Society of Law, Medicine, and Ethics; scientists such as Stephen Jay Gould and Gerald Holton; Texas; Montana; Idaho; and South Dakota. Eliot Marshal, *Supreme Court to Weigh Science*, 259 SCIENCE 588 (1993). The American Association for the Advancement of Science, the National Academy of Sciences, the American Medical Association, and others backed Merrell Dow and urged retention of the *Frye* standard. *Id.* Clearly with this kind of interest, the standard the Supreme Court would set down would have important ramifications in litigation.

81. 113 S. Ct. at 2798.

controlling the effect of potentially unreliable scientific evidence than the general acceptance restriction.[82] He also confronted the concerns of those who felt any role by the judge in determining the admissibility of evidence was too much and would stifle the search for truth.[83] Blackmun argued that the need for truth was overcome by a judicial need to make timely decisions in real legal disputes, and that the Federal Rules required such a balance to be struck.[84]

C. The Dissent in Daubert

Chief Justice Rehnquist concurred in part and dissented in part.[85] He agreed with rejecting the *Frye* test, but criticized the court for what he considered unnecessary dicta in explaining how judges should decide questions of admissibility.[86] He further disagreed with the majority's dictatious considerations that reliability is required by the rules to admit evidence.[87]

Rehnquist pointed out several potential weaknesses in the majority's decision. He questioned whether the *Daubert* standards apply to the technical and other types of expert testimony mentioned in Federal Rule 702, in addition to scientific evidence.[88] Moreover, he noted no distinction in Rule 702 between these different types of evidence to suggest they should be subjected to different standards.[89] Rehnquist also wryly pointed out the difficulty of judges trying to perform the quasi-scientific role of determining the validity of the scientific theories offered in their courtrooms.[90]

D. Questions Remaining After Daubert

The exact contours of the *Daubert* rule are now difficult to discern, because it is impossible to predict how the courts will apply it. There are several potentially problematic issues to be resolved. First, how will trial judges assess the validity of scientific method through falsifiability and other such arcane factors? Second, courts must determine how much weight the factors mentioned by the Court have in determining the admissibility. For example, general acceptance of a technique, while no longer a necessary prerequisite to admission, could be considered a sufficient condition for admissibility. This would allow profferers of evidence the same method of laying the foundation for expert testimony that they would have had under *Frye*. Finally, it remains to be seen whether this new standard will really be an improvement over *Frye*. The Arizona Supreme Court must consider all these factors if it concludes the *Daubert* decision is persuasive enough to justify a reinterpretation of Arizona's

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82. *Id.*
83. *Id.*
84. *Id.* at 2799.
85. *Id.* at 2799.
86. Rehnquist noted that:

> "General observations" by this Court customarily carry great weight with lower federal courts, but the ones offered here suffer from the flaw common to most such observations—they are not applied to deciding whether or not particular testimony was or was not admissible, and therefore they tend to be not only general, but vague and abstract.

Id. at 2799.
87. *Id.* at 2800.
88. *Id.*
89. *Id.*
90. "I defer to no one in my confidence in federal judges; but I am at a loss to know what is meant when it is said that the scientific status of a theory depends on its 'falsifiability,' and I suspect some of them will be too." *Id.* at 2800.

scientific evidence rule.

V. THE ADMISSIBILITY OF SCIENTIFIC EVIDENCE IN ARIZONA

A. The Frye Rule in Arizona

Whatever rule Arizona decides to adopt in the future, it is clear that *Frye* is currently the law in determining the admissibility of scientific evidence in Arizona.[91] The Arizona Supreme Court has consistently adhered to *Frye* and has noted the lack of any viable alternatives.[92] The supreme court has also praised *Frye* for its efficiency in having evidence evaluated by those in the best position to do so—the scientists in the relevant scientific field.[93]

Frye has been used in criminal cases to admit field sobriety tests in driving under the influence cases,[94] lie detector tests under stipulation,[95] and bite mark analysis.[96] It has also been widely accepted in civil cases,[97] including a case where computer simulation was used to recreate an accident.[98] In toxic tort cases, however, the court has held that a plaintiff's scientific evidence may be a scientific hypothesis of causation, rather than a procedure or technique, and thus not have to meet the requirements of *Frye*.[99]

The application of *Frye* in Arizona is fairly straightforward and typical.[100] Arizona courts have not limited *Frye* to only scientific evidence.

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91. In State v. Mena, 128 Ariz. 226, 624 P.2d 1274 (1981) the court held that "a scientific principle must have gained general acceptance in the particular field in which it belongs in order to be accepted by a court as fact." *Id.* at 231, 624 P.2d at 1279. *Accord* Starr v. Campos, 134 Ariz. 254, 257, 655 P.2d 794, 797 (Ct. App. 1982) ("the 'general acceptance' or 'Frey' [sic] standard has been severely criticized by evidence commentators,... the recent opinion of our supreme court in Mena leaves little doubt that this is law in Arizona.").

92. *See, e.g.*, State *ex rel.* Collins v. Superior Court In and For the County of Maricopa, 132 Ariz. 180, 644 P.2d 1266 (1982). The court in *Collins* said: "Frye has been in use for almost 60 years without the development of any alternative as a general test of reliability. No such alternative has been seriously suggested in the cases or in the literature, nor does any occur to the court." *Id.* at 196, 644 P.2d at 1282.

93. State v. Superior Court In and For the County of Cochise, 149 Ariz. 269, 277, 718 P.2d 171, 177 (1986).

94. *See* State v. Superior Court In and For the County of Cochise, 149 Ariz. 269, 718 P.2d 171 (1986) (*Frye* applies to any new technique that utilized scientific principles, and the Horizontal Gaze Nystagmus test is admissible under this standard to corroborate or attack blood alcohol levels).

95. State v. Valdez, 91 Ariz. 274, 371 P.2d 894 (1962).

96. State v. Richards, 166 Ariz. 576, 804 P.2d 109 (Ct. App. 1990).

97. *See, e.g.*, Troutman v. Valley Nat'l Bank of Arizona, 170 Ariz. 513, 826 P.2d 810 (Ct. App. 1992). Here the Court of Appeals, while unsure of *Frye*'s continuing strength, found that a thermographic medical exam met its requirements nonetheless and was admissible in a personal injury case. *Id.* at 518, 826 P.2d at 816.

98. Starr v. Campos, 134 Ariz. 254, 655 P.2d 794 (Ct. App. 1982).

99. Baroldy v. Ortho Pharmaceutical Corp., 157 Ariz. 574, 760 P.2d 574 (Ct. App. 1988).

100. *See, e.g.*, State *ex rel.* Collins v. Superior Court In and For the County of Maricopa, 132 Ariz. 180, 644 P.2d 1266 (1982). The court in *Collins* said:

> Under the Frye rule, once the court determines the reliability of the procedure under the test of general acceptance, evidence resulting from use of the particular technique is admissible, subject to a foundational showing that the expert was qualified, the technique was properly used, and the results were accurately recorded.

Id. at 196, 644 P.2d at 1282.

Rather, they have traditionally applied it to any evidence which is likely to have a great effect on the resolution of a factual controversy.[101] Arizona's Supreme Court accepted this rational in *State v. Roscoe*[102] where it decided that the *Frye* test, while valid, was not applicable to dog tracking. It held that dog tracking was not based on a scientific theory concerning dogs' abilities, but on an expert's experience working with dogs, which is more easily analyzed by a jury.[103] Thus it would not have a great enough effect on resolving the controversy to invoke the strict *Frye* requirements.[104]

Although *Frye* seems to have had its own general acceptance in Arizona, more recent cases have cast doubt on *Frye*'s continued viability.[105] The future of *Frye* seems particularly in question after *Daubert*, because in *Daubert* the Supreme Court relied upon the Federal Rules of Evidence to overturn *Frye*, and Arizona has adopted Federal Rule of Evidence 702 as its own Rule of Evidence 702.[106]

B. The Future of the Admissibility of Scientific Evidence in Arizona

In the wake of *Daubert*, a recent Arizona case discussed change in Arizona's *Frye* rule. In *State v. Bible*[107] the court discussed the possibility of altering the admissibility standard in the context of DNA testing in a heinous murder case.

At trial, the prosecution sought to introduce DNA tests that matched blood found on the defendant's shirt with the victim's blood.[108] The trial court admitted the DNA testing under *Frye* after finding that DNA testing is generally accepted in the relevant scientific community.[109] Based partly on this

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101. MORRIS K. UDALL ET AL., ARIZONA PRACTICE: LAW OF EVIDENCE, § 102, at 211–12 (1991). This treatise describes it as "any technique that in its application is likely to have an enormous effect in resolving completely a matter in controversy must be demonstrably reliable." *Id.* at 212.

102. 145 Ariz. 212, 700 P.2d 1312 (1984). The court quoted the language verbatim from the Udall treatise as the "discernible thread distinguishing what is rigorously scrutinized as scientific evidence." *Id.* at 219, 700 P.2d at 1319.

103. *Id.* at 220, 700 P.2d at 1320.

104. *Id.*

105. Troutman v. Valley Nat'l Bank of Arizona, 170 Ariz. 513, 826 P.2d 810 (Ct. App. 1992). Here the court summarily held that there was no need to apply *Frye* because the defense offered no evidence showing that a thermogram test was not accepted. But in a curious footnote, the court stated:

> Because of the difficulty in applying a "Frye" test, a number of courts have modified the rule. We deal with the admissibility of the scientific evidence, not its credibility. Although Frye is not explicitly rejected in Arizona, we feel the focus should be a balancing between probativeness, materiality [sic] and reliability against the evidence's tendency to unfairly prejudice the other party.

Id. at 518 n.2, 826 P.2d at 815 n.2. This test seems to be more vague than even the *Daubert* decision and is also at odds with the general thrust of cases in Arizona. *See also* State v. Olivas, 77 Ariz. 118, 119, 267 P.2d 893, 894 (1954) ("scientific disagreement affects only the weight and not the *admissibility* of evidence" (emphasis added)).

106. ARIZ. R. EVID. 702 is identical to FED. R. EVID. 702: "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."

107. State v. Bible, 175 Ariz. 549, 858 P.2d 1152 (1993).

108. *Id.* at 562, 858 P.2d at 1165.

109. *Id.* at 576, 858 P.2d at 1179.

evidence, the defendant was convicted and sentenced to death.[110]

On appeal to the Arizona Supreme Court, the defendant argued that the DNA testing did not satisfy the general acceptance requirement.[111] Before considering the merits of this argument, the court addressed what standard it *should* use to decide the admissibility of scientific evidence.[112] It first emphasized that *Frye* has been the traditional standard of admission in Arizona, both before and after the adoption of the Arizona Rules of Evidence.[113]

The court next considered the State's argument that *Frye* should be abandoned.[114] The court looked at the benefits of *Frye* and noted the importance of caution in admitting scientific evidence, because of the risk of admitting evidence which may be inaccurate or which may unduly influence the jury.[115] It also acknowledged that the *Frye* rule helped establish uniformity of admissibility rulings and saved judicial time by reducing the evidentiary presentations in cases where a process had already been accepted.[116] The court also considered the shortcomings of *Frye*.[117]

The Arizona court considered the *Daubert* decision and its recognition of the infamous flaws of *Frye*.[118] The court emphasized that it was not *bound* by *Daubert* since the Supreme Court in *Daubert* was only interpreting federal law and not the Constitution.[119] The court also noted the substantial difference in how courts interpret the Arizona and Federal Rules of Evidence.[120] Unlike the Federal Rules, which Congress established by statute, Arizona's rules were enacted by the state supreme court itself.[121] Thus, the court noted it could rely not only on the text of those rules, but also on its own intent in adopting those rules.[122]

Bible ultimately left the future of Arizona's evidence standard with more of a sense of suspense than change. The court, after all its deliberations on *Frye*, *Daubert*, and scientific evidence, held that "this is not the case to determine whether Arizona should follow *Daubert*."[123] The court decided that the field of DNA matching was such a complex and evolving scientific field that it would be a poor choice to use DNA matching as a vehicle to overrule *Frye*.[124] The court went on to hold that DNA matching did meet *Frye* standards

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110. *Id.*
111. *Id.* at 577, 858 P.2d at 1180.
112. *Id.*
113. *Id.* at 578, 858 P.2d at 1181.
114. *Id.*
115. *Id.*
116. *Id.*
117. *Id.* at 579, 858 P.2d at 1182. The court referred to the criticisms of *Frye* made by MCCORMICK ON EVIDENCE, *supra* note 48, § 203, at 873. The court echoed that *Frye* could be unnecessarily rigid and that its objectives could be reached with less rigid limitations. The court noted that McCormick suggests that courts look to reliability or validity, and that only relevancy and a need for expertise should control the decision to admit evidence. According to McCormick, as quoted by the court, this avoids the quagmire of what exactly is scientific that both *Frye* and *Daubert* still present. 175 Ariz. at 579, 858 P.2d at 1182.
118. *Bible*, 175 Ariz. at 579, 858 P.2d at 1182.
119. *Id.* at 580, 858 P.2d at 1183.
120. *Id.* at 579–80, 858 P.2d at 1182–83.
121. *Id.*
122. *Id.*
123. *Id.* at 580, 858 P.2d at 1183.
124. *Id.* The court held that "the difficulties of addressing the technology used in this case may well promote an evidentiary rule not suitable for many other types of cases."

and was thus admissible.[125] Although it technically left the *Frye* standard intact, the court seemed to merely postpone defining a new standard rather than affirming the old one.

VI. BENEFITS AND SHORTCOMINGS OF *FRYE*

A. Benefits of the Frye Standard

Despite its critics, there is some merit in *Frye's* basic conservatism and relatively simple application. Moreover, it does help ensure the reliability of scientific testimony admitted in court. *State v. Roscoe*[126] and other cases emphasize that the most important benefit of *Frye* is that it keeps a jury from being misled by unproven and potentially unsound scientific methods.[127]

Frye also avoids the potential *Daubert* problem of lay judges examining and evaluating scientific techniques.[128] Arizona cases have previously asserted that the general acceptance requirement is more appropriate because it ensures that those best qualified to evaluate and judge a theory will determine its admissibility.[129] *Frye* is also a beneficial rule insofar as it ensures uniform decisions.[130] It also helps assure that there will be an adequate supply of expert witnesses.[131]

B. Disadvantages

Commentators have long criticized the *Frye* test for its shortcomings. Its greatest perceived weakness is its unduly conservative nature which can keep relevant and reliable testimony out of a proceeding.[132] *Frye* also can allow

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125. *Id.* at 590, 858 P.2d at 1193.

126. 145 Ariz. 212, 219, 700 P.2d 1312, 1319 (1985).

127. *See also* People v. Kelly, 549 P.2d 1240, 1245 (Cal. 1976) ("The primary advantage ... of the *Frye* test lies in its essentially conservative nature.... *Frye* was deliberately intended to interpose a substantial obstacle to the unrestrained admission of scientific evidence based upon new scientific principles.").

128. *See supra* note 75 and accompanying text.

129. *See* State v. Superior Court, 149 Ariz. 269, 718 P.2d 171 (1986). Here, the court stated "Frye guarantees that reliability will be assessed by those in the best position to do so: members of the relevant scientific field who can dispassionately study and test the new theory." *Id.* at 277, 718 P.2d at 179. *Cf.* Strong, *supra* note 36, at 366 ("*Frye* does, however, possess a notable and frequently noted virtue—the fact on which it turns may be intelligently determined by judges with little or no scientific training. Any rule seriously offered as an alternative to *Frye* must possess this virtue."); United States v. Addison, 498 F.2d 741, 743–744 (D.C. Cir. 1974) ("The requirement of general acceptance in the scientific community assures that those most qualified to assess the general validity of a scientific method will have the determinative voice.").

130. As previously noted, the *Bible* court recognized the uniformity benefit. *See supra* note 116. Specifically, the court stated "[o]ther benefits of Frye are uniformity of evidentiary rulings and avoiding complex evidentiary presentations in succeeding cases after a particular principle is judicially recognized." State v. Bible, 175 Ariz. 549, 578, 858 P.2d 1152, 1181 (1993). *See also* People v. Kelly, 549 P.2d 1240, 1244 (Cal. 1976) (describing uniformity in rulings as an advantage of the *Frye* test).

131. Several courts and commentators have recognized this benefit. *See, e.g.*, United States v. Addison, 498 F.2d 741, 744 (D.C. Cir. 1974) ("Additionally, the Frye test protects prosecution and defense alike by assuring that a minimal reserve of experts exists who can critically examine the validity of a scientific determination in a particular case."); Jones v. State, 716 S.W.2d 142, 145 (Tex. 1986); Giannelli, *supra* note 48, at 1207 (1980); Mark McCormick, *Scientific Evidence: Defining a New Approach to Admissibility*, 67 IOWA L. REV. 879, 883 (1982).

132. *See, e.g.*, United States v. Sample, 378 F. Supp. 44, 53 (E.D. Pa. 1974) ("The

scientific techniques to be admitted despite the fact that they are clearly faulty, as long as they are long standing practices.[133] Other critics have argued that *Frye* has been applied too selectively, and thus inconsistently.[134] Still others object because it requires a higher standard than that required for non-scientific expert testimony.[135]

Besides these policy criticisms, *Frye* can be difficult for courts to apply. First, determining exactly what is considered scientific evidence is itself a problem.[136] A second difficulty in application is how narrowly or broadly to define the relevant scientific community.[137] A third is the level of agreement necessary to constitute general acceptance.[138]

Overall, *Frye* has many weaknesses and difficulties in application. But perhaps it has been so enduring because other alternatives may be even more inefficient, unjust, or difficult to apply. Nevertheless, based on the language in *Bible*, Arizona seems primed to rework *Frye* in some fashion.

VII. ARIZONA'S ALTERNATIVES TO *FRYE*

The *Daubert* standard is one of the options the Arizona Supreme Court could consider as a possible substitute for *Frye*. As previously noted however, Arizona is not bound by the *Daubert* decision.[139] Nevertheless, the Supreme Court in *Daubert* relied upon the Federal Rules of Evidence to create the federal standard of admissibility.[140] Since Arizona adopted the Federal Rules as

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Frye test of general acceptance in the scientific community precludes too much relevant evidence for purposes of the fact determining process at a revocation hearing.); Giannelli, *supra* note 48, at 1123 ("If ... alternative approaches exist, then the conservatism implicit in the *Frye* test is not an 'advantage,' but rather an unjustified obstacle to the truth-determining process."); MCCORMICK ON EVIDENCE, *supra* note 34, § 203, at 363 ("Most commentators agree...that [*Frye's*] objectives can be attained satisfactorily with less drastic constraints on the admissibility of scientific evidence.). *Daubert* itself observed that this conservatism conflicts with the modern liberal standard of evidence embodied in the *Federal Rules of Evidence*. *See supra* note 60 and accompanying text. *See also* State v. Hall, 297 N.W.2d 80, 84 (Iowa 1980).

133. *See* Andre A. Moenssens, *Admissibility of Scientific Evidence-An Alternative to Frye*, 25 WM. & MARY L. REV. 545 (1984) (discussing the long acceptance of the silver nitrate test despite its inaccuracy).

134. *See* John W. Osbourne, *Judicial/Technical Assessment of Novel Scientific Evidence*, 1990 U. ILL. L. REV. 497, 507.

135. MCCORMICK ON EVIDENCE, § 203, at 488–89 (John W. Strong, ed.) (2d ed. 1972).

136. In Arizona, the basic characteristic of evidence to which the more rigorous standard of general acceptance is applied is not that it is simply scientific, but its application is likely to have a great effect on resolving a factual controversy. State v. Roscoe. 145 Ariz. 212, 217, 700 P.2d 1312, 1318 (1985); UDALL, *supra* note 101. This is a far from concrete standard in troublesome cases, and often defining something as scientific evidence or as merely expert testimony could likely influence the outcome of the case.

137. Jones v. State, 716 S.W.2d 142, 146 (Tex. 1986). *See also* McCormick, *supra* note 131.

138. Arizona cases have indeed demonstrated the difficulty and ambiguity of deciding what level of agreement in the relative community actually constitutes general acceptance. *Compare* State v. Superior Court, 149 Ariz. 269, 279, 718 P.2d 171, 181 (1986) ("The 'general acceptance' requirement does not necessitate a showing of universal acceptance of the reliability of the scientific principle and procedure.") *with* Starr v. Campos, 134 Ariz. 254, 257, 655 P.2d 794, 797 (1982) ("[Under the *Frye* standard] the court may not resolve a scientific dispute between proponents and opponents of the technique, so the very existence of the dispute precludes admission of the testimony.").

139. *See supra* note 119 and accompanying text.

140. Daubert v. Merrell Dow Pharmaceuticals, Inc., 113 S. Ct. 2786, 2794 (1993).

its own, it will likely at least consider the persuasiveness of the Supreme Court's argument. But Arizona's Rules of Evidence, are court enacted, while the Federal Rules were enacted by Congress.[141] So Arizona could certainly follow the reasoning of the Supreme Court in accepting a *Daubert* type standard, but it also has the latitude to logically diverge from the United States Supreme Court's decision.

If the Arizona Supreme Court did adopt the *Daubert* standard, the problem of *Frye's* conservative nature would seem reasonably solved. Evidence that was shown to be reliable would be admissible regardless of the scientific community's acceptance of it. But some critics of the *Daubert* decision would argue that even the more liberal standard that the Supreme Court adopted gave judges too much power to exclude evidence, based on their considerations of reliability.[142]

Potentially the biggest problem with *Daubert* is that it leaves unclear the standard of reliability necessary for admissibility.[143] The Court's suggestion of testability and falsifiability, peer review and publishing, rate of error, and general acceptance do provide some guidance.[144] But the Court does not make clear in *Daubert* which of these are necessary, sufficient, or merely relevant conditions in determining reliability.[145]

The most helpful concept in the *Daubert* decision is simply that the evidence, to qualify as "scientific", must be reliable.[146] This is the crux of admissibility under *Daubert*, and a trial judge must decide whether a scientific expert's theory is reliable enough. This puts the judge in the difficult position of judging evidence of which, by definition, the expert has superior knowledge. *Frye*'s standard test avoids this difficulty by allowing a judge to assess scientific evidence through the expert's peers, who are in a much better position to judge that work. *Frye*'s conservative nature, which may itself be an asset, may at worst be a necessary evil in evaluating evidence for admissibility.

There are other alternatives that Arizona's courts and legislature could consider besides keeping *Frye* or accepting the new *Daubert* standard. However, most of these are permutations of *Frye* and *Daubert* and thus share many of their benefits and shortcomings. One of these is the McCormick relevancy approach, which suggests that scientific expert testimony should be treated the same as other expert testimony.[147] It should be admissible and

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141. *See* ARIZ. CONST. art. VI, Section 5(5). ARIZ. R. SUP. CT. 28. In Arizona, the only guiding principles are the text of a rule and the *court*'s intent in adopting the rule in the first place. *See supra* notes 107–25 and accompanying text.

142. Justice Blackmun alluded to these concerns in *Daubert*, 113 S. Ct. at 2798.

143. The Arizona Supreme Court acknowledged the ambiguous standard of *Daubert*. "In application, Daubert leaves many questions unanswered." State v. Bible, 175 Ariz. 549, 580, 858 P.2d 1152, 1183 (1993).

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

145. In addition, testability and rate of error ask a judge to perform scientific evaluations that judges may be ill-equipped to do, especially if relying on the one sided presentation of the proponent of a scientific theory. *See Daubert*, 113 S. Ct. at 2800 n.6 (Rehnquist, C.J., dissenting).

146. *Id.* at 2795.

147. MCCORMICK ON EVIDENCE, § 203, at 364 (John W. Strong, ed.) (4th ed. 1992):

> [T]he traditional standards of relevancy and the need for expertise—and nothing more—should govern. The last mentioned method for evaluating the admissibility of scientific evidence is the most appealing. It avoids the difficult problems of defining when "scientific" evidence is subject to the general acceptance requirement and how general this acceptance must be, of discerning exactly what

weighed by the jury as long as it is probative, and it is not unduly prejudicial or misleading. But this test can be especially unfair and impractical because of the effect of unreliable but persuasive evidence when only one party can afford experts. For example, one commentator has expressed concern that in a criminal case a defendant may be unable to afford an expert witness to rebut the state's expert.[148] This relevancy standard leaves a judge with no test of probative value, so he will admit more unreliable evidence.[149]

Another proposal suggests that reliability should be the cornerstone of admissibility and codified in Rule 702 itself.[150] This view is reflected in a proposed amendment to the Federal Rules which seeks to add an express requirement of reasonable reliability for the propositions of any expert witness.[151] This proposed standard is very similar to *Daubert*. But it has the advantage of not creating a reliability requirement not mentioned in the current Rule 702, as the court did in *Daubert*.[152] Proponents of such a rule argue that it maintains the benefits of *Frye*'s essentially conservative nature, because it places the burden of showing reliability on the proponent of evidence.[153] In this way it is much closer to *Frye* than the mere relevancy approach. But under this proposal, the trial judge still has the troublesome role of playing scientist to decide if something is reliable. Just like *Daubert*, this approach is ambiguous as to what standard of reliability should be applied.[154]

Overall, the Arizona Supreme Court is likely to consider all these alternatives the next time it is confronted with a serious challenge to the *Frye* rule. But *Frye*, *Daubert*, and these similar alternatives are not the only possibility, and this Note suggests a more radical proposal to handle the admissibility of scientific evidence.

> it is that must be accepted, and of determining the "particular field" to which the scientific evidence belongs and in which it must be accepted. General scientific evidence is a proper condition for taking judicial notice of scientific facts, but it is not a suitable criterion for the admissibility of scientific evidence. Any relevant conclusions supported by a qualified expert witness should be received unless there are distinct reasons for exclusion.

Id. at 364.

148. Ronald J. Bretz, *Scientific Evidence and the Frye Rule: The Case for a Cautious Approach*, 4 COOLEY L. REV. 506 (1987). Bretz also points out that criminal investigation techniques are seldom subject to academic review, and that they often have high rates of error. This makes the thought of introducing them subject only to a general relevancy restriction troubling.

149. *See* Giannelli, *supra* note 48, at 1250.

150. Fredric I. Lederer, *Proposals for a Model Rule on Admissibility of Scientific Evidence: Resolving the Frye Dilemma—A Reliability Approach*, 115 F.R.D. 79, 84 (1987). Lederer's proposed rule begins, "if reliable scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue ..." the expert witness' testimony should be permitted. This new proposal for Rule 702 is identical to the existing rule except for the introduction of the word "reliable." FED. R. EVID. 702.

151. Strong, *supra* note 36, at 365.

152. *See* Daubert v. Merrell Dow Pharmaceuticals, Inc., 113 S. Ct. 2786, 2800 (1993) (Rehnquist, C.J., dissenting) ("Federal Rule of Evidence 402 provides...that '[e]vidence which is not relevant is not admissible.' But there is no similar reference in the Rule to 'reliability.'").

153. Lederer, *supra* note 150.

154. Strong, *supra* note 36, at 365. Professor Strong suggests that difficulty could easily induce trial judges to apply the "conservative and inflexible *Frye* standard for lack of some more attractive alternative." *Id.*

VIII. A NOVEL STANDARD PROPOSAL: THE SCIENCE THRESHOLD COMMITTEE

This Note proposes that the Arizona legislature adopt a more radical policy to determine the admissibility of scientific evidence. The Arizona Supreme Court would be spared trying to form a rule from the difficult alternatives. This proposal seeks to solve the most obvious and criticized problems of *Daubert* and *Frye*, and promotes judicial economy, efficiency, reliability, and uniformity of decision. Its drawback is increased difficulty in implementation and set-up than more traditional responses to novel scientific evidence.

The legislature can best solve the tangle of scientific evidence by establishing an independent judicial science committee to address the important concerns of novel scientific evidence. The committee would be comprised of some judges or lawyers, along with a group of scientific experts from diverse fields, and the committee would have the power to call upon other scientific experts to help evaluate novel scientific evidence.

When a party in a lawsuit seeks to admit novel scientific evidence, the party would have to submit the evidence to the independent judicial science committee, rather than the trial judge. The committee would, to the best of its ability, evaluate scientific evidence based on its *reliability.* If the committee felt the reliability outweighed any undue effect on the jury, that scientific theory or methodology would be approved and would be admissible evidence in court. Thereafter, that methodology or scientific evidence would be admissible for other litigants in other cases. If a later litigant felt that evidence was unfairly admitted, she could make a new submission to the committee to get it to reconsider their previous decision.

It may seem at first that this procedure is unduly burdensome, because it requires litigants to go outside of the court to seek admission of their evidence. But the scientists on the committee and independent experts could evaluate scientific theories much more effectively and quickly than a lay judge.[155] Moreover, it also would be more efficient, since the admissibility of evidence, once approved, would not be subject to repeated litigation within separate trials.

Establishing such a committee may be an added judicial expense to the state. But the extra costs would be minimized, and perhaps eliminated, by the amount of time saved by judges in the current evaluation of such scientific evidence by *Daubert* or *Frye* standards. This is especially true since the committee would only have to evaluate a scientific technique once for it to be used in numerous lawsuits. But even if the committee ended up costing the state more, it would be worth it in terms of justice. Better than any other rule or proposal, it would assure that reliable scientific evidence, and only reliable scientific evidence, is admitted to the jury.

This committee would eliminate the exclusionary, unduly conservative aspects of *Frye*.[156] Regardless of the time lag that it takes for a scientific community to generally accept a theory, this committee could judge its reliability immediately. It could do so more accurately than any judge, and it would not exclude theories whose only flaws were that they were too recent to be generally accepted.

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155. *See supra* note 90 and accompanying text.
156. *See supra* note 132 and accompanying text.

It would also avoid the effect of *Daubert* of judges deciding the reliability of scientific methods beyond their ken.[157] It would promote efficiency in the court room, and allow judges to concentrate on the legal issues which are their expertise. Instead, the committee of scientists, together with jurists for legal guidance, would decide the reliability of scientific evidence.

Such a committee would also ensure uniformity of decision. Once the committee decides to approve the scientific evidence, it would be admissible in court by all litigants. Different plaintiffs would not be subject to different decisions by different judges. This would ensure uniformity of decision even more than *Frye* does,[158] because a judge would only have to follow the committee's ruling with regard to the admissibility of certain scientific evidence. That judge would not even have to go so far as to determine whether the science is generally accepted.

Overall, this committee would serve the principles of justice better than *Frye*, *Daubert*, or any of the alternatives. While no system can completely eliminate all the problems inherent in such a complex legal issue, this proposal avoids the major problems with present theories for standards of admissibility. An independent scientific and judicial committee would be the best answer to the problematic, and increasingly important, issue of the admissibility of scientific evidence.

IX. CONCLUSION

The standard for admissibility of scientific evidence is an increasingly central part of modern litigation for two reasons. First, scientific evidence is a more and more prevalent and important part of both civil and criminal litigation, with ever increasing applications. Second, scientific evidence is also an area where admissibility may have more impact on the outcome of litigation than any other type of evidence. Therefore, it is vital for Arizona to adopt a standard of admissibility that ensures, as much as possible, that reliable, and only reliable, scientific evidence is admitted in the courtroom.

The *Frye* standard currently used by Arizona has advantages of conservatism and uniformity of decision, but it also has the disadvantage of keeping out possibly reliable evidence. The new federal *Daubert* standard outlined by the Supreme Court will probably admit more evidence, but it will be difficult for judges to apply and leaves many unanswered questions.

In searching for the best possible alternative, this Note suggests the establishment of an independent committee to evaluate the reliability of scientific evidence, and only admit scientific evidence which meets a threshold requirement of reliability. This suggestion avoids the major flaws of both the *Frye* and *Daubert* standards, as well as other similar proposed standards, and would be the most efficient and accurate way to screen scientific evidence. Given the importance of a scientific evidence standard, this new committee would move the Arizona legal system into the twenty-first century more sensibly and equitably than any other alternative.

157. *See supra* note 90.
158. *See supra* note 130.