

*Frye, Frye, Again: The Past, Present, and Future of the General Acceptance Test*

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*Daubert; Joiner; Kumho Tire*. The United States Supreme Court's expert evidence trilogy has received a tremendous amount of attention, and rightly so. These cases dramatically tightened the rules for the admissibility of expert evidence in federal courts and in states that have adopted the trilogy.

Meanwhile, most commentators have consigned the common law *Frye* general acceptance test—which *Daubert*'s reliability test superseded in federal and many state courts—to oblivion. While the *Daubert* trilogy has been the subject of dozens of law review articles since 1993, commentary on *Frye* is mainly limited to the occasional bar journal or CLE article.

While legal scholars seem convinced of *Frye*'s demise, the case law tells a very different story. Many jurisdictions continue to adhere to *Frye*, including Arizona,<sup>1</sup> California,<sup>2</sup> Colorado,<sup>3</sup>

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<sup>1</sup> State v. Bible, 858 P.2d 1152 (Ariz. 1993).

<sup>2</sup> People v. Leahy, 882 P.2d 321 (Cal. 1994).

<sup>3</sup> Lindsey v. People, 892 P.2d 281 (Co. 1995).

the District of Columbia,<sup>4</sup> Florida,<sup>5</sup> Illinois,<sup>6</sup> Kansas,<sup>7</sup> Maryland,<sup>8</sup> Michigan,<sup>9</sup> Minnesota,<sup>10</sup> Mississippi,<sup>11</sup> Nebraska,<sup>12</sup> New Jersey,<sup>13</sup> New York,<sup>14</sup> Pennsylvania,<sup>15</sup> and Washington.<sup>16</sup> These jurisdictions include almost all of the most populous states (save Texas and Ohio) in the United States and together contain almost half of the American population.<sup>17</sup> Because not all of the non-*Frye* states have adopted *Daubert*,<sup>18</sup> *Frye* is not only alive, but it is the plurality rule in state

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<sup>4</sup> Nixon v. United States, 728 A.2d 582, 588 (D.C. 1999).

<sup>5</sup> Flanagan v. State, 625 So.2d 827 (Fla. 1993).

<sup>6</sup> People v. Miller, 620 N.E.2d 721, 731 (Ill. 1996).

<sup>7</sup> State v. Heath, 957 P.2d 449 (Kan. 1998).

<sup>8</sup> Hutton v. State, 663 Md. 1289 (Md. 1995).

<sup>9</sup> The Michigan Supreme Court has not explicitly rejected *Daubert*, but lower courts continue to apply *Frye*. E.g., DePyper v. Navarro, 1995 WL 788828, \*34 (Mich. Cir. Ct.).

<sup>10</sup> Goeb v. Timothy Tharaldson, 615 N.W.2d 800 (Minn. 2000).

<sup>11</sup> Gleeton v. State, 716 So.2d 1083 (Miss. 1998).

<sup>12</sup> State v. Carter, 524 N.W.2d 763 (Neb. 1994). But see Phillips v. Industrial Machine, 597 N.W.2d 377, 389 (Neb. 1999) (Gerrard, J., concurring) (concurring opinion joined by two other justices arguing that Nebraska should replace *Frye* with *Daubert*).

<sup>13</sup> State v. Harvey, 699 A.2d 596 (N.J. 1997).

<sup>14</sup> People v. Wesley, 83 N.Y.2d 417, 426, 611 N.Y.S.2d 97, 102 fn.2 (1994).

<sup>15</sup> Commonwealth v. Blasioli, 713 A.2d 1117 (Pa. 1998).

<sup>16</sup> See State v. Copeland, 130 Wash.2d 244, 259-61, 922 P.2d 1304 (1996).

<sup>17</sup> They have 258 electoral college votes, for example, based on the 1990 census.

<sup>18</sup> A few states follow neither *Frye* nor *Daubert*, but use more liberal admissibility tests. E.g., Dow Chemical Co. v. Mahlum, 970 P.2d 98, 108 n.3 (Nev. 1998); State v. Council, 515 S.E.2d 508, 517-18 (S.C. 1999). Ohio has basically adopted *Daubert*, but under its evidence code general acceptance may be required if “testimony reports the result of a procedure, test, or experiment.” Ohio R. Evid. 702(C)(1). Meanwhile, some courts adopted *Daubert* when they thought it comported with their very liberal interpretations of their state versions of Rule 702. Now that *Daubert* has proven to be both a strict and an expansive test, it remains to be seen

courts, which are the venue for the vast majority of litigation.

Although the general acceptance test originated in 1923, many issues concerning the application of *Frye* remain unsettled. As discussed below, confusion over the scope of *Frye* has mushroomed in the last decade, coinciding with more general interest in the issue of the proper standards for the admissibility of expert evidence.

Part I of this article briefly reviews the history of the *Frye* rule from its origins in 1923 to its demise in federal court in *Daubert* in 1993. This section focuses especially on how *Frye*—a rule that for decades applied almost exclusively in criminal cases—came to be the focal point of the controversy over the admissibility of scientific evidence in toxic tort cases in the early 1990s.

Part II of this article discusses the development of the *Frye* test since 1993. Following the lead of federal courts operating under *Daubert*'s broad gatekeeper mandate, *Frye* jurisdictions are increasingly applying their tests for the admissibility of expert evidence to civil cases, especially toxic tort cases. However, *Frye* jurisdictions remain divided on whether the general acceptance test applies primarily to the expert's general methodologies only or conclusions. Recently, several courts have followed *Joiner*'s lead and scrutinized experts' reasoning process in extrapolating from the underlying scientific evidence to the their conclusions.

Meanwhile, *Frye* jurisdictions also must decide whether to follow the lead of federal courts applying *Kumho Tire* and apply *Frye* to non-scientific evidence, especially social science evidence. Thus far, few *Frye* courts have done so. One alternative adopted by some courts is to apply *Frye* only to novel scientific evidence, but to subject social science evidence to a separate reliability test under state versions of Federal Rule of Evidence 702.

Part III of this article concludes that case law under *Frye* is slowly converging with *Daubert*

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whether such states will continue to follow federal precedent.

jurisprudence. Rather than allowing this process to continue haphazardly and inconsistently, with all the awkwardness that shoehorning the *Frye* general acceptance test into *Daubert-Joiner-Kumho* reliability precedents entails, state legislatures should enact state versions of new Federal Rule of Evidence 702, which explicitly adopts the *Daubert* trilogy.

## I. A Brief History of *Frye*: 1923-1993

In *Frye v. United States*,<sup>19</sup> the District of Columbia Court of Appeals refused to admit evidence that was based on a forerunner of the modern lie detector test. In a pithy opinion, the court announced that “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.”<sup>20</sup>

The *Frye* general acceptance test gradually spread.<sup>21</sup> While evidence scholars have pointed out that *Frye* was cited only a few dozen times in published cases through the 1960s, the dearth of citations to *Frye* does not mean that courts ignored it. First, some courts adopted the general acceptance test without citing *Frye*.<sup>22</sup> Second, *Frye* applied only to novel scientific techniques. There were few major advances in forensic criminal evidence during this period that courts did

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<sup>19</sup> 293 F. 1013 (D.C. Cir. 1923).

<sup>20</sup> *Id.* at 1014.

<sup>21</sup> Courts cited *Frye* five times in published opinions before World War II, mostly in cases involving lie detectors. After World War II, courts cited *Frye* six times before 1950, twenty times during the 1950s, and twenty-one times during the 1960s. Bert Black et al., *Science and the Law in the Wake of Daubert: A New Search for Scientific Knowledge*, 72 Tex. L. Rev. 715, 722 n.30 (1994).

<sup>22</sup> E.g., *Puhl v. Milwaukee Auto. Ins. Co.*, 99 N.W.2d 163, 168-69 (Wis. 1959) (paraphrasing *Frye* and adopting the general acceptance test, but not citing the case); *People v. Miller*, 98 N.W.2d 524, 535 (Mich. 1959) (adopting “general scientific recognition” test, but not citing *Frye*); *Shanks v. State* 45 A.2d 85, 86 (Md. 1946) (discussing “general acceptance” standard for use of blood tests without citing *Frye*).

not quickly accept. Moreover, few courts considered the types of expert scientific evidence presented in a typical civil case—for example, an automobile accident or medical malpractice case—to be based on a novel scientific technique within the meaning of the *Frye* rule.<sup>23</sup> Finally, most state court opinions, particularly at the trial court level, are unpublished, and we do not know how often *Frye* was relied upon in cases that did not reach higher courts.

Indeed, despite the dearth of published authority citing *Frye*, by 1954 the general acceptance test was sufficiently conspicuous to attract criticism from Professor Charles McCormick's treatise on evidence. Professor McCormick wrote that the general acceptance test "is a proper condition upon the court's taking judicial notice of scientific facts, but not a criterion for the admissibility of scientific evidence."<sup>24</sup> To replace *Frye*, McCormick advocated what became known as the relevancy approach:<sup>25</sup> "Any relevant conclusions which are supported by a qualified expert witness should be received unless there are other reasons for exclusion. Particularly, its probative value may be overborne by the familiar dangers of prejudicing or misleading the jury, unfair surprise and undue consumption of time."<sup>26</sup>

The Federal Rules of Evidence, which went into effect in 1975, failed to clarify the standard for admitting novel scientific evidence. Rule 702 states that any qualified expert who possesses "scientific, technical, or other specialized knowledge [that] will assist the trier of fact to understand the evidence or to determine a fact in issue" may testify at trial.<sup>27</sup> The only clear effect of this rule was to liberalize the type of person who could appear as an expert. Neither the Rules

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<sup>23</sup> See Paul C. Giannelli, Daubert: *Interpreting the Federal Rules of Evidence*, 15 Cardozo L. Rev. 1999, 2003-04 (1994).

<sup>24</sup> CHARLES T. MCCORMICK, HANDBOOK OF THE LAW OF EVIDENCE 363 (1954).

<sup>25</sup> Paul C. Giannelli, *The Admissibility of Novel Scientific Evidence: Frye v. United States, a Half-Century Later*, 80 COLUM. L. REV. 1197, 1232 (1980).

<sup>26</sup> MCCORMICK, *supra* note , at 363-64.

<sup>27</sup> FED. R. EVID. 702 (pre-amendment).

nor the Advisory Committee notes discussed the viability of *Frye*.

*Frye* became a major issue in evidence circles around the same time the Federal Rules came into effect, as courts began to rule on the admissibility of novel forensic scientific evidence such as “voiceprint” identifications, bite mark comparisons, and hypnotically-refreshed testimony.<sup>28</sup> Forensic science became more important to prosecutors both because of technological advances, and because decisions by the United States Supreme Court in the 1960s favoring the rights of the accused made it more difficult for prosecutors to use other types of evidence.

This period also marked the beginning of an era of the federalization of criminal law, when the federal government began to prosecute crimes that had once been solely the responsibility of the states. The *Frye* rule, which originated in a federal court opinion, naturally began to attract increased attention.

Commentators began to attack *Frye* on a variety of grounds. Some argued that *Frye* was too conservative in restricting evidence that had not yet received “general acceptance.”<sup>29</sup> Others were unhappy with *Frye*’s vagueness. The opinion does not define “general acceptance” or the “particular field’s” boundaries, nor does it suggest whether the judge should defer to the scientific community or use another standard to resolve these uncertainties.<sup>30</sup> Confusion among judges on these issues led to contradictory *Frye* rulings in different jurisdictions concerning the same types

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<sup>28</sup> Giannelli, *supra* note \_\_, at 2004-09.

<sup>29</sup> E.g., Giannelli, *supra* note \_\_, at 1226 (noting that under *Frye* potentially helpful evidence may be excluded until general scientific consensus develops); *see also* Fredric I. Lederer, *Resolving the Frye Dilemma—A Reliability Approach*, 26 JURIMETRICS J. 240, 241 (1986) (“*Frye* tends to be unduly conservative in its effect on the admissibility of novel evidence.”).

<sup>30</sup> 1 LOUISELL & MUELLER, *supra* note 15, § 105; Giannelli, *supra* note \_\_, at 1248. *But see* Philip H. Dixon, *Recent Developments*, 64 CORNELL L. REV. 875, 881 (1979) (arguing that *Frye*’s vagueness is beneficial and gives court considerable leeway in deciding whether new scientific technique has achieved general acceptance in its appropriate scientific field).

of evidence.<sup>31</sup>

Immediately after the Federal Rules went into effect, some courts in jurisdictions adopting the rules utilized the relevancy approach, while most continued to apply *Frye*.<sup>32</sup> In the ensuing years a third approach, which became known as the reliability approach, also began to win adherents.<sup>33</sup>

As debate grew over the relative merits of *Frye*, the relevancy approach, and the reliability approach with regard to forensic criminal evidence, courts were soon faced with a new evidentiary challenge—toxic tort litigation.<sup>34</sup> Some courts applied a reliability test to such evidence.<sup>35</sup> Other courts applied something akin to a relevancy test.<sup>36</sup> Until 1988, no court applied *Frye* in a toxic tort case.

Most courts, in the end, admitted dubious testimony, even when they purported to apply a seemingly-strict reliability test.<sup>37</sup> Frustrated critics of “junk science” in civil cases quickly lost patience with the reliability approach. Many junk science critics instead argued that courts should apply a strict version of the *Frye* test in toxic tort cases.<sup>38</sup> They noted that several courts had

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<sup>31</sup> Black et al., *supra* note , at 739 (noting courts applying *Frye* both admitted and rejected voiceprint evidence).

<sup>32</sup> See Giannelli, *supra* note 18, at 1228-31.

<sup>33</sup> See, e.g., *United States v. Downing*, 753 F.2d 1224 (3d Cir. 1985); *United States v. Williams*, 583 F.2d 1194 (2d Cir. 1978); Jack Weinstein & Margaret Berger, *Weinstein’s Evidence* ¶ 702[03] (1995). Mark McCormick, *supra* note , at 911-12.

<sup>34</sup> See *supra* notes \_ to \_ and accompanying text.

<sup>35</sup> E.g., *In re “Agent Orange” Prod. Liab. Litig.*, 611 F. Supp. 1223, 1243-48 (E.D.N.Y. 1985), *aff’d*, 818 F.2d 187 (2d Cir. 1987).

<sup>36</sup> E.g., *Ferebee v. Chevron Chem. Co.*, 736 F.2d 1529 (D.C. Cir. 1984).

<sup>37</sup> See, e.g., *In re Paoli R.R. Yard PCB Litig.*, 916 F.2d 829 (3d Cir. 1990); *DeLuca v. Merrell Dow Pharmaceuticals*, 911 F.2d 941 (3d Cir. 1990).

<sup>38</sup> E.g., David Bernstein, Note, *Out of the Fryeing Pan and into the Fire: The Expert Witness Problem in Toxic Tort Litigation*, 10 REV. LITIG. 117, 138 (1990); Kunzweil et al., *The Environmental Expert After Rubanick and Christophersen: Beware the Jabberwock!* 1 (PLI Order No. 144-1521 Dec. 1991-Jan. 1992); Jeffrey K. Sherwood, *In Re Paoli Railroad: The Third Circuit Punts to the “Coffincorner”*, TOXICS L. REP., Nov. 14, 1990, at 773, 781.

reformulated *Frye* in criminal cases to ensure that *Frye* addressed the underlying reliability and validity of expert scientific opinion,<sup>39</sup> and that some of the worst judicial offenders in permitting junk science had done so after explicitly rejecting the general acceptance test.<sup>40</sup> Moreover, in a case that otherwise attracted little attention, perhaps because it applied the general acceptance test but did not explicitly cite *Frye*, the Sixth Circuit excluded “clinical ecology” testimony because it was not generally accepted in the relevant scientific community.<sup>41</sup>

The Fifth Circuit, en banc, soon boldly applied *Frye* in the toxic tort context in *Christophersen v. Allied-Signal Corp.*<sup>42</sup> The plaintiff’s expert had claimed that exposure to chemical fumes at the battery manufacturing plant where the decedent had worked caused his fatal colon cancer. The Fifth Circuit adopted a four-part test for the admissibility of scientific evidence that included the *Frye* rule.<sup>43</sup> Scientific testimony could not be admitted until the court ensured that the expert’s methodology was widely accepted, with “methodology” interpreted broadly to include reasoning.<sup>44</sup> The court ultimately concluded that the methodology or reasoning that the plaintiff’s

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<sup>39</sup> E.g., *United States v. Franks*, 511 F.2d 25, 33 n.12 (6th Cir. 1975); *People v. Kelly*, 549 P.2d 1240, 1244 (Cal. 1976).

<sup>40</sup> *Ferebee v. Chevron Chem. Co.*, 736 F.2d 1529 (D.C. Cir. 1984).

<sup>41</sup> *Sterling v. Velsicol*, 855 F.2d 1188, 1208 (6th Cir. 1988). Interestingly, the leading “loose scrutiny” case, *Ferebee v. Chevron Chem. Co.*, 736 F.2d 1529 (D.C. Cir. 1984), explicitly rejected applying the *Frye* rule to toxic tort cases. The court did not hold that *Frye* is inapplicable in civil cases but rather that *Frye* applies only “to the introduction of evidence based on novel scientific techniques or methodologies,” not to the misuse of a well-founded methodology. *Ferebee*, 736 F.2d at 15\_\_.

<sup>42</sup> 939 F.2d 1106 (5th Cir. 1991). Judge Patrick Higginbotham had previously hinted that he would support application of *Frye* to the admissibility of evidence in toxic tort cases. See *Brock v. Merrell Dow Pharmaceuticals, Inc.*, 884 F.2d 167, \_\_ (5th Cir. 1989) (Higginbotham, J., dissenting from denial of rehearing en banc).

<sup>43</sup> The test focused on:  
the expert’s qualifications (Rule 702);  
the factual basis for the testimony (Rule 703);  
the level of acceptance of the methodology employed (*Frye*); and  
the balance between probativeness and the potential for undue prejudice (Rule 403).

*Id.* at 1110-12.

<sup>44</sup> *Id.* at \_\_\_\_.

expert had used to arrive at his conclusion was not generally accepted within the relevant scientific community, and therefore excluded the expert's testimony.<sup>45</sup>

A few months after the Fifth Circuit decided *Christophersen*, Peter Huber's *Galileo's Revenge: Junk Science in the Courtroom* appeared.<sup>46</sup> Huber's book described the misuse of scientific evidence in a range of civil cases. The book attracted a great deal of attention and made the issue of "junk science" into a matter of public debate. A consistent theme of Huber's book was that in order to avoid the risk of being bamboozled by fringe scientists, courts should defer to mainstream scientific opinion when reviewing scientific evidence. To combat "junk science," Huber strongly advocated "a sophisticated, modern application of *Frye* [that] looks to the methods behind a scientific report."<sup>47</sup>

It did not take long for Huber's influence to be felt. In December 1991, the Ninth Circuit decided *Daubert v. Merrell Dow Pharmaceuticals*.<sup>48</sup> *Daubert* involved two boys born with tragic birth defects that reduced the size of their limbs. Their parents sued, alleging that the mothers' use of the morning sickness drug Bendectin during pregnancy had caused the children's deformities. The problem facing the plaintiffs was that the defendant presented the trial court with overwhelming scientific evidence from epidemiological studies showing that babies exposed to Bendectin *in utero* do not have a higher rate of limb reductions than those not exposed.

The plaintiffs countered by presenting experts who testified that based on their reanalyses of the data used in those epidemiological studies, they believed that Bendectin does cause birth

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<sup>45</sup> *Id.* at \_\_\_\_.

<sup>46</sup> PETER W. HUBER, *GALILEO'S REVENGE: JUNK SCIENCE IN THE COURTROOM* (1991). The author of this article served as Huber's research assistant for *Galileo's Revenge*.

<sup>47</sup> *Id.* at 200.

<sup>48</sup> 727 F. Supp. 570 (S.D. Cal. 1989).

defects. The district court, relying on an obscure interpretation of Federal Rule of Evidence 703,<sup>49</sup> found this evidence incompetent and granted summary judgment for the defendant.<sup>50</sup>

The Ninth Circuit affirmed.<sup>51</sup> The court began by noting that *Frye* was the test for the admissibility of scientific evidence in the Ninth Circuit.<sup>52</sup> Like Huber, who in his discussion of *Frye* overlooked the historical neglect of the general acceptance test in civil cases, the court ignored the fact that *Frye* had never previously been applied in a civil case in the Ninth Circuit, and had only been applied twice before in the toxic tort context in other jurisdiction.

The court noted that the plaintiffs' experts had not submitted their reanalyses to peer review or published them in a scientific journal.<sup>53</sup> Citing Huber, the court held that because the experts' reanalyses were not subjected to verification and scrutiny by others in the field the results of their studies would not be accepted in the scientific community.<sup>54</sup>

The Ninth Circuit's *Daubert* opinion quickly gained notoriety for its strong reliance on *Frye* to exclude evidence in a toxic tort case. The United States Supreme Court granted certiorari to decide whether *Frye* was still viable under the Federal Rules, particularly Rule 702.

## II. *Frye* Since *Daubert*

The Supreme Court's decision in *Daubert* repudiated the Ninth Circuit's view that *Frye* was viable under the Federal Rules of Evidence.<sup>55</sup> However, while the Ninth Circuit lost the battle, it won the war. The Ninth Circuit was only the third court to apply *Frye* to a toxic tort/products liability case, and one of the few courts to adopt a stringent standard for the admissibility of

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<sup>49</sup> For a time, "strict scrutiny" courts relied on Rule 703, following the lead of Judge Jack Weinstein in the *Agent Orange* case.

<sup>50</sup> *Daubert*, 727 F. Supp. at 575-76.

<sup>51</sup> 951 F.2d 1128 (9th Cir. 1991).

<sup>52</sup> *Id.* at 1129-30.

<sup>53</sup> *Id.* at 1130.

<sup>54</sup> *Id.* at 1131.

<sup>55</sup> *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993).

scientific evidence in civil cases.<sup>56</sup> The Supreme Court nevertheless endorsed the Ninth Circuit's view that scientific evidence in civil cases must be strictly scrutinized to ensure reliability. As Michael Green notes, "To say that the Supreme Court replaced *Frye* in its *Daubert* opinion is misleading. What the Court did in *Daubert* was to adopt a test for scrutinizing an expert's methodology and reasoning that filled a previously extant void."<sup>57</sup>

While the *Frye* controversy ultimately led to the creation of an invigorated and expanded reliability test in *Daubert* jurisdictions, the stringent criteria established by the *Daubert* trilogy have helped to cause a welcome expansion and tightening of the general acceptance test in *Frye* jurisdictions. For example, before 1991 no court applied *Frye* in toxic tort and products liability cases. By contrast, most courts in *Frye* jurisdictions today apply *Frye* in such contexts.

Meanwhile, *Frye* courts are struggling over whether the general acceptance test applies to general methodologies only, methodology and reasoning, or to an expert's ultimate conclusions. Courts in *Frye* jurisdictions are beginning to follow the Supreme Court's lead in *Joiner*<sup>58</sup> and hold that an expert's methodology *and* reasoning should be scrutinized.

Finally, most courts in *Frye* jurisdictions refuse to apply the general acceptance test to social science evidence. In the aftermath of *Kumho Tire*, however, courts should, and are likely to, apply *Frye* or some other form of gatekeeping test to non-scientific expert evidence.

#### A. *Frye* and Civil Cases

As a result of the *Daubert* controversy, the general acceptance test is expanding its reach in

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<sup>56</sup> The leading strict scrutiny case before *Daubert* was *In re "Agent Orange" Prod. Liab. Litig.*, 611 F. Supp. 1223, 1243-48 (E.D.N.Y. 1985), *aff'd on other grounds*, 818 F.2d 187 (2d Cir. 1987). Far more popular was the very liberal test adopted in *Ferebee v. Chevron Chem. Co.*, 736 F.2d 1529 (D.C. Cir. 1984).

<sup>57</sup> Michael D. Green, *The Road Less Well Traveled (And Seen): Contemporary Lawmaking in Products Liability*, 49 DEPAUL L. REV. 377, \_\_\_\_ (1999).

<sup>58</sup> *General Elec. Co. v. Joiner*, 522 U.S. 136, 149 (1997).

*Frye* jurisdictions to civil litigation.<sup>59</sup> In part, the expansion of *Frye* is a direct result of the publicity surrounding the Ninth Circuit's application of *Frye* to a toxic tort/products liability case in its original *Daubert* opinion. That opinion, though overruled by the Supreme Court on other grounds, has inspired state courts to apply *Frye* in civil cases.<sup>60</sup> More generally, the attention given to the Supreme Court's focus on the trial court's role of gatekeeper of all scientific evidence to prevent the proliferation of junk science has made the limitation of *Frye* to criminal cases seem outmoded.

Since the early 1990s, courts have applied *Frye* in products liability and toxic torts cases in Arizona,<sup>61</sup> California,<sup>62</sup> the District of Columbia,<sup>63</sup> Florida,<sup>64</sup> Illinois,<sup>65</sup> Maryland,<sup>66</sup> Minnesota,<sup>67</sup>

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<sup>59</sup> Some courts had previously applied *Frye* in civil cases, but usually this occurred only in (1) paternity cases; and (2) where the forensic technique in question was also used in the criminal context. *See, e.g.*, *Cameron v. Knapp*, 520 N.Y.S.2d 917 (Sup. Ct. 1987) (rejecting handwriting analysis in a medical malpractice case).

<sup>60</sup> *Id.* at 398-99 (noting that *Frye* and its general acceptance test "were virtually nonexistent in civil cases and toxic substances litigation" until the Ninth Circuit employed them in *Daubert*.).

<sup>61</sup> *Baroldy v. Ortho Pharmaceutical Corp.*, 760 P.2d 574 (Ariz. Ct. App. 1998); *Lofgren v. Motorola*, 1998 WL 299925, \* 20 (Ariz. Super. June 1, 1998).

<sup>62</sup> Memorandum of Opinion, *Dinerman v. McGhan Medical Corp.*, No. BC 065884 (Cal. Super. Ct. undated).

<sup>63</sup> *Bahura v. S.E.W. Investors*, 754 A.2d 928, 943 (D.C. Ct. App. 2000).

<sup>64</sup> *E.I. DuPont De Nemours & Co., Inc. v. Castillo ex rel. Castillo*, 748 So.2d 1108 (Fla. Ct. App. 2000); *Berry v. CSX Transp., Inc.*, 709 So.2d 552 (Fla. Ct. App. 1998); *Centex\_Rooney Constr. Co. v. Martin County*, 706 So.2d 20 (Fla. Ct. App. 1997) *Eldridge v. Riddell, Inc.*, 626 So.2d 232, 233 (Fla. Ct. App. 1993) (Warner, J. concurring).

<sup>65</sup> *Donaldson v. Central Illinois Public Service Co.*, 730 N.E.2d 68 (Ill. Ct. App. 2000); *Duran v. Cullinan*, 677 N.E.2d 999 (1997).

<sup>66</sup> *Owens Corning v. Bauman*, 726 A.2d 745 (Md. Ct. App. 1999); *United States Gypsum Company v. Mayor and City Council of Baltimore*, 647 A.2d 405 (Md. Ct. App. 1994); *Keene Corp. v. Hall*, 626 A.2d 997 (Md. Ct. Spec. App. 1993).

<sup>67</sup> *Goeb v. Tharaldson*, 615 N.W.2d 800, \_\_\_\_ (Minn. 2000).

New York,<sup>68</sup> and Pennsylvania.<sup>69</sup> Post-*Daubert*, no state has explicitly held that *Frye* is not applicable to evidence in products liability and toxic torts cases.

In California, the largest and therefore the most important *Frye* jurisdiction, there are no reported cases applying *Frye* to toxic tort or products liability cases,<sup>70</sup> and pre-*Daubert* opinions suggest that *Frye* would rarely if ever be applicable to personal injury litigation.<sup>71</sup> It is nevertheless likely that in the wake of the U.S. Supreme Court's evidence trilogy, California will follow other states and apply *Frye* to civil cases. Already, one trial court has excluded evidence in a breast implant case because it failed to meet the *Frye* test.<sup>72</sup> In an unpublished opinion, the court stated that in California "the proponent of evidence must demonstrate that correct scientific procedures were used in the particular case," and that "expert opinions must emanate from and be centered and grounded in what is current and predominant in the scientific 'marketplace.'"<sup>73</sup> The court drew no distinction between civil and criminal cases.

The trend of *Frye*'s application in civil cases is a positive development. After all, "the

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<sup>68</sup> Oppenheim v. United Charities of New York, 266 A.D.2d 116, 698 N.Y.S.2d 144 (App. Div.1999) (rejecting clinical ecology testimony based on the *Frye* rule); Selig v. Pfizer, Inc., 713 N.Y.S.2d 898, \_\_ (N.Y. Sup. Ct. 2000); Collins v. Welch, 178 Misc.2d 107, 109, 678 N.Y.S.2d 444 (Sup. Ct. 1998) (rejecting clinical ecology testimony).

<sup>69</sup> Blum v. Merrell Dow Pharmaceuticals, Inc., \_\_ A.2d \_\_ (Pa. 2000) (holding that the evidence in question would fail either the *Frye* or *Daubert* tests).

<sup>70</sup> Raoul D. Kennedy & James C. Martin, California Expert Witness Guide § 4.15, at 56 (2d ed., Mar. 1999 update).

<sup>71</sup> California only applies *Frye* when "the evidence is produced by a machine" or by other seemingly objective means. The state supreme court reasons that "like many laypersons, jurors tend to ascribe an inordinately high degree of certainty to proof derived from an apparently 'scientific' mechanism, instrument or procedure." People v. McDonald, 690 P.2d 709, 724 (Cal. 1984). The court has further explained that for *Frye* to apply there must be "an unproven technique or procedure [that] appears both in name and description to provide some definitive truth which the expert need only accurately recognize and relay to the jury," such as "machines or procedures which analyze physical data." People v. Stoll, 783 P.2d 698, 710-11 (Cal. 1989).

<sup>72</sup> Memorandum of Opinion, Dinerman v. McGhan Medical Corp., No. BC 065884 (Cal. Super. Ct. undated).

<sup>73</sup> Id. at \_\_.

same concerns for reliability that led to the adoption and application of *Frye* in criminal cases ‘are no less present because the action is civil in nature.’”<sup>74</sup> However, *Frye*’s applicability to tort cases is not yet a firmly established rule. Of the cases cited above, only the Minnesota and Pennsylvania cases were decided by a state’s highest court, and the Pennsylvania Supreme Court suggested that it might abandon *Frye* in favor of *Daubert* in the future. Other courts may prove themselves to be reluctant to apply *Frye* in toxic tort and products liability cases for fear of excessively raising the evidentiary barrier for plaintiffs.<sup>75</sup>

Yet ensuring the reliability of expert evidence is particularly important in products liability and toxic tort cases, where the economic stakes to both the parties to litigation and to society at large are extremely high. The risk of rejecting a valid plaintiffs’ claim is problematic, but certainly no more so than the risk of allowing junk science to drive safe products and substances—the Bendectin example comes to mind—off the market. The only way to protect society’s overall interests in toxic tort and products liability litigation is to enforce a standard that ensures the reliability of expert evidence, whether that standard be *Daubert*’s reliability test or the *Frye* general acceptance test. As Justice Breyer wrote in his concurring opinion in *Joiner*:

[M]odern life, including good health as well as economic well-being, depends upon

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<sup>74</sup> Blum v. Merrell Dow Pharmaceuticals, Inc., 705 A.2d 1314, \_\_\_\_ (Pa. Super. 1997), quoting Liles v. Balmer, 439 Pa. Super. 238, 653 A.2d 1237 (1994); see also Thomas

<sup>75</sup> This was the motivation behind the New Jersey Supreme Court’s pre-*Daubert* decision to not apply the state’s *Frye* standard to toxic tort cases. See Rubanick v. Witco Chem. Corp., 125 N.J. 421, 429 (N.J. 1991) (requiring only that a theory of causation be “based on a sound, adequately -founded scientific methodology involving data and information of the type reasonably relied on by experts in the scientific field). The following year, however, the court seemed to apply a more stringent standard, holding that expert witnesses in toxic tort cases must demonstrate that both their methodology and the factual bases for their conclusions are scientifically reliable. Landrigan v. Celotex, 127 N.J. 404, 412-13 (1992). The *Landrigan* standard is currently implicitly incorporated into New Jersey’s Rule of Evidence 702. N.J.R. Evid. 702, comment, and is significantly more stringent than versions of *Frye* that look solely to the general acceptance of an expert’s basic methodology. See *infra*.

the use of artificial or manufactured substances, such as chemicals. And it may prove particularly important to see that judges fulfill their *Daubert* gate-keeping function, so that they help assure that the powerful engine of tort liability, which can generate strong financial incentives to reduce, or to eliminate, production points towards the right substances and does not destroy the wrong ones.<sup>76</sup>

B. Methodologies/Conclusions/Reasoning Under *Frye*

After *Daubert* was decided, some judges and legal scholars argued that the decision required courts to limit themselves to determining whether a scientific expert witness was relying on studies that used a methodology appropriate for inquiry into the general subject at issue. Others maintained that courts should also review the expert's reasoning in extrapolating from those studies to their testimony on causation or other issues.<sup>77</sup> This debate was put to rest by the Supreme Court's opinion in *Joiner*.

*Joiner* acknowledged that under *Daubert* district courts must focus on principles and methodology, and not on the conclusions that they generate. However, the Court added, "conclusions and methodology are not entirely distinct from one another." "Trained experts," it is true, "commonly extrapolate from existing data. But nothing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence which is connected to existing data only by the ipse dixit of the expert. A court may conclude that there is simply too great an analytical gap between the data and the opinion proffered."<sup>78</sup>

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<sup>76</sup> *Joiner*, 522 U.S. at 149.

<sup>77</sup> Compare Bernstein, *supra* note \_\_\_\_ (arguing that *Daubert* requires courts to assess reasoning), with Kenneth J. Chesebro, *Taking Daubert's "Focus" Seriously: The Methodology/Conclusion Distinction*, 15 CARDOZO L. REV. 1745 (1994), and Michael H. Gottesman, *Admissibility of Expert Testimony After Daubert: The "Prestige" Factor*, 43 EMORY L.J. 867, 869-72 (1994) (both arguing that under *Daubert*, courts may only assess experts' general methodology).

<sup>78</sup> Cite.

The Court suggested in *Joiner* that lower courts should refuse to accept “any conclusion that good science does not permit to be drawn from the underlying data.”<sup>79</sup> In order to do so, the court must ensure “that every step in the expert’s reasoning process” is “grounded in good science.”<sup>80</sup>

A similar controversy has swirled around the *Frye* rule. California has long required under its version of *Frye* that the proponent of scientific evidence demonstrate both that the methodology used by the expert is generally accepted, and “that correct scientific procedures were used in the particular case.”<sup>81</sup> Several other courts adopted this version of the *Frye* rule as well, mainly in the context of DNA testing,<sup>82</sup> while others rejected it in favor of a general methodologies only approach.<sup>83</sup>

In *Christophersen*,<sup>84</sup> the Fifth Circuit applied *Frye* in a way that anticipated the Supreme Court’s ruling in *Joiner*. The Fifth Circuit found that while an expert’s conclusions *per se* need not be generally accepted, the methodology by which the expert arrived at his conclusion must be generally accepted.<sup>85</sup> Methodology, in this context, means not only the type of scientific study relied upon, but also includes the expert’s mode of reasoning. If the expert’s mode of reasoning in reaching his conclusion is not one “sufficiently established to have gained general acceptance in

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<sup>79</sup> Hall v. Baxter Health Care Corp., 947 F. Supp. 1387, 1401 (D. Ore. 1997).

<sup>80</sup> Id.

<sup>81</sup> People v. Kelly, 549 P.2d 1240, 1244 (Cal. 1976).

<sup>82</sup> United States v. Two Bulls, 918 F.2d 56, 61 (8th Cir. 1990); Ex parte Perry, 586 So.2d 242, 248 (Ala. 1991); People v. Lindsey, 868 P.2d 1085, 1090-91 (Colo. App. 1993); Commonwealth v. Rodgers, 605 A.2d 1228, 1234 (Pa. Super. Ct. 1992); People v. Adams, 489 N.W.2d 192 (Mich. 1992) (“the prosecutor must establish in each particular case that the generally accepted laboratory procedures were followed”).

<sup>83</sup> See State v. Cauthron, 846 P.2d 502, 506 (Wash. 1993) (rejecting the California rule). New York first adopted a rule analogous to the California rule in State v. Castro, 545 N.Y.S.2d 985, 987 (1989), and then proceeded to reject it in People v. Wesley, 83 N.Y.2d 417, 423, 611 N.Y.S.2d 97, 100 (1994) (“the general reliability of DNA matching was established at the hearing. The *Frye* test—the sole issue before us—requires no more”).

<sup>84</sup> See *supra* notes \_\_ to \_\_ and accompanying text.

<sup>85</sup> *Christophersen v. Allied-Signal Corp.*,

the particular field in which it belongs,” the expert’s testimony must be excluded. Moreover, if the expert offers “no more than theoretical speculation, then well-founded methodology and reasoning may not alone suffice.”<sup>86</sup>

Since *Christophersen*, state courts in *Frye* jurisdictions faced with motions to exclude expert evidence in toxic tort and product liability cases have ruled inconsistently on the methodologies/conclusions issue. In contrast to *Christophersen* and *Joiner*’s focus on the challenged expert’s reasoning process, several courts have held that it is only the expert’s underlying methodology that must be generally accepted,<sup>87</sup> while others have focused on the general acceptance of the expert’s ultimate conclusions.<sup>88</sup>

Neither rule of these rules is satisfactory. Allowing testimony based solely on the acceptance of an expert’s general methodology risks opening the floodgates to junk science. Epidemiology, DNA testing, and other methodologies are generally accepted by the scientific community, but only if the relevant studies or tests are conducted properly, and only if the person relying on the methodology has extrapolated (or reasoned) in a generally accepted way from the study or test results to his conclusions.

Meanwhile, courts risk depriving the jury of a great deal of helpful information if they require experts to prove that their ultimate conclusions are generally accepted. A scientist could conduct his research appropriately and extrapolate from it and other research in a generally accepted way, yet be the first to reach a particular conclusion relevant to particular case. This is

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<sup>86</sup> FN 8.

<sup>87</sup> See, e.g., *Berry v. CSX Transp., Inc.*, 709 So.2d 552 (Fla. Ct. App. 1998); *Centex\_Rooney Constr. Co. v. Martin County*, 706 So.2d 20 (Fla. Ct. App. 1997).

<sup>88</sup> See *McKenzie v. Westinghouse Elec. Corp.*, 674 A.2d 1167, \_\_\_ (Pa. Comm. 1996) (“there must be a showing, not that the studies establishing the causal relationship follow generally accepted methodologies, but that the existence of the causal relationship is generally accepted by the relevant medical community”); Pfizer.

an especially likely scenario in toxic tort litigation, where unique issues not of general interest to the scientific community are often presented. Otherwise sound testimony should not be excluded simply because the expert presenting it is the first one to endorse a particular conclusion.

Fortunately, several *Frye* jurisdictions recently have rejected both the general-methodologies-only and the conclusions approaches and focused instead on the expert's reasoning process.<sup>89</sup> This trend owes its emergence in part to *Joiner*, which, as discussed above, suggested that courts should focus on how an expert uses his methodology to reach the conclusion at issue.

For example, an Arizona superior court explicitly cited *Joiner* in rejecting the methodologies/conclusions distinction, instead holding that it must scrutinize an expert's reasoning process. The court proceeded to exclude under *Frye* evidence that exposure trichloroethylene caused various diseases among the plaintiffs. The plaintiffs' experts relied primarily on epidemiology, which the court acknowledged was, in a general sense, an appropriate methodology for determining whether exposure to a substance can cause disease. However, the court concluded that there were "no studies either epidemiological or animal . . . demonstrate [that] TCE, in the absence of other chemicals or in doses either similar to those at issue in this case or demonstrated through reliable scientific theory to be an appropriate extrapolation from existing studies, can be

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<sup>89</sup> Unfortunately, some judges still fail to recognize this third alternative. See, e.g., *Blum v. Merrell Dow Pharmaceuticals, Inc.*, \_\_\_ A.2d \_\_\_ (Pa. 2000) (Cappy, J., dissenting). Justice Cappy wrote: "I refer to the Superior Court's statement that there are 'two ways to analyze the question of whether the causation testimony proffered ... meets the Frye ... standard. One focuses on whether the causal relationship is generally accepted by the scientific community, and the other on whether the methodology is generally accepted by the scientific community.'" In fact, the Superior Court, as Justice Cappy half-heartedly acknowledges elsewhere, focused on the expert's reasoning, not his conclusions. See also *id.* at \_\_\_ (Castille, J., dissenting) ("Like Mr. Justice Cappy, I believe that the *Frye* test in this Court's jurisprudence has only required, and should only require, that the methodology employed by the testifying scientist, and not his or her ultimate conclusions or opinions as to causation, be generally accepted by the relevant scientific community.").

linked to any of the diseases at issue in this case at low level, environmental doses of TCE.”<sup>90</sup>

Moreover, the plaintiffs’ experts failed to explain the non-applicability of studies showing no such link at even higher doses than those at issue.<sup>91</sup>

Similarly, a Pennsylvania appellate court, discussing the admissibility of evidence that Bendectin causes birth defects, stated that “we do not ask whether the expert’s conclusions regarding the teratogenic effects of Bendectin are generally accepted. Rather, we consider the ‘underlying principle’ which must be generally accepted to be that the methods used by the experts to arrive at their conclusions actually give an accurate prediction of human teratogenicity.”<sup>92</sup> The court concluded that the underlying scientific principal of the plaintiffs’ expert testimony was not generally accepted in the relevant scientific community.

The Minnesota Supreme Court has held that under its version of *Frye*, a novel scientific technique must not only be generally accepted in the relevant scientific community, but “the particular evidence derived from that test must have a foundation that is scientifically reliable.”<sup>93</sup> Thus, the court found that evidence linking exposure to an insecticide to various injuries was properly excluded because neither of plaintiffs’ experts arrived at their opinions on causation

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<sup>90</sup> Lofgren v. Motorola, 1998 WL 299925, \* 12 (Ariz. Super. June 1, 1998)..

<sup>91</sup> Id.

<sup>92</sup> Blum v. Merrell Dow Pharmaceuticals, Inc., 705 A.2d 1314, \_\_\_ (Pa. Super. 1997), *aff’d*, \_\_\_ A.2d. \_\_\_ (Pa. 2000). Cf. Donaldson v. Central Illinois Public Service Co., 730 N.E.2d 68 (Ill. Ct. App. 2000) (holding that if a substance is known cause certain types of cancer, experts may extrapolate that the substance can cause other types of cancer because the “extrapolation method” is generally accepted); Duran v. Cullinan, 677 N.E.2d 999, 1003 (Ill. Ct. App. 1997) (finding that extrapolation method of determining cause of birth defects is generally accepted, and favorably analyzing the expert’s reasoning in extrapolating in this case, but taking the expert’s claim that he was adhering to generally accepted reasoning process at face value). The Illinois opinions cited above are disturbing because they contain no citations to any scientific book or article suggesting that the type of extrapolation engaged in by the experts in question was appropriate according to generally accepted standards. Rather, the courts seem to assume based on the experts’ own representations and common sense that extrapolation is proper.

<sup>93</sup> Goeb v. Tharaldson, 615 N.W.2d 800, \_\_\_ (Minn. 2000).

through reliable means.<sup>94</sup>

A New York trial court judge, meanwhile, excluded testimony in a medical malpractice case on the grounds that the plaintiff's expert failed to show that his causation theory for cerebral palsy was generally accepted in the field of child neurology, and also failed to show that his conclusion that "was based on any scientifically valid methodology."<sup>95</sup> The court explicitly cited *Joiner* for its position that it need not admit opinion evidence not supported by existing data.<sup>96</sup>

The opinion in a *Frye* jurisdiction most explicitly focusing on an expert's reasoning rather than just his general methodology is *E.I. DuPont De Nemours & Co., Inc. v. Castillo*.<sup>97</sup> In *Castillo*, the plaintiff claimed that exposure to the fungicide Benlate caused a child's birth defects. The plaintiff's expert relied on in vivo and in vitro tests, which DuPont acknowledged are generally accepted methods for analyzing the toxicology of a chemical such as Benlate. However, DuPont contended that the expert's direct extrapolation of data from the in vivo and in vitro testing to the conclusion that a substance is a human teratogen is not generally accepted science. The plaintiff responded that when an expert's opinion is based upon generally accepted scientific principles and methodology, it is not necessary that the expert's opinion be generally accepted as well. The court disagreed, holding that "where, as here, plaintiffs wish to establish a substance's teratogenicity in human beings based on animal and in vitro studies, the methodology used in the studies, including the method of extrapolating from the achieved results, must be generally accepted in the relevant scientific community." The court ultimately concluded that the "direct extrapolation method" used by the plaintiffs' experts was not generally accepted, and therefore the

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<sup>94</sup> Id. at \_\_.

<sup>95</sup> Lara v. New York City Health & Hospitals Corp., N.Y.L.J. Oct. 4, 2000, at 26 (Sup. Ct. N.Y.).

<sup>96</sup> Id. at \_\_.

<sup>97</sup> 748 So.2d 1108 (Fla. Ct. App. 2000).

testimony should be excluded.<sup>98</sup>

Courts that insist on examining the acceptance of experts' reasoning are obviously disinclined to limit *Frye* to *novel* techniques, as some jurisdictions still purport to do;<sup>99</sup> even an old, generally accepted technique can be used in an unaccepted, unreliable way. One court has explicitly rejected the view that *Frye* does not apply when an expert's testimony is not "based on outwardly novel scientific technique." Rather, *Frye* must be applied to determine whether an expert reaches his conclusions by "accepted scientific methods," particularly when the conclusions are novel.<sup>100</sup> Such opinions bring *Frye* ever closer to merger with *Daubert* and *Joiner*.

### C. *Frye* and Non-Scientific Expert Evidence

Many courts continue to hold that *Frye* only applies when an expert is relying on a scientific technique or test.<sup>101</sup> Thus, most *Frye* jurisdictions hold that *Frye* does not apply to expert opinion testimony based on knowledge and experience, even if the opinion has an underlying scientific

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<sup>98</sup> Id. at \_\_\_. By contrast, another Florida appellate court had the following to say about causation evidence:

Dr. Kelly's opinion was not only based upon Berry's statements of his symptoms, but was based upon Berry's personal history, medical records, physical examinations and medical tests. In short, Dr. Kelly's opinion was based upon sufficient epidemiological data, facts and personal observation, and was therefore reliable.

*Berry v. CSX Transp., Inc.*, 709 So.2d 552, **pin** (Fla. Ct. App. 1998). This is an obvious non-sequitor. An opinion is based on appropriate data is not reliable if the expert does not extrapolate properly from that data.

<sup>99</sup> See, e.g., *Campbell v. People*, 814 P.2d 1 (Colo. 1991).

<sup>100</sup> *Pfizer* at 902.

<sup>101</sup> *Owens Corning v. Bauman*, 726 A.2d 745 (Md. Ct. App. 1999). Some courts continue to require that the technique or test be novel, see, e.g., *Wahl v. America Honda Motor Co.*, 181 Misc.2d 396, 399, 693 N.Y.S.2d 875 (Sup. Ct.1999) (engineer's testimony, which was based on "recognized technical and specialized knowledge" is not subject to the *Frye* standard), but that requirement appears to be fading, see *supra* note \_\_ and accompanying text.. Professor Giannelli focused on the "novelty" aspect of *Frye* in his famous Columbia article on the doctrine, but it is not at all clear that novelty had been an important requirement for the applicability of *Frye*.

basis, because there is no technique or test involved.<sup>102</sup> One court, for example, has held that testimony by an ophthalmologist that a cataract was caused by exposure to transformer fluid is not subject to *Frye*,<sup>93</sup> while another court held that a physician may testify regarding the growth rate of mesothelioma based on his training and his experience in seeing over 2,500 cases of mesothelioma.<sup>94</sup>

Meanwhile, *Frye* also is not generally applied to social science evidence because such evidence is not deemed to be scientific. In particular, courts have refused to apply *Frye* to psychiatric evidence even when it is based on empirical research,<sup>95</sup> although New York is a

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<sup>102</sup> *Logerquist v. McVey*, 1 P.3d 113 (Ariz. 2000) (“Although compliance with *Frye* is necessary when the scientist reaches a conclusion by applying a scientific theory or process based on the work or discovery of others, under Ariz. R. Evid. 702 and 703 experts may testify concerning their own experimentation and observation and opinions based on their own work without first showing general acceptance.”); *People v. Pitts*, 223 Cal. App. 3d 606, 865 (1990) (“[T]here is a difference between development of a new scientific technique—a novel method of proof—and development of a body of medical knowledge and expertise. . . . The expression of an expert medical opinion as to the cause of a wound or injury falls outside of the realm of what is subject to the Kelly-*Frye* rule.”). But cf. *People v. Williams*, 6 N.Y.2d 18 (applying *Frye* to testimony regarding the credibility of a heroin addict); see generally *Lofgren v. Motorola*, 1998 WL 299925, \* 5 (Ariz. Super. June 1, 1998) (distinguishing a case that applied a standard arguably more liberal than *Frye* partly on the grounds “that the expert was testifying on his own general experience,” but noting that casting testimony as based on personal experience may result in an improper evasion of *Frye*).

<sup>93</sup> *Florida Power & Light Company, v. Tursi*, 729 So.2d 995 (Fla. Ct. App. 1999). It is hard to see how a general acceptance test can apply to testimony based on training and experience where there is no underlying scientific basis. However, the same concern applies to *Daubert-Kumho*’s reliability test. This author has suggested that parties wishing to present such testimony should not be allowed to present adversarial experts, but courts should instead appoint neutral experts. See David E. Bernstein, Washington Legal Foundation paper.

<sup>94</sup> *Owens Corning v. Bauman*, 726 A.2d 745 (Md. Ct. App. 1999). See also *Harris v. Cropmate Co.*, 706 N.E.2d 55 (Ill. Ct. App. 1999) (testimony regarding \_ not subject to *Frye*); *Carter v. Shoppers Food Warehouse Md. Corp.*, 727 A.2d 958 (Md. Ct. Spec. App. 1999) (testimony regarding safety measures not subject to *Frye*).

<sup>95</sup> E.g., *Logerquist v. McVey*, 1 P.3d 113 (Ariz. 2000) (*Frye* does not apply to testimony regarding repressed memories); *People v. McDonald*, 37 Cal. 3d 351, 373 (1984) (unreliability of eyewitness identifications); *People v. Phillips*, 175 Cal. Rptr. 703, 713-14 (1981) (evidence concerning “Munchausen’s syndrome by proxy”).

prominent exception in this regard.<sup>96</sup> Courts also remain reluctant to apply *Frye* to testimony by economists.<sup>97</sup>

The underlying rationale behind the limitation of *Frye* to scientific evidence is that scientific evidence may “appear infallible to the average juror,”<sup>98</sup> especially if it is based on a seemingly-objective test or device. By contrast, juries are assumed to understand that testimony based on experience or based on social science data is fallible. “Absent some special feature which effectively blindsides the jury, expert opinion testimony,” one court suggests, special screening of expert testimony for reliability test is not necessary.<sup>99</sup>

In fact, however, the potentially intimidating effect of scientific testimony on the jury is not the appropriate or primary modern rationale for special, strict rules for the admissibility expert testimony. The important dividing line is not between scientific and non-scientific testimony, but between lay witnesses and experts. Learned Hand summed up a problem with experts one hundred years ago: “[H]ow can the jury judge between two statements each founded upon an experience confessedly foreign in kind to their own? It is just because [jurors] are incompetent for such a task

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<sup>96</sup> People v. Taylor, 75 NY2d 277 (admitting evidence regarding rape trauma syndrome); Matter of Nicole V., 71NY2d 112 (admitted evidence regarding sexually abused child syndrome); People v. Johnston, AD2d; 709 NYS2d 230 (excluding evidence regarding child susceptibility to suggestive interrogation); People v. Burton, 153 Misc2d 681 (excluding evidence regarding acute grief syndrome); People v. Wernick, 89 NY2d 111 (excluding evidence regarding neonaticide syndrome); People v. Fortin, 184 Misc 2d 10 (excluding evidence regarding parental alienation syndrome); People v. Johnston, N.Y.L.J., June 14, 2000, at 25 (App. Div. N.Y.) (excluding evidence regarding the suggestability of children).

<sup>97</sup> See \_\_\_ v. \_\_\_ 2000 WL 1687804, \*10-11 (Mo. App.) (Refusing to apply *Frye* to economics testimony). But cf. Schumann v. Mo. Highway & Transp. Comm’n, 912 S.W.2d 548, 554 n. 8 (Mo. App.1995)(the court considered whether an economist’s testimony regarding hedonic damages should have been admitted under the standards established in *Frye*, *Daubert*, and Missouri’s evidence code).

<sup>98</sup> Cite.

<sup>99</sup> Id. at \_\_; see also Flanagan v. State, 625 So.2d 827 (Fla. 1993).

that the expert is necessary at all.”<sup>100</sup> Thus, courts have a duty to ensure that experts are presenting reliable testimony.

This obligation is especially acute because unlike ordinary fact witnesses, who typically come from a very limited pool of witness, there is usually an almost unlimited pool of the latter. For example, there is a limited pool of potential expert witnesses in a particular case. For example, there is a virtually unlimited pool of qualified experts who could testify in a typical medical malpractice case. While attorneys are stuck with the testimonial limitations of the available fact witnesses, an attorney who needs an expert has a virtually unlimited opportunity to “shop” for an expert with a pleasing courtroom manner who will testify that he or she agrees with the attorney’s theory of the case.<sup>101</sup>

Some of these potential expert witnesses will be venal hired guns who will say anything for money. As Judge Jack Weinstein has noted, “[a]n expert can be found to testify to the truth of almost any factual theory, no matter how frivolous.”<sup>102</sup> Ordinary fact witnesses may also have their biases, but attorneys can only take advantage of these biases if the witnesses already exist; attorneys cannot normally shop for an ordinary fact witness. By contrast, attorneys can seek expert witnesses who will parrot the attorneys’ line, and, indeed, implicitly “bribe” them to do so.<sup>103</sup>

Moreover, ordinary biases, such as a familial or friendly relationship to one of the parties, can typically be brought out on cross-examination.<sup>104</sup> Some authorities have argued that cross-examination will also reveal an expert witness’ bias to the jury.<sup>105</sup> This is dubious, because it not

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<sup>100</sup>Learned Hand, *Historical and Practical Considerations Regarding Expert Testimony*, 15 HARV. L. REV. 40, 54 (1902).

<sup>101</sup>Samuel R. Gross, *Expert Evidence*, 1991 WISC. L. REV. 1113, 1127.

<sup>102</sup>Jack B. Weinstein, *Improving Expert Testimony*, 20 U. RICH. L. REV. 473, 482 (1986).

<sup>103</sup>Gross, *supra* note \_\_\_\_.

<sup>104</sup>*Id.*

<sup>105</sup>Ronald J. Allen & Joseph S. Miller, *The Common Law Theory of Experts: Deference or Education?*, 87 NW. U. L. REV. 1131, 1146 (1993).

at all clear how opposing counsel can discredit a hired gun expert for taking money for his testimony, given that opposing counsel will have his own expert—who may be scrupulously honest—on his payroll.

In any event, even if the biases of hired guns can be revealed through cross-examination, that does not resolve the problems caused by expert-shopping. Not all, and perhaps not even most experts who testify to opinions outside the mainstream of their field are venal hired guns. Our system assumes, perhaps optimistically, that the jury can determine if the expert is outright lying. But what if the expert is simply shading the truth? Or, even more likely, what if the expert is simply an eccentric or outside the mainstream?

Indeed, parties have every incentive to hire “outlier” experts with sincere but extreme views so long as they can conceal the outlier status. There is no reason to hire an expert, for example, who will tell the jury that a client’s losses are worth \$150,000 if an attorney can find an equally credible expert willing to testify that the true figure is \$300,000. Moreover, there is no ethical obligation on attorneys to hire mainstream experts. Indeed, their ethical duty to zealously advocate for their clients may *require* them to hire outliers if it would help their client’s case.<sup>106</sup>

The United States Supreme Court implicitly recognized these dynamics when it held in *Kumho Tire* that *all* expert testimony, not just scientific testimony, must be subjected to a reliability test. *Frye*, however, is so closely associated with scientific techniques and tests that few courts have broadened its traditional focus on criminal forensic techniques beyond the toxic torts and products liability context.<sup>107</sup>

However, some *Frye* jurisdictions are expanding their trial courts’ gatekeeper role by

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<sup>106</sup> See David Bernstein, Note, *Out of the Frye-ing Pan and Into the Fire: The Expert Witness Problem in Toxic Tort Litigation*, 10 Rev. Litig. 117, 159 (1990).

<sup>107</sup> For an exception, see *Clemente v. Blumenberg*, 183 Misc. 2d 923 705 N.Y.S. 2d 792 (holding that expert testimony regarding biomechanics failed the general acceptance test).

applying a *Daubert*-like reliability test under their state evidence codes or common law to types of expert testimony not traditionally subject to *Frye*. An Illinois court, for example, has held that even non-novel scientific evidence is subject to a reliability test.<sup>108</sup> In Maryland, meanwhile, an expert may not testify under the state evidence code on any subject “unless there is a sufficient basis” beyond the common knowledge of the jury “upon which to support his conclusions.”<sup>109</sup> A New York trial court, meanwhile, has explicitly adopted the *Daubert* test for non-scientific evidence.<sup>110</sup> The court held that *Frye* was not applicable to engineering testimony based on “recognized technical or other specialized knowledge.”<sup>111</sup> Instead the court applied “the reliability standard as drives from *Daubert* and *Kumho Tire*.”<sup>112</sup>

### III. *Frye* Should be Replaced With New Federal Rule 702

Many *Frye* states reaffirmed their allegiance to *Frye* very soon after *Daubert* was decided. At that time many commentators (incorrectly) believed that *Daubert* was a weaker test than *Frye*, a belief that explicitly influenced some courts’ decision to retain *Frye*,<sup>113</sup> and undoubtedly implicitly influenced other courts.<sup>114</sup>

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<sup>108</sup> Harris v. Cropmate Co., 706 N.E.2d 55, 83 (Ill. Ct. App. 1999).

<sup>109</sup> Carter v. Shoppers Food Warehouse Md. Corp., 727 A.2d 958 (Md. Ct. Spec. App. 1999).

<sup>110</sup> Wahl v. America Honda Motor Co., 181 Misc.2d 396, 399, 693 N.Y.S.2d 875 (Sup. Ct.1999). But cf. Long v. Missouri Delta Med. Ctr., 2000 WL 1687804, \*10-\*11 (Mo. Ct. App.) (refusing to apply a reliability test to testimony by an economics expert absent explicit direction from the state supreme court).

<sup>111</sup> *Id.*

<sup>112</sup> *Id.*

<sup>113</sup> E.g., People v. Leahy, 34 Cal. Rptr. 2d 663 (emphasizing the purported relative liberality of the *Daubert* test); Brim v. State, 695 So.2d 268, 271 (1995) (“Despite the federal adoption of a more lenient standard in [*Daubert*], we have maintained the higher standard of reliability as dictated by *Frye*.”); State v. Carter, 524 N.W.2d 763, 778 (Neb. 1994) (referring to “the more lenient relevancy standard of *Daubert*”).

<sup>114</sup> For example, in People v. Berberich, N.Y.L.J. Jan. 11, 2000, at 25 (Sup. Ct. N.Y.), the court assumed that both *Daubert* and *Kumho Tire* were weaker tests than *Frye*. This is particularly ironic, since *Kumho Tire* enforces a gatekeeping standard for types of evidence that were never subject to the *Frye* test.

Yet as some commentators predicted,<sup>115</sup> *Daubert*, particularly as extended by *Joiner* and *Kumho Tire*, has become a far broader and stricter test than *Frye* ever was. As discussed in Part II, instead of being the vanguards of strict scrutiny of scientific evidence, *Frye* courts are stretching *Frye* beyond its original boundaries in a struggle to keep up with Supreme Court precedents. A better solution would be for *Frye* jurisdictions to adopt amended Federal Rule of Evidence 702, which incorporates the holding of the Supreme Court's expert evidence trilogy.

*Frye* should be replaced by the trilogy for several reasons. First, the trilogy makes it clear that the trial court must serve as gatekeeper of expert evidence in civil as well as criminal cases. By contrast, as discussed above, only Minnesota has unambiguously held that *Frye* applies in civil cases. Moreover, even in states where courts have begun to apply *Frye* in civil cases, social science and experience-based experts are still given free reign. The *Daubert* trilogy, by contrast, requires that trial courts exercise their gatekeeping responsibility with regard to *all* expert evidence.

The second reason states should adopt the *Daubert* trilogy is that *Joiner* requires courts to scrutinize an expert's reasoning, not just his general methodology. As discussed above, many *Frye* jurisdictions adhere to a general-methodologies-only approach, which in many cases amounts to little more than a let-it-all in rule. As a result plaintiffs' attorneys with dubious expert testimony are advised by their peers to "stay out of federal court and thus avoid *Daubert*" whenever

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<sup>115</sup> E.g., David Bernstein, *Hauling Junk Science Out of the Courtroom*, WALL ST. J., July 13, 1993, at A16 ("as standards are established, [*Daubert*] means that junk science will have a far harder time making it to court"); David E. Bernstein & Peter W. Huber, *Defense Perspective*, 1 SHEPARD'S EXPERT & SCI. EVID. Q. 59, 60 (1993) ("The trend towards stricter scrutiny of scientific evidence began in the late-1980s; in the aftermath of *Daubert* it will accelerate"); Marc S. Klein, *The Revolution in Practice and Procedure: "Daubert Hearings,"* 1 SHEPARD'S EXPERT & SCI. EVID. Q. 655, 656 (1994); see also *Scientific Evidence in the Courtroom: Admissibility and Statistical Significance After Daubert*, (Washington Legal Foundation 1993).

possible.<sup>116</sup> State courts—particularly those that were initially concerned that *Daubert* established too liberal a test for the admissibility of expert evidence—assumedly do not want to be the dumping grounds for junk science. Adopting the *Daubert* trilogy would also correct the error of courts that exclude expert testimony where the conclusions are not generally accepted, even if the expert’s methodology and reasoning is sound.

Third, *Frye* courts are inclined to treat scientific and non-scientific evidence differently. Some courts then apply a let-it-all-in approach to non-scientific evidence, others attempt to apply *Frye* to such evidence even where “general acceptance” has little if any meaning, while a growing number of courts are applying a separate reliability test to non-scientific evidence. The result is confusion at best, and a proliferation of unreliable “non-scientific” evidence at worst. As three justices of the Nebraska Supreme Court have observed, “[a]doption of the *Daubert/Kumho Tire* standards, on the other hand, both encourages the trial court to act as gatekeeper and places that function in the context of a sensible and uniform scheme for the evaluation of all types of expert opinion testimony.”<sup>117</sup>

Fourth, even the *Frye* rule was to evolve into a modern, sophisticated test that applies to all expert testimony and focuses on an expert’s reasoning,<sup>118</sup> *Daubert*’s flexible approach focusing on reliability is superior to *Frye*’s narrow focus on general acceptance.<sup>119</sup> If courts are to scrutinize

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<sup>116</sup> Ned Miltenberg, *Out of the Fryeing Pan and into the Fire, and Out Back Again--Or “Back to the Future,”* 2 Ann. 2000 ATLA CLE 2645 (2000).

<sup>117</sup> *Phillips v. Industrial Machine*, 597 N.W.2d 377, 389 (Neb. 1999) (Gerrard, J., concurring).

<sup>118</sup> “Even in states which do not have a version of the federal code of evidence, such as New York, one easily discerns an emerging trend on the part of trial judges to more assiduously scrutinize expert testimony to assure that it is reliable.” Michael Hoenig, *‘Testability’ of Expert’s Technique or Theory*, N.Y.L.J., Nov. 13, 2000, at 3.

<sup>119</sup> As the Supreme Court of Alaska notes:  
*Frye* is potentially capricious because it excludes scientifically reliable evidence which is not yet generally accepted, and admits scientifically unreliable evidence which although generally accepted, cannot meet rigorous scientific scrutiny.

expert testimony for reliability, they should do so directly through a reliability test, rather than use general acceptance as an indirect proxy for reliability. *Frye* can occasionally lead to the exclusion of evidence which is scientifically reliable, but fails the general acceptance test because it is too novel to have received such acceptance. More frequently, *Frye* leads to the admission of evidence that has never been shown to be reliable, but is generally accepted by a subgroup of experts who specialize in the forensic field in question.<sup>115</sup> Many forensic tests are generally accepted by those who conduct and interpret the tests, but have never been subject to independent verification.<sup>116</sup> Thus, contrary to the assertions of at least two courts, evidence that is admissible under *Frye* should frequently be excluded under *Daubert*.<sup>117</sup>

Fifth, courts too often use the *Frye* rule as an excuse to avoid grappling with the quality of the scientific evidence before them. As the New Mexico Supreme Court has pointed out, while in theory *Frye* requires courts to defer to the views of the scientific community, “in practice too many courts reference reported case law to determine what is generally accepted in the scientific community. It is improper to look for scientific acceptance only from reported case law because that amounts to finding a consensus in the legal community based on scientific evidence that is sometimes many years old.”<sup>118</sup>

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Because the *Frye* test potentially excludes evidence that should be admitted under our rules, and also potentially admits evidence that should be excluded under our rules, we conclude that it is both unduly restrictive and unduly permissive.

<sup>115</sup> See David E. Bernstein, *The Science of Forensic Psychiatry and Psychology*, 2 PSYCHOLOGY, PSYCHIATRY & L. 75 (1995). It should be acknowledged that California’s *Frye-Kelly* test is closer to a reliability test than to a traditional general acceptance test. See *supra* notes \_\_ to \_\_ and accompanying text.

<sup>116</sup> See Paul C. Giannelli, “Junk Science”: *The Criminal Cases*, 84 J. CRIM. L. & CRIMINOLOGY 105 (1993).

<sup>117</sup> *State v. Coon*, 974 P.2d 386, \_\_ (Alaska 1997) (“It also seems unlikely that methodologies that were admitted under *Frye* and that remain generally accepted in the appropriate community will be excluded, absent affirmative evidence of unreliability.”); accord *Johnson v. Commonwealth*, 12 S.W.3d 258, 262 (1999).

<sup>118</sup> *State v. Alberico*, 861 P.2d 192, \_\_ (1993).

Finally, courts have yet to resolve the ambiguities inherent in the *Frye* test, such how to determine the relevant field, whether “general acceptance” requires a consensus, a majority, or a significant minority, and whether the quality as well as the quantity of the majority and minority’s views should be taken into account.

## Conclusion

About a decade ago, Peter Huber and other junk science critics advocated the adoption of a stringent version of the *Frye* test that was much stricter and broader than the test applied in any actual *Frye* jurisdiction. So successful were the critics of junk science in associating *Frye* with strict scrutiny that many courts and commentators thought that opponents of junk science lost the *Daubert* case because *Frye* was overruled. Ironically, several courts adopted *Daubert* at least in part because they thought it was more liberal than *Frye*, while other courts reaffirmed *Frye* in what they thought was an attempt to combat junk science.

In fact, *Frye* as actually applied a decade ago was a rather limited, restricted test that barely restricted junk science in criminal cases, and was rarely applied in civil cases. The tests established by the *Daubert* trilogy are much more like what Huber advocated in *Galileo’s Revenge* than was the *Frye* rule as applied in most courts circa 1991. *Daubert*, then, is more like the aspirational *Frye* test advocated by junk science critics than *Frye* itself ever was. Over the last few years *Frye* has started to mature into the type of test that junk science opponents advocated a decade ago. In another irony, this change has come about mainly because of the influence of the *Daubert* trilogy, which itself only exists because of the overruling of *Frye* in federal courts. *Frye*, however, has by now lost its utility, at least in comparison to the *Daubert* trilogy. While federal courts gradually learn to implement the *Daubert* trilogy, case law under

*Frye* is in chaos with *Frye* jurisdictions (ironically) often looking to federal *Daubert* precedents as guidance.

As discussed above, there are several reasons *Frye* should be replaced with the *Daubert* trilogy. At the same time, there are no convincing reasons to retain *Frye*. After a distinguished and controversial career, *Frye v. United States* should be given its gold watch and forced into retirement.