

Reference Manual on Scientific Evidence

Third Edition

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The Admissibility of Expert Testimony

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[Editor's Note: While revising this chapter Professor Berger became ill and, tragically, passed away. We have published her last revision, with a few edits to respond to suggestions by reviewers.]

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I. Supreme Court Cases

In 1993, the Supreme Court’s opinion in *Daubert v. Merrell Dow Pharmaceuticals*¹ ushered in a new era with regard to the admissibility of expert testimony. As expert testimony has become increasingly essential in a wide variety of litigated cases, the *Daubert* opinion has had an enormous impact. If plaintiffs’ expert proof is excluded on a crucial issue, plaintiffs cannot win and usually cannot even get their case to a jury. This discussion begins with a brief overview of the Supreme Court’s three opinions on expert testimony—often called the *Daubert* trilogy²—and their impact. It then examines a fourth Supreme Court case that relates to expert testimony, before turning to a variety of issues that judges are called upon to resolve, particularly when the proffered expert testimony hinges on scientific knowledge.

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

In the seminal *Daubert* case, the Court granted certiorari to decide whether the so-called *Frye* (or “general acceptance”) test,³ which some federal circuits (and virtually all state courts) used in determining the admissibility of scientific evidence, had been superseded by the enactment of the Federal Rules of Evidence in 1973. The Court held unanimously that the *Frye* test had not survived. Six justices joined Justice Blackmun in setting forth a new test for admissibility after concluding that “Rule 702 . . . clearly contemplates some degree of regulation of the subjects and theories about which an expert may testify.”⁴ While the two other members of the Court agreed with this conclusion about the role of Rule 702, they thought that the task of enunciating a new rule for the admissibility of expert proof should be left to another day.⁵

The majority opinion in *Daubert* sets forth a number of major themes that run throughout the trilogy. First, it recognized the trial judge as the “gatekeeper” who must screen proffered expert testimony.⁶ Second, the objective of the screening is to ensure that expert testimony, in order to be admissible, must be “not only relevant, but reliable.”⁷ Although there was nothing particularly novel about the Supreme Court finding that a trial judge has the *power* to make an admissibility determination—Federal Rules of Evidence 104(a) and 702 pointed to such a conclusion—and federal trial judges had excluded expert testimony long before

1. 509 U.S. 579 (1993).

2. The other two cases are *Gen. Elec. Co. v. Joiner*, 522 U.S. 136 (1997) and *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999). The disputed issue in all three cases was causation.

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

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

5. *Id.* at 601.

6. *Id.* at 589.

7. *Id.*

Daubert, the majority opinion in *Daubert* stated that the trial court has not only the power but the *obligation* to act as gatekeeper.⁸

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

To determine whether proffered scientific testimony or evidence satisfies the standard of evidentiary reliability,¹¹ a judge must ascertain whether it is "ground[ed] in the methods and procedures of science."¹² The Court, emphasizing that "[t]he inquiry envisioned by Rule 702 is . . . a flexible one,"¹³ then examined the characteristics of scientific methodology and set out a nonexclusive list of four factors that bear on whether a theory or technique has been derived by the scientific method.¹⁴ First and foremost, the Court viewed science as an empirical endeavor: "[W]hether [a theory or technique] can be (and has been) tested" is the "methodology [that] distinguishes science from other fields of human inquiry."¹⁵ The Court also mentioned as indicators of good science whether the technique or theory has been subjected to peer review or publication, whether the existence of known or potential error rates has been determined, and whether standards exist for controlling the technique's operation.¹⁶ In addition, although general acceptance of the methodology within the scientific community is no longer dispositive, it remains a factor to be considered.¹⁷

The Court did not apply its new test to the eight experts for the plaintiffs who sought to testify on the basis of *in vitro*, animal, and epidemiological studies

8. *Id.*

9. *Id.* at 591–92.

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

11. Commentators have faulted the Court for using the label "reliability" to refer to the concept that scientists term "validity." The Court's choice of language was deliberate. It acknowledged that scientists typically distinguish between validity and reliability and that "[i]n a case involving scientific evidence, evidentiary reliability will be based upon scientific validity." *Daubert*, 509 U.S. at 590 n.9.

12. *Id.* at 590.

13. *Id.* at 594.

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

15. *Id.*

16. *Id.* at 593–94.

17. *Id.* at 594.

that the drug Bendectin taken by the plaintiffs' mothers during pregnancy could cause or had caused the plaintiffs' birth defects. Instead, it reversed and remanded the case. Nor did the Court deal with any of the procedural issues raised by the *Daubert* opinion, such as the burden, if any, on the party seeking a ruling excluding expert testimony, or the standard of review on appeal.

The *Daubert* opinion soon led to *Daubert* motions followed by *Daubert* hearings as parties moved *in limine* to have their opponents' experts precluded from testifying at trial for failure to satisfy the new requirements for expert testimony. The motions raised numerous questions that the Court had not dealt with, some of which were dealt with in the next two opinions by the Supreme Court.

B. General Electric v. Joiner

In *General Electric Co. v. Joiner*,¹⁸ the second case in the trilogy, certiorari was granted in order to determine the appropriate standard an appellate court should apply in reviewing a trial court's *Daubert* decision to admit or exclude scientific expert testimony. In *Joiner*, the 37-year-old plaintiff, a longtime smoker with a family history of lung cancer, claimed that exposure to polychlorinated biphenyls (PCBs) and their derivatives had promoted the development of his small-cell lung cancer. The trial court applied the *Daubert* criteria, excluded the opinions of the plaintiff's experts, and granted the defendants' motion for summary judgment.¹⁹ The court of appeals reversed the decision, stating that "[b]ecause the Federal Rules of Evidence governing expert testimony display a preference for admissibility, we apply a particularly stringent standard of review to the trial judge's exclusion of expert testimony."²⁰

All the justices joined Chief Justice Rehnquist in holding that abuse of discretion is the correct standard for an appellate court to apply in reviewing a district court's evidentiary ruling, regardless of whether the ruling allowed or excluded expert testimony.²¹ The Court unequivocally rejected the suggestion that a more stringent standard is permissible when the ruling, as in *Joiner*, is "outcome determinative" because it resulted in a grant of summary judgment for the defendant because the plaintiff failed to produce evidence of causation.²² In a concurring opinion, Justice Breyer urged judges to avail themselves of techniques, such as the use of court-appointed experts, that would assist them in making determinations about the admissibility of complex scientific or technical evidence.²³

18. 522 U.S. 136 (1997).

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

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

21. *Gen. Elec. Co. v. Joiner*, 522 U.S. at 141-43.

22. *Id.* at 142-43.

23. *Id.* at 147-50. This issue is discussed in further detail in Justice Breyer's introduction to this manual.

With the exception of Justice Stevens, who dissented from this part of the opinion, the justices then did what they had not done in *Daubert*—they examined the record, found that the plaintiff’s experts had been properly excluded, and reversed the court of appeals decision without a remand to the lower court. The Court concluded that it was within the district court’s discretion to find that the statements of the plaintiff’s experts with regard to causation were nothing more than speculation. The Court noted that the plaintiff never explained “how and why the experts could have extrapolated their opinions”²⁴ from animal studies far removed from the circumstances of the plaintiff’s exposure.²⁵ It also observed that the district court could find that the four epidemiological studies the plaintiff relied on were insufficient as a basis for his experts’ opinions.²⁶ Consequently, the court of appeals had erred in reversing the district court’s determination that the studies relied on by the plaintiff’s experts “were not sufficient, whether individually or in combination, to support their conclusions that Joiner’s exposure to PCBs contributed to his cancer.”²⁷

The plaintiff in *Joiner* had argued that the epidemiological studies showed a link between PCBs and cancer if the results of all the studies were pooled, and that this weight-of-the-evidence methodology was reliable. Therefore, according to the plaintiff, the district court erred when it excluded a conclusion based on a scientifically reliable methodology because it thereby violated the Court’s precept in *Daubert* that the “focus, of course, must be solely on principles and methodology, not on the conclusions that they generate.”²⁸ The Supreme Court responded to this argument by stating that

conclusions and methodology are not entirely distinct from one another. Trained experts commonly extrapolate from existing data. But nothing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence which is connected to existing data only by the *ipse dixit* of the expert. A court may conclude that there is simply too great an analytical gap between the data and the opinion proffered.²⁹

24. *Id.* at 144.

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

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

27. *Id.* at 146–47.

28. *Id.* at 146 (quoting *Daubert*, 509 U.S. at 595).

29. *Id.* at 146.

Justice Stevens, in his partial dissent, assumed that the plaintiff's expert was entitled to rely on such a methodology, which he noted is often used in risk assessment, and that a district court that admits expert testimony based on a weight-of-the-evidence methodology does not abuse its discretion.³⁰ Justice Stevens would have remanded the case for the court below to determine if the trial court had abused its discretion when it excluded the plaintiff's experts.³¹

C. *Kumho Tire Co. v. Carmichael*

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

In *Kumho*, the plaintiffs brought suit after a tire blew out on a minivan, causing an accident in which one passenger died and others were seriously injured. The tire, which was manufactured in 1988, had been installed on the minivan sometime before it was purchased as a used car by the plaintiffs in 1993. In their diversity action against the tire's maker and its distributor, the plaintiffs claimed that the tire was defective. To support this allegation, the plaintiffs relied primarily on deposition testimony by an expert in tire-failure analysis, who concluded on the basis of a visual inspection of the tire that the blowout was caused by a defect in the tire's manufacture or design.

When the defendants moved to exclude the plaintiffs' expert, the district court agreed with the defendants that the *Daubert* gatekeeping obligation applied not only to scientific knowledge but also to "technical analyses."³² The district court excluded the plaintiffs' expert and granted summary judgment. Although the court conceded on a rehearing that it had erred in treating the four factors discussed in *Daubert* as mandatory, it adhered to its original determination because the court simply found the *Daubert* factors appropriate, analyzed them, and discerned no competing criteria sufficiently strong to outweigh them.³³

30. *Id.* at 153–54.

31. *Id.* at 150–51.

32. *Carmichael v. Samyang Tire, Inc.*, 923 F. Supp. 1514, 1522 (S.D. Ala. 1996), *rev'd*, 131 F.3d 1433 (11th Cir. 1997), *rev'd sub nom. Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999).

33. *Id.* at 1522, 1524.

The Eleventh Circuit reversed the district court's decision in *Kumho*, holding, as a matter of law under a de novo standard of review, that *Daubert* applies only to scientific opinions.³⁴ The court of appeals drew a distinction between expert testimony that relies on the application of scientific theories or principles—which would be subject to a *Daubert* analysis—and testimony that is based on the expert's "skill- or experience-based observation."³⁵ The court then found that the testimony proffered by plaintiff was "non-scientific" and that "the district court erred as a matter of law by applying *Daubert* in this case."³⁶ The circuit court agreed that the trial court has a gatekeeping obligation; its quarrel with the district court was with that court's assumption that *Daubert's* four factors had to be applied.

All of the justices of the Supreme Court, in an opinion by Justice Breyer, held that the trial court's gatekeeping obligation extends to all expert testimony,³⁷ and unanimously rejected the Eleventh Circuit's dichotomy between the expert who "relies on the application of scientific principles" and the expert who relies on "skill- or experience-based observation."³⁸ The Court noted that Federal Rule of Evidence 702 "makes no relevant distinction between 'scientific' knowledge and 'technical' or 'other specialized' knowledge," and "applies its reliability standard to all . . . matters within its scope."³⁹ Furthermore, said the Court, "no clear line" can be drawn between the different kinds of knowledge, and "no one denies that an expert might draw a conclusion from a set of observations based on extensive and specialized experience."⁴⁰

The Court also unanimously found that the court of appeals had erred when it used a de novo standard, instead of the *Joiner* abuse-of-discretion standard, to determine that *Daubert's* criteria were not reasonable measures of the reliability of the expert's testimony.⁴¹ As in *Joiner*, and again over the dissent of Justice Stevens,⁴² the Court then examined the record and concluded that the trial court had not abused its discretion when it excluded the testimony of the witness. Accordingly, it reversed the opinion of the Eleventh Circuit.

The opinion adopts a flexible approach that stresses the importance of identifying "the particular circumstances of the particular case at issue."⁴³ The court must then make sure that the proffered expert will observe the same standard of "intellectual rigor" in testifying as he or she would employ when dealing with similar matters outside the courtroom.⁴⁴

34. *Carmichael v. Samyang Tire, Inc.*, 131 F.3d 1433, 1435 (11th Cir. 1997).

35. *Id.*

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

37. *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999).

38. *Id.* at 151.

39. *Id.* at 148.

40. *Id.* at 156.

41. *Id.* at 152.

42. *Id.* at 158.

43. *Id.* at 150.

44. *Id.* at 152.

How this extremely flexible approach of the Court is to be applied emerges in Part III of the opinion when the Court engages in a remarkably detailed analysis of the record that illustrates its comment in *Joiner* that an expert must account for “how and why” he or she reached the challenged opinion.⁴⁵

The Court illustrated the application of this standard to the facts of the case and its deference to the district court findings as follows:

After examining the transcript in some detail, and after considering respondents’ defense of Carlson’s methodology, the District Court determined that Carlson’s testimony was not reliable. It fell outside the range where experts might reasonably differ, and where the jury must decide among the conflicting views of different experts, even though the evidence is shaky. In our view, the doubts that triggered the District Court’s initial inquiry here were reasonable, as was the court’s ultimate conclusion.⁴⁶

Although *Kumho* is the most recent pronouncement by the Supreme Court on how to determine whether proffered testimony by an expert is admissible, and Rule 702 of the Federal Rules of Evidence was amended in 2000 to provide “some general standards that the trial court must use to assess the reliability and helpfulness of proffered expert testimony,” it is still *Daubert* that trial courts cite and rely on most frequently when ruling on a motion to preclude expert testimony.⁴⁷ Even though *Daubert* interprets a federal rule of evidence, and rules of evidence are designed to operate at trial, *Daubert*’s greatest impact has been pre-trial: If plaintiff’s experts can be excluded from testifying about an issue crucial to plaintiff’s case, the litigation may end with summary judgment for the defendant. Furthermore, although summary judgment grants are reviewed de novo by an appellate court, there is nothing to review if plaintiff failed to submit admissible evidence on a material issue. Consequently, only the less stringent abuse-of-discretion standard will apply, and there will be less chance for a reversal on appeal.

D. Weisgram v. Marley

Plaintiff is entitled to only one chance to select an expert who can withstand a *Daubert* motion. In a fourth Supreme Court case, *Weisgram v. Marley*,⁴⁸ the district court ruled for plaintiffs on a *Daubert* motion and the plaintiffs won a jury verdict. On appeal, the circuit court found that, despite the abuse-of-discretion standard, plaintiff’s experts should have been excluded and granted judgment as a matter of law for the defendants. Plaintiffs argued that they now had the right to a new trial at which they could introduce more expert testimony. The Supreme Court

45. Gen. Elec. Co v. Joiner, 522 U.S. 136, 144 (1997).

46. Kumho Tire Co. v. Carmichael, 526 U.S. at 153.

47. A search of federal cases on Westlaw after *Kumho* was decided indicates that the *Daubert* decision has been cited more than twice as often as the *Kumho* decision.

48. 528 U.S. 440 (2000).

granted certiorari limited to the new trial issue (it did not review the *Daubert* determination) but refused to grant a new trial. Justice Ginsberg explained:

Since *Daubert*, moreover, parties relying on expert testimony have had notice of the exacting standards of reliability such evidence must meet. . . . It is implausible to suggest, post-*Daubert*, that parties will initially present less than their best expert evidence in the expectation of a second chance should their first trial fail.⁴⁹

Weisgram causes tactical problems for plaintiffs about how much to spend for expert testimony. Should they pay for additional expensive expert testimony even though they think the district court would rule in their favor on a *Daubert* motion, or is the risk of a reversal on *Daubert* grounds and a consequent judgment for the defendant too great despite the abuse-of-discretion standard? *Weisgram* may indeed push plaintiffs to bring the very best expertise into litigation—a stated goal of the trilogy, but it may also make it difficult to litigate legitimate claims because of the cost of expert testimony. Is access to the federal courts less important than regulating the admissibility of expert testimony? Even if plaintiffs successfully withstand a *Daubert* motion, that does not guarantee they will win were the case to be tried. But very few cases now go to trial, and an inability by the defendant to exclude plaintiffs' experts undoubtedly affects the willingness of the defendant to negotiate a settlement.

II. Interpreting *Daubert*

Although almost 20 years have passed since *Daubert* was decided, a number of basic interpretive issues remain.

A. *Atomization*

When there is a *Daubert* challenge to an expert, should the court look at all the studies on which the expert relies for their collective effect or should the court examine the reliability of each study independently? The issue arises with proof of causation in toxic tort cases when plaintiff's expert relies on studies from different scientific disciplines, or studies within a discipline that present different strengths and weaknesses, in concluding that defendant's product caused plaintiff's adverse health effects. Courts rarely discuss this issue explicitly, but some appear to look at each study separately and give no consideration to those studies that cannot alone prove causation.

Although some use the language in *Joiner* as the basis for this slicing-and-dicing approach,⁵⁰ scientific inference typically requires consideration of numerous

49. 528 U.S. at 445 (internal citations omitted).

50. See discussion, *supra* notes 28–31 and related text.

findings, which, when considered alone, may not individually prove the contention.⁵¹ It appears that many of the most well-respected and prestigious scientific bodies (such as the International Agency for Research on Cancer (IARC), the Institute of Medicine, the National Research Council, and the National Institute for Environmental Health Sciences) consider all the relevant available scientific evidence, taken as a whole, to determine which conclusion or hypothesis regarding a causal claim is best supported by the body of evidence. In applying the scientific method, scientists do not review each scientific study individually for whether by itself it reliably supports the causal claim being advocated or opposed. Rather, as the Institute of Medicine and National Research Council noted, “summing, or synthesizing, data addressing different linkages [between kinds of data] forms a more complete causal evidence model and can provide the biological plausibility needed to establish the association” being advocated or opposed.⁵² The IARC has concluded that “[t]he final overall evaluation is a matter of scientific judgment reflecting the weight of the evidence derived from studies in humans, studies in experimental animals, and mechanistic and other relevant data.”⁵³

B. Conflating Admissibility with Sufficiency

In *Daubert*, Justice Blackmun’s opinion explicitly acknowledges that in some cases admissible evidence may not suffice to support a verdict in favor of plaintiffs. In other words, it seems to recognize that the admissibility determination comes first and is separate from the sufficiency determination. But in *Joiner* the Court pays little attention to this distinction and suggests that plaintiff’s expert testimony may be excluded if the evidence on which he seeks to rely is itself deemed insufficient.

But what difference does it make if sufficiency is conflated with admissibility?⁵⁴ After all, the case’s final outcome will be the same. As *Daubert* recognizes, the trial judge’s authority to decide whether the plaintiff has produced sufficient evidence to withstand a dispositive motion under Rule 56 or 50 is indisputable; a one-step process that considers sufficiency when adjudicating a *Daubert* motion is arguably

51. See e.g., Susan Haack, *An Epistemologist in the Bramble-Bush: At the Supreme Court with Mr. Joiner*, 26 J. Health Pol. Pol’y & L. 217–37 (1999) (discussing the individual studies that lead to the compelling inference of a double-helical structure of a DNA molecule, which, when considered separately, fail to compel that inference). See also *Milward v. Acuity Specialty Products Group, Inc.*, ___ F.3d ___, 2011 WL 982385, *10 639 F.3d 11, 26 (1st Cir. 2011) (reversing the district court’s exclusion of expert testimony based on an assessment of the direct causal effect of the individual studies, finding that the “weight of the evidence” properly supported the expert’s opinion that exposure to benzene can cause acute promyelocytic leukemia).

52. Institute of Medicine and National Research Council, *Dietary Supplements: A Framework for Evaluating Safety* 262 (2005).

53. Vincent J. Cogliano et al., *The Science and Practice of Carcinogen Identification and Evaluation*, 112 *Envl. Health Persp.* 1272 (2004).

54. The distinction between admissibility and sufficiency is also discussed in Michael D. Green et al., *Reference Guide on Epidemiology*, Section VII, in this manual.

more efficient than a two-step process that requires the district judge to analyze admissibility before it can turn to sufficiency.

There are, however, consequences to conflating admissibility and sufficiency. The *de novo* standard of review that ordinarily applies to judgments as a matter of law following a determination of insufficient evidence is converted into the lower abuse-of-discretion standard that governs evidentiary rulings on admissibility, and thereby undermines the jury trial mandate of the Seventh Amendment. Science proceeds by cumulating and synthesizing evidence until there is enough for a new paradigm. That does not mean that every study meets the most rigorous scientific standards. Judgment is required in determining which inferences are appropriate, but an approach that encourages looking at studies sequentially rather than holistically has costs that must be considered.

C. Credibility

Daubert and the expense of litigation make it difficult for courts to hew to the line that assigns credibility issues to the jury rather than the court. One troublesome area is conflicts of interest. To what extent should a court permit the plaintiff to inquire into the defense expert's relationship with the defendant? If the expert testified at trial, information that could have skewed the expert's testimony could be brought to the attention of the jury through cross-examination or extrinsic evidence. Impeachment by bias suffers from fewer constraints than other forms of impeachment.⁵⁵ But suppose the defendant seeks through a *Daubert* challenge to exclude the plaintiff's expert witness as relying on unreliable evidence to show causation in a toxic tort action. The defendant supports its argument with testimony by an academic from a highly respected institution whose research shows that the defendant's product is safe. Should the court permit the plaintiff to inquire whether the expert was on the payroll of the defendant corporation, or attended conferences paid for by the defendant, or received gifts from the defendant? What about corporate employees ghostwriting reports about their products that are then submitted in someone else's name? Other ties that an expert may have to industry have also been reported: royalties, stock ownership, working in an institution that receives considerable funding from the defendant. These are all practices that have been reported in the media and are practices that the plaintiff would like to question the expert about under oath.⁵⁶ A court is unlikely to allow a wide-ranging

55. See *United States v. Abel*, 469 U.S. 45, 50 (1984) (explaining that "proof of bias is almost always relevant because the jury, as finder of fact and weigher of credibility, has historically been entitled to assess all evidence which might bear on the accuracy and truth of a witness' testimony").

56. See, e.g., *In re Welding Fume Products*, 534 F. Supp. 2d 761, 764 (N.D. Ohio 2008) (requiring all parties to the litigation to "disclose the fact of, and the amounts of, payments they made, either directly or indirectly, to any entity (whether an individual or organization) that has authored or published any study, article, treatise, or other text upon which any expert in this MDL litigation relies, or has relied").

fishing expedition if the plaintiff has no proof that the defense expert engaged in such behavior. But even if the plaintiff has extrinsic evidence available that points to conflicts of interest on the part of the expert, how should a court assess this information in ruling on the admissibility of plaintiff's experts? Is this a credibility determination? Should allegations about conflicts be resolved by the judge at an in limine hearing, or should the plaintiff's expert be permitted to testify so that this issue can be explored at trial?

Another troublesome issue about credibility arises when an expert seeks to base an opinion on controverted evidence in the case. May the court exclude the expert's opinion on a *Daubert* motion if it finds that the expert's model did not incorporate the appropriate data that fit the facts of the case, or is this an issue for the jury?⁵⁷

Does the court avoid a credibility determination if it finds that the expert is qualified but the court disagrees with the theory on which the expert is relying? In *Kochert v. Greater Lafayette Health Serv. Inc.*,⁵⁸ a complex antitrust case, the court held that the trial court properly excluded the plaintiff's economic experts on the ground that the plaintiff's antitrust theory was based on the wrong legal standard after ruling for the plaintiff on *Daubert* challenges.

III. Applying *Daubert*

Application of *Daubert* raises a number of persistent issues, many of which relate to proof of causation. The three cases in the trilogy and *Weisgram* all turned on questions of causation, and the plaintiffs in each of the cases ultimately lost because they failed to introduce admissible expert testimony on this issue.

Causation questions have been particularly troubling in cases in which plaintiffs allege that the adverse health effects for which they seek damages are a result of exposure to the defendant's product.

A. *Is the Expert Qualified?*

As a threshold matter, the witness must be qualified as an expert to present expert opinion testimony. An expert needs more than proper credentials, whether grounded in "skill, experience, training or education" as set forth in Rule 702 of the Federal Rules of Evidence. A proposed expert must also have "knowledge."

57. Compare *Consol. Insured Benefits, Inc. v. Conesco Med. Ins. Co.*, No. 03-cv-3211, 2006 WL 3423891 (D.S.C. 2006) (fraud case; *Daubert* motion to exclude plaintiff's expert economist's testimony on damages; court finds that testimony question of weight, not admissibility) with *Concord Boat Corp. v. Brunswick Corp.*, 207 F.3d 1039, 1055-56 (8th Cir. 2000) (excluding expert's testimony as "mere speculation" that ignored inconvenient evidence).

58. 463 F.3d 710 (7th Cir. 2006).

For example, an expert who seeks to testify about the findings of epidemiological studies must be knowledgeable about the results of the studies and must take into account those studies that reach conclusions contrary to the position the expert seeks to advocate.

B. Assessing the Scientific Foundation of Studies from Different Disciplines

Expert opinion is typically based on multiple studies, and those studies may come from different scientific disciplines. Some courts have explicitly stated that certain types of evidence proffered to prove causation have no probative value and therefore cannot be reliable.⁵⁹ Opinions based on animal studies have been rejected because of reservations about extrapolating from animals to humans or because the plaintiff's extrapolated dose was lower than the animals'—which is invariably the case because one would have to study unmanageable, gigantic numbers of animals to see results if animals were not given high doses. The field of toxicology, which, unlike epidemiology, is an experimental science, is rapidly evolving, and prior case law regarding such studies may not take into account important new developments.

But even when there are epidemiological studies, a court may conclude that they cannot prove causation because they are not conclusive and therefore unreliable. And if they are unreliable, they cannot be combined with other evidence.⁶⁰

Experts will often rely on multiple studies, each of which has some probative value but, when considered separately, cannot prove general causation.

As noted above, trial judges have great discretion under *Daubert* and a court is free to choose an atomistic approach that evaluates the available studies one by one. Some judges have found this practice contrary to that of scientists who look at knowledge incrementally.⁶¹ But there are no hard-and-fast scientific rules for synthesizing evidence, and most research can be critiqued on a variety of grounds.

59. See, e.g., *In re Rezulin*, 2004 WL 2884327, at *3 (S.D.N.Y. 2004); *Cloud v. Pfizer Inc.*, 198 F. Supp. 2d 1118, 1133 (D. Ariz. 2001) (stating that case reports were merely compilations of occurrences and have been rejected as reliable scientific evidence supporting an expert opinion that *Daubert* requires); *Haggerty v. Upjohn Co.*, 950 F. Supp. 1160, 1164 (S.D. Fla. 1996), *aff'd*, 158 F.3d 588 (11th Cir. 1998) (“scientifically valid cause and effect determinations depend on controlled clinical trials and epidemiological studies”); *Wade-Greaux v. Whitehall Labs., Inc.*, 874 F. Supp. 1441, 1454 (D.V.I. 1994), *aff'd*, 46 F.3d 1120 (3d Cir. 1994) (stating there is a need for consistent epidemiological studies showing statistically significant increased risks).

60. See *Hollander v. Sandoz Pharm. Corp.*, 289 F.3d 1193, 1216 n.21 (10th Cir. 2002) (“To suggest that those individual categories of evidence deemed unreliable by the district court may be added to form a reliable theory would be to abandon ‘the level of intellectual rigor of the expert in the field.’”).

61. See, e.g., *In re Ephedra*, 393 F. Supp. 2d 181, 190 (S.D.N.Y. 2005) (allowing scientific expert testimony regarding “a confluence of suggestive, though non-definitive, scientific studies [that] make[s] it more-probable-than-not that a particular substance . . . contributed to a particular result. . . .”; after a two-week *Daubert* hearing in a case in which there would never be epidemiological evidence, the court concluded that some of plaintiffs’ experts could testify on the basis of animal studies, analogous

Few studies are flawless. Epidemiology is vulnerable to attack because of problems with confounders and bias. Furthermore, epidemiological studies are grounded in statistical models. What role should statistical significance play in assessing the value of a study? Epidemiological studies that are not conclusive but show some increased risk do not prove a lack of causation. Some courts find that they therefore have some probative value,⁶² at least in proving general causation.⁶³

Even, however, if plaintiffs convince the trial judge that their experts relied on reliable and relevant evidence in establishing general causation, that is, in opining that the defendant's product can cause the adverse effects for which plaintiffs seek compensation, plaintiffs must also present admissible expert testimony that the defendant's product caused their specific injuries. For example, in the Zyprexa litigation,⁶⁴ the court found that plaintiffs' expert's conclusion that Zyprexa may cause excessive weight gain leading to diabetes was well supported, but the expert's assertion that Zyprexa had a direct adverse effect on cells essential to the production of insulin by the body in cases in which there was no documented weight gain lacked scientific support. The record demonstrates that the expert's opinions relied on a subjective methodology, a fast-and-loose application of his scientific theories to the facts, and conclusion-driven assessments on the issues of causation in the cases on which he proposed to testify. He was not allowed to testify because his opinions were neither "based upon sufficient facts or data," nor were they "the product of reliable principles and methods," and he had not "applied the principles and methods reliably to the facts of the case."⁶⁵

Courts handling *Daubert* motions sometimes sound as though only one possible answer is legitimate. If scientists seeking to testify for opposing sides disagree, some courts conclude that one side must be wrong.⁶⁶ The possibility that both sides are offering valid scientific inferences is rarely recognized, even though this happens often in the world of science.

As noted above, district courts have great discretion in deciding how to proceed when faced with evidence from different scientific disciplines and presenting different degrees of scientific rigor. In assessing the proffered testimony of the

human studies, plausible theories of the mechanisms involved, etc.); *Milward v. Acuity Specialty Prods. Group, Inc.*, 639 F.3d 11 (1st Cir. 2011).

62. See *Cook v. Rockwell Int'l Corp.*, 580 F. Supp. 2d 1071 (D. Colo. 2006) (discussing why the court excluded expert's testimony, even though his epidemiological study did not produce statistically significant results).

63. *In re Viagra Prods.*, 572 F. Supp. 2d 1071 (D. Minn. 2008) (extensive review of all expert evidence proffered in multidistricted product liability case).

64. See *In re Zyprexa Prods.*, 2009 WL 1357236 (E.D.N.Y. May 12, 2009) (providing citations to opinions dealing with *Daubert* rulings and summary judgment motions in the Zyprexa litigation).

65. See Fed. R. Evid. 702; cf. *Gen. Elec. Co. v. Joiner*, 522 U.S. 136, 146 (opinion that "is connected to existing data only by the *ipse dixit* of the expert" need not be admitted).

66. See *Soldo v. Sandoz Pharm. Corp.*, 2003 WL 22005007 (W.D. Pa. 2003) (stating that court appointed three experts to assist it pursuant to Fed. R. Evid. 706 and then rejected opinion expressing minority view).

expert in light of the studies on which the testimony is based, courts may choose to limit the opinion that the expert would be allowed to express if the case went to trial.⁶⁷ Given the expense of trials, the paucity of trials, and the uncertainty about how jurors would evaluate such testimony, limiting an expert's opinion may lead to settlements.⁶⁸

The abuse-of-discretion standard may lead to inconsistent results in how courts handle proof of causation. There can be inconsistencies even within circuits when district judges disagree on whether plaintiffs' experts have met their burden of proof.⁶⁹

C. How Should the Courts Assess Exposure?

Another difficulty in proving causation in toxic tort cases is that plaintiff must establish that he or she was exposed to defendant's product. Obviously this is not a problem with prescription drugs, but in other types of cases, such as environmental torts, establishing exposure and the extent of the exposure can be difficult.⁷⁰ Although exact data on exposure need not be required, an expert should, however, be able to provide reasonable explanations for his or her conclusions about the amount of exposure and that it sufficed to cause plaintiffs' injuries.⁷¹

67 See, e.g., *In re Ephedra*, 393 F. Supp. 2d 181 (S.D.N.Y. 2005) (stating that qualified experts may testify to a reliable basis for believing that ephedra may contribute to cardiac injury and strokes in persons with high blood pressure, certain serious heart conditions, or a genetic sensitivity to ephedra; experts would have to acknowledge that none of this has been the subject of definitive studies and may yet be disproved).

68. *But cf.* *Giles v. Wyeth*, 556 F.3d 596 (7th Cir. 2009) (plaintiff won *Daubert* challenge but lost at trial).

69. *Compare* *Bonner v. ISP Techs., Inc.*, 259 F.3d 924 (8th Cir. 2001) (affirming jury verdict that exposure to solvent caused plaintiff's psychological and cognitive impairment and Parkinsonian symptoms; defendant argued that expert's opinion based on case reports, animal studies, structural analysis studies should have been excluded on *Daubert* grounds; the court stated: "The first several victims of a new toxic tort should not be barred from having their day in court simply because the medical literature, which will eventually show the connection between the victims' condition and the toxic substance, has not yet been completed.") *with* *Glastetter v. Novartis Pharm. Corp.*, 107 F. Supp. 2d 1015 (E.D. Mo. 2000), *aff'd per curiam*, 252 F.3d 986 (8th Cir. 2001) (plaintiff claimed that drug she had taken for lactation suppression had caused her stroke; trial court held that *Daubert* precluded experts from finding causation on the basis of case reports, animal studies, human dechallenge/rechallenge data, internal documents from defendant, and Food and Drug Administration's revocation of drug for lactation suppression; appellate court stated: "We do not discount the possibility that stronger evidence of causation exists, or that, in the future, physicians will demonstrate to a degree of medical certainty that Parlodel can cause ICHs. Such evidence has not been presented in this case, however, and we have no basis for concluding that the district court abused its discretion in excluding Glastetter's expert evidence." *Id.* at 992).

70. Issues involving assessment of exposure are discussed in Joseph V. Rodricks, Reference Guide on Exposure Science, in this manual.

71. *Anderson v. Hess Corp.*, 592 F. Supp. 2d 1174, 1178 (D.N.D. 2009) ("[A] plaintiff [in a toxic tort case] is not required to produce a mathematically precise table equating levels of exposure

Suppose, for example, that plaintiff alleges that her unborn child suffered injuries when her room was sprayed with an insecticide. Plaintiff's expert is prepared to testify that she relied on another expert's opinion that the insecticide can cause harm of the sort suffered by the child and that academic studies have found injuries when less than the amount sprayed in this case was used. But the expert who offered this opinion reached this conclusion without considering the size of the house, or the area treated, or how it was applied, or the amount applied to the outside of the house. And no one had measured this substance in the mother. Consequently, the court found that plaintiff had not provided adequate proof of exposure.⁷²

A recent case that illustrates the complex problems that arise with exposure issues is *Henricksen v. ConocoPhillips Co.*⁷³ In *Henricksen*, the plaintiff who drove a gasoline tanker truck for 30 years alleged that his acute myelogenous leukemia (AML) was caused by his occupational exposure to benzene, a component of gasoline. Although some studies show that AML, or at least some forms of AML, may be caused by exposure to benzene, the same is not true with regard to gasoline. The court rejected testimony by plaintiff's experts that sought to link the exposure to the benzene in the gasoline to plaintiff's claim. There were numerous problems: Did plaintiff manifest symptoms typical of AML that was chemically induced and not idiopathic? How could one calculate how much benzene plaintiff would have been exposed to considering how many hours he worked and how the gasoline was delivered? How much benzene exposure is required to support the conclusion that general causation has been established? Each of these issues is discussed in considerable detail, suggesting that the studies that would logically be needed to conclude that the alleged exposure can be linked to causation may simply not have been done. Because the plaintiff bears the burden of proof, this means that plaintiff's experts often will be excluded.

IV. Forensic Science

To date, *Daubert* has rarely been raised in the forensic context, but this may be about to change.⁷⁴ We do not know as yet what shifts may occur in response to the National Academies' highly critical report on the forensic sciences.⁷⁵ We do know that the report played a role in the Supreme Court's opinion in *Melendez-*

with levels of harm—plaintiff must only produce evidence from which a reasonable person could conclude that the defendant's emissions probably caused the plaintiff's harms.”).

72. *Junk v. Terminix Int'l. Co.*, 594 F. Supp. 2d 1062 (S.D. Iowa 2008).

73. 605 F. Supp. 2d 1142 (E.D. Wash. 2009).

74. These issues are discussed at greater length in Paul C. Giannelli et al., Reference Guide on Forensic Identification Expertise, in this manual.

75. National Research Council, *Strengthening Forensic Science in the United States: A Path Forward* (2009).

*Diaz v. Massachusetts*⁷⁶ concerning the application of the Confrontation Clause to expert forensic testimony. But it will take some time to understand the repercussions this opinion will cause in the criminal justice system.

Even aside from this constitutional development and in the absence of congressional or other institutional action, the extensive coverage of the National Academies' report by the media and academia may bring about change. Furthermore, analysts of the more than 200 DNA exonerations to date claim that in more than 50% of the cases, invalid, or improperly conducted, or misleadingly interpreted forensic science contributed to the wrongful convictions.⁷⁷ The seriousness of these mistakes is aggravated because some of the inmates were on death row. These developments may affect judicial approaches to opinions offered by prosecution experts. Also, as judges write more sharply focused opinions in civil cases, the very different approach they use in criminal cases stands out in vivid contrast. Supposedly, the federal rules are trans-substantive, and it is certainly arguable that errors that bear on life and liberty should weigh more heavily than errors in civil cases concerned primarily with money.

To date, however, few prosecution experts have been excluded as witnesses in criminal prosecutions.⁷⁸ Usually judges have allowed them to testify or, at most, have curtailed some of the conclusions that prosecution experts sought to offer.⁷⁹ However, there are a number of issues in forensic sciences that may become the object of *Daubert* challenges.

A. Validity

As the discussion in Chapter 5 of the National Academies' report recounts, forensic fields vary considerably with regard to the quantity and quality of research done to substantiate that a given technique is capable of making reliable individualized

76. 129 S. Ct. 2527, 2536 (2009).

77. The Innocence Project, available at www.innocenceproject.org.

78. See *Maryland v. Rose*, Case No. K06-0545 at 31 (Balt. County Cir. Ct. Oct. 19, 2007) (excluding fingerprint evidence in a death penalty case as a "subjective, untested, unverifiable identification procedure that purports to be infallible").

79. See, e.g., *United States v. Green*, 405 F. Supp. 2d 104 (D. Mass. 2005) (explaining that an expert would be permitted to describe similarities between shell casings but prohibited from testifying to match; Judge Gertner acknowledged that toolmark identification testimony should be excluded under *Daubert*, but that every single court post-*Daubert* admitted the testimony); *United States v. Glynn*, 578 F. Supp. 2d 567 (S.D.N.Y. 2008) (explaining that testimony linking bullet and casings to the defendant was inadmissible under *Daubert*, but testimony that the evidence was "more likely than not" from the firearm was admissible under Federal Rule of Evidence 401); *United States v. Rutherford*, 104 F. Supp. 2d 1190, 1193 (D. Neb. 2000) (handwriting experts permitted to testify to similarities between sample from defendant and document in question but not permitted to conclude that defendant was the author). See *United States v. Rutherford*, 104 F. Supp. 2d 1190, 1193 (D. Neb. 2000); *United States v. Hines*, 55 F. Supp. 2d 530 (D. Md. 2002).

identifications. Non-DNA forensic techniques often turn on subjective analyses.⁸⁰ But making *Daubert* objections in these fields requires defense counsel to understand in detail how the particular technique works, as well as to be knowledgeable about the scientific method and statistical issues.⁸¹

B. Proficiency

Non-DNA forensic techniques often rely on subjective judgments, and the proficiency of the expert to make such judgments may become the focus of a *Daubert* challenge. In theory, proficiency tests could determine whether well-trained experts in those fields can reach results with low error rates. In practice, however, there are numerous obstacles to such tests. Sophisticated proficiency tests are difficult and expensive to design. If the tests are too easy, the results will not assess the ability of examiners to draw correct conclusions when forensic evidence presents a difficult challenge in identifying a specific individual or source.⁸² Furthermore, in many jurisdictions, forensic examiners are not independent of law enforcement agencies and/or prosecutors' offices and can often obtain information about a proficiency testing program through those sources.

C. Malfunctioning Laboratories

Numerous problems have been identified in crime laboratories ranging from uncertified laboratory professionals and unaccredited laboratories performing incompetent work to acts of deliberate fraud, such as providing falsified results from tests that were never done.⁸³ Although outright fraud may be rare, unintended inaccurate results that stem from inadequate supervision, training, and record keeping, failure to prevent contamination, and failure to follow proper statistical procedures can have devastating effects. Evidence that a laboratory has engaged in such practices should certainly lead to *Daubert* challenges for lack of reliability, but this requires that such investigations be undertaken and the defense have access to the results. Whether courts can be persuaded to almost automatically reject laboratory results in the absence of proper accreditation of laboratories and certification

80. See National Research Council, *supra* note 75, at 133.

81. Specific forensic science techniques are discussed in Paul C. Giannelli et al., Reference Guide on Forensic Identification Expertise, Sections V–X, in this manual.

82. *United States v. Llera Plaza*, 188 F. Supp. 2d 549 (E.D. Pa. 2002) (court acknowledged that defense raised real questions about the adequacy of proficiency tests taken by FBI fingerprint examiners but concluded that fingerprint testimony satisfied *Daubert* in part because no examples were shown of erroneous identifications by FBI examiners). An erroneous FBI identification was made in the Brandon Mayfield case discussed in the introduction to *Strengthening Forensic Science in the United States*, *supra* note 75, at 45–46.

83. See National Research Council, *supra* note 75, at 183–215 and Paul C. Giannelli et al., Reference Guide on Forensic Identification Expertise, Section IV, in this manual.

of forensic practitioners remains to be seen. Laboratory techniques, such as drug analyses, that do not suffer from the same uncertainties regarding validity as the forensic identification techniques can, of course, also produce erroneous results if the laboratory is failing to follow proper procedures.

D. Interpretation

Forensic techniques that rest on subjective judgments are susceptible to cognitive biases.⁸⁴ We have seen instances of contextual bias, but as yet there has been little research on contextual or other types of cognitive bias. We do not yet know whether courts will consider this type of evidence when expertise is challenged.

E. Testimony

Defense counsel may of course object to testimony that a prosecution expert seeks to give. When the prosecution relies on a subjective identification technique, lawyers for the defense should attempt to clarify what “match” means if the expert uses this terminology and to explain to the jury that studies to date do not permit conclusions about individualization. To do this, the defense may have to call its own experts and ask for jury instructions. Defense counsel must also remain alert and object to prosecution testimony in which the witness claims to know probabilities—that have not been established in a particular field—on the basis of extensive personal experience. Objections also should be raised to testimony about zero error rates. The defense must also remember that the *Daubert* opinion itself recognized that testimony can be excluded under Federal Rule of Evidence 403 if its prejudicial effect substantially outweighs its probative value.

F. Assistance for the Defense and Judges

Perhaps the most troubling aspect of trying to apply *Daubert* to forensic evidence is that very few defense counsel are equipped to take on this challenge. Such counsel lack the training and resources to educate judges on these complex issues. Judges in the state criminal justice system that handle the great majority of criminal cases often have overloaded dockets and little or no assistance. Whether a defendant in a particular case is constitutionally entitled to expert assistance is a complicated issue that defense counsel needs to explore.⁸⁵ Possibly the best chance for the defense to get meaningful help that also would assist the court is to get pro bono assistance

84. National Research Council, *supra* note 75, at 184–185.

85. See *Ake v. Oklahoma*, 470 U.S. 68 (1985) (recognizing indigent’s right to psychiatric expert assistance in a capital case in which defendant raised insanity defense). Jurisdictions differ widely in how they interpret *Ake*.

from other counsel who are knowledgeable about *Daubert* and have a sophisticated understanding of statistical reasoning. Lawyers who have handled complex issues about causation may be able to transfer their expertise to other difficult issues relating to expert testimony.⁸⁶ Judges might also consider asking for amicus briefs from appropriate organizations or governmental units.

G. Confrontation Clause

The majority in *Melendez-Diaz v. Massachusetts*, in an opinion by Justice Scalia over a strong dissent by Justice Kennedy, held that the defendant has a constitutional right to demand that a forensic analyst whose conclusions the prosecution wishes to introduce into evidence must be produced in court for cross-examination. In a drug case, for example, the prosecution may not simply introduce a report or an affidavit from the analyst if the defendant demands production of the analyst for cross-examination. When the analyst is produced, this will give the defense the opportunity through cross-examination to raise questions about fraud, incompetence, and carelessness and to ask questions about laboratory procedures and other issues discussed in the National Research Council report. Effective cross-examination will demand of defense counsel the same type of expertise needed to succeed on *Daubert* challenges. Numerous unanswered questions about the operation of *Melendez-Diaz* will have to be litigated. It remains to be seen how often, if at all, defense counsel will take advantage of the Confrontation Clause or whether they will waive the defendant's right to confront expert witnesses.⁸⁷

V. Procedural Context

Apart from their effect on admissibility of expert testimony, *Daubert* and its subsequent interpretations have also affected the broader context in which such cases are litigated and have altered the role of testifying experts in the pretrial stages of litigation.

A. Class Certification Proceedings

One question that arises with increasing frequency is whether and how *Daubert* is to be applied at class certification proceedings. The problem arises because of the commonality and predominance requirements in Rule 23(a) of the Federal Rules

86. Cf. *Kitzmiller v. Dover Area School Dist.*, 400 F. Supp. 2d 707 (M.D. Pa. 2005) (attorneys who specialized in defense product liability litigation and had expertise about the nature of science participated in case objecting to teaching intelligent design in public schools).

87. Both defendants and prosecutors face concerns about the resources required to fully implement such protections. See National Research Council, *supra* note 75, at 187.

of Civil Procedure and has emerged with regard to a wide variety of substantive claims that plaintiffs seek to bring as a class action. For example, in *Sanneman v. Chrysler Corp.*,⁸⁸ plaintiff sought class certification of a common-law fraud action and a breach-of-warranty action, the gist of which was “that Chrysler had fraudulently concealed a paint defect in many of the vehicles it manufactured beginning on or about 1990.”⁸⁹ Plaintiff’s expert testified at the class certification hearing that the paint problem is always caused by ultraviolet rays, but acknowledged “that other causes may contribute to or exacerbate the problem.”⁹⁰ After oral argument, the court concluded that plaintiff’s expert’s testimony satisfied *Daubert*, but because ultraviolet rays are not always the only cause of problems with paint, proof of damages would probably have to be made vehicle by vehicle. The motion for class certification was therefore denied. *Daubert* challenges have been raised to class certification in numerous other cases.⁹¹

As of this writing, there is a decided trend toward rejecting class certification on the ground that plaintiff’s proffered expert testimony does not satisfy the Rule 23(a) requirements, although the circuits are not unanimous in how rigorous the examination of expert proof needs to be. Must the expert testimony be subjected to the same rigorous scrutiny to determine whether it is relevant and reliable as when the issue is admissibility at trial, or is a less searching analysis appropriate at the certification stage? In other words, should the trial judge conduct a *Daubert* hearing and analysis identical to that undertaken when a defendant seeks to preclude a plaintiff’s witness from testifying at trial? Not only “should” the trial judge conduct a *Daubert* hearing, but, as the Seventh Circuit has ruled in *American Honda*, the trial judge “must” do so. If a full *Daubert* hearing is required in every class certification case, what has happened to the broad and case-familiar discretion that a trial judge is supposed to exercise?”

The trial judge in *Rhodes v. E.I. du Pont de Nemours & Co.*⁹² concluded that the expert opinions offered in support of class certification should be subjected to a full-scale *Daubert* analysis, including a *Daubert* hearing. The judge explained

88. 191 F.R.D. 441 (E.D. Pa. 2000).

89. *Id.* at 443.

90. *Id.* at 451.

91. See, e.g., *Blades v. Monsanto Co.*, 400 F.3d 562 (8th Cir. 2005) (antitrust price-fixing conspiracy); *Rhodes v. E.I. du Pont de Nemours & Co.*, 2008 WL 2400944 (S.D. W. Va. June 11, 2008) (medical monitoring claim in toxic tort action); *Gutierrez v. Johnson & Johnson*, 2006 WL 3246605 (D.N.J. Nov. 6, 2006) (employment discrimination); *Nichols v. SmithKline Beecham Corp.*, 2003 WL 302352 (E.D. Pa. Jan. 29, 2003) (violation of Sherman Antitrust Act); *In re St. Jude Med., Inc.*, 2003 WL 1589527 (D. Minn. Mar. 27, 2003) (product liability action); *Bacon v. Honda of Am. Mfg Inc.*, 205 F.R.D. 466 (S.D. Ohio 2001) (same); *Midwestern Mach v. Northwest Airlines, Inc.*, 211 F.R.D. 562 (D. Minn. 2001) (violation of Clayton Act); *In re Polypropylene Carpet*, 996 F. Supp. 18 (N.D. Ga. 1997) (same); *In re Monosodium Glutamate*, 205 F.R.D. 229 (D. Minn. 2001).

92. 2008 WL 2400944 (S.D. W. Va. June 11, 2008). See also *American Honda Motor Co. v. Allen*, 600 F.3d 813, 816 (7th Cir. 2010) (district court must perform a full *Daubert* analysis before certifying a class action where the expert’s report or testimony is critical to class certification).

that decisions that see a more limited role for *Daubert* in class certification hearings stem in part from misinterpreting the Supreme Court's opinion in *Eisen v. Carlisle & Jacquelin*.⁹³ In *Eisen*, which predated *Daubert* by 19 years, the Court instructed district courts to refrain from conducting "a preliminary inquiry into the merits of a proposed class action" when they consider certification.⁹⁴ At this time, only the Ninth Circuit forbids the lower courts from examining evidence that relates to the merits and from requiring a rigorous examination of the expert testimony and Rule 23(a) requirements.⁹⁵ The *Rhodes* case deplored this approach because the overwhelming majority of class actions settle and therefore allowing the action to proceed as a class action "might invite plaintiffs to seek class status for settlement purposes." On the other hand, knocking out the possibility of class certification early in the proceedings affects the possibility of settling cases in which liability is debatable. A possible compromise is partial certification that would allow a common issue to be established at a class trial, leaving individual issues for separate proceedings.

B. Discovery

1. Amended discovery rules

Rule 26 of the Federal Rules of Civil Procedure—the core rule on civil discovery—was amended in 1993 more or less contemporaneously with *Daubert* to allow judges to exert greater control of expert testimony. Those amendments required experts retained or specially employed to provide expert testimony, or whose duties as the party's employee regularly involve giving expert testimony, to furnish an extensive report prior to his or her deposition.⁹⁶ These reports were required to indicate

93. 417 U.S. 156 (1974).

94. *Id.* at 177–78.

95. See *Dukes v. Wal-Mart, Inc.*, 474 F.3d 1214 (9th Cir. 2007). The Supreme Court declined an opportunity to address the role of *Daubert* in class certification when it granted certiorari in *Dukes*, even though the issue was raised in some of the petitions. The Court subsequently granted a petition for certiorari in *Erica P. John Fund Inc. v. Halliburton Co.* (U.S. Jan. 7, 2011) (No. 09-1403), which raises related questions regarding the extent to which the district court may consider the merits of the underlying litigation and require that loss causation be demonstrated by a preponderance of admissible evidence at the class certification stage under Federal Rule of Civil Procedure 23. Other courts accord *Daubert* a limited role, such as requiring the trial judge to determine only that the expert testimony is "not fatally flawed." See *Fogarazzo v. Lehman Bros., Inc.*, 2005 WL 361205 (S.D.N.Y. Feb. 16, 2005).

96. Fed. R. Civ. P. 26(a)(2)(B), as amended December 1, 2010, made substantial changes to the 1993 amendments. The 1993 amendments also recognized a second category of testifying experts who were not retained or specially employed in anticipation of litigation, such as treating physicians, who were not required to provide reports. *But see* 3M v. Signtech USA, 177 F.R.D. 459 (D. Minn. 1998) (requiring report from employee experts who do not regularly provide expert testimony because it eliminates surprise and is consistent with the spirit of Rule 26(a)(2)(B)). Under the 2010 amendments the attorney must submit a report indicating the subject matter and the facts and opinions to which an unretained testifying expert is expected to testify. Fed. R. Civ. P. 26(a)(2)(C) (amended Dec. 1, 2010).

“the data *or other information* considered by the expert witness in forming the opinions” (emphasis added). Many, although not all, courts construed this language as opening the door to discovery of anything conveyed by counsel to the expert.⁹⁷ Courts taking this approach found that all communications between counsel and experts were discoverable even if the communication was opinion work product. In other words, these courts found that the protection for opinion work product in Rule 26(b)(3) was trumped by the disclosure provisions in Rule 26(a)(2)(B). These courts also required disclosure of all the expert’s draft reports and notes.

Trigon Ins. Co. v. United States,⁹⁸ went a step further. It held that drafts prepared with the assistance of consultants who would not testify, as well as all communications between the consultants and the experts, including e-mails, were discoverable. In *Trigon*, many of these materials had been destroyed. The court ordered the defendant to hire an outside technology consultant to retrieve as much of these data as possible, allowed adverse inferences to be drawn against the defendant, and awarded more than \$179,000 in fees and costs to plaintiff.⁹⁹

Those who favor the free discovery of communications between counsel and experts and draft reports justified these results as shedding light on whether the expert’s opinions are his or her own or those of counsel. Critics of this approach found it costly and time-consuming and point out that lawyers have developed strategies to overcome transparency, such as retaining two sets of experts—one to consult and the other to testify—which makes discovery even more expensive.

After a series of public hearings the Advisory Committee on Civil Rules determined that the disclosure rules increased the cost of litigation with no offsetting advantage to the conduct of litigation. The report of the Advisory Committee noted that such an extensive inquiry into expert communications with attorneys did not lead to better testing of expert opinions “because attorneys and expert witnesses go to great lengths to forestall discovery.”¹⁰⁰

Under amended rules that became effective in December 2010, disclosure is limited to “the facts or data” considered by the expert, and does not extend to “other information.” Draft reports are no longer discoverable, and communications between counsel and an expert are protected from discovery unless the communications: (1) relate to compensation for the expert’s study or testimony;

97. See *Karn v. Ingersoll Rand*, 168 F.R.D. 633 (N.D. Ind. 1996) (requiring disclosure of all documents reviewed by experts in forming their opinions); *Reg’l Airport Auth. v. LFG, LLC*, 460 F.3d 697, 716 (6th Cir. 2006) (“other information” interpreted to include all communications by counsel to expert).

98. 204 F.R.D. 277 (E.D. Va. 2002).

99. *Id.* See also *Sentech Corp. v. Royal Ins. Co.*, 2007 WL 5462339 (C.D. Cal. Oct. 24, 2007) (explaining that preclusion of expert from testifying for failure to disclose drafts and failing to disclose input of counsel at hearing made it impossible to discern the basis for his opinion).

100. Report of the Civil Rules Advisory Committee, from Honorable Mark R. Kravitz, Chair, Advisory Committee on Federal Rules of Civil Procedure, to Honorable Lee H. Rosenthal, Chair, Standing Committee on Rules of Practice and Procedure (May 8, 2008), available at <http://www.uscourts.gov/uscourts/RulesAndPolicies/rules/Reports/CV05-2009.pdf>.

(2) identify facts or data provided by counsel and considered by the expert; or (3) identify assumptions furnished by counsel that the expert relied upon in forming opinions. Testifying experts who were not required to provide a report under the previous rules—such as treating physicians—are now required to provide a summary of the facts or opinions to which the witness expects to testify. While this requirement relating to experts not required to file a report would provide more disclosure than under the 1993 amendments, the main thrust of the 2010 amendments is to narrow expert discovery with an eye toward minimizing expense and focusing attention on the expert’s opinion.

Nothing in the amendments precludes asking an expert at a deposition to explain the bases or foundations for his or her opinions or asking whether the expert considered other possible approaches, but inquiries into counsel’s input would be severely curtailed. Aside from communications with counsel relating to compensation, or inquiring into “facts or data” provided by counsel that the expert considered, the expert may also be asked if counsel furnished him or her with assumptions on which he or she relied. Now that the amended rules have become effective, it remains to be seen how broadly courts and magistrates will interpret the “assumptions” provision. Are there instances in which it will be inferred that counsel was seeking to have the expert make an assumption although this was never explicitly stated? Those who think more transparency is desirable in dealing with expert testimony will certainly push to expand this category. Whether these amendments if adopted can constrain the gamesmanship that surrounds expert testimony remains to be seen.

2. *E-discovery*

Also uncertain is whether experts will be needed to determine the proper scope of e-discovery. Rule 26(b)(2)(B) provides the following:

A party need not provide discovery of electronically stored information from sources that the party identifies as not reasonably accessible because of undue burden or cost.

The burden is on the party from whom discovery is sought to show this undue burden or cost, but the court may nevertheless order discovery if the requesting party can show good cause.

May the requesting party making a motion to compel proffer expert testimony to show that the requested information would have been readily accessible if the party with the information had used a different search methodology? Recent opinions by a magistrate judge so suggest.¹⁰¹ Magistrate Judge John Facciola notes that “[w]hether search terms or ‘keywords’ will yield the information sought is a complicated question involving the interplay, at least, of the sciences of computer

101. See *e.g.* *United States v. O’Keefe*, 537 F. Supp. 2d 14 (D.D.C. 2008); *Equity Analytics, LLC v. Lunden*, 248 F.R.D. 331 (D.D.C. 2008).

technology, statistics and linguistics. . . . This topic is clearly beyond the ken of a layman and requires that any conclusion be based on evidence that, for example, meets the criteria of Rule 702 of the Federal Rules of Evidence.”¹⁰²

Superimposing *Daubert* hearings on top of e-discovery proceedings will make an already costly procedure even more costly, one of the consequences that Rule 26(b)(2)(B) seeks to avoid. On the other hand, a search that would not lead to the information sought defeats the objectives of discovery. A helpful opinion on how these factors should be balanced that examines the issues a court must consider can be found in *Victor Shirley, Inc. v. Creative Pipe, Inc.*,¹⁰³ which also contains a very brief overview of the various techniques for conducting searches of electronically stored information. A court may well require technical assistance in dealing with these issues. In some instances, a court-appointed expert or a special master appointed pursuant to Rule 53 of the Federal Rules of Civil Procedure might be more desirable than a full-fledged *Daubert* battle among experts, particularly if one of the parties has far fewer resources than its opponent.

C. *Daubert* Hearings

When a *Daubert* issue arises, the trial court has discretion about how to proceed.¹⁰⁴ It need not grant an evidentiary hearing and has leeway to decide when and how issues about the admissibility of expert testimony should be determined. The burden is on the parties to persuade the court that a particular procedure is needed.¹⁰⁵

The generally unfettered power of the trial judge to make choices emerges clearly if we look at *United States v. Nacchio*,¹⁰⁶ a criminal case. The defendant claimed that the trial judge erred in granting the government’s *Daubert* motion to exclude his expert in the middle of the trial without an evidentiary hearing, leading to his conviction. On appeal, a divided panel of the Tenth Circuit reversed on the ground that the expert testimony had been improperly excluded and remanded for a new trial. After a rehearing, the conviction was reinstated in a 5-4 opinion. The majority rejected the defense’s central argument that the court had to take into account that this was a criminal case; the majority saw this purely as a *Daubert* issue and found that the burden of satisfying *Daubert* and convincing the trial judge to hold a hearing rested solely on the defendant. Although there may be some cases in which a reviewing court would find that the trial court abused its discretion in the procedures it used in handling a *Daubert* motion,¹⁰⁷ this has

102. See *Equity Analytics*, 248 F.R.D. at 333.

103. 250 F.R.D. 251 (D. Md. 2008).

104. *Kumho Tire Co. v. Carmichael*, 526 U.S. at 137, 150 (1999).

105. For example, in the government’s RICO tobacco case, all *Daubert* issues were decided on the papers without any testimony being presented. *United States v. Phillip Morris Inc.*, 2002 WL 34233441, at *1 (D.D.C. Sept. 30, 2002).

106. 555 F.3d 1234 (10th Cir. 2009).

107. See *Padillas v. Stork-Gamco, Inc.*, 186 F.3d 412 (3d Cir. 1999).

become more and more unlikely in civil cases as *Daubert* rulings have accumulated and courts increasingly expect litigators to understand their obligations.

VI. Conclusion

The *Daubert* trilogy has dramatically changed the legal landscape with regard to expert witness testimony. The Supreme Court attempted in *Daubert* to articulate basic principles to guide trial judges in making decisions about the admissibility of complex scientific and technological expert testimony. Unfortunately, the *Daubert* trilogy has, in actuality, spawned a huge, and expensive, new subject of litigation and have left many procedural and substantive questions unanswered. Moreover, there are serious concerns about whether the guidelines enunciated by the Court have been interpreted by lower courts to limit, rather than respect, the discretion of trial judges to manage their complex cases, whether the guidelines conflict with the preference for admissibility contained in both the Federal Rules of Evidence and *Daubert* itself, and whether the guidelines have resulted in trial judges encroaching on the province of the jury to decide highly contested factual issues and to judge the overall credibility of expert witnesses and their scientific theories. Perhaps most disturbingly, there are serious concerns on the part of many scientists as to whether the courts are, as *Daubert* prescribed, making admissibility decisions—decisions that may well determine the ultimate outcome of a case—which are in fact “ground[ed] in the methods and procedures of science.”¹⁰⁸

108. *Daubert v. Merrill Dow Pharms.*, 509 U.S. at 579, 590 (1993).