

**THE EPISTEMOLOGICAL TREND IN THE  
EVOLUTION OF THE LAW OF EXPERT  
TESTIMONY: A SCRUTINY AT ONCE  
BROADER, NARROWER, AND DEEPER**

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## I. INTRODUCTION

“[T]he word ‘knowledge’ connotes more than subjective belief or unsupported speculation. The term ‘applies to any body of known facts or to any body of ideas inferred from such facts or accepted as truths on good grounds.’”<sup>1</sup>

The law of expert testimony has a long, venerable history.<sup>2</sup> When experts first made their appearance in British courts, they served in nonwitness roles.<sup>3</sup> On some occasions, experts appeared as advisors to the court.<sup>4</sup> In 1345, “for example, the court summoned surgeons to assist in determining whether a particular wound was fresh.”<sup>5</sup> On other occasions, courts convened expert juries. “[I]n a 1351 case in which the defendant had been charged with selling bad food, a [special] jury of cooks and fishmongers was called.”<sup>6</sup> The early jury was self-informing, and it was not uncommon for courts to convene juries consisting of merchants or members of a relevant guild or trade.<sup>7</sup>

Eventually, though, the self-informing jury was replaced by a relatively passive jury that heard testimony from witnesses.<sup>8</sup> Witnesses became the primary source of case-specific information for the jurors. By the end of the eighteenth century, in actions such as the 1782 civil case, *Folkes v. Chadd*, parties had begun to call expert witnesses to present testimony to such juries.<sup>9</sup> At that

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<sup>1</sup> *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 590 (1993) (Blackmun, J.) (quoting WEBSTER’S THIRD NEW INTERNATIONAL DICTIONARY 1252 (1986)).

<sup>2</sup> 1 DAVID L. FAIGMAN ET AL., MODERN SCIENTIFIC EVIDENCE: THE LAW AND SCIENCE OF EXPERT TESTIMONY § 1-1.0 (2002).

<sup>3</sup> See DAVID H. KAYE, DAVID E. BERNSTEIN & JENNIFER L. MNOOKIN, THE NEW WIGMORE: EXPERT EVIDENCE § 1.3 (2d ed. 2011) (noting that experts often served on “special juries”).

<sup>4</sup> *Id.*

<sup>5</sup> *Id.* (citing Learned Hand, *Historical and Practical Considerations Regarding Expert Testimony*, 15 HARV. L. REV. 40, 42 (1901)).

<sup>6</sup> *Id.* (citing JAMES BRADLEY THAYER, A PRELIMINARY TREATISE ON EVIDENCE AT COMMON LAW 94 (1898)).

<sup>7</sup> *Id.*

<sup>8</sup> See *id.* (noting that “parties [began] to call their own skilled witnesses”).

<sup>9</sup> *Id.* (citing *Folkes v. Chadd*, [1782] 99 Eng. Rep. 589).

point, the question arose: What test should trial judges use to decide whether testimony by such witnesses is admissible?

Courts have provided three different answers to that question. Initially, they fashioned a marketplace test:<sup>10</sup>

The assurance of expertise was implied by the expert's success in an occupation or profession that embraced that knowledge. If a person could make a living selling his knowledge in the marketplace, then presumably expertise existed. . . . In effect, the marketplace determined whether valid knowledge existed by endowing it with commercial value. This is not a point that courts made explicitly, but it seems to be implicit in the courts' determinations of who was "qualified." . . . What better crucible for testing expertise than the everyday world of life's activities, with stakes as great or greater than those at issue in trials, and decisions reflected in consumers' hard earned dollars?<sup>11</sup>

The test was general acceptance in the marketplace. If sensible laypersons were willing to pay for the services of doctors and accountants, common sense suggested that doctors and accountants possessed knowledge that could be helpful in court. However, it gradually became clear that "the test of commercial value is a poor one."<sup>12</sup> In the marketplace, choices are often driven by factors other than validity.<sup>13</sup> The court's primary responsibility is factfinding, and many factors influential in the market are "not good proxies for what courts are looking for. . . . If the marketplace approves, as it does, of astrologers, sellers of phony cancer cures, and guides to new age vortices, are those therefore good enough to provide guidance in a courtroom?"<sup>14</sup>

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<sup>10</sup> 1 FAIGMAN ET AL., *supra* note 2, § 1-2.1, at 3.

<sup>11</sup> *Id.* at 4-5.

<sup>12</sup> *Id.* at 5.

<sup>13</sup> *Id.*

<sup>14</sup> *Id.*

In 1923, in the celebrated *Frye* case,<sup>15</sup> the court enunciated a new test to govern the admissibility of expert testimony. The defendant, James Alphonzo Frye, was charged with murder. The defense submitted expert testimony to establish the defendant's innocence. More specifically, the defense contemplated calling William Marston to testify about the systolic blood pressure test, a forerunner of the modern polygraph.<sup>16</sup> The theory was that when a person engages in a conscious attempt to deceive, his or her systolic blood pressure will change. If so, by carefully monitoring the person's blood pressure during an interrogation, an expert could determine whether the interogee was being truthful. Marston was prepared to testify that when Frye denied committing the murder during the test, Frye's blood pressure did not change and, consequently, Frye's denial was truthful. The trial judge excluded the testimony, and the appellate court affirmed the ruling. In justifying the affirmance, Judge Van Orsdel wrote:

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.<sup>17</sup>

The *Frye* court's general acceptance test differed from the prior marketplace test. Under the marketplace test, the focus was on the general profession or occupation. The question was whether the profession was so accepted in the marketplace that rational adults were willing to pay for the services of the profession's members. *Frye* narrowed the issue and focused on the particular

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<sup>15</sup> *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).

<sup>16</sup> 1 FAIGMAN ET AL., *supra* note 2, § 1-2.2, at 5.

<sup>17</sup> 293 F. at 1014.

theory or technique the expert used—“the thing from which [the expert made] the deduction” in the instant case.<sup>18</sup> Thus, *Frye* provided a different answer to the question of *what* must be accepted. Similarly, *Frye* furnished a different answer to the question of *who* must accept. Under the earlier marketplace test, the required acceptors were consumers in the market who signified acceptance by parting with their “hard earned dollars” to purchase services.<sup>19</sup> Under *Frye*, the proponent had to demonstrate that the theory was accepted by experts within the relevant specialty fields.<sup>20</sup> The experts in those disciplines formed “a kind of technical jury”<sup>21</sup> who passed on the admissibility of testimony about the theory or technique.

Just as the marketplace test had its critics, there were detractors of the general acceptance standard. As some detractors noted, courts ultimately endeavor to adjudicate factual issues and need to be assured that witnesses are offering valid knowledge to assist in that endeavor. The *Frye* court selected a rather curious method of determining whether the member of a particular discipline was providing knowledge based on a valid theory or technique; under *Frye*, “control was passed to the [very] people who produced the knowledge and offered it . . . to the courts.”<sup>22</sup> Nevertheless, *Frye* held sway for decades. Between the date of its rendition in 1923 and the early 1990s, the general acceptance test gradually became the overwhelming majority view in both federal and state courts.<sup>23</sup> By one count, the general acceptance test had become the controlling standard in at least forty-five states.<sup>24</sup>

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<sup>18</sup> *Id.*

<sup>19</sup> 1 FAIGMAN ET AL., *supra* note 2, § 1-2.1, at 5.

<sup>20</sup> *People v. Williams*, 331 P.2d 251, 254 (Cal. App. Dep’t Super. Ct. 1958) (finding a sufficient showing of reliability where a test is accepted by “those who would be expected to be familiar with its use”); *see also* PAUL C. GIANNELLI, EDWARD J. IMWINKELRIED, ANDREA ROTH & JANE CAMPBELL MORIARTY, *SCIENTIFIC EVIDENCE* § 1.06[c], at 20 (5th ed. 2012) (discussing *Williams*).

<sup>21</sup> 1 FAIGMAN ET AL., *supra* note 2, § 1-2.2, at 6 n.16 (quoting *People v. Barbara*, 255 N.W.2d 171, 194 (Mich. 1977)).

<sup>22</sup> *Id.* § 1-2.2, at 7.

<sup>23</sup> GIANNELLI, IMWINKELRIED, ROTH & MORIARTY, *supra* note 20, at 13.

<sup>24</sup> Betty R. Steingass, Comment, *Changing the Standard for the Admissibility of Novel Scientific Evidence: State v. Williams*, 40 OHIO ST. L.J. 757, 769 (1979).

Yet, just as the general acceptance test supplanted the marketplace test, *Frye's* general acceptance test eventually gave way. In 1975, a new statutory evidence scheme, the Federal Rules of Evidence, took effect in federal court.<sup>25</sup> The scheme included a provision, Rule 402, which arguably abolished uncodified exclusionary rules of evidence.<sup>26</sup> Significantly, the new statutes did not seem to include any language that could reasonably bear the interpretation that they incorporated the general acceptance test. The question naturally arose as to whether the *Frye* test had survived the enactment of the Federal Rules.

In 1993, the Supreme Court answered that question in the negative in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*<sup>27</sup> To begin with, the Court abandoned the traditional general acceptance test. Writing for the majority, Justice Blackmun cited Rule 402<sup>28</sup> and professed that he could not find any statutory language codifying *Frye*.<sup>29</sup> Hence, the enactment of the Federal Rules implicitly superseded *Frye*.<sup>30</sup> However, in his next breath the Justice cautioned that the abolition of the *Frye* test did not mean that all relevant expert testimony is admissible willy-nilly under the Federal Rules. Rather, Justice Blackmun deduced a new reliability standard from the reference in Federal Rule of Evidence 702 to “scientific . . . knowledge.”<sup>31</sup> His analysis proceeded in two steps.

In the first step, he construed the word “knowledge.” He declared that Congress’s choice of that word was significant because the common understanding is that “the word ‘knowledge’

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<sup>25</sup> RONALD L. CARLSON, EDWARD J. IMWINKELRIED, EDWARD J. KIONKA & KRISTINE STRACHAN, *EVIDENCE: TEACHING MATERIALS FOR AN AGE OF SCIENCE AND STATUTES 20* (6th ed. 2007).

<sup>26</sup> See Edward J. Imwinkelried, *Federal Rule of Evidence 402: The Second Revolution*, 6 REV. LITIG. 129, 133 (1987) (“The omission, in Rule 402, of any reference to case law suggests a legislative intent . . . to deprive trial judges of the power to exclude relevant evidence on common-law grounds which remained uncodified.”).

<sup>27</sup> 509 U.S. 579, 587 (1993).

<sup>28</sup> *Id.* at 587.

<sup>29</sup> See *id.* at 589 (“[T]he assertion that the Rules somehow assimilated *Frye* is unconvincing.”).

<sup>30</sup> *Id.* at 587.

<sup>31</sup> *Id.* at 589.

connotes more than subjective belief or unsupported speculation.”<sup>32</sup>

Justice Blackmun then turned to the modifying adjective, “scientific.”<sup>33</sup> Drawing on several amicus briefs from scientists and scientific organizations, the Justice adopted an essentially methodological definition of the term.<sup>34</sup> Rather than equating science with a static set of substantive propositions, Justice Blackmun described it as “a process for proposing and refining theoretical explanations about the world that are subject to further testing and refinement.”<sup>35</sup> The Justice elaborated:

[I]n order to qualify as “scientific knowledge,” an inference or assertion must be derived by the scientific method. Proposed 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.<sup>36</sup>

Today, well over forty states have adopted evidence codes patterned after the Federal Rules of Evidence.<sup>37</sup> Since *Daubert* is based on statutory interpretation rather than constitutional analysis, even those states are free to construe their codes differently. However, in a relatively short period of time, over half the states have followed suit and embraced some variation of the *Daubert* reliability standard.<sup>38</sup> As we have seen, during the period

<sup>32</sup> 509 U.S. at 590; *see also* *Leake v. United States*, 843 F. Supp. 2d 554, 557 (E.D. Pa. 2011).

<sup>33</sup> 509 U.S. at 590–92.

<sup>34</sup> *See* Edward J. Imwinkelried, *The Daubert Decision: Frye Is Dead, Long Live the Federal Rules of Evidence*, 29 TRIAL, Sept. 1993, at 60, 62–63 (noting that methodologies, not conclusions, are tested under Rule 702).

<sup>35</sup> 509 U.S. at 590 (emphasis omitted) (quoting Brief for the American Association for the Advancement of Science and the National Academy of Sciences as Amici Curiae in Support of Respondents at 7–8, *Daubert*, 509 U.S. 579 (No. 92-102), 1993 WL 13006281).

<sup>36</sup> *Id.*

<sup>37</sup> CARLSON, IMWINKELRIED, KIONKA & STRACHAN, *supra* note 25, at 21. The text lists forty-one states. Since the release of that edition of the text, Connecticut, Georgia, and Illinois have adopted similar codes. Georgia’s recent adoption of its code is the occasion for this Symposium.

<sup>38</sup> GIANNELLI, IMWINKELRIED, ROTH & MORIARTY, *supra* note 20, §§ 1.14–.15.

since the expert's role changed from juror to witness, courts have employed three different standards to determine whether an expert may testify. For centuries, the implicit standard was the marketplace test.<sup>39</sup> That test was overtaken by the general acceptance standard, which enjoyed a seventy-year reign as the dominant test.<sup>40</sup> In turn, the *Daubert* reliability standard has replaced the general acceptance test as the prevailing standard. We are now two decades into the *Daubert* era. The key question is: In what direction is the law of expert testimony evolving? The thesis of this Article is that we are moving toward a fundamentally epistemological approach to determining the admissibility of expert testimony.<sup>41</sup>

This Article develops its thesis in three parts. The first part discusses which disciplines are now subject to scrutiny. This part notes that while many *Frye* jurisdictions exempted soft science and nonscientific expertise, the *Daubert* line of authority mandates that, like an epistemologist, a trial judge examine knowledge claims by any expert. The second part addresses the breadth of the judge's analysis. The second part also points out that under the marketplace and general acceptance tests courts sometimes conducted a global analysis and inquired generally whether the discipline itself was recognized and possessed some valid knowledge. The second part demonstrates that under *Daubert* the judge must instead test the reliability of the specific theory or technique the expert proposes to rely upon. Like an epistemologist, the judge must challenge the particular knowledge claim advanced by the expert. The third and final part concerns the depth of the judge's scrutiny. The third part explains that by employing acceptance tests the marketplace and *Frye* standards effectively delegated the decision to the required acceptors—either market actors or members of the relevant specialty field.<sup>42</sup> Thus, under these standards, the judge was obliged to accept *ipse dixit* assertions by the acceptors. In sharp contrast, *Daubert* and its

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<sup>39</sup> 1 FAIGMAN ET AL., *supra* note 2, § 1-2.1, at 4.

<sup>40</sup> See *supra* note 23 and accompanying text.

<sup>41</sup> See generally Edward J. Imwinkelried, *Serendipitous Timing: The Coincidental Emergence of the New Brain Science and the Advent of an Epistemological Approach To Determining the Admissibility of Expert Testimony*, 62 MERCER L. REV. 959 (2011).

<sup>42</sup> GIANNELLI, IMWINKELRIED, ROTH & MORIARTY, *supra* note 20, § 1.06[a], at 17–18.

progeny such as *Joiner* forbid the judge from accepting such assertions.<sup>43</sup> Like a skeptical epistemologist, the judge must demand that the proponent establish sufficient warrant for the expert's knowledge claim. The upshot of the new *Daubert* approach is that contemporary judges must engage in an analysis that is at once broader, narrower, and deeper than the analyses they conducted under the marketplace and general acceptance tests.

## II. BROADER: THE TYPES OF INTELLECTUAL DISCIPLINES SUBJECT TO SCRUTINY UNDER *DAUBERT*

### A. THE PRIOR STATE OF THE LAW

The proponents of the general acceptance test sometimes contended that that test was preferable because it was a conservative standard that shielded lay jurors from bogus expertise that might mesmerize them.<sup>44</sup> However, most *Frye* jurisdictions carved out some exceptions to the scope of the test and exempted certain types of expertise from the test.

First, many *Frye* jurisdictions did not extend the test to nonscientific expertise.<sup>45</sup> Scientists are not the only types of experts who appear in court. Farmers can testify about irrigation techniques, lawyers may testify about malpractice, and experienced police officers can testify about criminal modus operandi. These types of experts neither possess scientific credentials nor invoke scientific theories during their testimony. The policy argument runs that their testimony does not pose the same probative dangers as scientific evidence. Again, the primary fear inspiring *Frye* is the belief that scientific testimony might overawe lay jurors and mislead them into ascribing undue weight

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<sup>43</sup> See, e.g., *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997) (“[N]othing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert.”); see also *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 157 (1999) (quoting *Joiner*).

<sup>44</sup> See, e.g., *People v. Kelly*, 549 P.2d 1240, 1245 (Cal. 1976) (defending *Frye*'s “conservative nature” in light of jurors’ tendency to overvalue scientific evidence).

<sup>45</sup> See John William Strong, *Language and Logic in Expert Testimony: Limiting Expert Testimony by Restrictions of Function, Reliability, and Form*, 71 OR. L. REV. 349, 362–63 (1992) (discussing the narrow use of the *Frye* test).

to the testimony.<sup>46</sup> Nonscientific testimony does not involve the trappings of formal science; hence, there is a plausible argument that there is less reason to restrict the admissibility of nonscientific testimony. As a result, in the past many jurisdictions adopted a laissez-faire attitude toward such testimony.<sup>47</sup> Under this approach, the trial judge may inquire whether the witness qualifies as an expert and whether the subject matter of the expert's testimony is so far removed from common experience that the jurors may benefit from expert insight,<sup>48</sup> but the proponent will not need to make any showing of the general acceptance of the expert's underlying theory or technique.

Second, in the past many *Frye* states exempted so-called "soft" science from the scope of the test.<sup>49</sup> A California decision, *People v. McDonald*,<sup>50</sup> is illustrative. In that case, the defense proffered expert psychological testimony about the supposed unreliability of lay eyewitness testimony.<sup>51</sup> The California Attorney General argued that the testimony was subject to the general acceptance test and attempted to establish that there is a controversy in psychological circles over the validity of the theory.<sup>52</sup> The court rejected the argument. The court reiterated the rationale that lay "jurors tend to ascribe an inordinately high degree of certainty to [scientific testimony]."<sup>53</sup> However, the court reasoned that that risk is a significant concern only when the "evidence is produced

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<sup>46</sup> *Kelly*, 549 P.2d at 1245 ("Several reasons . . . support a posture of judicial caution in this area. Lay jurors tend to give considerable weight to 'scientific' evidence when presented by 'experts' with impressive credentials. We have acknowledged the existence of a ' . . . misleading aura of certainty which often envelops a new scientific process, obscuring its currently experimental nature.'" (quoting *Huntington v. Crowley*, 414 P.2d 382, 390 (Cal. 1966) (second alteration in original))).

<sup>47</sup> Edward J. Imwinkelried, *The Escape Hatches from Frye and Daubert: Sometimes You Don't Need To Lay Either Foundation in Order To Introduce Expert Testimony!*, 23 AM. J. TRIAL ADV. 1, 10 (1999).

<sup>48</sup> Strong, *supra* note 45, at 361-62.

<sup>49</sup> Roger S. Hanson, *James Alphonzo Frye Is Sixty-Five Years Old; Should He Retire?*, 16 W. ST. U. L. REV. 357, 414 n.192 (1989) (noting that jurors can easily understand such evidence).

<sup>50</sup> 690 P.2d 709 (Cal. 1984), *overruled by* *People v. Mendozay*, 4 P.3d 265 (Cal. 2000).

<sup>51</sup> *Id.* at 714.

<sup>52</sup> *Id.* at 723-24.

<sup>53</sup> *Id.* at 724.

by a machine.”<sup>54</sup> Since psychologists and social scientists employ “no such methods,”<sup>55</sup> their testimony need not run the gauntlet of the *Frye* test. The court noted that in the past, it had never applied the general acceptance test “to expert medical testimony.”<sup>56</sup>

#### B. THE STATE OF THE LAW UNDER *DAUBERT*

Although the exemptions for nonscientific testimony and soft science had numerous adherents during the *Frye* era, the *Daubert* line of authority has ended those exemptions.

As previously stated, the *Daubert* Court extracted its reliability standard from the wording of Federal Rule of Evidence 702.<sup>57</sup> Rule 702 refers in the alternative to “scientific, technical, or other specialized knowledge.”<sup>58</sup> In *Daubert*, the Court dealt with purportedly scientific testimony,<sup>59</sup> that is, formal epidemiology. Construing Rule 702, the Court initially ruled that the testimony had to qualify as “knowledge,” something “more than subjective belief or unsupported speculation.”<sup>60</sup> The Court then added that to constitute “scientific knowledge,” the testimony had to be “derived by the scientific method.”<sup>61</sup> The Court stated that in deciding whether the proffered expert testimony qualified, the trial judge could consider several factors such as whether the expert’s theory is empirically testable, whether it has indeed been tested, and whether the technique has a known error rate.<sup>62</sup> However, the Court added the caveat that the list of factors it had provided was

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

<sup>55</sup> *Id.*

<sup>56</sup> *Id.*; see also *State v. Trager*, 974 P.2d 750, 750 (Or. Ct. App. 1999); 2 GREGORY P. JOSEPH, *EVIDENCE IN AMERICA* § 51.5, at 21–23 (1988) (noting courts’ limited application of the general acceptance test); David McCord, *Syndromes, Profiles, and Other Mental Exotica: A New Approach to the Admissibility of Nontraditional Psychological Evidence in Criminal Cases*, 66 OR. L. REV. 19, 82–88 (1987) (discussing the proper uses of the general acceptance test).

<sup>57</sup> *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 589–90 (1993).

<sup>58</sup> FED. R. EVID. 702(a).

<sup>59</sup> 509 U.S. at 583.

<sup>60</sup> *Id.* at 590.

<sup>61</sup> *Id.*

<sup>62</sup> *Id.* at 593–94.

not “a definitive checklist.”<sup>63</sup> The Court emphasized that “[t]he inquiry envisioned by Rule 702 is . . . a flexible one.”<sup>64</sup>

Post-*Daubert*, the question was whether, like *Frye*’s general acceptance test, the new reliability test would be limited to scientific testimony. *Daubert* did not explicitly address that question. On the one hand, the factors mentioned by the Court appeared to be derived from classic scientific methodology. Thus, the nature of the listed factors suggested that the prior exemptions survived, since several of the factors were clearly inappropriate outside the scientific context. On the other hand, in note eight of its opinion, the Court cautioned that “[o]ur discussion is limited to the scientific context because that is the nature of the expertise offered here.”<sup>65</sup>

The result was predictable: The lower courts divided.<sup>66</sup> Some courts took the position that *Daubert* encompassed nonscientific as well as scientific expertise. However, others adopted the view that *Daubert* was inapplicable and that nonscientific testimony was subject to a different, more relaxed admissibility standard. By way of example, the Eleventh Circuit declared that *Daubert* applied “only where an expert relies ‘on the application of [formal] scientific principles.’”<sup>67</sup>

The next development was also predictable. The dispute was so important that the Supreme Court revisited the issue in 1999 to resolve the split of authority. In that year, the Court handed down its decision in *Kumho Tire Co., Ltd. v. Carmichael*. Justice Breyer delivered the Court’s opinion.<sup>68</sup>

He began his analysis by pointing out that, although Rule 702 refers in the alternative to “scientific, technical, or other specialized” expertise, all those adjectives modify the noun “knowledge.”<sup>69</sup> Whatever the type of proffered expertise, the

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<sup>63</sup> *Id.* at 593.

<sup>64</sup> *Id.* at 594.

<sup>65</sup> *Id.* at 590 n.8.

<sup>66</sup> See *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 146–47 (1999).

<sup>67</sup> *Id.* at 146 (quoting *Carmichael v. Samyang Tire, Inc.*, 131 F.3d 1433, 1435 (11th Cir. 1997)).

<sup>68</sup> *Id.* at 137.

<sup>69</sup> *Id.* at 147.

testimony must amount to reliable “knowledge.”<sup>70</sup> The Justice flatly rejected the contention that it would be desirable or feasible “for judges to administer evidentiary rules under which a gatekeeping obligation depended upon a distinction between ‘scientific’ knowledge and ‘technical’ or ‘other specialized’ knowledge. There is no clear line . . . .”<sup>71</sup>

While Justice Breyer announced that a trial judge must subject any type of expertise to a *Daubert*-style reliability scrutiny, he conceded that in a given case it might be inappropriate for a trial judge to consider the factors listed in *Daubert*.<sup>72</sup> Simply stated, it can be hard to cram square pegs into round holes. In 1997, in *General Electric Co. v. Joiner*, the Court had ruled that trial judges have discretion in applying the *Daubert* factors to scientific evidence.<sup>73</sup> In *Kumho*, the Court conferred a deeper type of discretion on judges. *Kumho* gave trial judges “considerable leeway” in selecting the factors that may be “reasonable measures of the reliability of [nonscientific] expert testimony.”<sup>74</sup>

In light of *Kumho*, neither nonscientific expertise nor soft science is exempt from the reliability test.<sup>75</sup> In the words of the Advisory Committee Note accompanying the 2000 amendment to Federal Rule 702, “[t]he trial court’s gatekeeping function applies to testimony by any expert.”<sup>76</sup> Yet the judge might find it challenging to conduct an inquiry into the reliability of nonscientific expertise. In some respects, *Daubert*’s list of factors derived from the scientific paradigm makes it easier for the judge to structure an assessment of the reliability of formally scientific testimony.<sup>77</sup> However, the difficulty of the task does not discharge

<sup>70</sup> *Id.*

<sup>71</sup> *Id.* at 148.

<sup>72</sup> *Id.* at 152.

<sup>73</sup> 522 U.S. 136, 142 (1997).

<sup>74</sup> *Kumho*, 526 U.S. at 152.

<sup>75</sup> Even before *Kumho*, the Court of Appeals for the Ninth Circuit had rebuffed the contention that psychological testimony was exempt from *Daubert*. *United States v. Amador-Galvan*, 9 F.3d 1414, 1417–18 (9th Cir. 1993); *cf.* *People v. McDonald*, 690 P.2d 709, 723–24 (Cal. 1984) (distinguishing between expert testimony and scientific evidence).

<sup>76</sup> FED. R. EVID. 702 advisory committee’s note (2000).

<sup>77</sup> See generally Edward J. Imwinkelried, *The Next Step After Daubert: Developing a Similarly Epistemological Approach To Ensuring the Reliability of Nonscientific Expert Testimony*, 15 CARDOZO L. REV. 2271 (1994).

the trial judge from the duty to perform the task.<sup>78</sup> The necessity for an inquiry into reliability applies broadly to every type of expertise offered at trial under Rule 702.

III. NARROWER: SCRUTINY OF THE RELIABILITY OF THE SPECIFIC THEORY OR TECHNIQUE UTILIZED BY THE EXPERT RATHER THAN THE GLOBAL VALIDITY OF THE DISCIPLINE

A. THE PRIOR STATE OF THE LAW

Before *Daubert*, when courts passed on the admissibility of expert testimony, they often focused on the global validity of the expert's discipline rather than the validity of the particular theory or technique that the expert relied on.<sup>79</sup> In the era of the marketplace test, the courts' focus tended to be implicit.<sup>80</sup> Courts asked whether the occupation or profession was accepted in the market.<sup>81</sup> If so, they assumed that the members of the occupation or profession possessed a valid, valuable expertise.<sup>82</sup> The judge inquired whether the discipline was accepted in the market and whether the witness qualified as a member of the discipline,<sup>83</sup> but the inquiry ended there.

The language of the original *Frye* opinion differed significantly from the terms of the old marketplace test. As previously stated, *Frye* required the proponent to demonstrate that "the thing from which the deduction is made . . . be sufficiently established to have gained general acceptance in the particular field in which it belongs."<sup>84</sup> That language could plausibly be read as referring to the expert's specific theory or technique, and some *Frye* courts

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<sup>78</sup> David L. Faigman, *To Have and Have Not: Assessing the Value of Social Science to the Law as Science and Policy*, 38 EMORY L.J. 1005, 1079–84 (1989).

<sup>79</sup> See D. Michael Risinger, *Defining the "Task at Hand": Non-Science Forensic Science After Kumho Tire Co. v. Carmichael*, 57 WASH. & LEE L. REV. 767, 773 (2000) (noting that reliability of expert testimony must be determined specifically as applied to the "task at hand").

<sup>80</sup> 1 FAIGMAN ET AL., *supra* note 2, § 1-2.1, at 4.

<sup>81</sup> *Id.* at 3–4.

<sup>82</sup> *Id.*

<sup>83</sup> *Id.* at 5.

<sup>84</sup> *Frye v. United States*, 293 F. 1013, 1014 (D.C. Cir. 1923).

interpreted the language in that fashion.<sup>85</sup> Based on that language, the judge could separate<sup>86</sup> or disentangle<sup>87</sup> the witness's expert status and the validity of the expert's theory. Having done so, the judge could next demand that the proponent make a foundational showing of the general acceptance of the particular theory or technique. Yet not all *Frye* jurisdictions followed that approach. Some took a global approach, demanding only that the expert's opinion relate "to a developed, recognized field of knowledge."<sup>88</sup>

#### B. THE STATE OF THE LAW UNDER *DAUBERT*

Even if the witness is a member of a recognized discipline or field, as a matter of epistemology it is fallacious to assume that "everything the witness utters from the witness stand [is] a product of [reliable] expertise."<sup>89</sup> Although the courts often succumbed to that fallacy before 1993, the *Daubert* line of authority reduces the risk that trial judges scrutinizing expert testimony will commit that error.<sup>90</sup> The cases in the *Daubert* trilogy—*Daubert*, *Joiner*, and *Kumho*—require the judge to eschew a global approach and focus squarely on the specific theory or technique that the expert contemplates relying on.

In the seminal *Daubert* decision, in the formal summary at the end of his opinion, Justice Blackmun wrote that the proponent's foundation must convince the trial judge that the expert's theory or technique is sufficiently "reliable" to enable the expert to perform "the task at hand."<sup>91</sup> Earlier in the opinion, the Justice stressed that the expert's theory or technique must "fit" the case.<sup>92</sup>

<sup>85</sup> See GIANNELLI, IMWINKELRIED, ROTH & MORIARTY, *supra* note 20, § 1.06[b], at 23–25.

<sup>86</sup> See 1 FAIGMAN ET AL., *supra* note 2, § 1-2.2, at 6 (noting that the *Frye* opinion "separated the expertise from the experts").

<sup>87</sup> See *id.* § 1-2.1, at 5 (noting that before the twentieth century, courts never asked whether a body of knowledge existed outside the claims of the expert who asserted it).

<sup>88</sup> Imwinkelried, *supra* note 47, at 10 (citing Proposed MASS. R. EVID. 702 advisory committee notes).

<sup>89</sup> D. Michael Risinger, *Preliminary Thoughts on a Functional Taxonomy of Expertise for the Post-Kumho World*, 31 SETON HALL L. REV. 508, 510 (2000).

<sup>90</sup> See Risinger, *supra* note 79, at 774–76 (discussing the *Daubert* Court's rejection of the global reliability approach).

<sup>91</sup> *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 597 (1993).

<sup>92</sup> *Id.* at 591–92.

In explaining the notion of “fit,” the Justice stated that the theory or technique must have “a valid scientific connection to the pertinent inquiry” before the judge.<sup>93</sup>

*Joiner* also signals a repudiation of the global approach. In *Joiner*, Chief Justice Rehnquist analyzed the question whether the animal studies cited by the plaintiff were an adequate basis for the plaintiff’s expert’s opinion as to the cause of Joiner’s small-cell lung cancer.<sup>94</sup> After enumerating several criticisms of the animal studies,<sup>95</sup> the Chief Justice wrote:

Respondent [plaintiff] failed to reply to this criticism. Rather than explaining how and why the experts could have extrapolated their opinions from these seemingly far-removed animal studies, respondent chose “to proceed as if the only issue [was] whether animal studies can ever be a proper foundation for an expert’s opinion.” Of course, whether animal studies can ever be a proper foundation for an expert’s opinion was not the issue. The issue was whether *these* experts’ opinions were sufficiently supported by the animal studies on which they purported to rely.<sup>96</sup>

The *Kumho* opinion confirms the narrowing of the analytic focus. In reviewing the foundation laid by the plaintiffs for their tire-failure analyst’s expert opinion, Justice Breyer conducted a highly particularized analysis:

[C]ontrary to [plaintiffs’] suggestion, the specific issue before the [trial] court was not the reasonableness *in general* of a tire expert’s use of a visual and tactile inspection to determine whether overdeflection had caused the tire’s tread to separate from its steel-belted

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<sup>93</sup> *Id.* at 592.

<sup>94</sup> Gen. Elec. Co. v. Joiner, 522 U.S. 136, 144–45 (1997).

<sup>95</sup> *See id.* at 144 (describing the dissimilarities between the animal studies and the facts of Joiner’s case).

<sup>96</sup> *Id.* (citation omitted); *see also* Bourne *ex rel.* Bourne v. E.I. DuPont Nemours & Co., 189 F. Supp. 2d 482, 496–99 (S.D. W. Va. 2002) (discussing *Joiner* and finding that rat studies relied upon by plaintiff’s expert were a “poor ‘fit’ for the facts of the case”).

carcass. Rather, it was the reasonableness of using such an approach, along with [the expert's] particular method of analyzing the data thereby obtained, to draw a conclusion regarding *the particular matter to which the expert testimony was directly relevant*.<sup>97</sup>

The Justice acknowledged that visual and tactile inspection can be useful in analyzing tire abuse.<sup>98</sup> However, the tire-failure expert claimed to have developed a more “particular” method—namely, a theory that there are four characteristic signs of tire abuse and that the absence of at least two of the signs indicates that the accident was caused by a manufacturing defect in the tire.<sup>99</sup> Later in the opinion, Justice Breyer stressed that “the question before the trial court was specific, not general.”<sup>100</sup> In the next paragraph, the Justice stated that “[t]he particular issue in this case concerned” the reliability of the specific theory that the expert had employed.<sup>101</sup>

The 2000 opinion of the Northern District of Illinois in *United States v. Fujii*<sup>102</sup> is a wonderful example of the type of sharply focused analysis that the *Daubert* trilogy contemplates. In that case, the defendant was charged with involvement in a scheme to arrange the fraudulent entry of two Chinese nationals into the United States.<sup>103</sup> When they attempted to enter at John F. Kennedy airport in New York in 1999, the nationals presented hand-printed immigration forms. The government alleged that the defendant, a native Japanese, had forged the forms.<sup>104</sup> The government called a questioned document examiner to testify that the defendant had printed the forms, and the defense lodged a *Daubert* objection to the examiner's testimony.<sup>105</sup> The defense presented an expert affidavit that in Japan, students are trained

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<sup>97</sup> *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 153–54 (1999).

<sup>98</sup> *Id.* at 156.

<sup>99</sup> *Id.* at 154.

<sup>100</sup> *Id.* at 156.

<sup>101</sup> *Id.* at 157.

<sup>102</sup> 152 F. Supp. 2d 939 (N.D. Ill. 2000), *discussed in* Risinger, *supra* note 79, at 798–800.

<sup>103</sup> *See id.* at 939–40 (explaining defendant's alleged connection to the fraudulent entry).

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

<sup>105</sup> *Id.* at 940.

to exactly copy characters and suppress individuality in their printing style.<sup>106</sup> At the beginning of her analysis of the objection, Judge Gottschall stated that the issue was not the general, global reliability of the discipline of questioned document examination.<sup>107</sup> Rather, the question was the reliability of the examiner's theory that there are sufficient unique characteristics in Japanese handprinting to identify the individual printer.<sup>108</sup> Since the prosecution presented insufficient evidence to validate that specific theory, Judge Gottschall granted the motion to exclude.<sup>109</sup> In Professor Risinger's words, *Fujii* "is a masterful example of particularized 'task at hand' analysis under" the *Daubert* line of authority.<sup>110</sup>

#### IV. DEEPER: THE SCRUTINY OF THE BASIS FOR THE EXPERT'S CLAIM THAT THE THEORY OR TECHNIQUE IS RELIABLE

##### A. THE PRIOR STATE OF THE LAW

As we have seen, prior to *Daubert*, courts tended to defer to some group's decision to accept either the expert's discipline or the expert's theory.<sup>111</sup> Under the marketplace test, courts deferred to the market's decision to value the services of a particular occupation or profession.<sup>112</sup> The underlying judgment was that "[k]nowledge that proved valuable in the marketplace could hardly be without worth in a courtroom."<sup>113</sup> Similarly, under *Frye*, courts deferred<sup>114</sup> to the members of the scientific specialties "most

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<sup>106</sup> See *id.* at 941 (discussing the defense expert's affidavit).

<sup>107</sup> See *id.* ("This court need not weigh in on this question, however, for whether handwriting analysis *per se* meets the *Daubert* standards, its application to this case poses more significant problems.").

<sup>108</sup> See *id.* (stating that the government had provided "no evidence that Ms. Cox's expertise extends to making an identification of handprinting when the handprinter[s] in question are native Japanese writers").

<sup>109</sup> *Id.* at 947.

<sup>110</sup> Risinger, *supra* note 79, at 800.

<sup>111</sup> See generally Ronald J. Allen & Joseph S. Miller, *The Common Law Theory of Experts: Deference or Education?*, 87 NW. U. L. REV. 1131 (1993).

<sup>112</sup> See 1 FAIGMAN ET AL., *supra* note 2, § 1-2.1, at 4 ("If a person could make a living selling his knowledge in the market place, then presumably expertise existed.").

<sup>113</sup> *Id.* at 5.

<sup>114</sup> *State v. Copeland*, 922 P.2d 1304, 1314 (Wash. 1996).

qualified to assess the general validity of [the] scientific method.”<sup>115</sup> If the determinative<sup>116</sup> group accepted the discipline or theory, the judge could not probe the underlying basis of the expert’s knowledge claim and assess the adequacy of the support for the claim. Rather, if the judge found that the required degree of acceptance existed, the judge was obliged to accept the expert’s *ipse dixit*<sup>117</sup> knowledge claim at face value.<sup>118</sup>

#### B. THE STATE OF THE LAW UNDER *DAUBERT*

In *Joiner* and *Kumho*, the Supreme Court made clear that it is no longer permissible for trial judges to accept an expert’s knowledge claim at face value. In *Joiner*, Chief Justice Rehnquist wrote:

[N]othing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence that 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>119</sup>

As previously explained,<sup>120</sup> the numerous differences between the studies the plaintiffs’ expert relied upon and the facts of *Joiner*’s case<sup>121</sup> provided the basis for the Supreme Court’s decision to sustain the trial judge’s conclusion that “the studies upon which the experts relied were not sufficient, whether individually or in

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<sup>115</sup> *United States v. Addison*, 498 F.2d 741, 743–44 (D.C. Cir. 1974).

<sup>116</sup> *Id.*

<sup>117</sup> See *Risinger*, *supra* note 79, at 777 (explaining *ipse dixit* acceptance in the “guild” context).

<sup>118</sup> *Id.* at 770.

<sup>119</sup> *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146 (1997).

<sup>120</sup> See *supra* Part II.B (explaining *Joiner*’s exclusion of expert testimony).

<sup>121</sup> *Joiner*, 522 U.S. at 144–46. The Court identified several differences: although *Joiner* was an adult, the mice studied were infants; although *Joiner*’s exposure was dermal, the PCBs were injected directly into the peritoneums or stomachs of the mice; although the mice received “massive doses” of PCBs, *Joiner*’s exposure “was far less”; although *Joiner* developed small-cell carcinomas, the mice developed alveolargenic adenomas.

combination, to support” the experts’ conclusions that Joiner’s PCB exposure contributed to his cancer.<sup>122</sup>

In *Kumho*, Justice Breyer approvingly quoted the *Joiner* Court’s repudiation of *ipse dixit* knowledge claims by experts.<sup>123</sup> In *Kumho*, the plaintiff’s tire expert, Carlson, relied on a theory that he claimed enabled him to determine whether a defect had caused a tire’s separation: “Carlson testified precisely that in the absence of *at least two* of four signs of abuse (proportionately greater tread wear on the shoulder; signs of grooves caused by the beads; discolored sidewalls; marks on the rim flange), he concludes that a defect caused the separation.”<sup>124</sup> However, like the *Joiner* trial court, the *Kumho* trial court took its gatekeeping responsibilities seriously. Rather than deferring to Carlson, the trial judge evaluated the adequacy of the basis for Carlson’s theory and found its basis wanting.<sup>125</sup> There was no evidence that “other experts in the industry use Carlson’s two-factor test.”<sup>126</sup> The plaintiffs could not point to any empirical research, “articles or papers that validate Carlson’s approach.”<sup>127</sup> As in *Joiner*, the Court affirmed the trial judge’s duty to probe the basis for the expert’s claim and ruled that the judge had not abused discretion in finding the basis inadequate.<sup>128</sup>

Under *Daubert*, if the opponent makes a specific, timely objection, the trial judge must independently assess the sufficiency of the basis for the expert’s claim that the theory or technique is reliable.<sup>129</sup> Rather than passively accepting the claim, the judge must actively test it. Trial judges must take a more vigorous role

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<sup>122</sup> *Id.* at 146–47.

<sup>123</sup> *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 157 (1999).

<sup>124</sup> *Id.* at 154.

<sup>125</sup> *Id.* at 156.

<sup>126</sup> *Id.* at 157.

<sup>127</sup> *Id.*

<sup>128</sup> *Id.* at 158.

<sup>129</sup> Professor Faigman points out that in the early part of the twentieth century, society in general and the courts in particular tended to be quite deferential to professionals. 1 FAIGMAN ET AL., *supra* note 2, § 1-2.2, at 7 n.18. However, he adds that “[t]he latter part of the twentieth century has seen a weakening of the status of professions, and the most recent shifts in the rules of evidence may be seen to parallel the loss of autonomy of professions.” *Id.*

in evaluating the adequacy of the basis or warrant for the expert's claim.<sup>130</sup>

As *Kumho* indicates, this gatekeeping responsibility comes into play whenever the proponent offers any type of expert testimony. Suppose that, in a civil action, an expert claims that there is a meat-scrap-industry custom that a contract reference to "50% protein" allows a supplier to deliver any merchandise with more than 49.5% protein. The opposing attorney has a right to demand that the expert specify the basis for the claim. If the expert then testifies to having been a member of the industry for a substantial period of time and having encountered that usage on a large number of occasions, the judge should sustain the claim and admit the testimony.<sup>131</sup>

However, absent such a foundation, the claim is nothing more than *ipse dixit*. Or assume that, in a criminal case, a dog handler claims that a canine's alert indicated that the defendant's luggage contained illegal drugs. Again, the defense counsel has the right to insist that the expert detail the warrant for the claim. In response to the objection, the expert might testify that the dog in question received two months' training as a drug detection dog, that the handler has worked with the dog for a year, that during that year the handler witnessed the dog alert in that fashion on at least 100 occasions, that in ninety of those instances there were follow-up searches, and that all of the follow-up searches yielded contraband drugs. As a matter of logic, those facts suffice to support the inference that the dog's alert probably meant that there were drugs in the luggage. As the Advisory Committee Note accompanying the 2000 amendment of Federal Rule 702 notes, the "results" of the prior use of a technique can furnish an adequate, pragmatic basis to validate a technique.<sup>132</sup> However, as in the

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<sup>130</sup> *Cavallo v. Star Enter.*, 892 F. Supp. 756, 774 (E.D. Va. 1995), *aff'd in part, rev'd in part*, 100 F.3d 1150 (4th Cir. 1996) (explaining the change in procedure under *Daubert*); *see also* *Hoult v. Hoult*, 57 F.3d 1, 4–5 (1st Cir. 1995) (noting district court's obligation to evaluate reliability).

<sup>131</sup> Edward J. Imwinkelried, *The Meaning of "Appropriate Validation" in Daubert v. Merrell Dow Pharmaceuticals, Inc., Interpreted in Light of the Broader Rationalist Tradition, Not the Narrow Scientific Tradition*, 30 FLA. ST. U. L. REV. 735, 752 (2003) (discussing the process).

<sup>132</sup> FED. R. EVID. 702 advisory committee's note (2000).

contract hypothetical, if the expert could not articulate a rational basis for the claim, as gatekeeper, the trial judge would have no choice but to bar the expert's testimony.

## V. CONCLUSION

Epistemology is the study of the nature of knowledge.<sup>133</sup> Since the time immemorial, particularly since the classic Greek era,<sup>134</sup> humanity has grappled with the fundamental epistemological questions: What do you claim to know, and what is the basis or warrant for your claim? Epistemological inquiry led to the emergence of the scientific process. Scientific process is one of the preeminent methods of addressing the epistemological questions: treat the person's claim as a hypothesis, and then engage in controlled laboratory experimentation or systematic field observation to provide a basis for the claim. It is no accident that many of the giants in epistemology—including Aristotle,<sup>135</sup> David Hume,<sup>136</sup> Hans Vaihinger,<sup>137</sup> R.G. Collingwood,<sup>138</sup> and George Santayana<sup>139</sup>—were also serious students of the scientific method. The past quarter century has witnessed a dramatic increase in the use of expert testimony, including scientific evidence, in American courtrooms.<sup>140</sup> Some commentators have suggested that trial by jury is evolving into trial by expert.<sup>141</sup> Given science's epistemological roots, it was to be expected that the modern

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<sup>133</sup> 1 B.A.G. FULLER & STERLING M. McMURRIN, A HISTORY OF ANCIENT AND MEDIEVAL PHILOSOPHY App. VI, at xxxvii (3d ed. 1945).

<sup>134</sup> *Id.* at 92, 191.

<sup>135</sup> *Id.* at 191.

<sup>136</sup> ALBUREY CASTELL, AN INTRODUCTION TO MODERN PHILOSOPHY IN SEVEN PHILOSOPHICAL PROBLEMS 187, 191 (2d ed. 1963).

<sup>137</sup> *Id.* at 233–45.

<sup>138</sup> *Id.* at 249–56.

<sup>139</sup> WILL DURANT, THE STORY OF PHILOSOPHY 369 (1961).

<sup>140</sup> 1 MCCORMICK ON EVIDENCE § 13 (Kenneth S. Broun et al. eds., 7th ed. 2013) (discussing a study on the use of experts in early 1990s California trials in which the Rand Corporation determined experts appeared in 86% of trials studied with each trial featuring, on average, 3.3 experts).

<sup>141</sup> *See, e.g.*, William T. Pizzi, *Expert Testimony in the US*, 145 NEW L.J. 82, 82–83 (Jan. 27, 1995) (outlining the American judicial system's reliance on experts and considering possible solutions).

judicial disputes over the quality of scientific evidence would lead courts back to the fundamental epistemological questions.

More specifically, the thesis of this Article has been that the *Daubert* line of authority tasks trial judges to subject proffered expert testimony to essentially epistemological scrutiny. When a witness proposes testifying as an expert, the trial judge, like an epistemologist, must initially ask: What do you claim you know? What is the specific theory or technique that you intend to rely on during your testimony? The witness cannot hide behind education or experience; that background may enable formulation of a claim, but it does not constitute a claim. If the witness's notion is ineffable and inarticulable, the notion is mysticism, not expertise. Nor can the witness evade scrutiny by asserting membership in a recognized discipline or profession. At any given time in the history of a discipline or profession, the discourse will include a spectrum of types of propositions ranging from unsubstantiated conjecture to well-validated theories that command almost unanimous support.<sup>142</sup> Epistemological analysis does not proceed globally; rather, it focuses on the precise knowledge claim that has been advanced. Once the expert has identified that claim, the judge, again like an epistemologist, must reach the second fundamental question: What is the basis or warrant for the claim?<sup>143</sup>

Some have remarked that the judge's responsibilities under *Daubert* are "daunting."<sup>144</sup> In his concurrence in *Daubert*, Chief Justice Rehnquist cautioned against requiring federal trial judges to become in effect "amateur scientists."<sup>145</sup> After all, many trial judges have "little or no scientific training."<sup>146</sup> The problem is compounded because, under the prior marketplace and general acceptance tests, courts did not accumulate experience critically evaluating the bases for experts' knowledge claims. To an extent, *Daubert* forces courts to write on a *tabula rasa*.

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<sup>142</sup> Imwinkelried, *supra* note 131, at 742.

<sup>143</sup> Risinger, *supra* note 89, at 535.

<sup>144</sup> *Daubert v. Merrell Dow Pharms., Inc.*, 43 F.3d 1311, 1315 (9th Cir. 1995) (Kozinski, J.).

<sup>145</sup> *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 601 (1993) (Rehnquist, C.J., concurring in part, dissenting in part).

<sup>146</sup> *Casey v. Ohio Med. Prods.*, 877 F. Supp. 1380, 1383 (N.D. Cal. 1995).

Nevertheless, there are several reasons to be hopeful: To begin with, as the late Sir Karl Popper, a leading philosopher of science,<sup>147</sup> famously remarked, the scientific method is essentially “common-sense knowledge writ large.”<sup>148</sup> Thomas Huxley voiced the same concept when he wrote that science is “organized common sense”<sup>149</sup> or “common sense at its best.”<sup>150</sup> When a rational person encounters a problem in life and wants to surmount it, common sense counsels the person to attempt to identify the issue posed by the problem. After identifying the issue, the next sensible step is to investigate it—conducting a more or less formal test, carefully observing the test results, and rigorously evaluating the significance of those test results. Even a judge with no formal scientific training has the epistemic competence to discern whether an expert has followed the essential steps of sensible scientific analysis.

Moreover, even post-*Daubert*, the judge’s responsibility is limited. As Justice Blackmun stated in his majority opinion, “[t]he focus . . . must be solely on principles and methodology, not on the conclusions that they generate.”<sup>151</sup> The Advisory Committee Note to the 2000 amendment to Rule 702 elaborates on that passage, explaining that,

[a]s the court stated in *In re Paoli R.R. Yard PCB Litigation*, 35 F.3d 717, 744 (3d Cir. 1994), proponents “do not have to demonstrate to the judge by a preponderance of the evidence that the assessments of their experts are correct, they only have to demonstrate by a preponderance of evidence that their opinions are reliable . . . . The evidentiary

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<sup>147</sup> See Stephen Thornton, *Karl Popper*, in *STANFORD ENCYCLOPEDIA OF PHILOSOPHY* (Edward N. Zalta ed., Winter 2012), <http://plato.stanford.edu/archives/win2012/entries/popper> (“Karl Popper is generally regarded as one of the greatest philosophers of science of the 20th century.”); see also *Daubert*, 509 U.S. at 593 (citing Popper).

<sup>148</sup> KARL R. POPPER, *THE LOGIC OF SCIENTIFIC DISCOVERY*, at 22 (English ed., 1959) (1934); *id.* at 18 (“[S]cientific knowledge can only be an extension of common-sense knowledge . . .”).

<sup>149</sup> FREDERICK BERRY, *THE SCIENTIFIC HABIT OF THOUGHT* 30 (1927) (quoting an unspecified work of Huxley).

<sup>150</sup> T.H. HUXLEY, *THE CRAYFISH: AN INTRODUCTION TO THE STUDY OF ZOOLOGY* 2 (1880).

<sup>151</sup> *Daubert*, 509 U.S. at 595.

requirement of reliability is lower than the merits standard of correctness.”<sup>152</sup>

Before admitting expert testimony, the judge need not conclude that the expert’s theory is correct; the judge need find only that the theory is supported by adequate, methodologically sound empirical reasoning and data.<sup>153</sup>

Finally, whatever the Supreme Court precedents may not do, they settle the point that the proponent has the burden of proving that the expert’s theory qualifies as reliable “scientific, technical, or other specialized knowledge” within the meaning of that expression in Rule 702.<sup>154</sup> If the proponent’s showing does not convince the judge that the proponent has met that burden, the judge is not supposed to agonize interminably over the validity of the expert’s theory or technique. The judge is not a philosopher, much less an epistemologist. Rather, the judge is a decision maker. If the proponent does not satisfy the burden, *Daubert’s* assignment of the burden dictates the decision: The judge must exclude the expert testimony. We know at least that much.

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<sup>152</sup> FED. R. EVID. 702 advisory committee’s note (2000) (alteration in original).

<sup>153</sup> In *Daubert*, Justice Blackmun recognized that “arguably, there are no certainties in science.” 509 U.S. 579, 590 (1993). See generally Edward J. Imwinkelried, *Evidence Law Visits Jurassic Park: The Far-Reaching Implication of the Daubert Court’s Recognition of the Uncertainty of the Scientific Enterprise*, 81 IOWA L. REV. 55 (1995) (exploring the far-reaching implications of Justice Blackmun’s acknowledgement of uncertainty in science).

<sup>154</sup> *Daubert*, 509 U.S. at 592.

