

# The Supreme Court's Trilogy on the Admissibility of Expert Testimony

MARGARET A. BERGER

*Margaret A. Berger, J.D., is Suzanne J. and Norman Miles Professor of Law, Brooklyn Law School, Brooklyn, New York.*

## CONTENTS

- I. Introduction, 10
- II. The First Two Cases in the Trilogy: *Daubert* and *Joiner*, 11
  - A. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 11
  - B. *General Electric Co. v. Joiner*, 13
- III. *Kumho Tire Co. v. Carmichael*, 15
  - A. The District Court Opinion, 15
  - B. The Court of Appeals Opinion, 17
  - C. The Supreme Court Opinion, 17
- IV. The Implications of the *Kumho* Opinion, 21
  - A. A Comparison of *Kumho* and *Daubert*, 21
    - 1. Differences in emphasis between *Daubert* and *Kumho*, 21
    - 2. The role of “general acceptance” and the “intellectual rigor” test, 23
  - B. The Reaffirmation and Extension of *Joiner*’s Abuse-of-Discretion Standard, 26
    - 1. The scope of the standard, 26
    - 2. The possibility and consequences of intracircuit and intercircuit conflict, 27
    - 3. Procedures a trial judge may use in handling challenges to expert testimony, 28
  - C. Persistent Issues, 29
    - 1. Determining if the expert’s field or discipline is reliable, 30
    - 2. Challenging an expert’s testimony to prove causation, 32
- V. Conclusion, 38

## I. Introduction

On March 23, 1999, the U.S. Supreme Court decided *Kumho Tire Co. v. Carmichael*,<sup>1</sup> the third in a series of cases dealing with the admissibility of expert testimony. The trilogy began in 1993 with *Daubert v. Merrell Dow Pharmaceuticals, Inc.*,<sup>2</sup> a toxic tort action, in which the Court promulgated a new test for federal courts to use when ruling on the admissibility of scientific evidence. The second case, *General Electric Co. v. Joiner*,<sup>3</sup> decided in 1997, likewise dealt with the admissibility of scientific evidence in the context of a toxic tort suit. In *Kumho*, the Court extended the approach of these prior opinions to nonscientific expert testimony proffered in a product liability action. In doing so, *Kumho* provides new insights into the meaning of *Daubert* and *Joiner*, and offers guidance on how federal trial and appellate courts can appropriately respond when a party seeks to exclude an opponent's expert testimony. Because of its broad scope, *Kumho* is likely to play a significant role in all future rulings on the admissibility of expert proof.<sup>4</sup>

The opinions in the trilogy are so interrelated that *Kumho*'s significance and potential impact emerge much more clearly when viewed in conjunction with the Court's analyses in the earlier cases. Consequently, section II of this chapter examines the *Daubert* and *Joiner* opinions. Section III begins with a survey of the lower courts' opinions in *Kumho* and then turns to the Supreme Court's opinion. Section IV examines the current state of the law with regard to expert testimony in light of *Kumho* and addresses some of the more troublesome questions that are likely to arise in connection with requests to exclude expert testimony. As in the Evidentiary Framework chapter that appeared in the first edition of the *Reference Manual on Scientific Evidence*, the aim of this discussion is to provide a starting point for analysis by highlighting issues that the courts will have to resolve.

1. 119 S. Ct. 1167 (1999).

2. 509 U.S. 579 (1993).

3. 522 U.S. 136 (1997).

4. David L. Faigman et al., *Preface* to 3 *Modern Scientific Evidence: The Law and Science of Expert Testimony* at v (David L. Faigman et al. eds., 1999) ("The importance of this decision cannot be overstated, and it ranks with *Daubert* in the likely effect it will have on the practice of admitting expert testimony.") [hereinafter *Modern Scientific Evidence*].

## II. The First Two Cases in the Trilogy: *Daubert* and *Joiner*

### *A. Daubert v. Merrell Dow Pharmaceuticals, Inc.*

In the seminal *Daubert* case, the Court granted certiorari to decide whether the so-called *Frye* (or “general acceptance”) test, which was used by some federal circuits in determining the admissibility of scientific evidence, had been superseded by the enactment of the Federal Rules of Evidence. The Court held unanimously that the *Frye* test had not survived. Six justices joined Justice Blackmun in setting forth a new test for admissibility after concluding that “Rule 702 . . . clearly contemplates some degree of regulation of the subjects and theories about which an expert may testify.”<sup>5</sup> While the two other members of the Court agreed with this conclusion about the role of Rule 702, they thought that the task of enunciating a new rule for the admissibility of expert proof should be left to another day.<sup>6</sup>

The majority opinion in *Daubert* continued by setting forth major themes that run throughout the trilogy: The trial court is the “gatekeeper” who must screen proffered expertise, and the objective of the screening is to ensure that what is admitted “is not only relevant, but reliable.”<sup>7</sup> There was nothing particularly novel about a trial judge having the *power* to make an admissibility determination. Federal Rules of Evidence 104(a) and 702 pointed to such a conclusion, and federal trial judges had excluded expert testimony long before *Daubert*. However, the majority opinion in *Daubert* stated that the trial court has not only the power but the *obligation* to act as “gatekeeper.”<sup>8</sup>

5. *Daubert*, 509 U.S. at 589.

6. Chief Justice Rehnquist, joined by Justice Stevens in an opinion concurring in part and dissenting in part, stated: “I do not doubt that Rule 702 confides to the judge some gatekeeping responsibility in deciding questions of the admissibility of proffered expert testimony.” *Id.* at 600. However, Chief Justice Rehnquist and Justice Stevens would have decided only the *Frye* issue and left “the further development of this important area of the law to future cases.” *Id.* at 601. The Chief Justice raised a number of questions about the majority’s opinion that foreshadowed issues that arose in *Joiner* and *Kumho*:

Does all of this dicta apply to an expert seeking to testify on the basis of “technical or other specialized knowledge”—the other types of expert knowledge to which Rule 702 applies—or are the “general observations” limited only to “scientific knowledge”? What is the difference between scientific knowledge and technical knowledge; does Rule 702 actually contemplate that the phrase “scientific, technical, or other specialized knowledge” be broken down into numerous subspecies of expertise, or did its authors simply pick general descriptive language covering the sort of expert testimony which courts have customarily received?

*Id.* at 600.

7. *Id.* at 589.

8. “The primary locus of this obligation is Rule 702 . . . .” *Id.*

The Court then went on to consider the meaning of this two-pronged test of relevancy and reliability in the context of scientific evidence.<sup>9</sup> With regard to relevancy, the Court explained that expert testimony cannot assist the trier in resolving a factual dispute, as required by Rule 702, unless the expert's theory is tied sufficiently to the facts of the case. "Rule 702's 'helpfulness' standard requires a valid scientific connection to the pertinent inquiry as a precondition to admissibility."<sup>10</sup> This consideration, the Court remarked, "has been aptly described by Judge Becker as one of 'fit.'"<sup>11</sup>

To determine whether proffered scientific testimony or evidence satisfies the standard of evidentiary reliability,<sup>12</sup> a judge must ascertain whether it is "ground[ed] in the methods and procedures of science."<sup>13</sup> The Court, emphasizing that "[t]he inquiry envisioned by Rule 702 is . . . a flexible one,"<sup>14</sup> then examined the characteristics of scientific methodology and set out a nonexclusive list of four factors that bear on whether a theory or technique has been derived by the scientific method.<sup>15</sup> First and foremost the Court viewed science as an empirical endeavor: "Whether [a theory or technique] can be (and has been) tested" is the "'methodology [that] distinguishes science from other fields of human inquiry.'"<sup>16</sup> Also mentioned by the Court as indicators of good science are peer review or publication, and the existence of known or potential error rates and standards controlling the technique's operation.<sup>17</sup> Although gen-

9. *Id.* The majority explicitly noted that "Rule 702 also applies to 'technical, or other specialized knowledge.' Our discussion is limited to the scientific context because that is the nature of the expertise offered here." *Id.* at 590 n.8.

10. *Id.* at 591-92.

11. *Id.* at 591. Judge Becker used this term in *United States v. Downing*, 753 F.2d 1224, 1242 (3d Cir. 1985), in the course of discussing the admissibility of expert testimony that pointed to particular factors that make eyewitness testimony unreliable. On remand, the district court rejected the proffered expert testimony on the ground of "fit" because it found that factors discussed by the expert, such as the high likelihood of inaccurate cross-racial identifications, were not present in the case. *United States v. Downing*, 609 F. Supp. 784, 791-92 (E.D. Pa. 1985), *aff'd*, 780 F.2d 1017 (3d Cir. 1985).

12. Commentators have faulted the Court for using the label "reliability" to refer to the concept that scientists term "validity." The Court's choice of language was deliberate. It acknowledged that scientists typically distinguish between validity and reliability and that "[i]n a case involving scientific evidence, evidentiary reliability will be based upon scientific validity." *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 590 n.9 (1993). However, the Court also explained that by its reference to evidentiary reliability, it meant trustworthiness, as that concept is used elsewhere in the Federal Rules of Evidence. *Id.*

13. *Id.* at 590.

14. *Id.* at 594.

15. *Id.* at 593-94. "[W]e do not presume to set out a definitive checklist or test." *Id.* at 593.

16. *Id.* at 593 (quoting Michael D. Green, *Expert Witnesses and Sufficiency of Evidence in Toxic Substances Litigation: The Legacy of Agent Orange and Bendectin Litigation*, 86 Nw. U. L. Rev. 643, 645 (1992)).

17. *Id.* at 593-94.

eral acceptance of the methodology within the scientific community is no longer dispositive, it remains a factor to be considered.<sup>18</sup>

The Court did not apply its new test to the eight experts for the plaintiffs who sought to testify on the basis of in vitro, animal, and epidemiological studies that the drug Bendectin taken by the plaintiffs' mothers during pregnancy could cause or had caused the plaintiffs' birth defects. Instead, it reversed the decision and remanded the case. Nor did the Court deal with any of the procedural issues raised by the *Daubert* opinion, such as the burden, if any, on the party that seeks a ruling excluding expert testimony, or the standard of review on appeal.<sup>19</sup>

### *B. General Electric Co. v. Joiner*

The Supreme Court granted certiorari in *General Electric Co. v. Joiner*,<sup>20</sup> the second case in the trilogy, in order to determine the appropriate standard an appellate court should apply in reviewing a trial court's *Daubert* decision to admit or exclude scientific expert testimony. In *Joiner*, the 37-year-old plaintiff, a long-time smoker with a family history of lung cancer, claimed that exposure to polychlorinated biphenyls (PCBs) and their derivatives had promoted the development of his small-cell lung cancer. The trial court applied the *Daubert* criteria, excluded the opinions of the plaintiff's experts, and granted the defendants' motion for summary judgment.<sup>21</sup> The court of appeals reversed the decision, stating that "[b]ecause the Federal Rules of Evidence governing expert testimony display a preference for admissibility, we apply a particularly stringent standard of review to the trial judge's exclusion of expert testimony."<sup>22</sup>

All the justices joined Chief Justice Rehnquist in holding that abuse of discretion is the correct standard for an appellate court to apply in reviewing a district court's evidentiary ruling, regardless of whether the ruling allowed or excluded expert testimony.<sup>23</sup> The Court unequivocally rejected the suggestion that a more stringent standard is permissible when the ruling, as in *Joiner*, is "outcome determinative."<sup>24</sup> In a concurring opinion, Justice Breyer urged judges to avail themselves of techniques, such as the use of court-appointed experts,

18. *Id.* at 594.

19. The Ninth Circuit panel thereafter found that the experts had been properly excluded and affirmed the grant of summary judgment dismissing the plaintiffs' case. *Daubert v. Merrell Dow Pharms., Inc.*, 43 F.3d 1311 (9th Cir. 1995).

20. 522 U.S. 136 (1997).

21. *Joiner v. General Elec. Co.*, 864 F. Supp. 1310 (N.D. Ga. 1994).

22. *Joiner v. General Elec. Co.*, 78 F.3d 524, 529 (11th Cir. 1996).

23. *General Elec. Co. v. Joiner*, 522 U.S. at 141-43.

24. *Id.* at 142-43.

that would assist them in making determinations about the admissibility of complex scientific or technical evidence.<sup>25</sup>

With the exception of Justice Stevens, who dissented from this part of the opinion, the justices then did what they had not done in *Daubert*—they examined the record, found that the plaintiff’s experts had been properly excluded, and reversed the decision without remanding the case as to this issue.<sup>26</sup> The Court concluded that it was within the district court’s discretion to find that the statements of the plaintiff’s experts with regard to causation were nothing more than speculation. The Court noted that the plaintiff never explained “how and why the experts could have extrapolated their opinions”<sup>27</sup> from animal studies far removed from the circumstances of the plaintiff’s exposure.<sup>28</sup> It also observed that the district court could find that the four epidemiological studies the plaintiff relied on were insufficient as a basis for his experts’ opinions.<sup>29</sup> Consequently, the court of appeals had erred in reversing the district court’s determination that the studies relied on by the plaintiff’s experts “were not sufficient, whether individually or in combination, to support their conclusions that Joiner’s exposure to PCBs contributed to his cancer.”<sup>30</sup>

The plaintiff in *Joiner* had argued that the epidemiological studies showed a link between PCBs and cancer if the results of all the studies were pooled, and that this weight-of-the-evidence methodology was reliable. Therefore, according to the plaintiff, the district court erred when it excluded a conclusion based on a scientifically reliable methodology because it thereby violated the Court’s precept in *Daubert* that the “focus, of course, must be solely on principles and

25. *Id.* at 147–50. Justice Breyer also mentioned narrowing the scientific issues in dispute at Rule 16 pretrial conferences, examining proposed experts at pretrial hearings, and appointing special masters and specially trained law clerks. *Id.*

26. *Id.* at 143–47. Justice Stevens expressed doubt as to whether the admissibility question had been adequately briefed, and in any event, he thought that the record could be studied more efficiently by the court of appeals than by the Supreme Court. *Id.* at 150–51. In addition, he expressed concern about how the Court applied the *Daubert* test to the reliability ruling by the trial judge. *Id.* at 151. See *infra* text accompanying note 32.

27. *Id.* at 144.

28. The studies involved infant mice that had massive doses of PCBs injected directly into their bodies; Joiner was an adult who was exposed to fluids containing far lower concentrations of PCBs. The infant mice developed a different type of cancer than Joiner did, and no animal studies showed that adult mice exposed to PCBs developed cancer or that PCBs lead to cancer in other animal species. *Id.*

29. The authors of the first study of workers at an Italian plant found lung cancer rates among employees somewhat higher than might have been expected but refused to conclude that PCBs had caused the excess rate. A second study of workers at a PCB production plant did not find the somewhat higher than expected incidence of lung cancer deaths to be statistically significant. The third study made no mention of exposure to PCBs, and the workers in the fourth study who had a significant increase in lung cancer rates had also been exposed to numerous other potential carcinogens. *Id.* at 145–46.

30. *Id.* at 146–47.

methodology, not on the conclusions that they generate.”<sup>31</sup> The Supreme Court responded to this argument by stating that

conclusions and methodology are not entirely distinct from one another. Trained experts 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>32</sup>

Justice Stevens, in his partial dissent, assumed that the plaintiff's expert was entitled to rely on such a methodology, which he noted is often used in risk assessment, and that a district court that admits expert testimony based on a weight-of-the-evidence methodology does not abuse its discretion.<sup>33</sup> Justice Stevens would have remanded the case for the court below to determine if the trial court had abused its discretion when it excluded the plaintiff's experts.<sup>34</sup>

### III. *Kumho Tire Co. v. Carmichael*

#### A. *The District Court Opinion*

Less than one year after deciding *Joiner*, the Supreme Court granted certiorari in *Kumho*<sup>35</sup> to decide if the trial judge's gatekeeping obligation under *Daubert* applies only to scientific evidence or if it extends to proffers of “technical, or other specialized knowledge,” the other categories of expertise specified in Federal Rule of Evidence 702. A split had developed in the circuits on this issue. In addition, there was uncertainty about whether disciplines like economics, psychology, and other “soft” sciences counted as science; when the four factors endorsed in *Daubert* as indicators of reliability had to be applied; and how experience factors into the gatekeeping process. Although Rule 702 specifies that an expert may be qualified through experience, the Court's emphasis in *Daubert* on “testability” suggested that an expert should not be allowed to base a conclusion solely on experience if the conclusion can easily be tested.

In *Kumho*, the plaintiffs brought suit after a tire blew out on a minivan, causing an accident in which one passenger died and others were seriously injured. The tire, which was manufactured in 1988, had been installed on the minivan

31. *Id.* at 146 (quoting *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 595 (1993)).

32. *Id.* at 146.

33. *Id.* at 153–54.

34. *Id.* at 150–51.

35. *Carmichael v. Samyang Tire, Inc.*, 131 F.3d 1433 (11th Cir. 1997), *cert. granted sub nom. Kumho Tire Co. v. Carmichael*, 118 S. Ct. 2339 (1998), *and rev'd*, 119 S. Ct. 1167 (1999).

sometime before it was purchased as a used car by the plaintiffs in 1993. In their diversity action against the tire's maker and its distributor, the plaintiffs claimed that the tire was defective. To support this allegation, the plaintiffs relied primarily on deposition testimony by Dennis Carlson, Jr., an expert in tire-failure analysis, who concluded on the basis of a visual inspection of the tire that the blowout was caused by a defect in the tire's manufacture or design.

When the defendant moved to exclude Carlson's testimony, the district court agreed with the defendant that the *Daubert* gatekeeping obligation applied not only to scientific knowledge but also to "technical analyses."<sup>36</sup> Therefore, the district court examined Carlson's visual-inspection methodology in light of the four factors mentioned in *Daubert*—the theory's testability, whether it was the subject of peer review or publication, its known or potential rate of error, and its general acceptance within the relevant scientific community.<sup>37</sup> After concluding that none of the *Daubert* factors was satisfied, the court excluded Carlson's testimony and granted the defendant's motion for summary judgment.<sup>38</sup>

The plaintiffs asked for reconsideration, arguing that the court's application of the *Daubert* factors was too inflexible. The court granted the plaintiffs' request for reconsideration, and agreed that it had erred in treating the four factors as mandatory rather than illustrative.<sup>39</sup> But the plaintiffs were not aided by this concession, because the court went on to say:

In this case, application of the *Daubert* factors did operate to gauge the reliability of Carlson's methods, and all of the factors indicated that his testimony was properly excluded. The Court's analysis revealed no countervailing factors operating in favor of admissibility which could outweigh those identified in *Daubert*, and the parties identified no such factors in their briefs. Contrary to plaintiffs' assertions, the Court did not convert the flexible *Daubert* inquiry into a rigid one; rather, the Court simply found the *Daubert* factors appropriate, analyzed them, and discerned no competing criteria sufficiently strong to outweigh them.<sup>40</sup>

The district court then reaffirmed its earlier order, excluding Carlson's expert testimony and granting summary judgment.<sup>41</sup>

36. *Carmichael v. Samyang Tire, Inc.*, 923 F. Supp. 1514, 1522 (S.D. Ala. 1996) ("The plaintiffs may be correct that Carlson's testimony does not concern a scientific concept per se; however, it certainly is testimony about an application of scientific concepts involved in physics, chemistry, and mechanical engineering. In other words, Carlson's method is necessarily ground in some scientific foundation . . ."), *rev'd*, 131 F.3d 1433 (11th Cir. 1997), *cert. granted sub nom. Kumho Tire Co. v. Carmichael*, 118 S. Ct. 2339 (1998), and *rev'd*, 119 S. Ct. 1167 (1999).

37. *Id.* at 1520–21.

38. *Id.* at 1522, 1524.

39. *Carmichael v. Samyang Tires, Inc.*, Civ. Action No. 93-0860-CB-S (S.D. Ala., June 5, 1996), App. to Pet. for Cert. at 1c (order granting motion for reconsideration discussed in *Kumho*, 119 S. Ct. at 1173).

40. *Id.*

41. *Id.*

## B. The Court of Appeals Opinion

The Eleventh Circuit reversed the district court's decision in *Kumho*, holding, as a matter of law under a de novo standard of review, that *Daubert* applies only in the scientific context.<sup>42</sup> The court of appeals opinion stressed the difference between expert testimony that relies on the application of scientific theories or principles—which would be subject to a *Daubert* analysis—and testimony that is based on the expert's “skill- or experience-based observation.”<sup>43</sup> The court then found

that Carlson's testimony is non-scientific . . . . Carlson makes no pretense of basing his opinion on any scientific theory of physics or chemistry. Instead, Carlson rests his opinion on his experience in analyzing failed tires. After years of looking at the mangled carcasses of blown-out tires, Carlson claims that he can identify telltale markings revealing whether a tire failed because of abuse or defect. Like a beekeeper who claims to have learned through years of observation that his charges always take flight into the wind, Carlson maintains that his experiences in analyzing tires have taught him what “bead grooves” and “sidewall deterioration” indicate as to the cause of a tire's failure. . . . Thus, we conclude that Carlson's testimony falls outside the scope of *Daubert* and that the district court erred as a matter of law by applying *Daubert* in this case.<sup>44</sup>

The Eleventh Circuit did not, however, conclude that Carlson's testimony was admissible. Instead, it directed the district court on remand “to determine if Carlson's testimony is sufficiently reliable and relevant to assist a jury.”<sup>45</sup> In other words, the circuit court agreed that the trial court has a gatekeeping obligation; its quarrel with the district court was over that court's assumption that *Daubert*'s four factors had to be considered.

## C. The Supreme Court Opinion

All the justices of the Supreme Court, in an opinion by Justice Breyer, held that the trial court's gatekeeping obligation extends to all expert testimony<sup>46</sup> and unanimously rejected the Eleventh Circuit's dichotomy between the expert who “relies on the application of scientific principles” and the expert who relies on

42. *Carmichael v. Samyang Tire, Inc.*, 131 F.3d 1433, 1435 (11th Cir. 1997), *cert. granted sub nom. Kumho Tire Co. v. Carmichael*, 118 S. Ct. 2339 (1998), *and rev'd*, 119 S. Ct. 1167 (1999).

43. *Id.* at 1435.

44. *Id.* at 1436 (footnotes omitted).

45. *Id.* The court noted that the defendant had raised “a number of potentially troubling criticisms of Carlson's alleged expertise and methodology, including his rendering of an opinion regarding the Carmichaels' tire before he had personally inspected its carcass.” *Id.* at 1436–37.

46. *Kumho Tire Co. v. Carmichael*, 119 S. Ct. 1167, 1171 (1999) (“*Daubert*'s general holding—setting forth the trial judge's general ‘gatekeeping’ obligation—applies not only to testimony based on ‘scientific’ knowledge, but also to testimony based on ‘technical’ and ‘other specialized’ knowledge.”).

“‘skill- or experience-based observation.’”<sup>47</sup> The Court noted that Federal Rule of Evidence 702 “makes no relevant distinction between ‘scientific’ knowledge and ‘technical’ or ‘other specialized’ knowledge,” and “applies its reliability standard to all . . . matters within its scope.”<sup>48</sup> Furthermore, said the Court, “no clear line” can be drawn between the different kinds of knowledge,<sup>49</sup> and “no one denies that an expert might draw a conclusion from a set of observations based on extensive and specialized experience.”<sup>50</sup>

The Court also unanimously found that the court of appeals had erred when it used a *de novo* standard, instead of the *Joiner* abuse-of-discretion standard, to determine that *Daubert*’s criteria were not reasonable measures of the reliability of Carlson’s testimony.<sup>51</sup> As in *Joiner*, and again over the dissent of Justice Stevens,<sup>52</sup> the Court then examined the record and concluded that the trial court had not abused its discretion when it excluded Carlson’s testimony. Accordingly, it reversed the opinion of the Eleventh Circuit.

The opinion adopts a flexible approach that stresses the importance of identifying “the particular circumstances of the particular case at issue.”<sup>53</sup> The court must then make sure that the proffered expert will observe the same standard of “intellectual rigor” in testifying as he or she would employ when dealing with similar matters outside the courtroom.<sup>54</sup>

The crux of the disagreement between the parties was whether extending the trial judge’s *Daubert* gatekeeping function to all forms of expert testimony meant that the trial judge would have to apply *Daubert*’s four-factor reliability test in all cases. The defendant had stated at oral argument that the factors discussed in

47. *Id.* at 1176 (quoting *Carmichael v. Samyang Tire, Inc.*, 131 F.3d 1433, 1435 (11th Cir. 1997), *cert. granted sub nom. Kumho Tire Co. v. Carmichael*, 118 S. Ct. 2339 (1998), and *rev’d*, 119 S. Ct. 1167 (1999)). “We do not believe that Rule 702 creates a schematism that segregates expertise by type while mapping certain kinds of questions to certain kinds of experts. Life and the legal cases that it generates are too complex to warrant so definitive a match.” *Id.*

48. *Id.* at 1174.

49. *Id.*

50. *Id.* at 1178.

51. *Id.* at 1171 (“the law grants a district court the same broad latitude when it decides *how* to determine reliability as it enjoys in respect to its ultimate reliability determination” (citing *General Elec. Co. v. Joiner*, 522 U.S. 136, 143 (1997))).

52. Justice Stevens objected that this question had not been raised by the certiorari petition and would have remanded the case to the court of appeals for a review of the record. *Id.* at 1180. He noted, however, that he did “not feel qualified to disagree with the well-reasoned factual analysis” of the question in Part III of the Court’s opinion. *Id.*

53. *Id.* at 1175. “In sum, Rule 702 grants the district judge the discretionary authority, reviewable for its abuse, to determine reliability in light of the particular facts and circumstances of the particular case.” *Id.* at 1179.

54. *Id.* at 1176.

*Daubert* were “always relevant.”<sup>55</sup> Justice Breyer’s opinion rejects this notion categorically:

The conclusion, in our view, is that we can neither rule out, nor rule in, for all cases and for all time the applicability of the factors mentioned in *Daubert*, nor can we now do so for subsets of cases categorized by category of expert or by kind of evidence. Too much depends upon the particular circumstances of the particular case at issue.<sup>56</sup>

The *Daubert* factors “may” bear on a judge’s gatekeeping determinations, however.<sup>57</sup> The four *Daubert* factors “‘may or may not be pertinent’”; it will all depend “‘on the nature of the issue, the expert’s particular expertise, and the subject of his testimony.’”<sup>58</sup> Determining which factors are indicative of reliability in a particular case cannot be accomplished solely by categorical a priori characterizations about the particular field in question. The Court explained: “Engineering testimony rests upon scientific foundations, the reliability of which will be at issue in some cases. . . . In other cases, the relevant reliability concerns may focus upon personal knowledge or experience.”<sup>59</sup> In all cases, a court must exercise its gatekeeping obligation so that the expert, whether relying on “professional studies or personal experience,” will, when testifying, employ “the same level of intellectual rigor” that the expert would use outside the courtroom when working in the relevant discipline.<sup>60</sup>

How this extremely flexible approach of the Court is to be applied emerges in Part III of the opinion when the Court engages in a remarkably detailed analysis of the record that illustrates its comment in *Joiner* that an expert must account for “how and why” he or she reached the challenged opinion.<sup>61</sup> The Court refused to find that the methodology Carlson was advocating could never be used by an expert testifying about tire failures:

[C]ontrary to respondents’ suggestion, the specific issue before the 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 carcass. Rather, it was the reasonableness of using such an approach, along with Carlson’s particular

55. See Official Transcript at 11–16, *Kumho Tire Co. v. Carmichael*, 119 S. Ct. 1167 (1999) (No. 97-1709). Counsel for petitioner, after a series of questions based on the *Daubert* standards, finally responded by saying, “The questions are always relevant, absolutely. That’s our point.” *Id.* at 16.

56. *Kumho*, 119 S. Ct. at 1175. Indeed, as is discussed further below, the Court stated that the *Daubert* factors “do not all necessarily apply even in every instance in which the reliability of scientific testimony is challenged.” *Id.*

57. *Id.* The Court answered the question of whether the four specific *Daubert* questions may be considered by replying: “Emphasizing the word ‘may’ in the question, we answer that question yes.” *Id.*

58. *Id.* (quoting Brief for United States as *Amicus Curiae* Supporting Petitioners at 19, *Kumho Tire Co. v. Carmichael*, 119 S. Ct. 1167 (1999) (No. 97-1709)).

59. *Id.*

60. *Id.* at 1176.

61. See *supra* note 27 and accompanying text.

method of analyzing the data thereby obtained, to draw a conclusion regarding the particular matter to which the expert testimony was directly relevant. That matter concerned the likelihood that a defect in the tire at issue caused its tread to separate from its carcass.<sup>62</sup>

The Court then discussed numerous case-specific facts that made it reasonable for the district court to conclude in this case that Carlson's testimony was not reliable because "[i]t fell outside the range where experts might reasonably differ, and where the jury must decide among the conflicting views of different experts, even though the evidence is 'shaky.'"<sup>63</sup> The tire was old and repaired, some of its treads "had been worn bald," and Carlson had conceded that it should have been replaced.<sup>64</sup> Furthermore, although Carlson claimed that he could determine by a visual and tactile inspection when a tire had not been abused, thereby leading him to conclude that it was defective, the tire in question showed some of the very marks that Carlson had identified as pointing to abuse through overdeflection.<sup>65</sup> Perhaps even more troublesome to the Court was the fact that

the expert could not say whether the tire had traveled more than 10, or 20, or 30, or 40, or 50 thousand miles, adding that 6,000 miles was "about how far" he could "say with any certainty." The [district] court could reasonably have wondered about the reliability of a method of visual and tactile inspection sufficiently precise to ascertain with some certainty the abuse-related significance of minute shoulder/center relative tread wear differences, but insufficiently precise to tell "with any certainty" from the tread wear whether a tire had traveled less than 10,000 or more than 50,000 miles.<sup>66</sup>

The Court further noted that the district court's confidence in Carlson's methodology might also have been lessened by "Carlson's repeated reliance on the 'subjectiveness' of his mode of analysis" when questioned about his ability to differentiate between an overdeflected tire and a tire that looks overdeflected,<sup>67</sup> and by the fact that Carlson had called the tire defective after looking at photographs of it and before he ever inspected it.<sup>68</sup> Finally, the Court remarked that there is no indication in the record that other experts, papers, or articles support Carlson's theory,<sup>69</sup> and that "no one has argued that Carlson himself, were he still working for Michelin, would have concluded in a report to his employer that a similar tire was similarly defective on grounds identical to those upon which he rested his conclusion here."<sup>70</sup>

62. *Kumho*, 119 S. Ct. at 1177.

63. *Id.* (quoting *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 596 (1993)).

64. *Id.*

65. *Id.*

66. *Id.* (citation omitted).

67. *Id.*

68. *Id.*

69. *Id.* at 1178.

70. *Id.* at 1179.

## IV. The Implications of the *Kumho* Opinion

### A. A Comparison of *Kumho* and *Daubert*

#### 1. Differences in emphasis between *Daubert* and *Kumho*

Nothing the Supreme Court said in *Kumho* is explicitly inconsistent with what it said in *Daubert*. As Justice Breyer's opinion stated, *Daubert* described "the Rule 702 inquiry as 'a flexible one,'" <sup>71</sup> and made "clear that the factors it mentions do not constitute a 'definitive checklist or test.'" <sup>72</sup> Nevertheless, *Kumho* may indicate that the Court has somewhat backed away from laying down guidelines for particular categories of expert testimony. Certainly the Court's opinion does not support those who construed *Daubert* as creating a four-factor test for scientific evidence, or those who thought that the Court might in subsequent cases articulate classification schemes for other fields of expertise. <sup>73</sup>

The Court seems less absorbed in epistemological issues, in formulating general rules for assessing reliability, or in fleshing out the implications of its having singled out testability as the preeminent factor of concern. It appears less interested in a taxonomy of expertise and more concerned about directing judges to concentrate on "the particular circumstances of the particular case at issue." <sup>74</sup> This flexible, nondoctrinaire approach is faithful to the intention of the drafters of the Federal Rules of Evidence, who viewed Article VII as setting forth flexible standards for courts to apply rather than rigid rules.

In *Kumho*, the Court contemplated that there will be witnesses "whose expertise is based purely on experience," and although it suggested that *Daubert*'s questions may be helpful in evaluating experience-based testimony, it did not single out testability as the preeminent factor of concern, as it did in *Daubert*. <sup>75</sup> The Court offered the example of the "perfume tester able to distinguish among

71. *Id.* at 1175 (quoting *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 594 (1993)).

72. *Id.* (quoting *Daubert*, 509 U.S. at 593).

73. Arvin Maskin, *The Impact of Daubert on the Admissibility of Scientific Evidence: The Supreme Court Catches Up with a Decade of Jurisprudence*, 15 Cardozo L. Rev. 1929, 1934 (1994) ("some courts are applying the four factors as if they were the definitive checklist or test."); Bert Black et al., *Science and the Law in the Wake of Daubert: A New Search for Scientific Knowledge*, 72 Tex. L. Rev. 715, 751 (1994) ("Some commentators have read these observations as essentially constituting a new four-factor test . . ."). The oversimplification of *Daubert* as embodying a four-factor test may have been furthered by commentaries that noted the nondefinitive nature of the factors but used them to organize their discussion. See 1 Modern Scientific Evidence, *supra* note 4, § 1-3.3. The 1999 Pocket Part added a new § 1-3.4[2], *The Four-Factors of Daubert*.

74. *Kumho*, 119 S. Ct. at 1175. The Court expressed agreement with the Brief of the Solicitor General that the factors to use in making reliability determinations will depend "'on the nature of the issue, the expert's particular expertise, and the subject of his testimony.'" *Id.* (quoting Brief for the United States as *Amicus Curiae* Supporting Petitioners at 19, *Kumho Tire Co. v. Carmichael*, 119 S. Ct. 1167 (1999) (No. 97-1709)).

75. *Id.* at 1176.

140 odors at a sniff” and stated that at times it will “be useful” to ask such a witness “whether his preparation is of a kind that others in the field would recognize as acceptable.”<sup>76</sup> However, this is somewhat different, and much less rigid, than conditioning testimony by perfume testers on objective standards that establish whether perfume testers can do what they claim to be able to do.

It may also be significant that in *Kumho* the Court was silent about the distinction between admissibility and sufficiency. In the interim between *Daubert* and *Kumho*, disputes involving expert testimony have increasingly been addressed as questions of admissibility. Because *Daubert* requires judges to screen expert testimony, civil defendants make *Daubert* motions to exclude plaintiff’s experts prior to trial instead of waiting to move for judgment as a matter of law if the verdict is unfavorable. Such an approach furthers both case-processing efficiency and economy, as the in limine exclusion of expert proof may eliminate the need for trial by making possible a grant of summary judgment.

In *Daubert*, the Court observed that when expert testimony is admitted, the trial court “remains free to direct a judgment” if it concludes “that the scintilla of evidence presented” is insufficient.<sup>77</sup> The Court did not contemplate that a district judge could exclude testimony that meets the “scintilla” standard if the judge concludes that the proponent will not be able to meet its burden of persuasion on the issue to which the testimony relates. Nevertheless, the benefits of economy and efficiency that accrue when expert proof is considered in the context of admissibility determinations may tempt courts to consider sufficiency when ruling on admissibility.<sup>78</sup> Moreover, some opinions have held that the “fit” prong of the *Daubert* test and the helpfulness standard of Rule 702 require courts to exclude a plaintiff’s expert testimony that does not satisfy the plaintiff’s substantive burden of proof on an issue.<sup>79</sup> In *Kumho*, the Supreme Court showed no discomfort with this trend toward assessing issues regarding expert proof through admissibility determinations; there is no reminder, as there is in *Daubert*,

76. *Id.*

77. *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 596 (1993).

78. In his book on the Bendectin litigation, Joseph Sanders suggests that such decisions may “undermine a sophisticated approach to the question of scientific validity” and become troublesome precedents in cases in which the issue in dispute is considerably closer. Joseph Sanders, *Bendectin on Trial: A Study of Mass Tort Litigation* 195 (1998).

79. See, e.g., *Daubert v. Merrell Dow Pharms., Inc.*, 43 F.3d 1311, 1320 (9th Cir.) (*Daubert* on remand) (“In assessing whether the proffered expert testimony ‘will assist the trier of fact’ in resolving this issue, we must look to the governing substantive standard, which in this case is supplied by California tort law.”), *cert. denied*, 516 U.S. 869 (1995); *Hall v. Baxter Healthcare Corp.*, 947 F. Supp. 1387, 1398 (D. Or. 1996) (“Under Oregon law, the plaintiffs in this litigation must prove not merely the possibility of a causal connection between breast implants and the alleged systemic disease, but the medical probability of a causal connection.”).

that if the admissibility test is satisfied, questions of sufficiency remain open for resolution at trial.<sup>80</sup>

## 2. The role of “general acceptance” and the “intellectual rigor” test

Some early comments predicted that *Kumho* may result in a retreat from *Daubert* and a resurrection of *Frye* because *Kumho*'s flexible approach and abuse-of-discretion standard authorize trial courts to rely on “general acceptance” as the chief screening factor.<sup>81</sup> Such an effect certainly does not seem to have been intended by the Court. The enormous detail with which Justice Breyer described steel-belted radial tires like the Carmichael tire (a sketch is appended to the opinion), the particular characteristics of the ill-fated tire, and Carlson's proposed testimony would all have been unnecessary if the Court's only consideration was “general acceptance.” All the Court would have needed to say was that workers in the tire industry did not use Carlson's approach.<sup>82</sup> Although the Court in *Kumho* endorsed an extremely flexible test, it manifested no inclination to return to *Frye*.

This misunderstanding about the role of “general acceptance” may have been enhanced by a passage in which the Court acknowledged the significance of the *Daubert* gatekeeping requirement:

The objective of that requirement is to ensure the reliability and relevancy of expert testimony. It is to make certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field.<sup>83</sup>

This reference to “the same level of intellectual rigor that characterizes the practice of an expert in the relevant field” is not synonymous with *Frye*'s insistence on “general acceptance” of “the thing from which the deduction is made . . . in the particular field in which it belongs.”<sup>84</sup> The difference between these

80. It should also be noted that as of this writing, a proposed amendment to Rule 702 is pending before the Judicial Conference. It would require expert testimony to be “based upon sufficient facts or data.” A possible interpretation of this phrase is that the expert's testimony may be excluded if it would not suffice to meet the proffesor's burden of persuasion on an issue. The advisory committee notes accompanying the amendment include the following clarification: “The emphasis in the amendment on ‘sufficient facts or data’ is not intended to authorize a trial court to exclude an expert's testimony on the ground that the court believes one version of the facts and not the other.”

81. See, e.g., Michael Hoenig, *New York “Gatekeeping”*: “*Frye*” and “*Daubert*” Coexist, N.Y. L.J., July 12, 1999, at 3 (“*Kumho Tire* says the general acceptance standard could be pivotal for trial judges even when non-science or experience-based expert testimony is proffered.”); Joseph F. Madonia, *Kumho Tire Steers New Course on Expert-Witness Testimony*, Chi. Daily L. Bull., July 2, 1999, at 5 (“Thus, while superficially appearing to extend *Daubert* to an additional class of expert witnesses, *Kumho Tire* could just as easily end up being an excuse for courts to avoid *Daubert* altogether.”).

82. See *supra* note 70 and accompanying text.

83. *Kumho Tire Co. v. Carmichael*, 119 S. Ct. 1167, 1176 (1999).

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

two formulas—which epitomizes the contrast between *Daubert* and *Frye*—becomes apparent if one looks at two Seventh Circuit opinions by Chief Judge Posner in which the “intellectual rigor” standard was first employed.

In *Rosen v. Ciba-Geigy Corp.*,<sup>85</sup> the plaintiff, a heavy smoker with a history of serious heart disease, sued the manufacturer of a nicotine patch that his physician had prescribed in the hope of breaking the plaintiff’s cigarette habit. The plaintiff continued to smoke while wearing the patch, despite having been told to stop, and he suffered a heart attack on the third day of wearing the patch.

The district court dismissed the action, after excluding testimony by the plaintiff’s cardiologist, Dr. Harry Fozzard, a distinguished department head at the University of Chicago, whose opinion was that the nicotine patch precipitated the heart attack. The court of appeals affirmed the decision. Chief Judge Posner stated that *Daubert*’s object “was to make sure that when scientists testify in court they adhere to the same standards of intellectual rigor that are demanded in their professional work,”<sup>86</sup> and he went on to explain why the district judge had rightly concluded that the cardiologist’s proposed testimony did not meet this standard:

Wearing a nicotine patch for three days, like smoking for three days, is not going to have a significant long-run effect on coronary artery disease; that much is clear. In the long, gradual progression of Rosen’s coronary artery disease those three days were a blink of the eye. The patch could have had no significance for Rosen’s health, therefore, unless it precipitated his heart attack in June of 1992. That is an entirely different question from whether nicotine, or cigarettes, are bad for one’s arteries.

... Nowhere in Fozzard’s deposition is there an explanation of how a nicotine overdose (for remember that Rosen was smoking at the same time that he was wearing the patch) can precipitate a heart attack, or a reference to a medical or other scientific literature in which such an effect of nicotine is identified and tested. Since Fozzard is a distinguished cardiologist, his conjecture that nicotine can have this effect and may well have had it on Rosen is worthy of careful attention, even though he has not himself done research on the effects of nicotine. But the courtroom is not the place for scientific guesswork, even of the inspired sort. Law lags science; it does not lead it. There may be evidence to back up Fozzard’s claim, but none was presented to the district court.<sup>87</sup>

The difference between the “intellectual rigor” standard and the “general acceptance” standard is revealed even more clearly in *Braun v. Lorillard, Inc.*<sup>88</sup> In *Braun*, the plaintiff, who had mesothelioma, sued the manufacturer of his brand of cigarettes on the ground that crocidolite asbestos fibers in the cigarettes’ filters had caused his illness. The plaintiff died before trial, and his attorney sought to introduce expert testimony that crocidolite asbestos fibers, the type of asbestos

85. 78 F.3d 316 (7th Cir.), *cert. denied*, 519 U.S. 819 (1996).

86. *Id.* at 318.

87. *Id.* at 319.

88. 84 F.3d 230 (7th Cir.), *cert. denied*, 519 U.S. 992 (1996).

fibers most likely to cause mesothelioma, were found in the decedent's lung tissues. The plaintiff's expert, Schwartz, regularly tested building materials; he had never tested human or animal tissues for the presence of asbestos fibers, or any other substance, before he was hired by the plaintiff's lawyers. The expert was hired after the plaintiff's original experts, who regularly tested human tissue, found nothing. The district court refused to permit testimony at trial concerning the presence of crocidolite asbestos fibers, and the court of appeals affirmed the decision. Chief Judge Posner explained that the Supreme Court in *Daubert* held

that the opinion evidence of reputable scientists is admissible in evidence in a federal trial even if the particular methods they used in arriving at their opinion are not yet accepted as canonical in their branch of the scientific community. But that is only part of the holding of *Daubert*.<sup>89</sup>

After quoting the “intellectual rigor” test articulated in *Rosen*, Judge Posner stated that “[t]he scientific witness who decides to depart from the canonical methods must have grounds for doing so that are consistent with the methods and usages of his scientific community.”<sup>90</sup> That this is a different requirement than the *Frye* test is shown by the sentences in the opinion that immediately follow:

The district judge did remark at one point that *Daubert* requires that the expert's method be one “customarily relied upon by the relevant scientific community,” which is incorrect. But she did not rest her decision to exclude his testimony on that ground. Her ground was that Schwartz had testified “that he really didn't have any knowledge of the methodology that should be employed, and he still doesn't have any information regarding the methodology that should be employed with respect to lung tissue. It seems to me that this witness knows absolutely nothing about analyzing lung tissue and [for?] asbestos fibers.”<sup>91</sup>

The court explained further:

If, therefore, an expert proposes to depart from the generally accepted methodology of his field and embark upon a sea of scientific uncertainty, the court may appropriately insist that he ground his departure in demonstrable and scrupulous adherence to the scientist's creed of meticulous and objective inquiry. To forsake the accepted methods without even inquiring *why* they are the accepted methods—in this case, why specialists in testing human tissues for asbestos fibers have never used the familiar high temperature ashing method—and without even knowing *what* the accepted methods are, strikes us, as it struck Judge Manning, as irresponsible.<sup>92</sup>

It is not enough, therefore, under the “intellectual rigor” test for experts to venture hunches that they would never express or act upon in their everyday

89. *Id.* at 234.

90. *Id.*

91. *Id.*

92. *Id.* at 235.

working lives. Experts must show that their conclusions were reached by methods that are consistent with how their colleagues in the relevant field or discipline would proceed to establish a proposition were they presented with the same facts and issues.

Chief Judge Posner's exposition of the "intellectual rigor" test should not be read as meaning that once a "canonical method" is identified, a court may never inquire further into reliability. Clearly, in *Kumho* the Supreme Court wished to avoid the result sometimes reached under *Frye* when testimony was admitted once experts pointed to a consensus in a narrow field they had themselves established.<sup>93</sup> In the course of discussing the inapplicability of *Daubert* factors in every instance, the Court noted, "[n]or . . . does the presence of *Daubert*'s general acceptance factor help show that an expert's testimony is reliable where the discipline itself lacks reliability, as, for example, do theories grounded in any so-called generally accepted principles of astrology or necromancy."<sup>94</sup> The problem of determining when a discipline lacks reliability is discussed further below.<sup>95</sup>

## *B. The Reaffirmation and Extension of Joiner's Abuse-of-Discretion Standard*

### *1. The scope of the standard*

In *Kumho*, the Supreme Court extended the *Joiner* abuse-of-discretion standard to all decisions a trial judge makes in ruling on the admissibility of expert testimony, including the procedures it selects to investigate reliability:

Our opinion in *Joiner* makes clear that a court of appeals is to apply an abuse-of-discretion standard when "it reviews a trial court's decision to admit or exclude expert testimony." That standard applies as much to the trial court's decisions about how to determine reliability as to its ultimate conclusion. Otherwise, the trial judge would lack the discretionary authority needed both to avoid unnecessary "reliability" proceedings in ordinary cases where the reliability of an expert's methods is properly taken for granted, and to require appropriate proceedings in the less usual or more complex cases where cause for questioning the expert's reliability arises.<sup>96</sup>

The adoption of one standard of review for all determinations means that the abuse-of-discretion standard applies even with regard to issues that transcend

93. See discussion of the development of voiceprint evidence in Andre A. Moenssens, *Admissibility of Scientific Evidence—An Alternative to the Frye Rule*, 25 Wm. & Mary L. Rev. 545, 550 (1984) ("The trend in favor of admitting voiceprints continued until a group of lawyers discovered that, in each case, the same two or three experts had been the proponents who bestowed 'general acceptance' on the technique.").

94. *Kumho Tire Co. v. Carmichael*, 119 S. Ct. 1167, 1175 (1999).

95. See *infra* text accompanying notes 110–13.

96. *Kumho*, 119 S. Ct. at 1176 (citations omitted).

the particular case, such as the validity of a new DNA typing procedure or marker, or whether a particular substance is capable of causing particular diseases or injuries. Some commentators believe that it is unwise to allow conclusions about the soundness of a scientific theory or a theory's general applications to vary on a case-by-case basis; consequently, they advocate a *de novo* standard of review for such issues.<sup>97</sup> For now, however, the standard of review required by the Supreme Court is the same regardless of whether the trial court decided an issue that may be common to many different cases,<sup>98</sup> such as general causation, or an issue that relates only to the particular case, such as specific causation. Ultimately, of course, a court may resort to judicial notice pursuant to Federal Rule of Evidence 201 if a matter is sufficiently well established.

## 2. *The possibility and consequences of intracircuit and intercircuit conflict*

Since it is the trial court that is afforded this broad latitude to decide “*how to test an expert’s reliability*” and “*whether that expert’s relevant testimony is reliable*,”<sup>99</sup> in theory judges are free to select different procedures and apply different factors to a particular expert or type of expertise than their colleagues do in the same district or circuit. As a consequence, similar cases could be resolved differently on the basis of inconsistent determinations about admissibility.<sup>100</sup> The extent to which this will occur within circuits is not clear at this time. Even though the abuse-of-discretion standard mandates deference to the trial court, it remains to be seen to what extent the courts of appeals will acquiesce in district court rulings on the admissibility of expert testimony.

Of particular interest is whether the appellate courts will exert more supervision, and reverse more frequently, when a ruling below admits rather than excludes evidence. Justices Scalia, O’Connor, and Thomas joined in a brief concurring opinion in *Kumho* to warn that the abuse-of-discretion standard “is not discretion to abandon the gatekeeping function” or “to perform the function inadequately.”<sup>101</sup> Because the Supreme Court docket is so limited, it is the courts of appeals that will have the final word on the proper exercise of discretion by

97. See 1 Modern Scientific Evidence, *supra* note 4, § 1-3.5, at 19–20 (Supp. 1999).

98. Even with regard to an issue like general causation, the evidence being introduced may well vary over time because science does not stand still. Furthermore, the issue in two individual cases may not be the same. If in Case A the court allowed the plaintiff’s expert to testify on the basis of published research that the plaintiff’s leukemia was caused by his 10-year exposure during childhood to Agent X, this does not necessarily mean that the plaintiff’s expert in Case B should be allowed to testify that the plaintiff’s leukemia was caused by a one-year exposure to Agent X when she was in her forties. The research on which the expert purports to rely still has to fit the facts of the case.

99. *Kumho*, 119 S. Ct. at 1176 (emphasis added).

100. See, e.g., the discussion in text accompanying notes 126–46 *infra* about opinions on causation offered by clinical physicians.

101. *Kumho*, 119 S. Ct. at 1179. Justice Scalia’s opinion continued:

trial judges in their circuits. Depending on the issue, deference to the trial court may well be exercised differently from circuit to circuit.

What is more likely than intracircuit conflicts, and indeed was possible even under *Daubert* and led to the grant of certiorari in *Kumho*, is that the courts of appeals will reach divergent conclusions about some of the unresolved issues discussed in subsection C *infra*. A consequence of the latitude endorsed by *Kumho* may be an increase in forum-shopping as plaintiffs seek a congenial circuit and a sympathetic district judge. Defendants may also engage in forum-shopping by removing cases to federal court that were originally brought in state court. Ultimately, if outcomes in federal court differ substantially from those in state court, forum-shopping may arouse *Erie* concerns about deference to state substantive policy which the courts have ignored up to now.<sup>102</sup> Of course, if rulings on the admissibility of expert testimony lead to different outcomes in federal cases brought under the diversity jurisdiction than in similar cases litigated in state courts, state legislatures may react by modifying the applicable substantive law on what has to be proved and thus bypass exclusionary evidentiary rulings.<sup>103</sup>

### 3. Procedures a trial judge may use in handling challenges to expert testimony

The Court explained in *Kumho* that applying the abuse-of-discretion standard to determinations of “how to test an expert’s reliability”<sup>104</sup> gives the trial judge broad latitude “to decide whether or when special briefing or other proceedings are needed to investigate reliability.”<sup>105</sup> This standard also allows the trial court to make other choices about how to respond to a request to exclude expert testimony, and to use mechanisms that would provide the court with needed information in making its relevancy and reliability determinations.

In civil cases, a court might respond to a motion in limine by refusing to undertake any reliability–relevancy determination until the movant has made a *prima facie* showing of specific deficiencies in the opponent’s proposed testi-

Rather, it is discretion to choose among *reasonable* means of excluding expertise that is *fausse* and science that is junky. Though, as the Court makes clear today, the *Daubert* factors are not holy writ, in a particular case the failure to apply one or another of them may be unreasonable, and hence an abuse of discretion.

*Id.*

102. See Michael H. Gottesman, *Should Federal Evidence Rules Trump State Tort Policy?: The Federalism Values Daubert Ignored*, 15 Cardozo L. Rev. 1837 (1994).

103. In product liability design defect cases, for instance, if courts insist on too rigorous a standard for technical experts, such as requiring absolute proof that an alternative design prototype exists, this might garner support for a less demanding consumer expectation test. See James A. Henderson, Jr., & Aaron D. Twerski, *Intuition and Technology in Product Design Litigation: An Essay in Proximate Causation*, 88 Geo. L.J. (forthcoming 2000).

104. *Kumho*, 119 S. Ct. at 1176 (emphasis added).

105. *Id.* See William W. Schwarzer & Joe S. Cecil, *Management of Expert Evidence*, § IVA.A., in this manual.

mony.<sup>106</sup> Although the burden of persuasion with regard to showing the admissibility of expert testimony is clearly on the proponent, shifting the burden of production to the party seeking to exclude the expert testimony may at times be expeditious and economical. As the Court noted in *Kumho*, quoting from Federal Rule of Evidence 102, “the Rules seek to avoid ‘unjustifiable expense and delay’ as part of their search for ‘truth’ and the ‘just determination’ of proceedings.”<sup>107</sup>

Certainly, a trial court need not hold a full pretrial hearing in every case, and, indeed, the trial judge in *Kumho* did not. However, in complex civil litigation that has the potential to affect numerous persons, the trial court may conclude that extensive evidentiary hearings are the most efficacious way for the court to inform itself about the factors it will have to take into account in ruling on admissibility. The facts of the case and the consequences of losing the in limine motion will determine the extent of the opportunity the proponent of the expert must be given to present its case.<sup>108</sup>

Trial judges also have discretion to avail themselves of the techniques Justice Breyer described in his concurring opinion in *Joiner*: using court-appointed experts, special masters, and specially trained law clerks, and narrowing the issues in dispute at pretrial hearings and conferences.<sup>109</sup>

In a criminal case in which the defense challenges the prosecution’s expert testimony, a trial court may choose to proceed differently than it would in a civil case, in light of factors such as the narrower scope of discovery, the defense’s lack of resources and need for expert assistance, and the government’s role in developing the expertise that is now in question. As in civil cases, the court must take into account the particular facts of the case. Whatever the district court does, a clear message that emerges from the Court’s remarkably detailed factual analysis in *Kumho* is that the district court must explain its choices so that the appellate court has an adequate basis for review.

### *C. Persistent Issues*

The discussion below considers a number of difficult and recurring issues that courts have had to face in ruling on the admissibility of expert testimony. The impact of *Kumho* is considered.

106. See generally Margaret A. Berger, *Procedural Paradigms for Applying the Daubert Test*, 78 Minn. L. Rev. 1345 (1994).

107. *Kumho Tire Co. v. Carmichael*, 119 S. Ct. 1167, 1176 (1999) (quoting Fed. R. Evid. 102).

108. See, e.g., *Padillas v. Stork-Gamco, Inc.*, No. CIV.A.97-1853, 1999 WL 558113 (3d Cir. 1999) (trial court abused its discretion in excluding expert’s report without holding an in limine hearing even though plaintiff failed to request hearing).

109. See *supra* note 25.

1. *Determining if the expert's field or discipline is reliable*

As mentioned earlier,<sup>110</sup> in *Kumho*, the Supreme Court anticipated that at times proffered expert testimony may have to be excluded because the field to which the expert belongs lacks reliability. However, other than singling out astrology and necromancy as examples of disciplines whose theories would not be admissible,<sup>111</sup> the Court offered no guidance on how a court can properly reach this conclusion.

a. Challenging an expert from a nonorthodox branch of a traditional discipline

One context in which the problem of reliability arises is when practitioners of a traditional discipline, such as medicine, find untenable claims by a nonconformist branch, such as clinical ecology. Thus far, federal courts have sided with the orthodox group and rejected the clinical ecologists' theory that environmental insults may cause people exposed to them to develop a "multiple-chemical sensitivity" that makes them hypersensitive to certain substances.<sup>112</sup> Since *Daubert*, decisions excluding the proposed testimony of a clinical ecologist have usually been justified on the ground that the multiple-chemical sensitivity theory has not been validated by testing. Although *Kumho* does not "rule in" testability as a factor to be considered in all cases, neither does it "rule out" testability as a reasonable criterion of reliability in an appropriate case.<sup>113</sup> It is unlikely, therefore, that courts will handle clinical ecologists any differently than before, unless, of course, new research substantiates their theories.

In the future, courts will have to deal with other theories put forth by nonorthodox factions in an established field. For instance, new claims resting on postulates of alternative medicine are sure to arise. It may be in this context—determining the reliability of a novel hypothesis vouched for by a splinter group of self-anointed experts whose views are not acceptable to the traditional majority—that courts will find the full range of *Daubert*'s factors most helpful.

b. Challenging the reliability of a traditional field of expertise: the forensic sciences

A somewhat different question arises when challenges are made to a field whose practitioners have in the past routinely been permitted to testify as experts. How much of an obligation does the Supreme Court's emphasis on gatekeeping place

110. See *supra* note 94 and accompanying text.

111. 119 S. Ct. at 1175.

112. See surveys of federal case law in *Summers v. Missouri Pac. R.R. Sys.*, 132 F.3d 599, 603 (10th Cir. 1997); *Bradley v. Brown*, 42 F.3d 434, 438–39 (7th Cir. 1994); *Coffin v. Orkin Exterminating Co.*, 20 F. Supp. 2d 107, 109–11 (D. Me. 1998).

113. See *supra* note 56 and accompanying text.

on the trial court? When, if ever, must the judge analyze proffered traditional expertise to see whether it really is capable of furnishing reliable answers to questions before the court?

In the wake of *Daubert*, with its emphasis on empirical validation, challenges to reliability have been raised with regard to numerous techniques of forensic identification, such as fingerprinting, handwriting analysis, ballistics, and bite-mark analysis. DNA typing may well be the only area of forensic identification in which research has been conducted in accordance with conventional scientific standards.<sup>114</sup> In other areas, experts have in large measure relied on their experience to arrive at subjective conclusions that either have not been validated or are not objectively verifiable.<sup>115</sup>

These post-*Daubert* challenges to forensic identification have been largely unsuccessful if looked at solely in terms of rulings on admissibility. Courts have by and large refused to exclude prosecution experts. For instance, although a number of scholars have challenged the ability of forensic document examiners to identify the author of a writing,<sup>116</sup> courts have permitted such experts to testify even while expressing concern about the reliability of their methodology.<sup>117</sup> Before *Kumho*, some courts reached this result using an approach not unlike that of the court of appeals in *Kumho*: The courts concluded that handwriting analysis is not a science, and that, therefore, *Daubert*—and the need for empirical validation—is inapplicable.<sup>118</sup>

That courts continued to allow forensic identification experts to testify is not, however, the whole story. It is clear that in the aftermath of *Daubert*, empirical research has begun to examine the foundation of some forensic sciences.<sup>119</sup> It would be a great pity if such efforts cease in the wake of *Kumho* because trial judges have discretion to admit experience-based expertise. Even though the Court's opinion clearly relieves a judge from having to apply the *Daubert* factors in a given case, it does not eliminate the fundamental requirement of "reliability." The post-*Daubert* debate on forensic techniques has identified many hypotheses that could be tested. A court has the power since the *Kumho* decision

114. See David H. Kaye & George F. Sensabaugh, Jr., Reference Guide on DNA Evidence, § IV.A-B, in this manual.

115. For a detailed examination of these various techniques of forensic identification, see 1 & 2 Modern Scientific Evidence, *supra* note 4, §§ 15-1.0 to 26-2.3.

116. A widely cited article by D. Michael Risinger et al., *Exorcism of Ignorance as a Proxy for Rational Knowledge: The Lessons of Handwriting Identification "Expertise,"* 137 U. Pa. L. Rev. 731 (1989), had questioned the reliability of handwriting analysis prior to *Daubert*. The Court's analysis in *Daubert* seemed tailor-made for continuing the attack.

117. See, e.g., *United States v. Starzecpyzel*, 880 F. Supp. 1027, 1028-29 (S.D.N.Y. 1995).

118. See *United States v. Jones*, 107 F.3d 1147 (6th Cir.), *cert. denied*, 521 U.S. 1127 (1997).

119. See 1 & 2 Modern Scientific Evidence, *supra* note 4, §§ 1-3.4, 22-2.0 (commenting on the solicitation of research proposals on the validity of handwriting analysis by the United States Department of Justice, Office of Justice Programs, National Institute of Justice).

to decide that particular *Daubert* factors, including testability and publication, apply under “the particular circumstances of the particular case,” given the significance of the issue to which the expert opinion relates and the ease with which the reliability of the expert’s conclusions can be verified.<sup>120</sup>

If research continues and courts focus more on the particular circumstances of the case, as *Kumho* directs, they will perhaps draw more distinctions than they generally do now in ruling on the admissibility of forensic identification expertise. A court could rule, for instance, that a document examiner is capable of reaching certain conclusions but not others. In other words, the issue might be recast: rather than appraising the reliability of the field, courts would instead question the ability of experts in that field to provide relevant, reliable testimony with regard to the particular contested issue.<sup>121</sup>

## 2. Challenging an expert’s testimony to prove causation

### a. Is evidence used in risk assessment relevant?

Not surprisingly, each of the cases in the Supreme Court’s trilogy involved the proof of causation in either a toxic tort or product liability case. Causation is frequently the crucial issue in these actions, which have aroused considerable controversy because they often entail enormous damage claims and huge transaction costs. Particularly in toxic tort cases, proving causation raises numerous complicated issues because the mechanisms that cause certain diseases and defects are not fully understood. Consequently, the proof of causation may differ from that offered in the traditional tort case in which the plaintiff details and explains the chain of events that produced the injury in question. In toxic tort cases in which the causal mechanism is unknown, establishing causation means providing scientific evidence from which an inference of cause and effect may be drawn. There are, however, numerous unresolved issues about the relevancy and reliability of the underlying hypotheses that link the evidence to the inference of causation.

The facts of the *Joiner* case illustrate a number of issues that arise in proving causation in toxic tort cases. Justice Stevens’ separate opinion assumes that evidence that would be considered in connection with risk assessment is relevant in proving causation in a toxic tort action, although the standard of proof might be higher in a court of law.<sup>122</sup> Consequently, he would have found no abuse of

120. See *supra* note 74 and accompanying text.

121. This issue is also certain to arise with respect to social scientists. The split in circuits about the extent to which *Daubert* applies to the social sciences is also resolved by *Kumho* in the sense that the trial court has a gatekeeping function with regard to this type of evidence as well. However, the extent to which courts will choose to apply the *Daubert* factors to social scientists’ testimony remains an open issue.

122. *General Elec. Co. v. Joiner*, 522 U.S. 136, 153–54 (1997) (“It is not intrinsically ‘unscientific’

discretion had the district court admitted expert testimony based on a methodology used in risk assessment, such as the weight-of-evidence methodology (on which the plaintiff's expert claimed to rely), which pools all available information from many different kinds of studies, taking the quality of the studies into account.<sup>123</sup> Combining studies across fields is even more controversial than pooling the results of epidemiological studies in a meta-analysis, a statistical technique that some find unreliable when used in connection with observational studies.<sup>124</sup> Of course, even if a court has no objection to the particular methodology's relevance in proving causation, it may disagree with how it was applied in the particular case. As the Supreme Court said in *Joiner*, "nothing . . . requires a district court to admit opinion evidence which is connected to existing data only by the ipse dixit of the expert."<sup>125</sup>

However, not all would agree with Justice Stevens' assumption that whatever is relied upon in assessing risk is automatically relevant in proving causation in a court of law. Proof of risk and proof of causation entail somewhat different questions because risk assessment frequently calls for a cost-benefit analysis. The agency assessing risk may decide to bar a substance or product if the potential benefits are outweighed by the possibility of risks that are largely unquantifiable because of presently unknown contingencies. Consequently, risk assessors may pay heed to any evidence that points to a need for caution, rather than assess the likelihood that a causal relationship in a specific case is more likely than not.

There are therefore those who maintain that high-dose animal studies have no scientific value outside the context of risk assessment.<sup>126</sup> These critics claim that although such studies may point to a need for more research or extra caution, they are irrelevant and unreliable in proving causation because of the need to extrapolate from the animal species used in the study to humans, and from the high doses used in the study to the plaintiff's much lower exposure.

Both *Kumho*'s insistence on "the particular circumstances of the particular case at issue"<sup>127</sup> and *Joiner*'s discussion of animal studies suggest, however, that

for experienced professionals to arrive at a conclusion by weighing all available scientific evidence. . . . After all, as *Joiner* points out, the Environmental Protection Agency (EPA) uses the same methodology to assess risks, albeit using a somewhat different threshold than that required in a trial." (footnote omitted) (citing Brief for Respondents at 40-41, *General Elec. Co. v. Joiner*, 522 U.S. 136 (1997) (No. 96-188) (quoting EPA, Guidelines for Carcinogen Risk Assessment, 51 Fed. Reg. 33992, 33996 (1986))).

123. For a discussion of the weight-of-evidence methodology and arguments supporting its use to prove causation in toxic tort cases, see Carl F. Cranor et al., *Judicial Boundary Drawing and the Need for Context-Sensitive Science in Toxic Torts after Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 16 Va. Env'tl. L.J. 1, 67-75 (1996).

124. See Michael D. Green et al., Reference Guide on Epidemiology § VI, in this manual.

125. *Joiner*, 522 U.S. at 146. See *supra* text accompanying note 32.

126. See, e.g., Phantom Risk: Scientific Inference and the Law 12 (Kenneth R. Foster et al. eds., 1993).

127. See *supra* note 53 and accompanying text.

the Court does not have a doctrinaire view on the risk-assessment-versus-causation debate. The Court is more interested in focusing on “how and why” causation could be inferred from the particular evidence being proffered than in formulating per se rules about the admissibility or inadmissibility of categories of evidence to prove causation. In *Joiner*, the district court had refused to allow the plaintiff’s experts to testify on the basis of animal studies because the studies varied so substantially from the facts of Joiner’s exposure. They had been done with infant mice, who had been injected with much higher doses of PCBs than those in the fluids the plaintiff had been exposed to at work, and the mice developed a different type of cancer than the plaintiff did. The Supreme Court stated that Joiner failed to explain how the experts could have extrapolated from these results, and instead chose “to proceed as if the only issue [was] whether animal studies can ever be a proper foundation for an expert’s opinion.”<sup>128</sup> The Supreme Court said that “[o]f course . . . was not the issue.”<sup>129</sup> The issue was whether these experts’ opinions were sufficiently supported by the animal studies on which they purported to rely.”<sup>130</sup>

Obviously the match between the results in the animal studies and Joiner’s disease would have been closer if the studies had been conducted on adult mice who had developed tumors more similar to his. However, reliance on animal studies is always going to require some extrapolation—from animals to humans, from the high doses the subjects are given to the plaintiff’s much lower exposure. Does this mean that a district court will always be justified in exercising its discretion to exclude animal studies? Would the decision of the district court in *Joiner* have been affirmed if the court had admitted the studies? How does the nature and extent of other proof of causation affect the admissibility determination? Is such a ruling appropriate if no epidemiological studies have been done and the plaintiff’s proof consists almost exclusively of animal studies that match the plaintiff’s circumstances far more substantially than did those in *Joiner*? In such a case, is it appropriate to exclude testimony about animal studies because the court has concluded that it would grant judgment as a matter of law on the ground of insufficiency?

b. May clinical physicians testify on the basis of differential diagnoses?

Judges disagree on whether a physician relying on the methodology of clinical medicine can provide adequate proof of causation in a toxic tort action. Recent cases in the Fifth and Third Circuits illustrate very different approaches to this issue.

128. *Joiner*, 522 U.S. at 144 (quoting *Joiner v. General Elec. Co.*, 864 F. Supp. 1310, 1324 (N.D. Ga. 1994), *rev’d*, 78 F.3d 524 (11th Cir. 1996), and *rev’d*, 522 U.S. 136 (1997)).

129. *Id.*

130. *Id.*

In the Fifth Circuit, two single-plaintiff toxic tort cases, one decided before *Kumho* and one after it, suggest that the court will permit a medical expert to testify about causation only if sufficient proof exists that the medical establishment knows how and at what exposures the substance in question can cause the plaintiff's alleged injuries or disease. In *Black v. Food Lion, Inc.*,<sup>131</sup> which was decided after *Kumho*, the appellate court reversed the decision of a trial judge who admitted testimony by a medical expert that the plaintiff's fall in the defendant's grocery store had caused her to develop fibromyalgia, a syndrome characterized by chronic fatigue, insomnia, and general pain. The expert had followed the approved protocol for determining fibromyalgia, but the appellate court found that there is no known etiology for fibromyalgia, which the expert conceded.<sup>132</sup> It was therefore scientifically illogical, and an instance of "post-hoc propter-hoc reasoning" for the expert to conclude that the disease must have been caused by the fall because she had eliminated all other possible causes.<sup>133</sup> The court then stated:

The underlying predicates of any cause-and-effect medical testimony are that medical science understands the physiological process by which a particular disease or syndrome develops and knows what factors cause the process to occur. Based on such predicate knowledge, it may then be possible to fasten legal liability for a person's disease or injury.<sup>134</sup>

The court then held that since neither the expert nor medical science knows "the exact process" that triggers fibromyalgia, the expert's "use of a general methodology cannot vindicate a conclusion for which there is no underlying medical support."<sup>135</sup>

Furthermore, the Fifth Circuit found that it was not an abuse of discretion to exclude the expert's opinion even when the expert pointed to some support for finding causation. In *Moore v. Ashland Chemical, Inc.*,<sup>136</sup> the plaintiff claimed that he developed a reactive airways disorder (RAD) after a defendant negligently caused him to clean up a chemical compound spill without proper safety precautions. The district court entered judgment for the defendants after the jury

131. 171 F.3d 308 (5th Cir. 1999).

132. *Id.* at 313.

133. *Id.*

134. *Id.* at 314. This language would seemingly rule out proof through epidemiological or animal studies unless the disease process is understood. Of course, this was a single-plaintiff case, so perhaps the court is limiting itself to that kind of case.

135. *Id.* The court faulted the trial court's exercise of its discretion:

If the magistrate judge thought he was applying *Daubert*, however, he fatally erred by applying its criteria at a standard of meaninglessly high generality rather than boring in on the precise state of scientific knowledge in this case. Alternatively, if the magistrate judge decided to depart from *Daubert*, he failed to articulate reasons for adopting the test he used. In particular, he failed to show why an alternate test was necessary to introduce "in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field."

*Id.* (quoting *Kumho Tire Co. v. Carmichael*, 119 S. Ct. 1167, 1176 (1999)).

136. 151 F.3d 269 (5th Cir. 1998) (en banc), *cert. denied*, 119 S. Ct. 1454 (1999).

found that the plaintiff's injury had not been caused by the defendants' negligence. A divided panel of the Fifth Circuit reversed the decision because the trial court had not allowed one of the plaintiff's medical experts to state his opinion that exposure to the spill had caused the plaintiff's illness.<sup>137</sup> On a rehearing en banc, a divided court found that the district court had not abused its discretion in excluding the opinion.

The majority stated that the trial court could properly conclude that the material safety data sheet that warned that the solution in question could cause respiratory problems had limited value because it did not specify the level of exposure necessary to cause injuries, and in any event, the plaintiff's expert did not know how much exposure there had been.<sup>138</sup> A study showing the effects of fumes could be discounted because the level and duration of the exposure were greater.<sup>139</sup> The temporal connection between the spill and the onset of symptoms was entitled to little weight.<sup>140</sup> The expert's opinion, based on his experience, that any irritant could cause RAD in a susceptible subject was inadequate because it had not been confirmed by the *Daubert* factors.<sup>141</sup> The court assumed that in resolving an issue of medical causation, a court must apply the scientific method, and "[t]his requires some objective, independent validation of the expert's methodology. The expert's assurances that he has utilized generally accepted scientific methodology is [sic] insufficient."<sup>142</sup>

Although *Kumho* suggests that there is no scientific method that must be applied to a particular issue without taking the circumstances of the case into account, the Fifth Circuit in *Black* stated that *Kumho*'s "reasoning fully supports this court's en banc conclusion in *Moore* that *Daubert* analysis governs expert testimony."<sup>143</sup> Do *Moore* and *Black* read together mean that a trial court will always be found to have abused its discretion if it permits a treating physician to testify about general causation in a case in which no consensus exists about causation on the basis of prior studies? The dissenting judges in *Moore* apparently thought so; they objected that under the majority's approach, a plaintiff will never be able to win a case involving chemical compounds that have not been

137. *Moore v. Ashland Chem., Inc.*, 126 F.3d 679 (5th Cir. 1997) (panel opinion). The trial court had admitted the second treating physician's causation opinion even though it relied heavily on the opinion of the expert whose causation testimony was excluded and relied essentially on the same data. *Id.* at 683. The appellate court sitting en banc supposed that the district court had done so because the second physician was the actual treating physician and because he had relied on one study in a medical journal. In view of the verdict, the defendants had not raised the propriety of this ruling on appeal. 151 F.3d at 273–74.

138. 151 F.3d at 278.

139. *Id.* at 278–79.

140. *Id.* at 278.

141. *Id.* at 279.

142. *Id.* at 276.

143. *Black v. Food Lion, Inc.*, 171 F.3d 308, 310 (5th Cir. 1999) (citing *Moore v. Ashland Chem., Inc.*, 151 F.3d 269, 275 n.6 (5th Cir. 1998) (en banc), *cert. denied*, 119 S. Ct. 1454 (1999)).

thoroughly tested.<sup>144</sup> In contrast, the concurring judge in *Moore* thought that the district judge would not have abused her discretion in admitting the excluded opinion on causation, and would “not read the majority opinion to require otherwise.”<sup>145</sup> How the Fifth Circuit will treat this issue in future cases is not clear, but certainly a district court that admits a physician’s causation testimony without a detailed exploration and explanation for doing so can expect its decision to be reversed.<sup>146</sup> In light of *Kumho*’s insistence on paying heed to the particular circumstances of the case, courts may be more willing to allow treating physicians’ causation testimony that is based on a differential diagnosis when the etiology of the condition is understood even though no published epidemiological or toxicological studies implicate the defendant’s product in causing harm.<sup>147</sup>

The Third Circuit’s opinion on testimony by medical experts is at the opposite end of the spectrum. In *Heller v. Shaw Industries, Inc.*,<sup>148</sup> the plaintiff claimed that her respiratory problems were caused by volatile organic compounds (VOCs) emitted by a carpet manufactured by the defendant. After an extensive in limine hearing, the trial court excluded the testimony of the plaintiff’s key expert and granted summary judgment. The appellate court, in an opinion by Judge Becker, agreed that the trial court had properly excluded the testimony of an industrial hygienist that sought to show that the carpet was the source of the VOCs in the plaintiff’s home, and that consequently summary judgment was proper.<sup>149</sup> But the court wrote an extensive opinion on why the district judge erred in also excluding the plaintiff’s medical expert.<sup>150</sup> Its conclusion is clearly at odds with what the Fifth Circuit said in *Moore* and *Black*:

Assuming that Dr. Papano conducted a thorough differential diagnosis . . . and had thereby ruled out other possible causes of Heller’s illness, and assuming that he had relied on a valid and strong temporal relationship between the installation of the carpet and Heller’s problems . . . , we do not believe that this would be an insufficiently valid methodology for his reliably concluding that the carpet caused Heller’s problems.

144. *Moore*, 151 F.3d at 281.

145. *Id.* at 279.

146. See *Tanner v. Westbrook*, 174 F.3d 542 (5th Cir. 1999), a Fifth Circuit opinion on the admissibility of causation testimony by clinical physicians, in which the appellate court reversed the trial court’s judgment after finding insufficient support in the record for the expert’s conclusion that birth asphyxia was more likely than not the cause of an infant’s cerebral palsy. The court remanded the case, however, stating, “Whether this weakness is a by-product of the absence of exploration of the *Daubert* issues at a pretrial hearing, we do not know. Nor do we know if his opinion is supportable.” *Id.* at 549.

147. Cf. *Westberry v. Gislaved Gummi AB*, 178 F.3d 257, 261–65 (4th Cir. 1999) (treating physician properly permitted to testify that breathing airborne talc aggravated plaintiff’s preexisting sinus condition; no epidemiological studies, animal studies, or laboratory data supported the expert’s conclusions; the opinion surveys cases in which courts have admitted testimony based on differential diagnoses).

148. 167 F.3d 146 (3d Cir. 1999).

149. *Id.* at 159–65.

150. *Id.* at 153–59.

... [W]e do not believe that *Daubert* . . . require[s] a physician to rely on definitive published studies before concluding that exposure to a particular object or chemical was the most likely cause of a plaintiff's illness. Both a differential diagnosis and a temporal analysis, properly performed, would generally meet the requirements of *Daubert* . . .<sup>151</sup>

Judge Becker was writing before *Kumho*. We do not know yet how much precedential weight a district court in the Third Circuit will feel impelled to accord the dictum in *Heller* in future cases and whether the decision of a district court will be reversed if it excludes testimony on causation by a treating physician because of a lack of published studies. Nor is it clear that all panels of the Fifth Circuit will follow *Black* in treating a district court's admission of testimony by a treating physician as an abuse of discretion. At this time, the possibility of an intercircuit conflict plainly exists.

## V. Conclusion

In *Kumho*, the Supreme Court extended the trial judge's gatekeeping obligation concerning expert testimony that it first discussed in *Daubert*. All expert testimony, not just testimony that rests on scientific principles, is now subject to screening to ensure that it is relevant and reliable. The choice of proceedings needed to make this determination lies in the trial court's discretion.

The Court endorsed a nondoctrinaire, flexible approach that requires district courts to focus "upon the particular circumstances of the particular case at issue."<sup>152</sup> The Court did not develop further the technique it used in *Daubert* of pointing to particular factors that spell out reliability with regard to a particular kind of expertise. That is not to say that the factors discussed in *Daubert* are now irrelevant. They "may or may not be pertinent,"<sup>153</sup> even with regard to expert scientific proof, depending on the issue, the expertise in question, and the subject of the expert's testimony. The choice of factors to be used in determining reliability is also left to the trial court's discretion.

The enormous scope and open-ended nature of *Kumho* guarantee that battles over the admissibility of expert testimony will continue. Numerous issues remain unresolved, and the possibility exists that splits in the circuits will result, particularly in connection with the proof of causation in toxic tort cases, the question that engaged the Court's interest in expert testimony in the first place. It remains to be seen whether the trilogy of opinions completed by *Kumho* will constitute the Court's final statement on the subject of expert proof.

151. *Id.* at 154.

152. *Kumho Tire Co. v. Carmichael*, 119 S. Ct. 1167, 1175 (1999).

153. *Id.* at 1170.