# What Is an Environmental Expert? The Impact of *Daubert*, *Joiner* and *Kumho Tire* on the Admissibility of Scientific Expert Evidence*

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* This article is distinguishable from other articles discussing the admissibility of expert evidence due to the amount of time over which this article was written and the research that went into it. The first draft of this article was completed in March of 1999, five days before the Supreme Court's *Kumho Tire v. Carmichael* decision. The analyses and subsequent conclusions within this article have since been revised to incorporate an amendment to Federal Rule of Evidence 702, the *Kumho Tire v. Carmichael* decision, a second edition to the *Reference Manual on Scientific Evidence*, and the numerous court opinions and commentary that have been written discussing the admissibility of expert evidence.

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## I.
## INTRODUCTION

Environmental experts are typically environmental engineers and environmental and occupational health doctors[1] whose testimony is based on "scientific, technical, or other specialized knowledge" that "will assist the trier of fact."[2] In complex environmental and toxic tort[3] cases, "scientific, technical or other specialized" expert evidence[4] "has become virtually indispensable, especially on the issues of causation[5] and damages."[6] For the following reasons, environmental and toxic tort expert evidence must be treated differently than ordinary evidence in environmental and toxic tort litigation.

First, unlike expert evidence, ordinary evidence is typically derived from fact witnesses whose testimony is limited to inferences and opinions based on firsthand knowledge.[7] An expert witness'

1. *See* Anthony Z. Roisman, *The Courts, Daubert, and Environmental Torts: Gatekeepers or Auditors?*, 14 PACE ENVTL. L. REV. 545, 554 (1997).

2. FED. R. EVID. 702; *see also* Kumho Tire Co. v. Carmichael, 526 U.S. 137, 141 (1999).

3. Toxic torts are "civil actions asserting a demand for recovery of damages that arose from exposure to a chemical substance, emission, or product, where that exposure allegedly caused physical and/or physiological harm." 1 JAMES T. O'REILLY, TOXIC TORTS PRACTICE GUIDE § 2.01, at 2-1 (2d ed. 1992).

4. This Note adopts the inclusive term "scientific expert evidence" from the *Reference Manual on Scientific Evidence* to cover both scientific testimonial and nontestimonial evidence, such as demonstrative evidence presented by experts. *See* REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 1 n.1 (1994) [hereinafter 1994 MANUAL].

5. *See, e.g.*, Heller v. Shaw Indust., Inc., 167 F.3d 146, 151 (3d Cir. 1999) (focusing primarily on causation).

6. CARLSON ET AL., EVIDENCE: TEACHING MATERIAL FOR AN AGE OF SCIENCE AND STATUTES 617 (4th ed. 1997).

7. *See* FED. R. EVID. 701 advisory committee's note. See the laundry list of inferences and opinions contemplated by the adoption of Rule 701 in the advisory committee's note (as amended) to rule 701 at pg. 685; *See, e.g.*, Amorgianos v. Nat'l R.R. Passenger Corp., 137 F. Supp. 2d 147, 176 (E.D.N.Y 2001) (court excluded the expert's opinion on the duration of exposure in a toxic tort case because the issue of

testimony, in contrast, is not limited to firsthand knowledge or observation.[8] Scientific expert witnesses may testify to inferences and opinions based on data (tests, models, and peer publications) "reasonably relied upon by experts in the particular field."[9] A distinction is recognized between lay and expert witnesses because experts possess an "unique ability" to draw conclusions from data.[10] The United States Court of Appeals for the District of Columbia first recognized this distinction in *Frye v. United States*.[11] Congress codified this distinction in the adoption of Article VII of the Federal Rules of Evidence ("Rules") in 1975,[12] which separates Rule 701[13] from Rules 702[14] and 703,[15] in

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duration is not one for which an expert opinion is required because the issue of duration is a question of fact that requires personal knowledge).

8. *See* Kumho Tire Co. v. Carmichael, 526 U.S. 137, 149 (1999) (citing Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 592 (1993)); FED. R. EVID. 702 advisory committee's notes.

9. FED. R. EVID. 703 advisory committee's note.

10. CARLSON, *supra* note 6, at 618.

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

12. Rules of Evidence for United States Courts and Magistrates, Pub. L. No. 93-595, 88 Stat. 1926, 1937 (1975) (codified as amended at 28 U.S.C. app. at 887-88 (1994)).

13. *See* FED. R. EVID. 701. Rule 701 provides:

> Opinion Testimony by Lay Witnesses.
>
> If the witness is not testifying as an expert, the witness' testimony in the form of opinions or inferences is limited to those opinions or inferences which are (a) rationally based on the perception of the witness, and (b) helpful to a clear understanding of the witness' testimony or the determination of a fact in issue, and (c) not based on scientific, technical, or other specialized knowledge within the scope of Rule 702.

14. *See* FED. R. EVID. 702. Rule 702 provides:

> Testimony by Experts.
>
> If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

15. *See* FED. R. EVID. 703. Rule 703 provides:

> Bases of Opinion Testimony by Experts.
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> The facts or data in the particular case upon which an expert bases an opinion or inference may be those perceived by or made known to the expert at or before the hearing. If of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject, the facts or data need not be admissible in evidence in order for the opinion or inference to be admitted. Facts or data that are otherwise inadmissible shall not be disclosed to the jury by the proponent of the opinion or inference unless the court determines that their probative value in assisting the jury to evaluate the expert's opinion substantially outweighs their prejudicial effect.

order to distinguish ordinary witnesses from expert witnesses. Since the enactment of the Rules, the Supreme Court has twice recognized that Rules 702 and 703 grant expert witnesses "wide latitude to offer opinions . . . not based on firsthand knowledge or observation."[16] Because expert witnesses are not limited to firsthand knowledge, their testimony ought to be treated differently than more reliable firsthand evidence from lay witnesses.

Second, expert evidence in environmental and toxic tort cases often "involve[s] complex scientific theories that are *novel*, and affect many people beyond just the individual litigants."[17] Novel scientific expert evidence is evidence that has not received widespread peer review[18] and/or acceptance from the judicial or scientific communities.[19] Such evidence raises countervailing concerns. On the one hand, a "liberal admission standard [may] impede the judicial process"[20] by allowing "junk science"[21] into

16. Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 592 (1993); Kumho Tire Co. v. Carmichael, 526 U.S. 137, 250 (1999).

17. Samuel H. Jackson, *Technical Advisors Deserve Equal Billing with Court Appointed Experts in Novel and Complex Scientific Cases: Does the Federal Judicial Center Agree?*, 28 ENVTL. L. 431, 433 (1998) (emphasis added) (citing CARNEGIE COMM'N ON SCIENCE, TECH., AND GOV'T, SCIENCE AND TECHNOLOGY IN JUDICIAL DECISIONMAKING—CREATING OPPORTUNITIES AND MEETING CHALLENGES 28 (1993)). "The importance of scientific accuracy . . . reaches well beyond the case itself. A decision wrongly denying compensation in a toxic substance case, for example, can not only deprive the plaintiff of warranted compensation but also discourages other similarly situated individuals from even trying to obtain compensation and encourages the continued use of a dangerous substance. On the other hand, a decision wrongly granting compensation . . . can improperly force abandonment of the substance," which would deny the public of the benefits of the substance. REFERENCE MANUAL ON SCIENTIFIC EVIDENCE 3-4 (2d ed. 2000) [hereinafter the 2000 MANUAL].

18. *See* Nelson v. Tennessee Gas Pipeline Co., 243 F.3d 244, 251 (6th Cir. 2001) (internal quotation marks omitted) (Plaintiffs argued "that the lack of publication or other peer review should have been disregarded because it only demonstrates that the novel opinions are at the forefront of toxicology." But the Sixth Circuit concluded that though the lack of peer review and publication was plainly relevant, it was not dispositive).

19. *See* United States v. Downing, 753 F.2d 1224, 1232-39 (3d Cir. 1985) (discussing the perceived evidentiary problems posed by novel forms of scientific expertise). The FJC expressly recognized that the greatest challenge facing environmental and toxic tort litigants exists in cases involving novel issues in which "science is still evolving and claims and defenses have not been shaken out in earlier litigation." 1994 MANUAL, *supra* note 4, at 14.

20. Erin K.L. Mahaney, *Assessing the Fitness of Novel Scientific Evidence in the Post-Daubert Era: Pesticide Exposure Cases as a Paradigm for Determining Admissibility*, 26 ENVTL. L. 1161, 1162 (1996) (citing *Daubert*, 509 U.S. at 596-97).

21. PETER W. HUBER, GALILEO'S REVENGE: JUNK SCIENCE IN THE COURTROOM 2 (1991). Huber popularized the term "junk science." On the science side, Huber characterized junk science as the "mirror image of real science." *Id.* On the legal

the courtroom. On the other hand, "a restrictive standard will prevent courts from becoming fully informed about [novel] scientific developments,"[22] which may be relied upon by toxic tort and environmental litigants. As technology and the underlying scientific theories continue to grow, more litigation will include complex and/or novel scientific expert evidence.[23] Given the possible increased reliance on novel scientific evidence and the potential impacts of such litigation beyond just the individual litigants,[24] scientific expert evidence ought to be treated differently than ordinary witness testimony.

The third reason for treating scientific expert evidence differently than lay witness evidence in environmental and toxic tort litigation is the latency period of the diseases involved in such litigation.[25] A disease may develop many years after an acute exposure or after many years of long-term, low-dose exposure to a carcinogen or toxin.[26] The long latency period obscures the chain of causation. The causation chain is further obscured in novel cases because the mechanism by which the toxin causes the disease may not be understood.[27] Subsequently, a fact witness, or a witness with firsthand knowledge, does not typically possess the experience or knowledge to explain the causal link to the trier of fact.[28] Given the technical and complex nature of prov-

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side, Huber characterized junk science as speculative theories that are compelled through the courts by a combination of the 'let-it-all-in' legal theory and money. *Id.* at 3.

22. Mahaney, *supra* note 20, at 1162 (citing *Daubert*, 509 U.S. at 596-97).

23. *See* DiPetrillo v. Dow, 729 A.2d 677, 686 (R.I. 1999) (offering guidance to trial courts on the standard for admissibility that should govern preliminary evidentiary hearings out of the presence of the jury "[b]ecause more and more litigation will include complex and/or novel scientific and technical evidence . . . .").

24. Consider the potential impacts if a plaintiff, relying on novel scientific evidence, were awarded damages for a claim that brain cancer resulted from cellular phone use.

25. *See* O'REILLY, *supra* note 3, at 3-44 to 3-46 (noting that the most distinguishing feature of toxic torts is the latency period, which is the "time between exposure and on-set of symptoms"); Mark Parascandola, *What is Wrong with the Probability of Causation?*, 39 JURIMETRICS J. 29, 29 (1998).

26. *See* O'REILLY, *supra* note 3, at 3-44 to 3-46.

27. Parascandola, *supra* note 25, at 29 ("Moreover, the mechanism by which the carcinogen or toxin causes the disease may be poorly understood.").

28. *See* 1994 MANUAL, *supra* note 4, at 64 ("[A] proffered lay witness will not have the experience and knowledge required to render the desired opinion.").

ing causation in a typical toxic tort claim,[29] scientific expert evidence is needed to establish a prima facie case.[30]

Finally, the difference perceived by a jury between scientific expert evidence and ordinary evidence can be so great that a court must treat expert evidence differently. A jury may presuppose that the scientific expert evidence it confronts is infallible,[31] because technology, such as automobiles and computers, surrounds our daily lives.[32] Therefore, scientific expert evidence should be treated differently than ordinary evidence because scientific expert evidence may enter a courtroom with a preconceived notion of infallibility that may misguide a jury. For these reasons, scientific expert evidence should continue to be treated differently than non-expert evidence, particularly in environmental and toxic tort litigation.

Part II of this Note discusses the evolution of expert evidence from *Frye v. United States*,[33] *Daubert v. Merrell Dow Pharmaceuticals, Inc.*,[34] and *General Electric Co. v. Joiner*[35] to the Supreme Court's most recent interpretation of Rule 702 in *Kumho Tire Co. v. Carmichael*.[36] Part III discusses the impact that *Kumho Tire* will have on the admissibility of scientific expert evidence. Specifically, this section argues that the discretionary application of the *Daubert* and non-*Daubert* factors to expert evi-

29. *See* Parascandola, *supra* note 24, at 30; *see also* Sterling v. Velsicol Chem. Corp., 647 F. Supp. 303 (W.D. Tenn. 1986), *aff'd in part and rev'd in part*, 855 F.2d 1188 (6th Cir. 1987) (exemplifying the complexity of the expert evidence involved, and the small army of multi-disciplininary scientists needed to explain the causal link to the trier of fact).

30. "It is well established that a plaintiff in a toxic tort case must prove that he or she was exposed to and injured by a harmful substance manufactured by the defendant." Mitchell v. Gencorp, Inc., 165 F.3d 778, 781 (10th Cir. 1999) (citations omitted). "In order to carry this burden, a plaintiff must demonstrate 'the levels of exposure that are hazardous to human beings generally as well as the plaintiff's actual level of exposure to the defendant's toxic substance before he or she may recover.'" *Id.* (quoting Wright v. Willamette Industries, Inc., 91 F.3d 1105, 1106 (1996)).

31. *See* United States v. Addison, 498 F.2d 741, 744 (1974) ("[S]cientific proof may in some instances assume a posture of mystic infallibility in the eyes of a jury of laymen."); Samuel J. McNaughton, *What is Good Science?*, 13 NAT. RESOURCES & ENV'T 513, 517 (1997) ("[S]cience in our society has come to have a quality of infallibility attached to it.").

32. *See* McNaughton, *supra* note 31, at 513.

33. 293 F. 1013 (D.C. Cir. 1923).

34. 509 U.S. 579 (1993).

35. 522 U.S. 136 (1997).

36. 526 U.S. 137 (1999). The Supreme Court's trilogy on expert evidence is so interrelated that *Kumho Tire*'s significance and potential impact cannot be adequately discussed without the Court's analyses in *Daubert* and *Joiner*.

dence will open the evidentiary gates wider for the admission of scientific expert evidence, which will tilt the potential admission of scientific expert evidence back toward an equilibrium between plaintiffs and defendants. Additionally, this section discusses the consequences of a trial court's failure to consider a relevant *Daubert* or non-*Daubert* factor. Part IV first discusses that extensive evidentiary hearings may be the most effective way to determine the admissibility of novel expert evidence, and then argues that the model approach to admit novel scientific expert evidence in light of *Daubert* and *Kumho Tire* is for the litigant to develop a detailed record during discovery in addition to a Rule 26 Report of the expert's opinion,[37] and to present the experts' individual proffered expert evidence as a whole conclusion during a *Daubert* inquiry. This section concludes that Trial judges should assign limited weight to the "general acceptance" factor when evaluating novel expert evidence during a *Daubert* inquiry.

## II.

## THE EVOLUTION OF EXPERT EVIDENCE: *FRYE*, *DAUBERT*, *JOINER*, AND *KUMHO TIRE*

In *Frye v. United States*, the United States Court of Appeals for the District of Columbia promulgated a test for the admissibility of scientific expert evidence.[38] The appellate court held that expert testimony "must be sufficiently established to have gained *'general acceptance'* in the particular field in which it belongs."[39] The *Frye* court noted that "just when the scientific principle or discovery crosses the line between the experimental and demonstrable states is difficult to define."[40] The "general acceptance" test failed to define this line, and proved to be too conservative for the judicial system.[41] Moreover, the "general acceptance" test misconceived the scientific process, because the validity of the test is premised on the belief that acceptance equals scientific validity. However, the degree of peer-acceptance is not a substantive test of scientific validity.[42]

37. FED. R. CIV. P. 26(a)(2)(A). Rule 26(a)(2)(A) provides, "In addition to the disclosures required by paragraph (1), a party shall disclose to other parties the identity of any person who may be used at trial to present evidence under Rules 702, 703, or 705 of the Federal Rules of Evidence."

38. 293 F. 1013 (D.C. Cir. 1923).

39. *Id.* at 1014 (emphasis added).

40. *Id.*

41. *See* CARLSON, *supra* note 6, at 264.

42. *See id.*

### A. *DAUBERT V. MERRELL DOW PHARMACEUTICALS, INC.*

Seventy years later, a unanimous Supreme Court rejected the "general acceptance" test as the sole criteria for determining the admissibility of scientific expert evidence in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*,[43] and supplanted it with the relevance and reliability standards of the Federal Rules of Evidence.[44] The "general acceptance" test was demoted to one of several factors to be considered in determining the admissibility of scientific expert evidence.[45]

In *Daubert*, two families claimed that Bendectin, an anti-nausea medication administered to pregnant women, caused birth defects in their children.[46] The district court granted summary judgment in favor of the defendant,[47] and the Ninth Circuit affirmed on grounds that the proffered theories of the two families' expert witnesses were not generally accepted in the scientific community.[48] The U.S. Supreme Court vacated and remanded the Ninth Circuit's ruling, because the lower decisions relied "almost exclusively on [the] 'general acceptance'" test.[49]

In *Daubert*, the Supreme Court focused on the plain language of Rule 702, and promulgated a two-prong test to assist trial judges[50] in determining the admissibility of expert evidence.[51]

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43. 509 U.S. 579 (1993).

44. *See id.* at 589. The Supreme Court reasoned that the drafters of the Federal Rules of Evidence did not mention *Frye* or its rigid "general acceptance" test, which "would be at odds with the 'liberal thrust' of the Federal Rules." *Id.* at 588 (citing Beech Aircraft Corp. v. Rainey, 488 U.S. 153, 169 (1988)).

45. *See generally* Edward Cheng, *Thomas S. Kuhn and Courtroom Treatment of Science Evidence*, 15 TEMP. ENVTL. L. & TECH. J. 195 (1996) (describing how the *Daubert* test is flawed and why the *Frye* test should be reinstated as the test of admissibility for expert evidence).

46. *See* Daubert v. Merrell Dow Pharm., Inc., 43 F.3d 1311, 1313 (9th Cir. 1995); *see also* 17 CHEM. REG. REP. (BNA) No. 26, at 1133 (1993).

47. *See* Daubert v. Merrell Dow Pharm., Inc., 727 F. Supp 570, 571 (S.D. Cal. 1989).

48. *See* Daubert v. Merrell Dow Pharm., Inc., 951 F.2d 1128, 1131 (9th Cir. 1991).

49. *Daubert*, 509 U.S. at 597-98; *see also* 17 CHEM. REG. REP. (BNA) No. 14, at 703 (1993).

50. The *Daubert* opinion spoke only to federal district court judges, but this paper uses the inclusive terms "trial courts" and "trial judges" to refer to all jurisdictions and judges that apply the *Daubert* test. Notably, state courts are still wrestling with the choice between the *Frye* test and the *Daubert* test. *See* 21 ENV'T REP. (BNA) No. 30, at 841 (1997).

51. *Daubert*, 509 U.S. at 592. In a footnote, the Court recognized that the *Frye* Court only focused on "novel" scientific evidence; however, *Daubert* read the requirements of Rule 702 to apply to unconventional as well as conventional evidence. *Id.* at 592 n.11.

The test establishes the trial judge's role as gatekeeper, requiring trial judges to determine, pursuant to Rule 104(a),[52] whether the proffered expert evidence is "(1) scientific knowledge that (2) will assist the trier of fact to understand or determine the facts in issue."[53] This gatekeeper role requires the trial judge to make a "preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid" under the first prong, and "whether that reasoning or methodology can be applied properly to the facts in issue" under the second prong.[54]

In other words, the first prong addresses the reliability of the proffered expert evidence, requiring the trial judge to determine whether the expert evidence has been subjected to the scientific method, and is not merely subjective or "unsupported speculation."[55] The second prong addresses the relevance of the proffered expert evidence, requiring the trial judge to determine whether the expert testimony "fits" the issue to which the expert is testifying.[56] The proffered expert evidence must satisfy both prongs to be admissible.[57]

*Daubert* offered four discretionary factors to assist the trial judge's determination of whether the proffered expert evidence is sufficiently reliable to be considered by the trier of fact. This non-exhaustive list of factors includes whether the technique or theory underlying the proffered expert evidence: (1) can be tested;[58] (2) "has been subjected to peer review and publica-

52. *See* FED. R. EVID. 104(a). Rule 104(a) governs preliminary questions of admissibility:

> Preliminary questions concerning the qualification of a person to be a witness, the existence of a privilege, or the admissibility of evidence shall be determined by the court, subject to the provisions of subdivision (b). In making its determination it is not bound by the rules of evidence except those with respect to privileges.
>
> The admissibility of all expert evidence is governed by the principles of Rule 104(a); subsequently, the proponent has the burden of establishing that the admissibility requirements under Rule 702 are met by a preponderance of the evidence. *See* FED. R. EVID. 702 advisory committee's note (as amended) at 687 (citing Bourjaily v. United States, 483 U.S. 171 (1987).

53. *Daubert*, 509 U.S. at 592.

54. *Id.* at 592-93.

55. *Id.* at 590.

56. *See id.* at 591.

57. *See id.* at 591-92.

58. In other words, "whether the expert's theory can be challenged in some objective sense, or whether it is instead simply a subjective, conclusory approach that cannot reasonably be assessed for reliability." *See* FED. R. EVID. 702 advisory committee's note (as amended) at 687.

tion;"[59] (3) has been generally accepted in the scientific community; and (4) has a "known or potential rate of error."[60] On remand, the Ninth Circuit introduced a fifth factor.[61] The Ninth Circuit concluded, "One very significant fact to be considered is whether the experts are proposing to testify about matters growing naturally and directly out of research they have conducted independent of litigation, or whether they have developed their opinions expressly for purposes of testifying."[62] The Ninth Circuit reasoned that research "conducted independent of the litigation provides important, objective proof that the research comports with the dictates of good science."[63] Ultimately, the Ninth Circuit concluded that the *Daubert* factors are not equally applicable, and may not be applicable at all, in every case.[64]

Other cases, both before and after *Daubert*, have identified factors to be considered in determining whether proffered expert testimony is reliable scientific knowledge. The factors identified in these cases were described in both a preliminary draft of the Advisory Committee on Evidence Rules note to the Proposed Amendment to Rule 702,[65] released for public comment after the

59. *See* HUBER, *supra* note 21, at 209 ("The ultimate test of [an expert's] scientific integrity is her readiness to publish and be damned.").

60. *Daubert*, 509 U.S. at 593-94.

61. *See Daubert*, 43 F.3d 1317.

62. *Id.*; *see also* Sheehan v. Daily Racing Form, Inc., 104 F.3d 940, 942 (7th Cir. 1997) (asking whether the expert "is being as careful as he would be in his regular professional work outside of his paid litigation consulting"); Amorgianos v. Nat'l R.R. Passenger Corp., 137 F. Supp. 2d 147, 190 (E.D.N.Y 2001) (among other reasons, the court concluded that the experts' methodology was not reliably applied in the case because each expert developed their hypothesis in the course of litigation and elected not to share their hypothesis with their peers).

63. *Daubert*, 43 F.3d at 1317; *see* Muzzey v. Kerr-McGee Chem. Corp., 921 F. Supp. 511, 518 (N.D. Ill. 1996) (applying the 'independent of litigation' factor); William M. Sneed, *The Ongoing Revolution in Expert Practice:* Daubert *and the Seventh Circuit*, 86 ILL. B.J. 418, 421 (Aug. 1998) (discussing *Muzzey*'s reliance on this factor and how the factor should only be a relevant subject for cross-examination, and not necessarily reflect whether the expert's reasoning and methodology comport with the scientific method).

64. *Daubert*, 43 F.3d at 1317. However, Circuit Judge Kozinski cautioned that the fact, "[t]hat an expert testifies for money does not necessarily cast doubt on the reliability of his testimony," because few experts testify in court merely as a gratuitous gesture. *Id.* The "independent of the litigation" factor was weighed heavily against the *Daubert* experts. The Ninth Circuit found that none of the experts based their testimony on preexisting or independent research, and none claimed to have published any literature in order to subject their conclusions to peer review, or explain or validate their methodology. *Id.* at 1318-19.

65. STANDING COMMITTEE OF THE JUDICIAL CONFERENCE OF THE UNITED STATES, PROPOSED AMENDMENTS TO THE FEDERAL RULES OF EVIDENCE 46-47 [hereinafter Post-*Kumho Tire* Amendment], *at* http://www.uscourts.gov/review.html.

*Kumho Tire* decision,[66] and the final draft of the Advisory Committee on Evidence Rules note to Rule 702.[67] Aside from the Ninth Circuit's "independent of litigation" factor discussed above, both the preliminary and final Advisory Committee's notes identified the following additional factors: (1) whether the expert has unjustifiably extrapolated from an accepted premise to an unfounded conclusion,[68] (2) whether the expert has adequately accounted for obvious alternative explanations,[69] (3) whether the expert "is being as careful as he would in his regular professional work outside of his paid litigation consulting,"[70] (4) the reliability of the particular field of expertise,[71] and (5) the existence and maintenance of standards and controls.[72] The Committee stated that "[a]ll of these factors remain relevant to the determination of the reliability of expert testimony under [Rule 702] as amended," and that "[o]ther factors may also be relevant."[73]

*Daubert* changed the admissibility standard of scientific expert evidence. *Daubert* expressly stated that the inquiry envisioned

66. The Post-*Kumho Tire* Amendment is to be distinguished from the proposed amendment to Rule 702 that was released for public comment before the *Kumho Tire* decision. *See* COMMITTEE ON RULES OF PRACTICE AND PROCEDURE OF THE JUDICIAL CONFERENCE OF THE UNITED STATES, PRELIMINARY DRAFT OF PROPOSED AMENDMENTS TO THE FEDERAL RULES OF CIVIL PROCEDURE AND EVIDENCE (1998) [hereinafter Pre-*Kumho Tire* Amendment]. The Pre-*Kumho Tire* Amendment will be discussed and defined *infra* Part II.C. and Part III.A.

67. *See* FED. R. EVID. 702 advisory committee's note (as amended), at 687-88.

68. *See* Post-*Kumho Tire* Amendment, *supra* note 65, at 46; FED. R. EVID. 702 advisory committee's note, at 687 (citing General Elec. Co. v. Joiner, 522 U.S. 136, 146 (1997) (noting that in some cases a trial court "may conclude that there is simply too great an analytical gap between the data and the opinion proffered"). Arguably, this factor erroneously focuses on the conclusion of the proffered expert evidence and not the principles and methodology of the proffered expert evidence, which contradicts *Daubert*'s mandate for trial courts to focus on the principles and methodology of the proffered expert evidence and not the conclusions they generate. *Daubert*, 509 U.S. at 596.

69. *See id.* (citing Claar v. Burlington N.R.R., 29 F.3d 499 (9th Cir. 1994)); Nelson v. Tennessee Gas Pipeline Co., 243 F.3d 244, 253-54 (6th Cir. 2001) (expert failed to account for confounding factors, which may have been responsible for the plaintiffs' symptoms).

70. *See id.* at 47 and 687 (quoting Sheehan v. Daily Racing Form, Inc., 104 F.3d 940 (7th Cir. 1997); Kumho Tire Co. v. Carmichael, 119 S. Ct. 1167 (1999)).

71. *See id.* (citing Moore v. Ashland Chemical, Inc., 151 F.3d 269 (5th Cir. 1998)(en banc); Sterling v. Velsicol Chem. Corp., 855 F.2d 1188 (6th Cir. 1988)).

72. The committee identified this factor as another distinct *Daubert* factor. *See* FED. R. EVID. 702 advisory committee's note (as amended), at 687.

73. *Id.* at 47, 688.

by Rule 702 is a "flexible one,"[74] and the focus of the trial judge "must be solely on principles and methodology, not the conclusions they generate."[75] To limit the effect of this more liberal admissibility standard, *Daubert* noted the evidentiary guards posted at the "*Daubert* gates."[76] Specifically, the Court stated that "[v]igorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of satisfying shaky but admissible evidence."[77] *Daubert* represents a significant step in the evolution of the admissibility of scientific expert evidence. The remaining steps are discussed next.

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

The standard for appellate review of a trial court's ruling on the admissibility of expert evidence is different under *Daubert* than it was under *Frye*. Appellate review under *Frye* was *de novo*,[78] and appellate review under *Daubert* is abuse-of-discretion, according to a unanimous Supreme Court in *General Electric Co. v. Joiner*.[79] In *Joiner v. General Electric Co.*,[80] the district court found no evidence that the plaintiff was either exposed to polychlorinated biphenyls ("PCBs") or that exposure to PCBs was linked to the plaintiff's lung cancer.[81] The Eleventh Circuit reversed, applying "a particularly stringent standard of review to the trial judge's exclusion of expert testimony."[82] The Supreme Court reversed, holding that "[i]n applying an overly 'stringent'

74. Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 594 (1993) ("The inquiry envisioned by Rule 702 is, we emphasize, a flexible one.").

75. *Id.* at 594-95. The Court later recognized that "conclusions and methodology are not entirely distinct from one another." *Joiner*, 522 U.S. at 146; *see also* Post-*Kumho Tire* Amendment, *supra* note 65, at 49. The distinction between methodology and conclusions will be further discussed *infra* Part III.B.

76. *See id.* at 596. Here, the Court addressed the concerned parties and amici.

77. *Id.* at 596 (citing Rock v. Arkansas, 483 U.S. 44, 61 (1987)).

78. *See* Daubert v. Merrell Dow Pharm., Inc., 951 F.2d 1128, 1130 (9th Cir. 1991) (stating "whether expert opinion can satisfy [the reliability requirement] is reviewed de novo by the appellate court . . . . " (citing United States v. Williams, 583 F.2d 1194, 1197-1201 (2d Cir. 1978))).

79. 522 U.S. 136, 143 (1997) (granting certiorari to determine the proper standard of review under *Daubert* and chosing abuse-of-discretion); *see also* 21 CHEM. REG. REP. (BNA) No. 46, at 1471 (1998).

80. 864 F. Supp. 1310, 1327 (N.D. Ga. 1994), *rev'd*, 78 F.3d 524 (11th Cir. 1996).

81. *See id.* at 1327.

82. Joiner v. General Elec. Co., 78 F.3d 524, 529 (11th Cir. 1996), *rev'd*, 522 U.S. 136 (1997). The Eleventh Circuit adopted the reasoning of the Third Circuit in *In re* Paoli R.R. Yard PCB Litigation, 33 F.3d 716 (3d Cir. 1994). In *Paoli*, the Third Circuit took a "hard look" at a district court's exclusion of evidence under the princi-

review to [the district court's] ruling, [the Eleventh Circuit] failed to give the trial court the deference that is the hallmark of abuse-of-discretion review."[83]

Chief Justice Rehnquist delivered the opinion of the Court and further held that whether the excluded evidence is "outcome determinative" does not change the standard of review.[84] The Court stated that "[o]n a motion for summary judgment, disputed issues of fact are resolved against the moving party . . . ."[85] The Court reasoned that "the question of admissibility of expert testimony is not such an issue of fact, and is reviewable under the abuse-of-discretion standard."[86]

Many members of the legal community believed that the case presented an excellent opportunity for the Court to revisit and perhaps "scale back" *Daubert* and its gatekeeping responsibilities.[87] The Court, however, reinforced the trial judges' role of screening expert evidence.[88] Congress and the Supreme Court later confirmed the trial court's gatekeeping role.[89]

After *Joiner*, the lower courts were split on how, or whether, the *Daubert* factors apply to expert evidence that might be characterized as "technical" or "other specialized" knowledge and not as "scientific knowledge."[90] In other words, the *Daubert*

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ples announced in *Daubert*. *See* 33 F.3d at 749-50; *see also* 21 CHEM. REG. REP. (BNA) No. 30, at 840 (1997).

83. *Joiner*, 522 U.S. at 143.

84. *Id.*

85. *Id.*

86. *Id.* Consequently, if the question of the admissibility of scientific expert evidence is not an issue of fact, then a motion for summary judgment on the admissibility of expert evidence may be inappropriate. *See* 21 CHEM. REG. REP. (BNA) No. 38, at 1112 (1997). Although the author believes that Chief Justice Rehnquist's statement merits further discussion, any further discussion of this topic would be beyond the scope of this article.

87. *See* Sneed, *supra* note 63, at 422.

88. *See id.*

89. *See* Kumho Tire Co. v. Carmichael, 526 U.S. 137, 148 (1999); Post-*Kumho Tire* Amendment, *supra* note 65, at 44-45; *See* FED. R. EVID. 702 advisory committee's note (as amended), at 687 (the "amendment affirms the trial court's role as gatekeeper").

90. This terminology comes from FED. R. EVID. 702. With regard to the split in the courts, some courts of appeals have held that the *Daubert* framework is applicable to both scientific expert testimony and non-scientific expert testimony, with varying adherence to the different factors in different contexts. *See, e.g.*, Talkington v. Atria Reclameluficers Fabriken B.V., 152 F.3d 254, 265 (4th Cir. 1998) (finding *Daubert* inquiry was inapplicable because electrical engineer claimed to rely on training and expertise and not any particular methodology); Michigan Millers Mut. Ins. Corp. v. Benfield, 140 F.3d 915, 920 (11th Cir. 1998) (stating that whether the *Daubert* factors are applicable to an expert hinges on "the manner in which th[e]

progeny were split on the issue of whether the *Daubert* factors applied only to expert evidence derived from expert evidence of scientific empirical studies (chemists, physicists), or whether the factors also applied to expert evidence derived from technical or skilled experts (engineers, physicians, mechanics).[91]

In favor of a uniform application of Rule 702 to all expert evidence, the preliminary draft of the Advisory Committee note to the Proposed Amendment to Rule 702, released for public comment before the *Kumho Tire* decision,[92] stated that this "amendment does not distinguish between scientific and other forms of expert testimony. The trial court's gate-keeping function applies to testimony by any expert . . . ."[93] The 1972 Committee note to Rule 702 also supports a uniform application of Rule 702 to all expert evidence. Specifically, the Committee note states that "within the scope of [Rule 702] are not only experts in the strictest sense of the word, e.g. physicians, physicists, and architects, but also the large group sometimes called 'skilled' witnesses, such as bankers or landowners . . . ."[94]

The lower courts did not consistently adhere to the proposed and 1972 Committee notes' uniform application of Rule 702 to all expert evidence, which prevented evidence deemed not to be expert evidence from being subjected to a *Daubert* inquiry, including the *Daubert* factors. The lower courts also failed to consistently adhere to the flexible application of the *Daubert* factors to evidence that was deemed to be expert evidence under Rule

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expert's testimony [i]s presented to the jury"); Kannankeril v. Terminix Int'l, Inc., 128 F.3d 802, 809 (3d Cir. 1997). Other courts of appeals have recognized that the *Daubert* inquiry is simply inapplicable to purported non-scientific expert evidence. Watkins v. Telsmith, Inc., 121 F.3d 984, 990 (5th Cir. 1997) ("[n]ot every [factor] outlined in *Daubert* will necessarily apply to expert testimony based on engineering principles and practical experience"); Tyus v. Urban Search Management, 102 F.3d 256 (7th Cir. 1996); *See, e.g.* Compton v. Subaru of Am., Inc., 82 F.3d 1513, 1518 (10th Cir. 1996) ("application of the *Daubert* factors is unwarranted in cases where expert testimony is based solely upon experience or training"); Berry v. City of Detroit, 25 F.3d 1342, 1350 (6th Cir. 1994); Tamarin v. Adam Caterers, Inc., 13 F.3d 51 (2d Cir. 1993) (finding *Daubert* inapplicable to testimony based on a payroll review prepared by an accountant because it is summary evidence).

91. *See* FED. R. EVID. 702 advisory committee's note; Nicholas Targ and Elise Feldman, *Courting Science: Expert Testimony after Daubert and Carmichael*, 13 NAT. RESOURCES & ENV'T 507, 509 (1999).

92. Pre-*Kumho Tire* Amendment, *supra* note 66, at 122. The Pre-*Kumho Tire* Amendment is further discussed and defined *infra* Part II.C.

93. *See id.* at 127.

94. FED. R. EVID. 702 advisory committee's note.

702.[95] The inconsistency of the lower courts resulted in either a strict application of the *Daubert* factors[96] or no application at all.[97] The split in the lower courts created a controversy because the inconsistent application of Rule 702 and the *Daubert* factors may have promoted forum shopping for both plaintiffs and defendants.[98] For example, "a plaintiff hoping to enter expert [evidence] may seek out a jurisdiction that takes a narrow view" of what evidence constitutes "scientific evidence," because a narrow definition of "scientific evidence" would not subject the plaintiff's proffered expert evidence to a *Daubert* inquiry.[99] Conversely, a defendant may seek out circuits adopting a broad view of "scientific evidence," because the plaintiff's proffered expert evidence would be subject to a *Daubert* inquiry under a broad definition of what evidence constitutes "scientific evidence."[100]

Hence, the lower courts were split on two issues regarding the admissibility of proffered expert evidence: first, whether the proffered expert evidence was considered scientific evidence, and therefore subjected to a *Daubert* inquiry;[101] and second, if the proffered expert evidence was considered scientific evidence and therefore subjected to a *Daubert* inquiry, whether the scientific expert evidence should be subject to all, some, or none of the *Daubert* factors.[102] The outcome of the two issues would determine whether the proffered scientific expert evidence is reliable and therefore admissible (assuming the underlying methodology of the expert evidence is relevant). The split in the lower courts

95. *See* Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 594 (1993) ("The inquiry envisioned by Rule 702 is, we emphasize, a flexible one").

96. *See* Moore v. Ashland Chem., Inc., 151 F.3d 269, 280 (5th Cir. 1998) (en banc) (excluding scientific expert evidence that did not meet the four *Daubert* factors); Peitzmeier v. Hennessy Indus., Inc., 97 F.3d 293, 296-98 (8th Cir. 1996) (excluding expert evidence that failed under the four *Daubert* factors).

97. *See* McCullock v. H.B. Fuller, Inc., 61 F.3d 1038, 1043 (2d Cir. 1995) (admitting expert testimony without applying the *Daubert* factors and without expressly undertaking a gate-keeping role); Compton, 82 F.3d at 1518 ("application of the *Daubert* factors is unwarranted in cases where expert testimony is based upon experience or training").

98. *See* Targ and Feldman, *supra* note 91, at 510.

99. *See id.* at 511.

100. *Id.*

101. *See Moore*, 151 F.3d at 275 n.6 (finding the *Daubert* factors applicable to all scientific expert testimony, including testimony grounded in experience and training); *Peitzmeier*, 97 F.3d at 296-98.

102. *See In re* Paoli R.R. Yard PCB Litig., 35 F.3d 717, 758 (3d Cir. 1994) (finding the *Daubert* factors of "only limited help in assessing whether the [clinical] methodology of [the experts] are reliable"); *McCullock*, 61 F.3d at 1043 (admitting expert testimony without applying the *Daubert* factors).

set the stage for the Supreme Court's decision in *Kumho Tire Co. v. Carmichael.*[103]

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

In *Kumho Tire*, a unanimous U.S. Supreme Court reversed the Eleventh Circuit, and held "that *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."[104] The Court also held that the trial judge may consider one or more of the discretionary factors articulated in *Daubert*, when doing so will help determine the expert's reliability.[105] Justice Breyer,[106] writing for the Court, reaffirmed that the test of reliability is "flexible" as stated in *Daubert*,[107] and that "*Daubert*'s list of specific factors neither necessarily nor exclusively"[108] applies to all expert evidence, because "[l]ife and the legal cases that it generates are too complex to warrant so definitive a match."[109] Ultimately, the *Kumho Tire* decision answered Chief Justice Rehnquist's six-year old question: "What is the difference between scientific knowledge and technical knowledge . . . ."[110] The answer was that there is no difference.[111]

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103. 526 U.S. 137 (1999).

104. *Id.* at 141 (citing FED. R. EVID. 702).

105. *Id.*

106. Notably, Justice Breyer authored the article, *"The Interdependence of Science and Law,"* 82 JUDICATURE 24 (1998), and most recently the introduction to the second edition of the REFERENCE MANUAL ON SCIENTIFIC EVIDENCE. *See* 2000 MANUAL, *supra* note 17, at 1-8.

107. Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 594 (1993).

108. Kumho Tire Co. v. Carmichael, 526 U.S. 137, 141 (1999).

109. *Id.* at 151.

110. Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 600 (1993) (Rehnquist, C.J., concurring and dissenting) ("[D]oes Rule 702 actually contemplate that the phrase 'scientific, technical, or other specialized knowledge be broken down into numerous subspecies, or did its authors simply pick general descriptive language covering the sort of expert testimony which courts have customarily received."). The Congressional Advisory Committee on Evidence Rules committee's note to amended Rule 702 also answered Chief Justice Rehnquist's question: "the amendment rejects the premise that an expert's testimony should be treated more permissively simply because it is outside the realm of science. An opinion from an expert who is not a scientist should receive the same degree of scrutiny for reliability as an opinion from an expert who purports to be a scientist." FED. R. EVID. 702 advisory committee's note (as amended) at 689.

111. *Kumho Tire*, 526 U.S. at 151.

In *Kumho Tire*, the plaintiffs alleged that a tire's design and manufacturing defects caused a fatal automobile accident.[112] The proffered experts differed over whether the tire failed because of misuse and abuse, or because of defects.[113] After finding that the plaintiffs' expert testimony did not satisfy the *Daubert* test of reliability, the district court excluded it and granted defendant's summary judgment motion.[114]

The Eleventh Circuit reversed the grant of summary judgment on the grounds that scientific and nonscientific evidence must be reviewed according to different standards.[115] The Eleventh Circuit performed a *de novo* review of the admissibility of the tire expert's opinion regarding the alleged tire defect,[116] reasoning that the expert was not testifying to scientific evidence and therefore, was not subjected to the *Daubert* factors or *Joiner*'s abuse-of-discretion standard of review.[117]

The U.S. Supreme Court disagreed. Focusing on the language of Rule 702, the Court concluded that Rule 702 "makes no relevant distinction between 'scientific' knowledge and 'technical' or 'other specialized' knowledge."[118] The Supreme Court reasoned that "it would prove difficult, if not impossible, for judges to administer evidentiary rules under which a gatekeeping obligation depended upon a distinction between 'scientific' knowledge and 'technical' or 'other specialized' knowledge."[119] The Court adhered to the Pre-*Kumho Tire* Amendment to Rule 702 and its

112. *Id.* at 142.

113. *See* Carmichael v. Samyung Tires, Inc., 923 F. Supp. 1514, 1517 (S.D. Ala 1996), *rev'd,* 131 F.3d 1433 (11th Cir. 1997), *rev'd, sub nom., Kumho Tire,* 526 U.S. at 137.

114. *See Carmichael,* 131 F.3d at 1521-22, 1524. Again, if the question of the admissibility of scientific expert evidence is not an issue of fact, then a motion for summary judgment on the admissibility of expert evidence may be inappropriate. *See supra* note 86.

115. *See Carmichael,* 131 F.3d at 1435.

116. *See id.* at 1435.

117. *See id.* The Eleventh Circuit misinterpreted *Daubert*'s "flexible" Rule 702 inquiry mandate, and subsequently mischaracterized the issue in a parenthetical. The circuit court stated that the issue was premised on "whether [the expert]'s testimony is based on his application of scientific principles or theories (which we should submit to a *Daubert analysis*)." *Id.* at 1436 (emphasis added). However, the *Daubert* analysis is a Rule 702 analysis, and the *Daubert* factors are merely part of that analysis. The circuit court should have characterized the issue as premised on "whether [the expert]'s testimony is based on his application of scientific principles or theories (which we should submit to the *Daubert* [*factors*]").

118. Kumho Tire Co. v. Carmichael, 526 U.S. 137, 147 (1999).

119. *Id.*

Committee note.[120] The Committee note argues for the trial judge's gatekeeping function to apply to all expert evidence, explaining that the "amendment [to Rule 702] does not distinguish between scientific and other forms of expert testimony."[121] Notably, the *Kumho Tire* Court cited the Committee's proposed amendment to Rule 702.[122]

The Court also focused on *Daubert*'s reliability prong to determine "whether [the expert's] preparation is of a kind that others in the field would recognize as acceptable."[123] The Court twice referred to *Daubert*'s deference to trial judges' discretion to determine whether the expert evidence has a "reliable basis in the knowledge and experience of the relevant discipline."[124] In fact, *Kumho Tire* used the lack of acceptance of the tire expert's two-factor test in his discipline to affirm the district court's holding that the expert evidence was unreliable.[125]

Finally, perhaps for the sake of judicial economy, the majority proceeded to determine that the district court did not abuse its discretion when it excluded the plaintiff's expert evidence.[126] Justice Stevens, as he did in *Joiner*,[127] dissented in part, because

120. *See id.* at 156-57 (citing Pre-*Kumho Tire* Amendment, *supra* note 66). The Pre-*Kumho Tire* Amendment modified the old Rule 702 by adding that opinion testimony of witnesses with qualified scientific, technical or specialized knowledge was admissible "provided that (1) the testimony is sufficiently based upon reliable facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case." *See* Pre-*Kumho Tire* Amendment, *supra* note 66 at 122.

In a memorandum regarding the REPORT OF THE ADVISORY COMMITTEE ON EVIDENCE RULES, the Advisory Committee stated: "The proposed amendment [to Rule 702] specifically extends the trial court's *Daubert* gatekeeping function to all expert testimony; requires a showing of reliable methodology and sufficient basis; and provides that the expert's methodology must be applied properly to the facts of the case." Memorandum from the Honorable Fern M. Smith, Chair of the Advisory Committee on Evidence Rules to the Honorable Alicemarie H. Stotler, Chair of the Standing Committee on Rules of Practice and Procedure 109 (May 1, 1998).

121. Pre-*Kumho Tire* Amendment, *supra* note 66, at 127.

122. The Court cited the Committee's proposed amendment in the context that "district courts must 'scrutinize' whether the 'principles and methods' employed by an expert 'have been properly applied to the facts of the case.'" *Kumho Tire*, 526 U.S. at 157 (citing Committee's Proposed Amendments, *supra* notes 65-66).

123. *Id.* at 151.

124. *Id.* at 149 (citing *Daubert*, 509 U.S. at 592).

125. *Id.* at 154-55.

126. *See id.* at 158.

127. General Elec. Co. v. Joiner, 522 U.S. 136, 150-51 (1997) (Stevens, J., concurring and dissenting) (answering the question of whether the district court properly held that the testimony of plaintiff's expert witnesses was inadmissible "requires a study of the record that can be performed more efficiently by the Court of Appeals than by the nine Members of this Court").

he felt that the Court's application of the abuse-of-discretion review should have been handled by the appellate court.[128]

1. 2000 Congressional Amendments to Federal Rules of Evidence 701, 702 and 703

In response to the *Daubert* progeny, particularly *Kumho Tire*, the Congressional Advisory Committee on Evidence Rules amended Rule 702.[129] The committee affirmed "the trial court's role as gatekeeper" and provided "that all types of expert testimony present questions of admissibility for the trial court in deciding whether the evidence is reliable and helpful."[130] However, the committee cautioned that the amendment to Rule 702 is "not intended to provide an excuse for an automatic challenge to the testimony of every expert,"[131] because the trial judge has the discretion to "avoid unnecessary 'reliability' proceedings in ordinary cases where the reliability of an expert's method is properly taken for granted . . . ."[132]

The committee subsequently amended Rules 701 and 703 in order to be consistent with the amendment to Rule 702.[133] Specifically, the committee amended Rule 701 in order to eliminate the risk that the reliability requirements set forth in Rule 702 and the disclosure requirements set forth in Federal Rule of Civil Procedure 26(a)(2)(A)[134] will be evaded by simply proffering an expert in lay witness clothing.[135] The amendment to Rule 701 "does not distinguish between expert and lay *witnesses*, but rather between expert and lay *testimony*," because "[c]ertainly it

128. *See* Kumho Tire Co. v. Carmichael, 526 U.S. 137, 159 (1999) (Stevens, J., concurring and dissenting) (repeating his view from *Joiner*, that answering the question of whether the trial judge abused his discretion when he excluded the plaintiff's expert testimony "requires a study of the record that can be performed more efficiently by the Court of Appeals than by the nine Members of this Court . . . .").

129. *See* FED. R. EVID. 702 advisory committee's note (as amended) at 687, 690; David M. Malone and Paul J. Zwier, *Epistemology After Daubert, Kumho Tire, and the New Federal Rule of Evidence 702*, 74 TEMP. L. REV. 103 (2001).

130. *See* FED. R. EVID. 702 advisory committee's note (as amended) at 687, 690.

131. *See id.* at 688.

132. *Id.* (citing *Kumho Tire*, 526 U.S. at 152). The "reliability" proceeding in ordinary cases is discussed *infra* Part IV.A.

133. *See* FED. R. EVID. 701 and 703 advisory committee's notes (as amended) at 685 and 692.

134. FED. R. CIV. P. 26(a)(2)(A) ("General Provisions Governing Discovery; Duty of Disclosure – Disclosure of expert witnesses . . . In addition to the disclosures required by paragraph (1), a party shall disclose to other parties the identity of any person who may be used at trial to present evidence under Rules 702, 703, or 705 of the Federal Rules of Evidence."). Rule 26 is discussed *infra* Part IV.A.

135. *See* FED. R. EVID. 701 advisory committee's note (as amended) at 692.

is possible for the same witness to provide both lay and expert testimony in a single case."[136]

The committee amended Rule 703[137] "to emphasize that when an expert reasonably relies on inadmissible information to form an opinion or inference, the underlying information is not admissible simply because the opinion or inference is admitted."[138] The committee's note to Rule 703 was revised in order "to emphasize that the balancing test[139] set forth in the proposal should be used to determine whether an expert's basis may be disclosed to the jury either (1) in rebuttal or (2) on direct examination to 'remove the sting' of an opponent's anticipated attack on an expert's basis."[140]

The distinction between Rules 702 and 703 regarding the basis of expert evidence is explained in the Rule 702 committee's note. The committee clarified that the "reasonable reliance" requirement of Rule 703 is a relatively narrow inquiry to Rule 702's "overarching requirement of reliability."[141] Specifically, "[w]hen an expert relies on inadmissible information, Rule 703 requires the trial court to determine whether that information is of a type reasonably relied on by other experts in the field . . . However, the question whether the expert is relying on a *sufficient* basis of information—whether admissible information or not—is governed by the requirements of Rule 702."[142]

## III.

### THE *KUMHO TIRE* IMPACT ON THE ADMISSIBILITY OF SCIENTIFIC EXPERT EVIDENCE

Commentators have historically proposed that trial judges must become amateur scientists in order to meet their gate-keeping responsibilities, because "[a]ny mechanism to keep 'junk science' out of the courtroom is only as good as those watching over

136. *Id.* (emphasis in original).

137. *See generally* Ronald L. Carlson, *Is Revised Expert Witness Rule 703 a Critical Modernization for the New Century?*, 52 FLA. L. REV. 715 (2000).

138. *See* FED. R. EVID. 703 advisory committee's note (as amended) at 692.

139. The balancing test to determine when inadmissible information, for substantive purposes, reasonably relied upon by an expert is admissible under Rule 703: the trial court "must consider the information's probative value in assisting the jury to weigh the expert's opinion on the one hand, and the risk of prejudice resulting from the jury's potential misuse of the information for substantive purposes on the other." *Id.*

140. *Id.*

141. *See* FED. R. EVID. 702 advisory committee's note (as amended) at 689.

142. *Id.* at 689-90.

it."[143] These commentators reasoned that "only [a] greater understanding of science and its methodology on the part of [trial judges] can prevent the blind application" of the gatekeeper responsibilities.[144] The commentators concluded that "judges must pit themselves against scientists who are testifying as experts in their fields."[145] At a glance, the *Daubert* and *Kumho Tire* decisions may seem to subscribe to the view of a judge's role as an amateur scientist, but neither *Daubert* nor *Kumho Tire* intended for this to happen.

In fact, it should not be difficult for trial judges, who are already comfortable with the notions of "assistance" and "relevance," to apply the *Daubert* test to scientific expert evidence.[146] For example, the District Court for the Eastern District of Virginia proudly asserted that it did not require any scientific training or use anything more than "the customary legal tools of logical reasoning to carry out its gatekeeping function."[147] Similarly, the Fifth Circuit noted that the trial court's role as a gatekeeper is intended to usurp the adversary system.[148] Recent commentary also supports the trial courts' ability to administer the *Daubert* test to scientific expert evidence: "While judges may lack the technical expertise of the scientific community, judges are uniquely qualified to determine the kind and quality of evidence that will satisfy the goals and standards of truth, justice, fairness, efficiency, and finality upon which our legal system relies."[149] Thus, neither trial judges nor scholars believe scientific expertise is a requisite element for the judges' role of evidentiary gatekeeper.

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143. Parascandola, *supra* note 25, at 44.

144. *Id.*

145. Jackson, *supra* note 17, at 436. This statement was made in the context that judges will need court-appointed experts or technical advisors in order to comply with their gate-keeping responsibility.

146. *See* Mahaney, *supra* note 20, at 1173. *But see* Jackson, *supra* note 17, at 436 (applying the *Daubert* standard is no small task, even for judges who have extensive experience with issues of relevency and must make evidentiary decisions on a daily basis).

147. Cavallo v. Star Enter., 892 F. Supp. 756, 775 (E.D. Va. 1995) (citations omitted), *aff'd*, 100 F.3d 1150 (4th Cir. 1996).

148. United States v. 14.83 Acres of Land Situated in Leflore County, Mississippi, 80 F.3d 1074, 1078 (5th Cir. 1996).

149. Targ and Feldman, *supra* note 91, at 507. In his article, Samuel McNaughton proposed four tests to determine what science is good science. The four tests are 1) procedure; 2) performance; 3) repeatability; and 4) peer review. *See* McNaughton, *supra* note 32, at 513.

The U.S. Supreme Court shares the confidence of courts and commentators in the ability of judges to fulfill their gatekeeping responsibilities. In *Daubert*, the Supreme Court expressed this confidence: "We are confident that federal judges possess the capacity to undertake [the preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid]."[150] The Court affirmed its confidence in *Kumho Tire*, finding "that *Daubert*'s general holding—setting forth the trial judge's general 'gatekeeping' obligation—applies" to all expert evidence.[151]

Justice Breyer, in the 2000 Reference Manual on Scientific Evidence ("2000 Manual"),[152] used two 1999 Supreme Court cases[153] that involved statistical analyses to explain that the Court was not asked to become amateur statisticians, but the Court was "expected to understand how the statistical analyses worked."[154] Justice Breyer continued to explain that the search for scientific accuracy "is not a search for scientific precision."[155] Trial judges "cannot hope to investigate all the subtleties that characterize good scientific work. A judge is not a scientist, and a courtroom is not a scientific laboratory."[156] Consistent with both *Daubert*, *Kumho Tire* and Justice Breyer's discussion within the 2000 Manual, trial judges will not have to become either amateur scientists or pit themselves against scientists who are testifying as experts in their fields in order to meet their gatekeeping obligations.

The evidentiary impact of *Daubert* and *Kumho Tire* is twofold. First, the discretionary application of the *Daubert* and non-*Daubert* factors to expert evidence will allow a wider admission of expert evidence. This evidentiary liberalization will take place in light of the uniform application of Rule 702 to all expert evidence as intended by Congress and the Court. Second, Justice Scalia's cautionary interpretation of *Kumho Tire*'s holding to mean that a trial court's "failure to apply [a relevant *Daubert* factor] may be unreasonable, and hence an abuse-of-discre-

150. Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 593 (1993).

151. Kumho Tire Co. v. Carmichael, 526 U.S. 137, 141 (1999).

152. The 2000 Manual is discussed *infra* Part III.B.

153. Hunt v. Cromartie, 526 U.S. 541 (1999); Dept. of Commerce v. U.S. House of Representatives, 525 U.S. 316 (1999).

154. 2000 Manual, *supra* note 17, at 2.

155. *Id.* at 4.

156. *Id.*

tion"[157] may be mitigated by the greater use of court appointed experts under Rule 706 as recommended by the Federal Judicial Center ("FJC")[158] and legal commentary.

### A. *Opening the Evidentiary Gates Wider and Tilting the Potential Admission of Scientific Expert Evidence Toward an Equilibrium Between Plaintiffs and Defendants*

The discretionary application of the *Daubert* and non-D*aubert* factors to expert evidence have opened the evidentiary gates wider for the admission of scientific expert evidence. This evidentiary liberalization will tilt the potential admission of scientific expert evidence back toward an equilibrium between plaintiffs and defendants.

#### 1. The Uniform Application of Rule 702 to All Expert Evidence as Intended by Congress and the Court

In *Daubert*, the Court intended to open the evidentiary gates.[159] In fact, *Daubert* encouraged trial courts to err on the side of admissibility, trusting the jury and the adversarial process to resolve the facts in issue.[160] The Court reasoned that "[v]igorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence."[161] The Court also reminded trial courts of other applicable Rules[162] and conventional devices[163] to guard against

157. *Id.* at 159 (Scalia, J., concurring).

158. The Federal Judicial Center ("FJC") is the research and education agency of the federal judicial system, and is chaired by Chief Justice William Rehnquist. *See About the Federal Judicial Center, at* http://www.fjc.gov/newweb/jnetweb.nsf/ism_about_fjc?OpenFrameSet

159. 509 U.S. at 588, 594.

160. *See* Roisman, *supra* note 1, at 560 n.55.

161. Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 596 (1993) (citing Rock v. Arkansas, 483 U.S. 44, 61 (1987)). *But see* Bernalyn D. McGaughey, *The Role and Responsibility of an Expert Witness*, 3 DRAKE J. AGRIC. L. 227, 235 (1998) ("Cross examination can be a very intimidating process, and many witnesses sure of their profession, become confused by the challenges presented to their opinions. Such circumstances are particularly likely with technical issues."). This essay was not written by a lawyer, but was written by "an experienced witness who has provided expert testimony in several cases and contributed support to cases from an advisory standpoint." *Id.* at 227.

162. *See Daubert*, 509 U.S. at 595. The Court specifically mentioned Rules 703, 706, and 403. Rule 703 prescribes the bases of expert testimony and is stated *supra* note 15. Rule 706 allows the court at its discretion to procure the assistance of an

admissible but shaky scientific evidence. Specifically, *Daubert* stated that "conventional devices, rather than wholesale exclusion . . . are the appropriate safeguards where the basis of scientific testimony meets the standards of Rule 702."[164] Notably, however, in *Kumho Tire*, the Court declined to mention any of these applicable Rules or conventional devices.

In some cases, the jury and the adversarial process may fail to properly resolve the facts in issue, perhaps because the shaky scientific evidence confused or prejudiced the trier of fact.[165] Consequently, the trial judge possesses the authority to grant: (1) a judgment as a matter of law (directed verdict )[166] during a trial after a party's presentation of a given issue or after presentation of the plaintiff's case-in-chief; and (2) a judgment notwithstanding the verdict[167] after a jury verdict has been rendered.[168] These conventional devices allow admissible but shaky scientific evidence, the methodology and reasoning of which may not satisfy all the relevant *Daubert* and non-*Daubert* factors, to reach the jury while still protecting against the potential confusion or prejudicial affect of shaky expert evidence.[169] The holding in *Joiner* acknowledged *Daubert*'s faith in the adversarial process and conventional devices, and affirmed *Daubert*'s application of Rule 702 to all expert evidence. In *Joiner*, the Court reasoned that while the Rules "allow district courts to admit a somewhat broader range of scientific testimony than would have been admissible under *Frye*, they leave in place the 'gatekeeper' role of

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expert of its own choosing, and is stated *infra* note 206. Rule 403 permits the exclusion of relevant evidence "if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury . . . ." *Daubert*, 509 U.S. at 595.

163. *See id.* at 596. The Court noted two devices: 1) Judgment as a Matter of Law pursuant to Federal Rule of Civil Procedure 50(a); and 2) Summary Judgment pursuant to Federal Rule of Civil Procedure 56.

164. *Id.*

165. *See* FED. R. EVID. 403 ("Exclusion of relevant evidence on grounds of prejudice, confusion, or waste of time . . . Although relevant, evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence."); *see, e.g.*, Curtis v. M&S Petroleum, Inc., 174 F.3d 661, 672-73 (5th Cir. 1999) (evidence excluded under Rule 403 because it was cumulative and "unduly prejudicial due to its apparent official nature").

166. *See* FED. R. CIV. P. 50(a).

167. *See* FED. R. CIV. P. 50(b).

168. *See* Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 596 (1993); *see also* Roisman, *supra* note 1, at 559-60.

169. *See* Roisman, *supra* note 1, at 560 n.55.

the trial judge in screening such evidence."[170] The Court again affirmed the broad application of Rule 702 to all scientific expert evidence in its *Kumho Tire* opinion.

The *Kumho Tire* opinion repeatedly cited *Joiner*, and stated that the law grants a trial court broad latitude when it decides how to determine reliability, i.e., which *Daubert* and non-*Daubert* factors are relevant to the court's reliability determination.[171] This latitude parallels that which a trial court enjoys with regard to the ultimate determination of the reliability of proffered expert evidence.[172] The Eleventh Circuit decision in *Kumho Tire*,[173] Third Circuit caselaw, and the Committee's Proposed Amendments to Rule 702 exemplify the discretionary application of the *Daubert* and non-*Daubert* factors and the uniform application of Rule 702 to all expert evidence as intended by *Daubert* and the Rules.

In *Kumho Tire*, the Eleventh Circuit concluded that the *Daubert* factors merely "suggest reliability issues for district courts to consider as they determine whether proffered evidence is sufficiently reliable for admission under Rule 702."[174] The district court had held that the plaintiff's expert testimony was inadmissible because the expert did not satisfy any of the *Daubert* factors.[175] The circuit court reversed and remanded the case to afford the district court the opportunity to determine whether the plaintiff's expert evidence was relevant and reliable under Rule 702.[176]

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170. General Elec. Co. v. Joiner, 522 U.S. 136, 142 (1997).

171. Kumho Tire Co. v. Carmichael, 526 U.S. 137, 142, 152-53 (1999) (citing *Joiner*, 522 U.S. at 143).

172. *See id.*

173. At the Eleventh Circuit, the decision in *Kumho Tire* was captioned as *Carmichael*, 131 F.3d 1433.

174. *See Kumho Tire*, 526 U.S. at 1435 (citing United States v. 14.38 Acres of Land, 80 F.3d at 1078).

175. *See Carmichael*, 923 F. Supp. at 1521; Sneed, *supra* note 63, at 421 (arguing that the Seventh Circuit is a prime example of how a non-discretionary application of the *Daubert* factors may result in the exclusion of numerous proffered expert evidence).

176. *Carmichael*, 131 F.3d at 1436-37. In contrast to the Eleventh Circuit's discretionary application of the *Daubert* factors, the Tenth Circuit held in a products liability case that the *Daubert* factors "are applicable only when a proffered expert relies on some principle or methodology" and not upon experience or training. *Compton*, 82 F.3d at 1518. The Tenth circuit reasoned that "[i]n such cases, Rule 702 merely requires the trial court to make a preliminary finding that proffered expert testimony is both relevant and reliable . . . ." *Id.* at 1519; *see also* Roisman, *supra* note 1, at 564 (discussing *In re* Paoli R.R. Yard PCB Litig., 35 F.3d 717 (3d Cir. 1994)) ("[T]he [Third Circuit] went far beyond the task of merely assuring that the expert

Similarly, the Third Circuit endorsed the uniform application of rule 702:

> [Proponents] do not have to demonstrate to the judge by a preponderance of the evidence that the assessments of their experts are correct, they only have to demonstrate by a preponderance of the evidence that their opinions are reliable. . . . The evidentiary requirement of reliability is lower than the merits standard of correctness.[177]

The Committee note to the Post-*Kumho Tire* Amendment to Rule 702 supports the Eleventh Circuit's discretionary application of the *Daubert* factors and the Third Circuit's application of Rule 702 to all expert evidence.[178] Specifically, the Committee note to the Post-*Kumho Tire* Amendment stated that "[t]he standards set forth in the amendment are broad enough to require consideration of any or all of the specific *Daubert* factors where appropriate."[179] Thus, the approach of both the Eleventh and Third Circuits and the Post-*Kumho Tire* Amendment to Rule 702 are consistent with an opening of the evidentiary gates.

The Eleventh Circuit's holding and the Post-*Kumho Tire* Committee note, however, may have overlooked what *Joiner* had already recognized, that "conclusions and methodology are not entirely distinct from one another."[180] Under *Frye*'s "general acceptance" test, exactly when the scientific methodology crosses the line into conclusions is difficult to define.[181] The "general acceptance" test failed to define this line, and was ultimately supplanted by the Federal Rules of Evidence.[182] The blurred line

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had used accepted scientific methodology. Instead, the court became enmeshed in resolving disputes between competing experts. . . .").

177. *In re* Paoli R.R. Yard PCB Litigation, 35 F.3d 717, 744 (3d Cir. 1994).

178. *See* Post-*Kumho Tire*, *supra* note 65, at 46 ("The standards set forth in the amendment are broad enough to require consideration of any or all of the specific *Daubert* factors where appropriate."); *see also* Pre-*Kumho Tire* Amendment, *supra* note 66, at 128 ("If the witness is relying solely or primarily on experience, then the witness must explain how that experience leads to the conclusion reached.").

179. Post-*Kumho Tire* Amendment, *supra* note 65, at 124.

180. General Elec. Co. v. Joiner, 522 U.S. 136, 146 (1997); *see also* Post-*Kumho Tire* Amendment, *supra* note 65, at 49. Justice Stevens singled-out the majority's statement, and characterized it as both inaccurate and not helpful in answering the admissibility question of whether Joiner's exposure to PCB's caused Joiner's cancer. *See Joiner*, 522 U.S. at 155 (Stevens, J., concurring and dissenting).

181. *See* Frye v. United States, 293 F. 1013, 1014 (D.C. Cir. 1923) ("Just when a scientific principle or discovery crosses the line between the experimental and demonstrable states is difficult to define.").

182. *See* Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 587 (1993) ("[Petitioners] contend that the *Frye* test was superseded by the adoption of the Federal Rules of Evidence. We agree.").

between conclusions and scientific methodology will complicate the court's determination of when and what factors to apply when proffered scientific experts rely solely on tests, models, and peer publications as their methodology to reach their conclusion. However, the use of court-appointed experts to clarify the blurred line between conclusions and scientific methodology, which should increase the successful application of all the relevant *Daubert* and non-*Daubert* factors, will be discussed *infra* Part III.B.

2. The Impacts of Opening the Evidentiary Gates Wider

*Daubert* intended to open the evidentiary gates when it created the gatekeeper function for trial judges. The discretionary application of the *Daubert* factors has opened the gates wider for the admission of scientific expert evidence. Several impacts are the consequence of this evidentiary liberalization.

One impact of opening the evidentiary gates wider is that the playing field in *Daubert* hearings will become more level rather than favoring defendants.[183] Defendants still are placed in a favorable position because the burden of proof of admissibility rests with the plaintiffs.[184] Pre-*Kumho Tire* defendants used the strict application of the *Daubert* factors to stymie plaintiffs' attempts to admit scientific expert evidence.[185] The biases of the

183. *See generally* Jeffrey D. Cutler, *Implications of Strict Scrutiny of Scientific Evidence: Does Daubert Deal a Death Blow to Toxic Tort Plaintiffs?*, 10 J. ENVTL. L. & LITIG. 189, 215-20 (1995) (concluding that "the supposed liberalization of the standard of admissibility of expert evidence actually allows trial courts to make recovery less available for typical toxic tort plaintiffs").

184. In Bourjaily v. United States, 483 U.S. 171, 175-76 (1987), the Court held that Rule 104(a) requires a plaintiff to prove by a preponderance of the evidence that the proffered expert evidence satisfies Rule 702's relevance and reliability criterion. *See* Mahaney, *supra* note 20, at 1169-70 (claiming that *Daubert*'s second "fit" prong does not lend itself to application of the preponderance standard). Commentator Erin K.L. Mahaney analyzed and provided a partial summary of Professor Berger's article on expert testimony entitled *Procedural Paradigms for Applying the Daubert Test*:

> In civil cases, Professor Margaret Berger suggests that courts place the initial burden upon the opponent of expert testimony to demonstrate deficiencies in the proffered testimony. Under her approach, mere claims that the other side's evidence is inadmissible would be insufficient to warrant a judicial inquiry. Absent self-evident flaws, the opponent of the evidence would have to demonstrate a distinct problem with the evidence before the court would initiate judicial screening.

Mahaney, *supra* note 20, at 1174-75 (citing Margaret A. Berger, *Procedural Paradigms for Applying the Daubert Test*, 78 MINN. L. REV. 1345, 1365-71 (1994)).

185. *See* Moore v. Ashland Chem., Inc., 151 F.3d 269, 279 (5th Cir. 1998) (en banc) (excluding scientific expert evidence that did not meet the four *Daubert* fac-

*Daubert* inquiries toward defendants were recognized by many peer reviewers of the FJC's 1994 *Reference Manual on Scientific Evidence*.[186] Peer reviewers criticized the "Evidentiary Framework" chapter in the 1994 Manual as biased toward defendants and tilted toward the exclusion of scientific expert evidence.[187] The chapter was intended to guide trial judges' determination of the admissibility of scientific expert evidence;[188] instead, it was criticized so strongly that former president of the Association of Trial Lawyers of America, Barry J. Nace, appealed unsuccessfully to Chief Justice Rehnquist in July 1994, to block the 1994 Manual's publication.[189] Post-*Kumho Tire* defendants no longer have the "strict" application technique at their disposal, and are now less capable of frustrating plaintiffs' attempts to admit scientific expert evidence.

Another impact of opening the evidentiary gates wider is the possibility for inter- and intra-circuit conflicts. *Kumho Tire* concluded that trial judges must have broad latitude in deciding in a given case how to determine whether particular expert evidence is reliable.[190] This broad latitude enables judges "to select different procedures and apply different factors to" particular expert evidence "than their colleagues do in the same district or circuit," which would create inter- and intra-circuit conflicts.[191] Consequently, the inter- and intra-circuit conflicts may increase forum-shopping "as plaintiffs seek [either] a congenial circuit [or] a sympathetic district judge," and defendants remove "cases to federal court that were originally brought in state court."[192] This impact is brought into perspective by the inconceivable hypothetical alternative to *Kumho Tire*'s holding[193] – the Court retreats

tors); Peitzmeier v. Hennessy Indus., Inc., 97 F.3d 293, 297-98 (8th Cir. 1996) (excluding expert evidence that failed under the four *Daubert* factors).

186. A more detailed discussion about the purpose of the 1994 MANUAL is discussed *infra* Part III.B.

187. Bradley P. Hartman, *Book Review: Federal Judicial Center Manual on Scientific Evidence*, 1 ENVTL. LAW. 661, 669 (1995). The "Evidentiary Framework" chapter was written by Professor Margaret A. Berger of the Brooklyn College of Law. *See* 1994 MANUAL, *supra* note 4, at 37.

188. *See* Rorie Sherman, *Judges' Manual Irks Plaintiff Bar*, NAT'L L.J., Aug. 1, 1994, at A6.

189. *See id.*

190. *See* Kumho Tire Co. v. Carmichael, 526 U.S. 137, 142, 151-54 (1999).

191. 2000 MANUAL, *supra* note 17, at 27.

192. 2000 MANUAL, *supra* note 17, at 28.

193. Recall that the Court held that the trial judge may consider one or more of the discretionary factors articulated in *Daubert* when doing so will help determine the expert's reliability. *Kumho Tire*, 526 U.S. at 141.

from *Daubert*'s gatekeeping function by removing the trial court's discretionary application of the *Daubert* and non-*Daubert* factors, and attempts to marry certain factors to certain types of expert evidence.[194]

Instead, *Kumho Tire* held that trial courts should "consider one or more of the more specific factors that *Daubert* mentioned when doing so will help determine" the admissibility of the expert evidence.[195] Although the burden of proof still remains on the plaintiff, the trial courts' flexible consideration of the *Daubert* and non-*Daubert* factors will tilt the potential admission of scientific expert evidence toward an equilibrium between plaintiffs and defendants. However, the trial judge's flexible consideration and ultimate determination of which *Daubert* factors apply to a given set of facts will be held to an abuse-of-discretion standard.

### B. *Failure to Consider a Relevant Factor Will be Deemed an Abuse-of-Discretion*

Justice Scalia interpreted *Kumho Tire*'s holding to mean that a trial court's "failure to apply [a relevant factor] may be unreasonable, and hence an abuse-of-discretion."[196] Consequently, a litigant's successful abuse-of-discretion argument will result in a remand to the trial court for further proceedings.[197] This potential result is a judicial reality that regularly burdens trial judges, and the passage of time will likely ease this burden. Trial judges will soon, if they have not already, become accustomed to the flexible *Daubert* and non-*Daubert* factors that go into the "preliminary assessment of whether the reasoning or methodology" of proffered scientific expert evidence is reliable.[198] Moreover,

194. *See* Targ and Feldman, *supra* note 91, at 507 ("While law seeks certainty from science at a given point in time, science . . . can offer only current understanding that may well change. Thus, science is something of an octagonal peg trying to fit into a round hole—most of it fits, but it leaves some gaps around the edges."); Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 590 (1993) ("there are no certainties in science").

195. *Kumho Tire Co.*, 526 U.S. at 141.

196. *Id.* at 159 (Scalia, J., concurring).

197. *Kumho Tire*'s extension of *Joiner*'s abuse-of-discretion standard to all decisions a trial judge makes during a *Daubert* inquiry raises the issue "whether the appellate courts will exert more supervision, and reverse more frequently, when a ruling below admits rather than excludes evidence." 2000 MANUAL, *supra* note 17, at 27.

198. Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 592-93 (1993). *See* the District Court for the Eastern District of Virginia's assertions discussed *supra* note 147 and accompanying text.

trial judges will presumably receive continued guidance from the FJC, which has and does consistently recommend that trial courts consider appointing experts on issues of science.[199] Court-appointed experts should increase the successful application of all the relevant *Daubert* and non-*Daubert* factors.

In 1994, the FJC "shifted into high gear" to produce the first edition of the Manual on the heels of the *Daubert* decision.[200] The FJC once again shifted into high gear to produce a second edition of the Manual on the heels of the *Kumho Tire* decision and the amendment to Rule 702.[201] The 1994 Manual was published to clarify *Daubert*,[202] and its purpose was "to assist judges in implementing effective management of expert evidence involving scientific issues."[203] The 2000 Manual furthered the purposes of the 1994 Manual.[204] Both editions of the Manual endorse *Daubert*'s suggestion[205] that trial courts consider using court-appointed experts, pursuant to Rule 706[206] or the inherent authority of the court,[207] to assist in performing their gatekeeping responsibilities.[208] Both editions also endorse the use of spe-

199. *See* 1994 MANUAL, *supra* note 4, at Part III; 2000 MANUAL, *supra* note 17, at 6-7, 59-66. The Rhode Island Supreme Court noted the trial court's option to appoint "neutral experts to aid in evaluating scientific evidence". *DiPetrillo*, 729 A.2d at 690 (citing *Daubert*, 509 U.S. at 595).

200. Roisman, *supra* note 1, at 545.

201. *See* FEDERAL JUDICIAL CENTER, REFERENCE MANUAL ON SCIENTIFIC EVIDENCE (2nd ed. 2000).

202. *See* Hartman, *supra* note 187, at 662.

203. 1994 MANUAL, *supra* note 4, at 11.

204. The second edition of the Reference Manual on Scientific Evidence "furthers the goal of assisting federal judges in recognizing the characteristics and reasoning of 'science' as it is relevant in litigation." 2000 MANUAL, *supra* note 17, at vii.

205. *See Daubert*, 509 U.S. at 595 ("[A] judge assessing a proffer of expert scientific testimony under Rule 702 should also be mindful of other applicable rules [such as Rule 706].").

206. FED. R. EVID. 706(a) ("The court may on its own motion or on the motion of any party enter an order to show cause why expert witnesses should not be appointed, and may request the parties to submit nominations. The court may appoint any expert witnesses agreed upon by the parties, and may appoint expert witnesses of its own selection.").

207. There are two principal sources of authority that permit a court to appoint an expert, Rule 706 and the inherent authority of the court to appoint experts "who are necessary to enable the court to carry out its duties. This includes authority to appoint a 'technical advisor' to consult with the judge during the decision-making process." 2000 MANUAL, *supra* note 17, at 59.

208. "In this age of science we must build legal foundations that are sound in science as well as in law. Scientists have offered their help. We in the legal community should accept that offer." 2000 MANUAL, *supra* note 17, at 8. Portions of the discussion regarding court-appointed experts are adapted from the chapter on this

cial masters[209] to assist the court in performing their gatekeeping responsibilities.[210]

Traditionally, trial judges have used court-appointed experts to offer testimony at trial, but, as *Daubert* hearings become more necessary and more common in environmental and toxic tort litigation, trial judges may need court-appointed experts and technical advisors[211] to assist the court in determining the reliability of the proffered scientific expert evidence before trial.[212] Such experts might be useful in resolving problems that result from competing experts. "The disparity between expert opinions . . . [can be] so extreme that opposing experts may effectively nullify each other's testimony," resulting in a phenomenon known as the "battle of the experts."[213] The "battle of the experts" can create a stalemate that leaves the trier of fact with "little more than his or her own interpretation of the issues."[214] The problem of the "battle of the experts" "could be remedied by a more liberal use of the courts' power to appoint impartial experts."[215] The court-appointed experts may also educate judges on the fundamental

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topic by Joe S. Cecil and Thomas E. Willging that appeared in the 1994 MANUAL. 2000 MANUAL, *supra* note 17, at 59 n.45.

209. *See id.* at 63-64. Special masters "are appointed by courts that require particular expertise and skill to assist" the court "in litigation involving difficult subject matter." *Id.* Special masters "have been used to make preliminary assessments of technical or scientific evidence offered by the parties." *Id.* at 64-65 (citation omitted).

210. Portions of the discussion regarding the use of special masters are adapted from the chapter on this topic by Margaret G. Farrell that appeared in the 1994 MANUAL. 2000 MANUAL, *supra* note 24, at 63 n.62.

211. The technical advisor's role is to "act as a sounding board for the judge—helping the jurist to educate himself in jargon and theory disclosed by the testimony and to think through the critical technical problems." JOE S. CECIL & THOMAS E. WILLGING, COURT-APPOINTED EXPERTS: DEFINING THE ROLE OF EXPERTS APPOINTED UNDER FEDERAL RULE OF EVIDENCE 706 41 (1993) [hereinafter CECIL & WILLGING STUDY] (citing Reilly v. United States, 863 F.2d 149, 158 (1st Cir. 1988)). *See* Jackson, *supra* note 17, at 445-49 for a comprehensive discussion of court-appointed technical advisors; Robert L. Hess II, *Judges Cooperating with Scientists: A Proposal for More Effective Limits on the Federal Trial Judge's Inherent Power to Appoint Technical Advisors*, 54 VAND. L. REV. 547 (2001).

212. *See* 1994 MANUAL, *supra* note 4, at 4. Although the appointment of an expert is made by the court, every effort should be made to select a person acceptable to the litigants. Jackson, *supra* note 17, at 445 n.95 (quoting FEDERAL JUDICIAL CENTER, MANUAL FOR COMPLEX LITIGATION § 21.51 (3d ed. 1995) ("[T]he parties should first be asked to submit a list of proposed experts and may be able, with the assistance of their own expert, to agree on one or more candidates.").

213. Jackson, *supra* note 17, at 433.

214. *Id. See* Richard T. Stilwell, Kumho Tire*: The Battle of the Experts Continues*, 19 REV. LITIG. 193 (2000).

215. CARLSON, *supra* note 6, at 637.

concepts behind differing expert opinions, and independently assess the scientific methodology used by the proposed expert witnesses to form their conclusions.[216]

Around the same time the Carnegie Commission's Report was produced, another study was performed by Joe S. Cecil and Thomas E. Willging.[217] The Cecil and Willging study focused on the court's use of scientific experts and technical advisors appointed under Rule 706 in preparation for the 1994 Manual's chapter entitled "Extraordinary Procedures."[218] The Cecil and Willging study explained that the duties of a court-appointed expert varied from case to case.[219] According to the study, "in order to use court-appointed experts efficiently and effectively, the role of the court-appointed expert should remain flexible enough to adapt to the particular needs of each case."[220] In other words, the judge should consider appointing both scientific and skilled experts, whichever type of expert would assist the trier of fact.[221] Certainly a judge may benefit from an informed expert who can answer questions objectively[222] regarding complex scientific or technical issues, particularly in complex environmental and toxic tort litigation where "conclusions and methodology are not entirely distinct from one another."[223]

Thus, the greater use of Rule 706, as recommended by the FJC and legal commentary, may mitigate Justice Scalia's cautionary

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216. *See* Jackson, *supra* note 17, at 447-48.

217. *See* 1994 MANUAL, *supra* note 4, at 525-73; CECIL & WILLGING STUDY, *supra* note 211.

218. Jackson, *supra* note 17, at 440.

219. *Id.* at 441.

220. *Id.*

221. *See id.* at 444-45 ("Judges have been somewhat reluctant to exercise their power to appoint experts. The principal reasons offered for not using court-appointed experts and technical advisors were 1) that judges infrequently feel that cases require extraordinary assistance, and 2) that judges are hesitant to intrude into the adversarial process. In addition to these reasons, some commentators have wondered whether trial judges were concerned about being reversed for inappropriately appointing an expert (the fundamental skepticism about the existence of a truly 'neutral objective expert'). 2000 MANUAL, *supra* note 17, at 7. "American judges, prior to the rise of 'managerial judging,' have tended to be less acquainted with the facts of the case 'until the parties presented their evidence at trial.'" *Id.* at 445 n.95 (quoting John H. Langbein, *The German Advantage in Civil Procedure*, 52 U. CHI. L. REV. 823, 835-41 (1985)).

222. *See* 2000 MANUAL, *supra* note 17, at 7 (among other reasons, judges have not often invoked their Rules-provided authority to appoint their own experts because of the fundamental skepticism about the existence of a truly 'neutral objective expert'); Jackson, *supra* note 17, at 444-45 (same concern).

223. General Elec. Co. v. Joiner, 522 U.S. 136, 146 (1997).

interpretation of *Kumho Tire*'s holding to mean that a trial court's "failure to apply [a relevant factor] may be unreasonable, and hence an abuse-of-discretion."[224] The benefits of expending judicial resources on an increased use of Rule 706 will be two-fold. First, trial judges will be less burdened by their gatekeeping responsibilities, particularly with regard to either complex scientific issues or damage-assessment issues. Second, litigants will be less successful, and perhaps less inclined, at claiming an abuse-of-discretion argument on appeal, resulting in fewer remands. In short, trial judges should appoint scientific experts in order to ensure the successful application of all relevant *Daubert* or non-*Daubert* factors, particularly in complex environmental and toxic tort litigation.

The discretionary application of the *Daubert* factors has allowed the admission of more scientific expert evidence, equalizing the position of plaintiffs and defendants. This evidentiary liberalization takes place in light of the uniform application of Rule 702 to all expert evidence as intended by Congress and the Court. *Daubert* intended to open evidentiary gates when it created the challenging, yet manageable, "gatekeeper" function for trial judges. The challenge of how to handle the admissibility of scientific expert evidence when the proffered expert evidence is novel to the judicial and scientific communities is still facing both trial judges and litigants alike.

## IV.

## ADMITTING NOVEL SCIENTIFIC EXPERT EVIDENCE, POST-*KUMHO TIRE*

The task of admitting novel expert evidence is daunting for both litigants to advocate and for trial judges to adjudicate. The difficulty is exemplified "when the dispute concerns [novel] matters . . . of scientific research, where fact meets theory and certainty dissolves into probability."[225] Furthermore, it is important to consider the admissibility of novel scientific expert evidence, because proffered novel expert evidence may represent a "first

224. Kumho Tire Co. v. Carmichael, 526 U.S. 137, 142, 159 (1999) (Scalia, J., concurring).

225. Daubert v. Merrell Dow Pharm., Inc., 43 F.3d 1311, 1316 (9th Cir. 1995).

case."[226] The "first case" scenario arises when toxic tort and environmental claims are supported by novel expert evidence.[227]

The model approach to admitting novel expert evidence is to satisfy *Daubert*'s two-prong test in light of *Kumho Tire*.[228] A litigant should successfully satisfy *Daubert*'s reliability and relevance prong by developing a detailed record during discovery. This record may streamline a searching *Daubert* inquiry in toxic tort and environmental litiagtion. Coupled with a well-developed record during discovery, a litigant involved in a toxic tort or environmental case should successfully satisfy *Daubert*'s relevance prong by arguing that the "whole is equal to the sum of the parts." Furthermore, trial judges should assign limited weight to the "general acceptance" factor when evaluating novel expert evidence during a *Daubert* inquiry. Moreover, trial judges should apply the remaining *Daubert* and non-*Daubert* factors to novel expert evidence[229] in accordance with the discretionary application of the *Daubert* factors and the flexible 702 inquiry envisioned by both *Daubert* and *Kumho Tire*.

### A. *Extensive Evidentiary Hearings May be the Most Effective Way to Determine the Admissibility of Novel Scientific Expert Evidence*

The *Daubert* decision and the Ninth Circuit's remand decision "unleashed the floodgates of motion practice related to the admissibility of expert testimony,"[230] and the *Kumho Tire* decision is expected to maintain the status quo. *Kumho Tire* stated the trial court has the discretion to hold a hearing on the motions *in limine* in addition to the motions. Specifically, the Court deferred to the discretion of the trial court "to decide whether or when special briefing or other proceedings are needed to investigate"[231] the expert's reliability. The Court's reference to "special

226. Mahaney, *supra* note 20, at 1163.

227. *See id.* at 1163 n.9 (citing Jean Macchiaroli Eggen, *Toxic Torts, Causation, and Scientific Evidence After* Daubert, 55 U. PITT. L. REV. 889, 947 (1994)).

228. Please note that many of the procedural techniques from the model approach may be used to admit developed expert evidence as well.

229. In determining the reliability of novel expert evidence, the "courts will find the full range of *Daubert*'s factors [and non-*Daubert* factors] most helpful." 2000 MANUAL, *supra* note 17, at 30.

230. Roisman, *supra* note 1, at 545. "Motion practice" describes the *Daubert* (or 702) evidentiary inquiry process that determines the relevance and reliability of proffered expert evidence before the proffered expert evidence reaches the jury.

231. Kumho Tire Co. v. Carmichael, 526 U.S. 137, 152 (1999).

briefings and proceedings" speaks to a *Daubert* (or evidentiary hearing) inquiry.

In regard to novel scientific expert evidence, the flexible procedural standard promulgated in *Kumho Tire* allows the trial court to choose the most effective way to educate itself about the factors it will have to consider in ruling on admissibility.[232] In "complex civil litigation that has the potential to affect numerous persons, the trial court may conclude that extensive evidentiary hearings" are the most effective way to determine the admissibility of the proffered expert evidence. The Rhode Island Supreme Court succinctly stated in its holding that a trial court should exercise its gatekeeping responsibilities for the admission of novel scientific expert evidence when:

> [a]n *appropriate* motion or objection challenges the admission of novel, unvalidated scientific or complex technical evidence . . . . [T]he trial justice [properly] exercises a gate-keeping function by 'hold[ing] a preliminary evidentiary hearing outside the presence of the jury in order to determine whether such evidence is reliable and [relevant].'[233]

*Kumho Tire* reasoned that *Joiner*'s abuse-of-discretion standard "applies as much to the trial court's decisions about how to determine reliability as to its ultimate conclusion."[234] Otherwise, the Court continued, the "trial judge would lack the discretionary authority needed to avoid unnecessary 'reliability' proceedings [*Daubert* inquiry] in ordinary cases where the reliability of an expert's methods is properly taken for granted."[235] Similarly, the Rhode Island Supreme Court concluded that a preliminary hearing is not appropriate if "an expert's expertise is so common and well understood that the necessary foundation can be laid while qualifying the witness as an expert during the trial, on the stand,

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232. 2000 MANUAL, *supra* note 17, at 29; *see* Berger, *supra* note 162, at 1374-75 ("Although the district court has enormous discretion on how to proceed, oral testimony and depositions should clearly be preferred" at a *Daubert* hearing.).

233. DiPetrillo v. Dow Chemical Co., 729 A.2d 677, 685 (R.I. 1999) (emphasis in original) (citing *State v. Quattrocchi*, 681 A.2d 879, 884 (R.I.1996)). *DiPetrillo* concluded that "Dow's motion [to suppress] failed to provide the trial justice with sufficient notice and specificity that the alleged defect in plaintiffs' proffered causation expertise was that it utilized invalidated, novel, and complex scientific theories and was therefore unreliable." *Id.* at 684. Moreover, the catalyst of Dow's failure to file an adequate notice was its failure at trial to move to strike or to object to the plaintiffs' experts' testimony. *See id.* at 684; *see also* 28 CHEM. REG. REP. 281/3 (1999) (summarizing the decision).

234. *Kumho Tire*, 526 U.S. at 152.

235. *Id.*; *see* FED. R. EVID. 702 advisory committee's note (as amended) at 688.

in front of the jury."[236] *Kumho Tire* bolstered its reasoning by pointing to the purpose of the Rules, particularly Rule 102.[237] Rule 102 seeks to avoid "unjustifiable expense and delay" as part of the search for "truth" and "justly determined" proceedings.[238]

The trial courts' decision whether to hold an evidentiary hearing on the motions *in limine* in addition to the motions is significant because evidentiary hearings may result in lengthy proceedings that deplete scarce judicial resources.[239] For example, *In re Paoli R.R. Yard PCB Litigation*[240] involved five days of evidentiary hearings in the district court. In the *In re Paoli* evidentiary hearings, the parties introduced affidavits and testimony of experts, whose only focus was to satisfy the *Daubert* factors.[241] "In effect," noted one commentator, "courts in the Third Circuit now appear to be creating a second trial . . . just to decide the question of whether experts should be allowed to testify" in the proponent's case-in-chief.[242] The United States District Court for the Western District of Tennessee avoided this potential lengthy proceeding when the court declined to order an evidentiary hearing because the admissibility of the expert evidence "was fully briefed by the parties" and the magistrate judge had an "adequate basis from which to determine the reliability" of the expert evidence.[243]

Therefore, for the sake of avoiding unjustifiable expenses and delays,[244] the Court grants the trial judge the authority to decide

236. *DiPetrillo*, 729 A.2d at 688 (citing Fenner, Michael G., *The* Daubert *Handbook: The Case, Its Essential Dilemma, and Its Progeny*, 29 CREIGHTON L.REV. 939, 948 (1996)).

237. *See* FED. R. EVID. 102 ("Purpose and construction: These rules shall be construed to secure fairness in administration, elimination of unjustifiable expense and delay, and promotion of growth and development of the law of evidence to the end that the truth may be ascertained and proceedings justly determined.").

238. *See id.* (citing FED. R. EVID. 102).

239. *See* Mahaney, *supra* note 20, at 1164 (citing Joseph Sanders, *Scientific Validity, Admissibility, and Mass Torts after* Daubert, 78 MINN. L. REV. 1387, 1429 (1994)); Roisman, *supra* note 1, at 558 ("Courts are split on the nature of the 104(a) hearing. Some urge wide-ranging evidentiary hearings which may last weeks, while others lean toward a paper hearing.").

240. 35 F.3d 717 (3d Cir. 1994).

241. *See* Roisman, *supra* note 1, at 558-59.

242. *Id.* The second trial, complete with witnesses and cross-examination, sometimes lasts for weeks. *See id.* "It is difficult to imagine that the Supreme Court intended such a result." *Id.*

243. Nelson v. Tennessee Gas Pipeline Co., 243 F.3d 244, 249 (6th Cir. 2001).

244. Another means of avoiding unjustifiable expenses and delays is for the burden of persuasion to be shifted to the party seeking to exclude the expert testimony. 2000 MANUAL, *supra* note 17, at 29.

when a searching *Daubert* hearing is appropriate, subject to *Joiner*'s abuse-of-discretion standard. A searching *Daubert* hearing may be appropriate under "first cases" where toxic tort and environmental claims are supported by novel scientific expert evidence.[245] However, a well-developed record during discovery may streamline a searching *Daubert* inquiry under a "first case" scenario.

### B. *Developing a Detailed Record During Discovery*

The searching *Daubert* inquiry may be streamlined by the record developed during discovery via depositions, affidavits, and reports of the expert's opinion as required under Federal Rule of Civil Procedure 26(a)(2)(A)[246] ("Rule 26").[247] Rule 26 guides trial courts as they "fit" novel expert evidence to the issue on which the expert is testifying,[248] without causing unjustifiable expenses and delays or allowing opposing parties to use the *Daubert* inquiry as a mechanism to stymie the proffered expert evidence.[249] Specifically, Rule 26 requires a party to disclose "the identity of any person who may be used at trial to present evidence under Rules [of Evidence] 702, 703, or 705."[250] This disclosure also requires experts to provide a written report ("Rule 26 Report") containing their opinions and the basis for

245. *See* Mahaney, *supra* note 20, at 1163 n.9 (citing Eggen, *supra* note 227, at 947).

246. FED. R. CIV. P. 26(a)(2)(A) ("General Provisions Governing Discovery; Duty of Disclosure, Disclosure of Expert Testimony: In addition to the disclosures required by paragraph (1), a party shall disclose to other parties the identity of any person who may be used at trial to present evidence under Rules 702, 703, or 705 of the Federal Rules of Evidence.").

247. *See* Berger, *supra* note 184, at 1375. "Professor Berger's view is consistent with the language of Rule 104(a) and the *Daubert* opinion itself, where the Supreme Court held that the Rule 104(a) inquiry was to be a 'preliminary assessment.'" Roisman, *supra* note 1, at 558 (citing Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 592-93 (1993)).

248. The importance of fact discovery is exemplified by the United States District Court, Eastern District of New York's concise statement that a "proffered expert opinion may fail to meet the fit requirement if it relates to 'facts or data that have not been adequately established in the case.'" Amorgianos v. Nat'l R.R. Passenger Corp., 137 F. Supp. 2d 147, 163 (E.D.N.Y 2001) (quoting 1994 MANUAL, *supra* note 4, at 47). In *Amorgianos*, the court concluded that there was "too great an 'analytical gap' between the conclusions reached by the authors" of the cited literature and the conclusions that the expert drew from the literature. *Id.* at 185. The court reasoned that the expert's asserted causal relationship between the "type and magnitude of the effect and the type and magnitude of exposure . . . are simply not in the same ballpark." *Id.* at 178, 185.

249. *See* Mahaney, *supra* note 20, at 1174.

250. FED. R. CIV. P. 26(a)(2)(A).

their opinions.[251] Since Rule 26 does not require experts to divulge their methodology,[252] Rule 26 Reports alone will not include information relevant to *Daubert*'s reliability and relevance prong inquiry.[253] However, when Rule 26 Reports are combined with depositions and affidavits, *Daubert*'s reliability and relevance inquiry becomes a much simpler task conducive to either a paper hearing or a streamlined *Daubert* hearing in a "first case" scenario.[254] In support of this proposition, the Seventh Circuit agreed with the Tenth Circuit that "Rule 26 enhances the district court's role as a 'gatekeeper.'"[255] Specifically, the Seventh Circuit stated that Rule 26 "permits 'an early and full evaluation' of evidentiary problems in a case and allows the court to 'make an early pretrial evaluation of issues of admissibility carefully and meticulously.'"[256]

With Rule 26 Reports and the appropriate affidavits and depositions, both the judge and the parties will have readily available information concerning the general bases for the expert's opinion and how these bases fit the issue about which the expert is testifying.[257] Therefore, a well-developed record during discovery will fulfill the *Daubert* reliability and relevance prong, and may streamline a *Daubert* hearing in a "first case" scenario. Coupled with a well-developed record during discovery, a litigant involved in a toxic tort or environmental case should successfully satisfy *Daubert*'s relevance prong by arguing that the "whole is equal to the sum of the parts."[258] A toxic tort or environmental litigant's successful application of *Daubert*'s relevance prong is discussed next.

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251. *See* FED. R. CIV. P. 26(a)(2)(B).

252. *See* Mahaney, *supra* note 19, at 1174 (citing Berger, *supra* note 162, at 1370).

253. *Daubert*'s reliability prong requires the trial judge to make a "preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid." Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 592 (1993).

254. *See* Mahaney, *supra* note 20, at 1174 (citing Berger, *supra* note 162, at 1370).

255. Salgado by Salgado v. General Motors Corp., 150 F.3d 735, 742 n.6 (7th Cir. 1998).

256. *Id.* (citing Robinson v. Missouri Pacific R.R. Co., 16 F.3d 1083, 1089 (10th Cir. 1994)).

257. *See id.* "The amendment [to Rule 702] specifically provides that the court must scrutinize not only the principles and methods used by the expert, but also whether those principles and methods have been properly applied to the facts of the case." FED. R. EVID. 702 advisory committee's note (as amended) at 688.

258. *Daubert*'s relevancy prong requires the trial judge to make a "preliminary assessment . . . of whether that reasoning or methodology properly can be applied to the facts in issue." *Daubert*, 509 U.S. at 593.

### C. *The "Whole is Equal to the Sum of the Parts" Theory*

The "whole is equal to the sum of the parts" theory is designed to fulfill *Daubert*'s relevance prong in complex civil litigation such as toxic tort or environmental cases.[259] This theory is particularly important in complex environmental and toxic tort cases because litigants will often have to rely on expert evidence from a multitude of overlapping scientific and technical disciplines.[260] Evaluating any one of these expert's methodology "requires combining all the relevant data and giving weight to each piece, not judging and rejecting each piece of data because it will not, by itself, sustain the conclusion reached."[261]

In *Joiner*, the Eleventh Circuit recognized and used this theory to reverse the district court's conclusion that there was no evidence that the plaintiff was either exposed to PCBs, or that exposure to PCBs promoted his lung cancer.[262] The Eleventh Circuit reasoned that expert causation evidence is "derived from individual pieces of evidence, each of which by itself might not be conclusive, but when viewed in their entirety are the building blocks of a perfectly reasonable conclusion . . . ."[263] This reasoning comports with the Rule 401[264] principle that if a piece of evidence adds a scintilla of probative value, then the evidence is

259. In toxic tort cases, expert evidence "on the issue of general causation meets *Daubert*'s 'fit' requirement only if the testimony includes an opinion that (1) exposure to the particular substance at issue, (2) in the dose to which the plaintiff was exposed, (3) for the duration in which plaintiff was exposed, (4) can cause the particular condition(s) of which the plaintiff complains." Amorgianos v. Nat'l R.R. Passenger Corp., 137 F. Supp. 2d 147, 163 (E.D.N.Y. 2001).

260. A case may require expert evidence in areas such as "geology, hydrogeology, accounting, engineering, public health, occupational medicine, industrial or clinical toxicology, risk assessment, analytical chemistry, soil science, computer modeling and animation, state-of-the-art practice, archive research, and industrial or insurance archeology." Stephanie Pullen Brown, *Practical Considerations in the Selection and Management of Experts*, 2 ENVTL. LAW 37, 42 (1995). *See, e.g.*, Sterling v. Velsicol Chem. Corp., 647 F. Supp. 303 (W.D. Tenn. 1986) (typifying the complexity of the expert evidence involved and the small army of multi-discipline scientists needed to explain the causal link to the trier of fact).

261. Roisman, *supra* note 1, at 565.

262. Joiner v. General Elec. Co., 864 F. Supp. 1310, 1327 (N.D. Ga. 1994).

263. Joiner v. General Elec. Co., 78 F.3d 524, 532 (11th Cir. 1996). *But see generally* Allen v. Pennsylvania Engineering Corp., 102 F.3d 194 (5th Cir. 1996) (erroneously examining each type of expert evidence to see if it alone sustains the experts' proffered conclusions).

264. FED. R. EVID. 401 ("Definition of 'relevant evidence': 'Relevant evidence' means evidence having any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence.").

relevant.[265] This theory also agrees with *Daubert*'s reasoning under the relevance prong. In *Daubert*, the Court reasoned that the proffered methodology and conclusion must only be supported by a little more than speculation, rather than to a certainty, because "there are no certainties in science."[266]

In order to admit novel scientific expert evidence in "first case" scenarios, the litigant should present conclusions as a whole derived from parts during either a *Daubert* hearing or a paper hearing. For example, a plaintiff may want to present the novel claim that exposure to electromagnetic fields causes cancer. The ultimate causal conclusion would likely be given by an expert oncologist. But standing alone, the testimony of the oncologist may fail *Daubert*'s relevance prong.[267] To illustrate how the causal conclusion was reached, a litigant must introduce testimony from other relevant experts such as a biophysicist, an electrical engineer, and an epidemiologist. Thus, the relevance inquiry would focus on the ultimate causal conclusion and not on the individual experts' conclusions.

Presenting novel scientific theories, for which skepticism may exist in either the scientific or judicial community, through a chain of experts will both facilitate the admissibility of the proponent's ultimate conclusion and satisfy *Daubert*'s relevance prong. Presuming the experts' methodologies satisfy *Daubert*'s reliability prong, the trial judge should admit the proponent's scientific expert evidence under Rule 401, because the evidence adds a scintilla of probative value and will assist the trier of fact. Therefore, coupled with a well-developed record during discovery, a litigant involved in a toxic tort or environmental case should suc-

265. FED. R. EVID. 401 advisory committee's note.

266. Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 590 (1993). *See* Targ and Feldman, *supra* note 91, at 507 ("While law seeks certainty from science at a given point in time, science . . . can offer only a current understanding that may well change. Thus, science is something of an octagonal peg trying to fit into a round hole—most of it fits, but it leaves some gaps around the edges."); Westberry v. Gislaved Gummi AB, 178 F.3d 257, 264 (4th Cir. 1999) ("[W]hile precise information concerning the exposure necessary to cause specific harm to humans and exact details pertaining to the plaintiff's exposure are beneficial, such evidence is not always available, or necessary . . . .").

267. An example of testimony that failed *Daubert*'s relevance prong is provided in the *Amorgianos* decision by the United States District Court, Eastern District of New York. *See Amorgianos*, 137 F. Supp. 2d at 176. In *Amorgianos*, the court excluded the expert's opinion on the duration of exposure in a toxic tort case because the issue of duration is not one for which an expert opinion is required because the issue of duration is a question of fact that requires personal knowledge and not expert evidence. *Id.*

cessfully satisfy *Daubert*'s relevance prong by arguing that the "whole is equal to the sum of the parts."

### D. *Assigning Limited Weight to the "General Acceptance" Factor When Evaluating Novel Scientific Expert Evidence During a Daubert Inquiry*

Trial judges should assign limited weight, depending upon the amount of time that the evidence has spent in the relevant discipline, to the "general acceptance" factor when evaluating novel expert evidence during a *Daubert* inquiry. Instead, trial judges should apply the remaining *Daubert* and non-*Daubert* factors to novel expert evidence in accordance with the discretionary application of the *Daubert* factors and the flexible 702 inquiry envisioned by both *Daubert* and *Kumho Tire*.[268] Otherwise, the blind application of the "general acceptance" factor to novel scientific expert evidence will automatically place the proffered expert evidence in jeopardy of exclusion because the factor maintained its most-persuasive-factor status in *Kumho Tire*.

In *Kumho Tire*, the "general acceptance" factor maintained its most-persuasive-factor status under *Daubert*'s reliability prong.[269] The court in *Kumho Tire* focused its analysis on *Daubert*'s reliability prong to determine "whether [the expert's] preparation is of a kind that others in the field would recognize as acceptable."[270] The Court twice referred to *Daubert*'s deference to the trial judge's discretion to determine whether the expert evidence has "a reliable basis in the knowledge and

268. In determining the reliability of novel expert evidence, the "courts will find the full range of *Daubert*'s factors [and non-*Daubert* factors] most helpful." 2000 MANUAL, *supra* note 17, at 30. In *Nelson*, the plaintiffs argued that "the lack of publication or other peer review should have been disregarded because it only demonstrates that the novel opinions are at the forefront of toxicology." *Nelson*, 243 F.3d at 251 (internal quotations omitted). The Sixth Circuit concluded that the lack of peer review and publication was plainly relevant, but not dispositive. *Id.*

269. This assertion does not conflict with the distinction articulated by Professor Margaret Berger in the 2000 MANUAL that *Kumho Tire*'s "intellectual rigor" test is not syonymous with *Frye*'s "general acceptance" test. 2000 MANUAL, *supra* note 17, at 23. This article asserts that despite *Kumho Tire*'s consideration of several different factors, the "general acceptance" factor maintained its most persuasive factor status; however, this article does not assert that *Kumho Tire* intended for trial courts to retreat from *Daubert*'s reliability inquiry back to *Frye*'s "general acceptance" inquiry. *Id.*; *see* Roisman, *supra* note 1, at 551 (stating that "this approach of expert opinion by popular ballot of the scientific community was firmly rejected by the Supreme Court . . . .").

270. Kumho Tire Co. v. Carmichael, 526 U.S. 137, 142, 151 (1999).

experience of the relevant discipline."[271] In fact, *Kumho Tire* primarily used the "general acceptance" factor to affirm the district court's holding that the expert evidence was unreliable, because the record failed to show the expert's two-factor test was generally accepted in the tire discipline.[272]

Technical expert evidence is typically novel and refers to evidence that has not received widespread acceptance from the judicial or scientific communities.[273] Therefore, by definition, novel expert evidence should consistently fail *Daubert*'s "general acceptance" factor, which would place the proffered expert evidence in jeopardy of exclusion because of the persuasiveness of the "general acceptance" factor. However, *Daubert* and *Kumho Tire* envision a more flexible application of the *Daubert* factors in a 702 inquiry.[274] The "general acceptance" factor should be weighed according to the amount of time that the proffered expert evidence has been made available in the relevant discipline. In general, the "general acceptance" factor should be weighed less when applied to novel scientific expert evidence and weighed more when applied to developed scientific expert evidence. The distinction between developed and novel scientific expert evidence is that the developed expert evidence has been available for a sufficient time in the relevant discipline.

*Daubert* provides some guidance for determining the relevant discipline for expert evidence but does not speak to the adequacy of the time period. *Daubert* states that the "explicit identification of a relevant scientific community and an express determination of a particular degree of acceptance within that community"[275] would strengthen the reliability of the proffered expert evidence under the "general acceptance" factor. In other words, once the developed expert evidence has entered the relevant scientific community for an adequate period of time, the scientific community will have had an opportunity to accept, deny, criticize, or praise the proffered expert evidence through peer-review articles

271. *Id.* at 149 (citing *Daubert*, 509 U.S. at 592).

272. *Id.* at 157.

273. *See* United States v. Downing, 753 F.2d 1224, 1232-37 (3d Cir. 1985) (discussing the challenges posed by novel expert testimony).

274. *See* Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 594 (1993). "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. Such an effect certainly does not seem to have been intended by the Court." 2000 MANUAL, *supra* note 17, at 23 (citation omitted).

275. *Id.* at 594 (citing *Downing*, 753 F.2d at 1238).

and journals. Peer-reviewed and generally accepted expert evidence may satisfy the *Daubert* reliability prong, and therefore the expert evidence is admissible as long as the relevance prong is also satisfied.

This argument mimics *Daubert*'s reasoning that "[w]idespread acceptance can be an important factor in ruling particular [expert] evidence admissible, and [developed expert evidence] 'which has been able to attract only minimal support within the community' . . . may properly be viewed with skepticism."[276] Accordingly, the amount of weight that the trial judge assigns to the "general acceptance" factor should reflect the amount of time and attention that the proffered expert evidence has received from the scientific community.[277] For example, the clinical ecology theory of multiple chemical sensitivity ("MCS")[278] has existed for several years in the scientific community, and has generally received negative reviews.[279] In fact, one journal of environmental medicine referred to MCS as "experimental methodology."[280] Consequently, if a litigant proffers expert evidence regarding MCS, then the trial judge may appropriately apply a skeptical analysis of the expert evidence, but only under the "general acceptance" factor. The remaining specific and nonspecific *Daubert* factors should be evaluated separately.

A post-*Kumho Tire* decision exemplifies the chilling effect that the "general acceptance" test may have on the admission of novel expert evidence. In *Black v. Food Lion, Inc.*,[281] the plain-

276. *Id.*

277. *See* Michael C. Anibogu, *The Future of Electromagnetic Field Litigation*, 15 PACE ENVTL. L. REV. 527, 599-600 (1998) ("If a relatively unknown technique has been able to gain only minimal support then the probability that the particular evidence will be admitted at trial is much lower and will be viewed upon skeptically [sic] by the scientific community and the particular court." (citing *Daubert*, 509 U.S. at 595)).

278. *See generally* Amy B. Spagnole, *The MCS Controversy: Admissibility of Expert Testimony Regarding Multiple Chemical Sensitivity Syndrome Under the* Daubert *Regime*, 4 SUFFOLK J. TRIAL & APP. ADVOC. 219 (1999); Andrew K. Kelley, *Sensitivity Training: Multiple Chemical Sensitivity and the ADA*, 25 B.C. ENVTL. L. REV. 485 (1998) (exploring the ways in which workers who suffer from MCS can be viewed as disabled under the ADA).

279. *See, e.g.*, Frank v. New York, 972 F. Supp. 130, 136-37 (N.D.N.Y. 1997) (holding that expert testimony regarding the cause of MCS was too speculative, and therefore inadmissible, because medical science cannot determine with sufficient precision that such a syndrome exists); *see also* Summers v. Missouri Pacific Railroad System, 132 F.3d 599, 604 (10th Cir. 1997); 2000 MANUAL, *supra* note 17, at 30. *See generally* Kelley, *supra* note 278.

280. 21 Chem. Reg. Rep. 519, 520 (1997).

281. 171 F.3d 308 (5th Cir. 1999).

tiff fell while shopping at a grocery store, and claimed that the fall caused a condition known as fibromyalgia syndrome.[282] The Fifth Circuit held that the magistrate judge abused his discretion by admitting a doctor's medical causation testimony, because the testimony did not causally link the injury to the medical condition.[283] The Fifth Circuit relied heavily on Frederick Wolfe's report, *The Fibromyalgia Syndrome: A Consensus Report on Fibromyalgia and Disability*,[284] ("Fibromyalgia Report") to conclude that the doctor's proffered theory failed to gain general acceptance within the medical profession, despite the Fibromyalgia Report's own admittance that "[o]verall . . . data from the literature are insufficient to indicate whether causal relationships exist between trauma and [fibromyalgia]. The absence of evidence, however, does not mean that causality does not exist, rather that appropriate studies have not been performed."[285]

The Fifth Circuit erroneously assigned too much weight to the "general acceptance" factor when it determined the reliability of the novel medical causation evidence, which ultimately resulted in the denial of the proffered expert evidence.[286] Unlike the sufficiently peer-reviewed alleged cancer causing effects of MCS, the relatively non-peer-reviewed alleged neurological effects of the fibromyalgia syndrome will routinely place the proffered expert evidence in jeopardy of exclusion because of the persuasiveness of the "general acceptance" factor. Until novel scientific expert evidence has spent an adequate amount of time in the relevant discipline and is no longer novel, the expert evidence will consistently fail the "general acceptance" factor.

In addition to recent case law, recent commentary also recognizes the chilling effect that the "general acceptance" test may

282. *Id.* at 309. The court described fibromyalgia as a condition "characterized by complaints of generalized pain, poor sleep, an inability to concentrate, and chronic fatigue. The condition is most common in women between the ages of 30 and 50 and is often associated with hormonal problems." The doctor hypothesized that the fall caused physical trauma to the plaintiff, which caused "hormonal changes," which caused plaintiff's fibromyalgia. *Id.*

283. *See id.* at 312.

284. *Id.*

285. *Id.* (citing Frederick Wolfe, *The Fibromyalgia Syndrome: A Consensus Report on Fibromyalgia*, 23 JOURNAL OF RHEUMATOLOGY 534, 535 (1996) [hereinafter Fibromyalgia Report]).

286. Although the Fifth Circuit erroneously applied the "general acceptance" test, the court correctly decided to exclude the proffered expert because the expert failed to satisfy any of the other *Daubert* factors. *Id.* at 313; *see* 2000 MANUAL, *supra* note 17, at 35 (discussing Black v. Food Lion, Inc.).

have on the admission of novel scientific expert evidence. For example, Samuel McNaughton noted in his article that unpublished science is not science with one exception: the expert evidence "is so new that it has not been accepted for publication in a peer-reviewed journal."[287] Stated simply by the Sixth Circuit, "[e]very useful new development must have its first day in court,"[288] because "neither newness nor lack of absolute certainty in a test suffices to render [the development] inadmissible in court."[289]

A clear understanding of the limited application of the "general acceptance" test to the admissibility of novel expert evidence is important, because this factor retained its most-persuasive-factor status in *Kumho Tire*. For the aforementioned reasons, trial judges should assign limited weight, depending upon the amount of time that the evidence has spent in the relevant discipline, to the "general acceptance" factor when evaluating novel expert evidence during a *Daubert* inquiry. Aside from the "general acceptance" factor, trial judges may apply the remaining specific and non-specific *Daubert* factors to novel scientific expert evidence in accordance with the flexible 702 inquiry envisioned by both *Daubert* and *Kumho Tire*.[290]

## V.
## CONCLUSION

A sign on a corner gas station reads, "Expert Foreign and Domestic Repairs." Would this supposed expert be subject to a full

287. McNaughton, *supra* note 31, at 515. Nevertheless, the article immediately undermines this exception by stating that judgment should be withheld until it has undergone the peer review process. *See id.* at 515. This contradictory statement flies in the face of the liberal 702 inquiry envisioned by *Daubert* and *Kumho Tire*.

288. United States v. Stifel, 433 F.2d 431, 438 (6th Cir. 1970).

289. *Id.*

290. Separate from the "general acceptance" factor, and potentially more applicable to a trial court's assessment of the admissibility of novel expert evidence, is the "intellectual rigor" test promulgated in *Daubert*. *See* 2000 MANUAL, *supra*, note 17, at 23. This test determines whether the proffered expert adhered "to the same standards of intellectual rigor that are demanded in their professional work" when they testified in court. 2000 MANUAL, *supra* note 17, at 24 (citing Rosen v. Ciba-Geigy Corp., 78 F.3d 316, 318 (7th Cir. 1996), *cert. denied*, 519 U.S. 819 (1996)). When expert evidence departs from the generally accepted methodology, then the expert must provide grounds for the departure. *Id.* at 25 (citing Braun v. Lorillard, Inc., 84 F.3d 230, 234 (7th Cir. 1996). Expert evidence that departs from the generally accepted methodology is characterized as novel expert evidence. Therefore, the "intellectual rigor" test, and not the "general acceptance" test, may be the more applicable test to assess the admissibility of novel expert evidence.

*Daubert* inquiry, which includes consideration of specific and non-specific *Daubert* factors? *Kumho Tire* answered this question with a resounding "yes." According to *Kumho Tire*'s broad interpretation of Rule 702 and the *Daubert* decision, the gas station mechanic possesses technical or specialized knowledge in foreign and domestic repairs, and would be subject to a *Daubert* inquiry.

*Kumho Tire* is particularly important to environmental lawyers, because environmental law relies heavily on both scientific empirical studies and technical or skilled expert knowledge.[291] Moreover, complex expert evidence is becoming more common in toxic tort and environmental litigation.[292] In complex environmental and toxic tort cases, litigants will often rely on expert evidence from a multitude of overlapping scientific and technical disciplines. In some of these cases, the novelty of the expert evidence renders the application of the "general acceptance" factor inappropriate. The trial judge should disregard the "general acceptance" factor altogether, and evaluate the remaining specific and non-specific *Daubert* factors in accordance with the *Kumho Tire* holding.

The historical frustration experienced by environmental and toxic tort plaintiffs may best be summarized by the simplicity of a statement from Senior Circuit Judge Butzner's dissent in *Goewey by Goewey v. United States*,[293] concerning a lawsuit by a mother who found her one-year old child sitting in a "pool of roof sealant."[294] Judge Butzner wrote: "Before exposure, he was a normal child. After exposure, he suffered severe neurological defects."[295] Nevertheless, the plaintiffs in *Goewey* failed to establish a causal connection between the infant's contact with the roof sealant and his subsequent neurological disorder.[296]

This legal and scientific gap that exists between causation and damages is the common web that entangles many environmental and toxic tort plaintiffs. The plaintiffs in *Goewey* are just one

291. *See* Targ and Feldman, *supra* note 91, at 511.

292. *See* Jackson, *supra* note 17, at 432 (citing CARNEGIE REPORT, *supra* note 17, at 24-25).

293. 106 F.3d 390, 1997 WL 35348, at *4 (4th Cir. Jan. 30, 1997) (unpublished disposition).

294. The plaintiffs alleged that the roof sealant contained Triorthocresylphosphates ("TOCP"), which is a known neurotoxin. *See* Goeway v. United States, 886 F. Supp 1268, 1280 (D.S.C. 1995).

295. Goewey by Goewey v. United States, 1997 WL 35348, at *5.

296. *Id.* at *3.

example.[297] Historically, plaintiffs' attempts to prove causation have been thwarted by the judicial system's hard and fast misapplication of the *Daubert* factors. However, *Kumho Tire* expressly recognized *Daubert*'s discretionary application of the specific and non-specific *Daubert* factors. The discretionary application of the specific and non-specific *Daubert* factors should tilt the admissibility of plaintiff's proffered expert evidence back toward an equilibrium with defendants, and begin to close the gap between plaintiffs' assertions of causation and damages.

297. *See, e.g.*, Burns Philp Food v. Cavalea Continental Freight, 135 F.3d 526, 530 (7th Cir. 1998) (holding that testimony of an environmental consultant failed to reliably link petroleum found on property to respondent's actions).