

THE UNIVERSITY OF MEMPHIS LAW REVIEW

Volume 28



Number 4

THE "SAME INTELLECTUAL RIGOR" TEST PROVIDES AN EFFECTIVE
METHOD FOR DETERMINING THE RELIABILITY OF *ALL* EXPERT
TESTIMONY, WITHOUT REGARD TO WHETHER THE TESTIMONY
COMPRISES "SCIENTIFIC KNOWLEDGE" OR "TECHNICAL OR
OTHER SPECIALIZED KNOWLEDGE"

J. Brook Lathram

Summer 1998

**The "Same Intellectual Rigor" Test
Provides an Effective Method for
Determining the Reliability of *All*
Expert Testimony, Without Regard to
Whether the Testimony Comprises
"Scientific Knowledge" or "Technical
or Other Specialized Knowledge"**

J. BROOK LATHRAM*

| | | |
|------|---|------|
| I. | INTRODUCTION | 1054 |
| II. | AN OTHERWISE QUALIFIED EXPERT WITNESS SHOULD BE PERMITTED TO TESTIFY ONLY IF, IN THE DEVELOPMENT OF THE OPINIONS SHE WISHES TO EXPRESS IN COURT, SHE HAS FAITHFULLY ADHERED TO THE STANDARDS OF INTELLECTUAL RIGOR DEMANDED BY HER PROFESSION | 1057 |
| III. | THE RELIABILITY OF EXPERT TESTIMONY, WHETHER COMPRISING "SCIENTIFIC KNOWLEDGE" OR "TECHNICAL OR OTHER SPECIALIZED KNOWLEDGE," SHOULD BE ASSESSED UNDER THE "SAME INTELLECTUAL RIGOR" TEST | 1063 |

* Partner, Burch, Porter & Johnson; B.A., 1969, Vanderbilt University; J.D., 1972, Columbia University School of Law. Mr. Lathram has taught antitrust law and a civil procedure seminar as an adjunct professor at The University of Memphis, Cecil C. Humphreys School of Law.

| | | |
|-----|--|------|
| A. | <i>"Scientific" vs. "Technical or Other Specialized" Knowledge</i> | 1064 |
| B. | <i>The Differences Between a "Scientific" Opinion and One That Is Either "Technical" or "Specialized" Do Not Justify the Application of Separate Standards to Determine Each Type's Respective Reliability</i> | 1068 |
| IV. | CONCLUSION | 1074 |

I. INTRODUCTION

Federal Rule of Evidence 702¹ commands trial judges to be "gatekeepers"² charged with the responsibility for screening out unreliable expert testimony. They must not be overly zealous in the performance of this gatekeeping task, however, lest they do injustice to the fundamental proposition that the weighing of legitimate yet competing opinions is a duty entrusted solely to the jury.³ The daunting task of carrying out these potentially conflicting gatekeeping and jury-deferment responsibilities resembles that faced by the relief pitcher who, with the bases loaded and the game on the line in the bottom of the ninth inning, is told by his manager: "You can't walk this guy, but, whatever you do, don't give him anything good to hit."

1. Federal Rule of Evidence 702 provides: "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." FED. R. EVID. 702.

Tennessee Rule of Evidence 702 contains precisely the same language as the federal rule with the significant addition of the word "substantially" prior to the phrase "assist the trier of fact." The Tennessee rule thus imposes a burden of establishing admissibility that is greater than that required by the federal rule. See *McDaniel v. CSX Transp., Inc.*, 955 S.W.2d 257, 264 (Tenn. 1997) ("[P]robative force of the [expert] testimony must be stronger before it is admitted in Tennessee."); see also *State v. Shuck*, 953 S.W.2d 662, 668 (Tenn. 1997) (noting that the Tennessee rule is "somewhat stricter than the comparable federal rule").

2. See *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 589 n.7 (1993) (recognizing "gatekeeping responsibility").

3. See, e.g., *McDaniel*, 955 S.W.2d at 265.

It has been five years since the Supreme Court's 1993 pronouncement in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*⁴ that expert testimony must be *reliable*, as well as *relevant*, to be admissible under Rule 702.⁵ Hundreds of reported cases have discussed *Daubert* in one way or another. This would seem to be an appropriate time, therefore, to ask whether the courts, in their efforts to apply *Daubert*, have developed a satisfactory test for determining the reliability⁶ of expert testimony.

This Article advocates adoption of the following test, already used by the Fifth and Seventh Circuits, to determine whether expert testimony is reliable: *The testimony of an otherwise qualified expert is reliable, for purposes of Rule 702, when the expert has, in developing the opinions she seeks to express in court, adhered to the same standards of intellectual rigor that are demanded by her professional work.*⁷ It is the

4. 509 U.S. 579 (1993).

5. See *id.* at 589 ("[U]nder the Rules, the trial judge must ensure that any and all scientific testimony or evidence admitted is *not only relevant, but reliable.*" (emphasis added)). Although in *Daubert* the Court was dealing with expert testimony comprising "scientific knowledge," the majority view among lower courts is that expert testimony consisting of "technical or other specialized knowledge" must, like its scientific counterpart, be reliable to be admissible under Rule 702. See *infra* notes 23-25 and accompanying text.

In addition to instructing that Rule 702 requires expert testimony to be reliable as well as relevant, *Daubert* has made two significant contributions to the development of the law on expert opinion evidence. First, it recognized that Federal Rule of Evidence 702 superseded the overly restrictive "general acceptance" test often associated with *Frye v. United States*, 293 F. 1013, 1014 (D.C. Cir. 1923). See *Daubert*, 509 U.S. at 589. (On the criticism of the *Frye* test, see, for example, *McDaniel*, 955 S.W.2d at 262.). Second, *Daubert* provided a nonexhaustive four-factor list (i.e., hypothesis-testing, rate-of-error, peer review, and general acceptance) that are helpful in assessing proposed expert testimony in cases that involve disputes over unsettled, complex scientific or technical propositions (for example, *Daubert's* highly controversial topic of whether the anti-nausea drug Bendectin causes birth defects). See *Daubert*, 509 U.S. at 593-94.

6. This Article discusses only the "reliability" requirement of Rule 702. The Rule's other requirement, relevance, centers on whether the expert testimony is capable of assisting the jury in deciding or understanding a fact that is actually disputed in the case. See *Daubert*, 509 U.S. at 591; *McDaniel*, 955 S.W.2d at 265.

7. The first case to use the "same intellectual rigor" terminology in articulating a test that made reliability contingent upon the expert's following a methodology consis-

tent with the dictates of her profession was *Rosen v. Ciba-Geigy Corp.*, 78 F.3d 316, 318-19 (7th Cir.) (noting that the district court properly excluded a cardiologist's speculative opinion that the plaintiff's wearing a nicotine patch for three days caused his heart attack), *cert. denied*, 117 S. Ct. 73 (1996). Subsequent Seventh Circuit decisions that have applied the "same intellectual rigor" test include, without limitation, *Sheehan v. Daily Racing Form, Inc.*, 104 F.3d 940, 942 (7th Cir.) (stating that a statistical analysis in an age discrimination case was inadmissible because the expert did not explain why certain employees were not included in the sample that was studied and, more importantly, because the expert ignored the effect, if any, of possible explanatory variables not related to age), *cert. denied*, 117 S. Ct. 2480 (1997); *Khan v. State Oil Co.*, 93 F.3d 1358, 1365 (7th Cir. 1996) (holding that an economist should have been permitted to testify in an antitrust case on the plaintiff's claimed damages because the inference he drew from financial records, although certainly not conclusive, "was straightforward, and, so far as appears, was made in just the way that an economist interested in a firm's profit margins for reasons unrelated to litigation would make it"), *rev'd on other grounds*, 118 S. Ct. 275 (1997); *Braun v. Lorillard Inc.*, 84 F.3d 230, 234-35 (7th Cir.) (noting that the trial court properly excluded the testimony of a biochemist who was unable to demonstrate that his method for testing building materials for the presence of asbestos fibers could be reliably used on human tissue), *cert. denied*, 117 S. Ct. 480 (1996).

Fifth Circuit panels apparently began applying the "same intellectual rigor" test last year. See *Watkins v. Telsmith, Inc.*, 121 F.3d 984, 991-92 (5th Cir. 1997) (affirming summary judgment in a product liability case because, in large part, the plaintiff's expert had not tested his proposed alternative design); see also *Moore v. Ashland Chem., Inc.*, 126 F.3d 679, 687 (5th Cir. 1997) (holding that it was reversible error for the district court to exclude the testimony of a clinical physician that plaintiff's reactive airways disease was caused by exposure to chemical gases on the defendants' premises), *reh'g en banc granted* (Nov. 12, 1997).

The words "otherwise qualified expert" are included in the statement of the proposed test for the obvious reason that, unless the proponent of the testimony satisfies the threshold requirement of showing that the proffered witness is a qualified expert in a discipline that authorizes her to speak informatively on the subject at issue, the expert's testimony will not assist the jury. See, e.g., *Bogosian v. Mercedes-Benz of North Am., Inc.*, 104 F.3d 472, 476-77 (1st Cir. 1997) (stating that the district court did not abuse its discretion in excluding the testimony of an automobile mechanic/consultant who, although well-experienced in automotive repair, was not qualified to opine on the issue of transmission defects); *Sanderson v. International Flavors & Fragrances, Inc.*, 950 F. Supp. 981, 1001 (C.D. Cal. 1996) (finding that a neuropsychologist who had no training in medicine, chemistry, or toxicology was not qualified to opine on issues of toxic causation); *Rice v. Cincinnati, New Orleans & Pacific Ry. Co.*, 920 F. Supp. 732, 737 (E.D. Ky. 1996) (holding that fellow trainmen of the plaintiff in a FELA action were not qualified to offer an expert opinion that the engine cab design was unsafe); *Diviero v. Uniroyal Goodrich Tire Co.*, 919 F. Supp. 1353, 1355-58 (D. Ariz. 1996) (stating that an engineer who had extensive experience with *bias-belted*, but not *steel-belted*, radial tires was not qualified to opine on a defect in the latter), *aff'd*, 114 F.3d 851 (9th Cir. 1997).

position of this Article that the "same intellectual rigor" approach should be used to determine the reliability of *all* expert testimony, without regard to whether the testimony comprises "scientific knowledge" or "technical or other specialized knowledge."⁸

Given the ever-increasing significance of expert testimony in lawsuits, it is important that the admissibility of expert testimony be governed by the application of sound, uniform legal principles. The standard for assessing the reliability of expert testimony must be one that simultaneously eliminates outcomes determined by sophistry-peddling "hired guns" and entrusts to juries the task of resolving genuine clashes of ideas. Adoption of the "same intellectual rigor" test will yield a Rule 702 that accomplishes these two objectives.

II. AN OTHERWISE QUALIFIED EXPERT WITNESS SHOULD BE PERMITTED TO TESTIFY ONLY IF, IN THE DEVELOPMENT OF THE OPINIONS SHE WISHES TO EXPRESS IN COURT, SHE HAS FAITHFULLY ADHERED TO THE STANDARDS OF INTELLECTUAL RIGOR DEMANDED BY HER PROFESSION

The least we should expect—and indeed demand—of one called upon to offer sworn expert testimony is that she support her position in the same manner that would reasonably be expected of an expert who, outside the courtroom, adheres faithfully to the standards of intellectual rigor demanded by her profession.⁹ Requiring expert testimony to satisfy this test would go a long way toward eradicating the kind of expert abuse that is typified by, to cite just a few examples:

- A physician's speculative testimony that wearing a nico-

8. These are the two categories of expert knowledge that, according to Rule 702, may be of assistance to a jury's determination or understanding of a contested fact issue. The text of Rule 702 is quoted *supra* note 1.

9. As previously indicated, *see supra* note 7, this discussion assumes that the expert's profession is one that, if she can satisfy the "reliability" and "relevance" prongs of Rule 702, qualifies her to testify on the subject at issue. Given this assumption, the relevant standards of intellectual rigor are those of the proffered expert's particular profession.

tine patch for three days caused a man to have a heart attack;¹⁰

- A biochemist's unsupported speculation that his method for testing building materials for asbestos fibers is transferable to human tissue;¹¹
- A causation opinion based on a test by an expert who conducts the test without witnesses, takes no notes during the test, discards the raw data, and, notwithstanding his own acknowledgment that calibration of his testing equipment is important, cannot remember if in fact he performed the calibration;¹²
- A psychologist's testimony that therapy-induced "recovered memory" served to document past sexual abuse;¹³
- Expert testimony based on factual assumptions that are not supported by the record;¹⁴ and
- Expert testimony that ignores material information.¹⁵

10. See *Rosen*, 78 F.3d at 319.

11. See *Braun*, 84 F.3d at 235.

12. See *American & Foreign Ins. Co. v. General Elec. Co.*, 45 F.3d 135, 136-39 (6th Cir. 1995).

13. See *State v. Hungerford*, 697 A.2d 916, 929-30 (N.H. 1997).

14. See, e.g., *Bogosian v. Mercedes-Benz of North Am., Inc.*, 104 F.3d 472, 479 (stating that the district court properly excluded the testimony of the plaintiff's expert because, inter alia, his opinion was based on an assumption about the manner of the accident's occurrence that was contradicted by the plaintiff's own testimony); *Guillory v. Domtar Indus. Inc.*, 95 F.3d 1320, 1331 (5th Cir. 1996) (noting that the district court properly excluded testimony by the defendant's expert concerning the results of a test that postulated circumstances of the plaintiff's accident that were not supported by the record: "Expert evidence based on a fictitious set of facts is just as unreliable as evidence based upon no research at all."); *Fedorczyk v. Caribbean Cruise Lines, Ltd.*, 82 F.3d 69, 74-76 (3d Cir. 1996) (stating that because the factual proposition on which the plaintiff's expert based his opinion of causation was speculative, the opinion was itself necessarily speculative and thus properly excluded); *Henry v. Hess Oil V.I. Corp.*, 163 F.R.D. 237, 245 (D.V.I. 1995) (finding that the plaintiff's expert, in testifying on the plaintiff's diminished earning capacity, had incorrectly assumed that the plaintiff was, following an accident, capable only of earning a salary at or near minimum wage).

15. See, e.g., *Sheehan v. Daily Racing Form, Inc.*, 104 F.3d 940, 942 (7th Cir. 1997) (holding that a statistical analysis in an age discrimination case was unreliable because, in part, it ignored the possible effect of explanatory variables unrelated to age); *Valentine v. Pioneer Chlor Alkali Co.*, 921 F. Supp. 666, 675-77 (D. Nev. 1996) (holding, in a toxic tort case, that the plaintiff's expert's published statistical analysis failed, inter alia, to account for selection bias, to control for potential recall bias, to

Confidence that debate has revealed the absolute truth of a disputed proposition is seldom reached. Yet, the search for truth drives all legitimate intellectual endeavor. A legal system, if it is to retain its integrity, must promote the same truth-seeking objective that should motivate scientists and other experts in their professional pursuits outside the courtroom. An expert who testifies under oath thus should be genuinely interested in seeking the truth of the proposition that she is advancing. When, therefore, the expert seeks to express her opinions in court, she should be held to the same standard to which she would be held when she seeks to convince her peers of the validity of her position outside the courtroom.

Adoption of the "same intellectual rigor" test would signify judicial recognition of three concepts that are essential to maintaining the integrity of the judicial system:

- (1) Truth (and not simply aiding the party who is paying her) is the end toward which the expert's efforts should be directed;¹⁶
- (2) In any given field of endeavor, standards are maintained by those who are genuinely pursuing the truth; and
- (3) The integrity of the judicial system will be severely compromised if experts are permitted, in the courtroom, to deviate from the standards of intellectual rigor that

consider lack of reliable dosage data, and to eliminate confounding variables); *In re Air Crash Disaster*, 795 F.2d 1230, 1234 (5th Cir. 1986) (a pre-*Daubert* case holding that the plaintiff's expert, in computing the value of the decedent's life, failed to consider such matters as the limits on growth that the decedent's business likely would have experienced in a competitive industry, the downturns that occurred cyclically in the industry, or the choices that the decedent might have made in the future to avoid work-related health or stress problems later in his career); *Wade-Greaux v. Whitehall Lab, Inc.*, 874 F. Supp. 1441, 1478 (D.V.I.) ("Each of plaintiff's expert witnesses is able to draw his or her respective conclusions only by ignoring the basic requirements of the relevant scientific community's methodology."), *aff'd*, 46 F.3d 1120 (3d Cir. 1994) (unpublished table decision).

16. "*Daubert* exhorts scientists to do good science and expects them to be scientists first and expert witnesses (and advocates) second." 1 DAVID L. FAIGMAN ET AL., *MODERN SCIENTIFIC EVIDENCE: THE LAW AND SCIENCE OF EXPERT TESTIMONY* § 1-3.4.1, at 37 (1997).

they would be expected to follow in their professional pursuits outside the courtroom.

Justice Blackmun may have had something akin to these concepts in mind when, in *Daubert*, he distinguished between an expert's *methodology* (the reliability of which *is* to be determined by the trial court) and an expert's *conclusion* (the reliability of which *is not* to be determined by the trial court).¹⁷ The quintessential methodologically unsound conclusion is, it seems fair to say, one that is developed without faithful adherence to the standards of intellectual rigor demanded by the expert's profession. Exclusion of a conclusion that is derived from an unsound methodology is required, not because of the trial court's disagreement with the expert's conclusion, but

17. See *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 595 (1993) ("The focus, of course, must be solely on principles and methodology, not on the conclusions that they generate."). But see *General Elec. Co. v. Joiner*, 118 S. Ct. 512, 519 (1997) ("But conclusions and methodology are not entirely distinct from one another."); *Lust v. Merrell Dow Pharm., Inc.*, 89 F.3d 594, 598 (9th Cir. 1996) ("When a scientist claims to rely on a method practiced by most scientists, yet presents conclusions that are shared by no other scientists, the district court should be wary that the method has not been faithfully applied."); *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 746 (3d Cir. 1994) ("*Paoli II*") (noting that a distinction between methodology and conclusions has only limited practical import; if the judge disagrees with the expert's conclusions, it will generally be because she thinks there is a mistake in the expert's investigative or reasoning process); *Clair v. Burlington N. R.R.*, 29 F.3d 499, 502 (9th Cir. 1994) (stating that a district court is "both authorized and obligated to scrutinize carefully the [expert's] reasoning *and* methodology" (emphasis added)); *Hall v. Baxter Healthcare Corp.*, 947 F. Supp. 1387, 1401 (D. Or. 1996) (pointing out that there is "no clear demarcation between scientific methodology and the conclusions it generates" and concluding that the "court need and should not ignore any step in [the scientific] process, but must ensure that in each step, from initial premise to *ultimate conclusion*, the expert faithfully followed valid scientific methodology" (emphasis added)). See also 1 FAIGMAN ET AL., *supra* note 16, § 1-3.3.1[2], at 22-25 (observing that "[s]cientific conclusions are inextricably connected to the methodologies used to reach them," and that Justice Blackmun's distinction "was bound to fail[,] at least as originally stated."). Professor Faigman and his colleagues further suggest, though, that the word "methodology," as used by Justice Blackmun to distinguish between these two concepts, should be read to embrace the "general theory," "general application," and "general technology" stages of the four-tiered system of knowledge acquisition and that the word "conclusions" should be read to embrace the last, "individual application," stage of this four-tiered system. 1 *id.* at 23.

because the process that generated the conclusion is inconsistent with the truth-seeking process that both the expert's profession and the courts should always seek to foster.

Judge Posner,¹⁸ writing for the Seventh Circuit, has articulated what has been called in this Article the "same intellectual rigor" test. This analysis can be effectively employed to detect unreliable—i.e., methodologically unsound—opinion testimony:

When the Supreme Court in *Daubert* told judges to distinguish between real and courtroom science, it was not with the object of discovering the essence of "science," if there is such an essence. The object, we think, while conceding the uncertainty concerning the reach of the majority opinion discussed in the Chief Justice's separate opinion, was to make sure that when scientists testify in court they *adhere to the same standards of intellectual rigor* that are demanded in their professional work. If they do, their evidence (provided of course that it is relevant to some issue in the case) is admissible even if the particular methods they have used in arriving at their opinion are not yet accepted as canonical in their branch of the scientific community. If they do not, their evidence is inadmissible no matter how imposing their credentials.¹⁹

The Tennessee Supreme Court's decision in *McDaniel v. CSX Transportation, Inc.*²⁰ indicates that Tennessee Rule of Evidence 702 may require application of a test for determining reliability that shares much in common with the "same intellectual rigor" test. The *McDaniel* court, after listing the same four factors said by *Daubert* to be partially indicative of reliability,

18. Richard A. Posner, United States Court of Appeals, Seventh Circuit.

19. *Rosen v. Ciba-Geigy Corp.*, 78 F.3d 316, 318-19 (7th Cir. 1996) (emphasis added) (citations omitted). Also see *Braun v. Lorillard Inc.*, in which Judge Posner wrote:

[The] abuse [at which *Daubert* is directed] is the hiring of reputable scientists, impressively credentialed, to testify for a fee to propositions that they have not arrived at through the methods that they use when they are doing their regular professional work rather than being paid to give an opinion helpful to one side in a lawsuit.

84 F.3d 230, 235 (7th Cir. 1996).

20. 955 S.W.2d 257 (Tenn. 1997).

added a fifth requirement—namely, “whether the expert’s research in the field has been conducted independent of litigation.”²¹ The court applied the Tennessee standard and concluded that the trial court’s in limine ruling that the plaintiffs’ experts may testify that the solvent used in the defendant’s mechanical shops caused the plaintiffs’ encephalopathy was not an abuse of discretion.²² The court found support for this ruling in the fact “that the research . . . , including that of several of the plaintiffs’ experts, was conducted independently of this litigation.”²³

It appears from the *McDaniel* opinion that the plaintiffs’ experts employed the same intellectual rigor in the litigation that they had previously employed in their professional pursuits outside the courtroom. That their position may not have been widely accepted among those practicing the relevant medical disciplines did not disqualify them from testifying because the pre-litigation intellectual consistency that they brought to the table, along with some support in peer-reviewed journals and textbooks, imbued their testimony with sufficient reliability to render it capable of assisting the jury’s determination of the causation issue.

Whether Tennessee will specifically adopt the “same intellectual rigor” test remains to be seen. One can reasonably hope that, in view of *McDaniel*’s emphasis on the value of nonlitigation development of the proffered expert conclusions, Tennessee will adopt the “same intellectual rigor” test or a similar standard.

21. *Id.* at 265. Earlier in its opinion, the court noted that this fifth factor had been applied by the Ninth Circuit in the *Daubert* case following remand by the Supreme Court, 43 F.3d 1311, 1317 (9th Cir. 1995) (*Daubert-Remand*). See *McDaniel*, 955 S.W.2d at 263; see also *Lust v. Merrell Dow Pharm., Inc.*, 89 F.3d 594, 597-98 (9th Cir. 1996) (placing a heightened burden on the party proffering expert testimony developed for litigation); *Wade-Greaux v. Whitehall Lab., Inc.*, 874 F. Supp. 1441, 1479 (D.V.I. 1994) (noting that the fact that an expert’s methodology has not been put to non-judicial use weighs against admissibility), *aff’d*, 46 F.3d 1120 (3d Cir. 1997).

22. See *McDaniel*, 955 S.W.2d at 266.

23. *Id.* (emphasis added).

III. THE RELIABILITY OF EXPERT TESTIMONY, WHETHER COMPRISING "SCIENTIFIC KNOWLEDGE" OR "TECHNICAL OR OTHER SPECIALIZED KNOWLEDGE," SHOULD BE ASSESSED UNDER THE "SAME INTELLECTUAL RIGOR" TEST

A trial court should not reduce the vigor with which it performs its gatekeeping role, much less completely abandon that role, simply because proffered expert testimony comprises "technical or specialized," rather than "scientific," knowledge.²⁴ Most courts have eschewed such a course and instead have held that, even for nonscientific testimony, the trial court is required by Rule 702 to discharge its gatekeeping responsibility and determine the reliability of the proffered testimony.²⁵ In keeping with this sentiment, one commentator has stated:

Many courts and commentators see in *Daubert* a response to so-called "junk science" and the perceived problem of the hired-gun expert witness. If this perception is correct, then courts should be reluctant to abandon *Daubert's* prescription too quickly when confronted by scientifically suspect expert testimony. Such abandonment would lead to ironic and unfortunate outcomes. "Junk scientists" and hired guns, who might be excludable under *Daubert* for failing to meet the rigors of science, would find that the key to admission lies in eschewing the meth-

24. At least one court has held that "*Daubert* is not applicable" to cases involving technical or specialized knowledge and that in such cases the reliability of the expert's testimony is a matter to be decided solely by the jury. *Thornton v. Caterpillar, Inc.*, 951 F. Supp. 575, 576-78 (D.S.C. 1997). This approach ignores the fundamental proposition that it is Rule 702, not *Daubert*, that is the source of the command to exclude unreliable expert testimony. See *United States v. Jones*, 107 F.3d 1147, 1156 (6th Cir. 1997). The text of Rule 702 offers no support for the position that the reliability requirement announced in *Daubert* need not be satisfied when the proffered testimony comprises technical or specialized, rather than scientific, knowledge. See *Moore v. Ashland Chem., Inc.*, 126 F.3d 678, 686 (5th Cir. 1997) (concluding that a logical interpretation of the text of Rule 702 would require a technical or specialized opinion to be reliable in order to assist the jury).

25. See, e.g., *Berry v. City of Detroit*, 25 F.3d 1342, 1350 (6th Cir. 1994) ("Although . . . *Daubert* dealt with scientific experts, its language relative to the 'gatekeeper' function of federal judges is applicable to all expert testimony offered under Rule 702."); *Moore*, 126 F.3d at 685-86.

ods of science altogether. Junk scientists would simply become junk technicians and junk specialists. This is probably not what the *Daubert* Court anticipated or intended. *Indeed, wholesale abandonment of Daubert outside of "scientific" evidence is not sound logically or as a practical matter.*²⁶

It is the intellectual rigor demanded by the expert's profession, not the label used to categorize the expert's opinion, that should determine the opinion's reliability. Proper performance of the trial court's gatekeeping role thus requires that it use the "same intellectual rigor" test to determine the reliability of *all* expert testimony, however characterized. Further elucidation of this point requires an explanation, presented in Part III.A, of the difference between "scientific" and "technical or other specialized" knowledge. Part III.B will use specific examples to demonstrate that the differences that do exist between these two categories of knowledge do not justify application of separate standards to determine each type's respective reliability.

A. "Scientific" vs. "Technical or Other Specialized" Knowledge

The hallmark of a *scientific* principle is its *falsifiability*, i.e., its amenability to being tested to see if it is false.²⁷ A principle's scientific *status* is conferred simply by its being vulnerable to testing. The principle's scientific *status* thus is to be distinguished from the principle's *merit*, which is dependent "on the degree to which [the principle] has survived attempts at falsification."²⁸

What distinguishes *scientific* from *nonscientific* expert testimony is the former's application of general scientific (i.e., falsifiable) principles to the specific facts of a case. The *reliability* of scientific testimony depends, in turn, on whether the

26. 1 FAIGMAN ET AL., *supra* note 16, § 1-3.4.1, at 30-31 (emphasis added) (citations omitted).

27. See 1 *id.* § 1-3.3.1, at 19; see also *Moore*, 126 F.3d at 685 ("Theoretically, therefore, hypotheses are not affirmatively proved, only falsified." (citations omitted)).

28. 1 FAIGMAN ET AL., *supra* note 16, § 1-3.3.1, at 20.

general principles applied by the expert have been validated through appropriate testing.²⁹

Assume, for example, a lawsuit in which a plaintiff claims that a pharmaceutical product caused her to develop cancer. The expert who professes to link the pharmaceutical product to the plaintiff's cancer is giving *scientific* testimony because she seeks to apply to the specific facts of the plaintiff's case the underlying general scientific principles that (a) the drug has been shown to cause some people to develop cancer and (b) there exists a technology that can be used by qualified scientists to determine with a high level of confidence which persons are more likely to develop cancer.³⁰ The *reliability* of the expert's testimony is contingent upon validation of these testable general scientific principles.

An expert who offers *nonscientific* testimony, by contrast, does not apply scientific principles when she testifies. An art historian's opinion that a particular painting is a *Cezanne*, for example, comprises not *scientific*, but *technical or specialized* knowledge.³¹ When she analyzes the painting, the art historian does not apply general principles that are susceptible to testing; the analysis is a unique event.³² The reliability of the art historian's analysis thus is not (and indeed cannot be) dependent on the validity of underlying verifiable general principles.

The Sixth Circuit, in *Berry v. City of Detroit*,³³ provided an illustration of another kind of expert testimony that, although it differs from the art historian's testimony in one respect, also comprises *nonscientific* knowledge.³⁴ If, posited the court, the issue were whether a bumblebee always takes off

29. See, e.g., 1 *id.* § 1-3.3.1[2], at 22-25.

30. See, e.g., 1 *id.*

31. See 1 *id.* § 1-3.4.1, at 32 (using this art historian-Cezanne example).

32. See 1 *id.* This hypothetical assumes that the art historian is not using any scientific techniques, such as a time-dating materials' analysis, but is instead simply applying her knowledge of the characteristics of *Cezanne* that make his paintings unique.

33. 25 F.3d 1342 (6th Cir. 1994) (holding that a sociologist should not have been permitted to testify in a civil rights action that the city's failure to discipline its police officers was the proximate cause of the shooting of the plaintiff's decedent).

34. See *id.* at 1349-50; see also *United States v. Jones*, 107 F.3d 1147, 1158 (6th Cir. 1997) (quoting from and applying *Berry's* illustration).

into the wind, a beekeeper who has observed countless bumblebee flights would, thanks to his considerable experience, possess sufficient *specialized knowledge* to enable her to assist a jury unfamiliar with the flight habits of bumblebees.³⁵

The beekeeper, like the art historian who opines that a particular painting is a *Cezanne*, is not applying scientific principles in her testimony. Scientific principles, however, *could* be applied to support the conclusion that bees always take off into the wind. In this limited respect, therefore, the beekeeper's testimony differs from the art historian's testimony. There undoubtedly is a scientific explanation for why bees always take off into the wind, whereas there is no testable general scientific principle that could explain the art historian's conclusion that a particular painting is a *Cezanne*. Significantly, though, the beekeeper is not applying that scientific explanation in her testimony, and this feature makes her testimony, like that of the art historian, nonscientific.

The beekeeper is permitted to testify because the reliability of her testimony is supplied by her training and experience, rather than by the validity of the scientific principles that *could* have been invoked (by a scientist conversant with the aerodynamic principles that explain how bees fly) to support the conclusion that bees always take off into the wind. The beekeeper's countless observations of bee take-offs provide her with "specialized knowledge" that is superior to that possessed by the jury.

Equally important, the connection between the beekeeper's observations and the conclusion that she extrapolates from them is sufficiently straightforward that it can assist the jury's understanding of the take-off habits of bees. The straightforward character of the testimony is essential to its reliability because it permits the jury to understand, and thus weigh, the

35. See *Berry*, 25 F.3d at 1349-50. The court contrasted the beekeeper's testimony on how a bumblebee is able to fly with that of an aeronautical engineer. See *id.* The court considered the aeronautical engineer's testimony to be scientific because he, unlike the beekeeper, is applying general scientific principles of aerodynamics in his testimony. See *id.*

beekeeper's conclusion without the necessity of an explanation of the scientific principles that account for bees always taking off into the wind. If expert testimony cannot be understood by the jury, it of course cannot satisfy Rule 702's requirement that it assist the jury in its determination or understanding of a contested issue.

The beekeeper's testimony is analogous to that offered by a mechanic on the workings of a carburetor. The workings of a carburetor are just as amenable to scientific understanding as the workings of an atom; however, the law permits the former to be expressed by an experienced mechanic, while requiring the latter to be expressed only by a scientist.³⁶ As one commentator has stated:

In short, Rule 702 implicitly relaxes the requirement for a scientific demonstration when a less rigorous, less time consuming and less expensive alternative would provide sufficiently accurate information. *When the subject of expert testimony is straightforward, the law dispenses with the requirement of scientific proof because it is excessive, not because it is unavailable.*³⁷

As the art historian, beekeeper, and mechanic examples illustrate, expert testimony can often assist a jury in its determination or understanding of a contested issue even when the testimony is provided by a witness who is not applying scientific principles. Nonscientific testimony can be helpful in instances when (as illustrated by the art historian example) the expert's opinion simply does not rest on testable general principles, as well as in instances when (as illustrated by the beekeeper and mechanic examples), notwithstanding the existence of a scientific explanation for the expert's opinion, the straightforward character of the expert's subject permits dispensing with the requirement of scientific proof.

There are times, of course, as in both *Daubert* and *McDaniel*,³⁸ when an expert opinion not only *can*, but *must*,

36. See 1 FAIGMAN ET AL., *supra* note 16, § 1-3.4.1, at 33 (discussing mechanic-carburetor example).

37. 1 *id.* (emphasis added).

38. In both *Daubert* and *McDaniel*, the issue was whether there was a causal rela-

be explained by the application of scientific principles. It is this capacity to be understood only when offered by a witness who can apply its underlying scientific principles to the facts of the case that distinguishes a *scientific* opinion from the *technical or specialized* opinion offered by the art historian, beekeeper, and mechanic in the foregoing examples.

B. The Differences Between a "Scientific" Opinion and One That Is Either "Technical" or "Specialized" Do Not Justify the Application of Separate Standards to Determine Each Type's Respective Reliability

That a scientific opinion, unlike its technical or specialized counterpart, involves the application of scientific principles does not justify use of a different standard to determine its methodological soundness from the standard used to determine the methodological soundness of a technical or specialized opinion. Whether her testimony comprises "scientific knowledge" or "technical or other specialized knowledge," an expert witness should be held to the same standard to which she is held when, outside the courtroom, she seeks to persuade her peers of the validity of her views. Although the specific factors applicable in assessing the reliability of a scientific opinion will often be different from those applicable in determining the reliability of a technical or specialized opinion,³⁹ the expert, in either instance, should be required to adhere faithfully to the standards of intellectual rigor demanded by her particular profession.

If, for example, the disputed opinion is the nonscientific proposition that a certain painting is a *Cezanne*, the trial court should determine if the testifying art historian has applied to her task those factors on which art historians reasonably rely, outside the courtroom, to make judgments of the type that she now wishes to express in court.⁴⁰ The mere fact that the art

relationship between exposure to an agent and a medical condition.

39. Scientific verification and rate-of-error, for example, do not come into play in the determination of the reliability of a technical or specialized opinion.

40. See 1 FAIGMAN ET AL., *supra* note 16, § 1-3.4.1, at 32.

historian's testimony is nonscientific (and that, accordingly, the factors relevant to the assessment of the reliability of her opinion are different from those relevant to the determination of the reliability of, for example, an opinion of the type presented in *Daubert*) should not give the art historian a "free ride" to present an opinion in the courtroom that was developed in a manner that fails to comport with the methodology demanded by her profession. Of course, if the testifying art historian has in fact followed the methodology that would reasonably be expected of an art historian faced with the same task outside the courtroom, the court must find that the opinion is sufficiently reliable to satisfy Rule 702, even though the court itself might, if it, rather than the jury, were deciding the case, reach a conclusion different from that of the testifying art historian.

To take another example, if the testimony of an engineer that a product was defectively designed is treated as "technical" or "specialized" knowledge, it does not automatically follow that the reliability of the proffered testimony may rest solely on the engineer's training and experience. Assuming that the engineer relies solely on her training and experience, the determinative question should be whether she has adhered to the standards of intellectual rigor demanded by her particular engineering specialty. If, in using this test, the court determines that the engineer should have done more than rely solely on her training and experience—for example, if the court finds that the engineer should have tested her proposed alternative design—the engineer's testimony is unreliable and must be excluded under Rule 702.⁴¹

41. See, e.g., *Watkins v. Telsmith, Inc.*, 121 F.3d 984, 990-92 (5th Cir. 1997) (affirming the district court's exclusion of the testimony of a civil engineer on the alleged defective design of the conveyor at a gravel wash plant and its grant of summary judgment; the court emphasized the expert's failure to test his proposed alternative design); *Rogers v. Ford Motor Co.*, 952 F. Supp. 606, 615 (N.D. Ind. 1997) (finding that the opinions of a professional engineer on a seat belt design lent themselves to testing, which he had not performed, and that the testimony thus must be excluded). *But see* *McKendall v. Crown Control Corp.*, 122 F.3d 803, 806-07 (9th Cir. 1997) (reversing summary judgment and holding that the plaintiff's expert was qualified to opine on the alleged defective design of a stockpicker forklift based on his 30 years of having investigated hundreds of forklift accidents; the failure to test a proposed alternative design

Nonscientific testimony can sometimes be considerably more complex than the previously discussed art historian, beekeeper, mechanic, and engineer examples might otherwise suggest. The general principles on which the expert's conclusion is based in such instances, although not scientific, nonetheless are often beyond the grasp of laymen. That the complex general principles that the expert seeks to apply are not scientifically verifiable should not relieve the expert from validating those principles to whatever extent she can with the tools available to her.

Assume, for example, that a social psychologist is proffered to testify that a defendant's confession was given under circumstances indicating that the confession may have been false.⁴² Before ruling that the proffered testimony possesses sufficient reliability to assist the jury, the court should, by using the "same intellectual rigor" test, require the expert to validate the general propositions that false confessions are indeed a documented phenomenon and that the incidence of false confessions is greater when certain circumstances (pertaining to the defendant's psychological profile and the interrogation techniques used to obtain the confession) are present.⁴³

was simply a fact to be brought out on cross examination).

42. The psychological effects of extreme stress would appear to involve a matter "so complex that scientists have not, and perhaps can never, isolate the phenomena sufficiently to study them in depth." 1 FAIGMAN ET AL., *supra* note 16, § 1-3.4.1, at 32. This subject, therefore, is best described as one that "remain[s] on the margins of scientific skill." 1 *id.* An expert opinion on the psychological effects of stress, therefore, should be characterized as "nonscientific" knowledge. See 1 *id.*

43. See *United States v. Hall*, 974 F. Supp. 1198, 1202-06 (C.D. Ill. 1997) (holding that the testimony of a social psychologist would be admitted, provided that he did not offer an opinion as to the truth or falsity of the defendant's confession), *on remand from* 93 F.3d 1337 (7th Cir. 1996). Commenting on the showing required to demonstrate the reliability of expert testimony proffered in the field of social science, the *Hall* court stated:

In any field of social science, an expert should have to testify, at a minimum, to the longevity of that particular field, the amount of literature written about the subject, the methods of peer review among its scholarly journals, the quantity of observational or other studies conducted in that field, the comparative similarity of observations obtained, the reasons why those studies are deemed valid and reliable, and the general consensus or debate as to what the raw data means.

An econometrician's testimony in an antitrust price-fixing case provides another illustration that nonscientific testimony can sometimes rest on complex general principles that should, to the extent permitted by the relevant discipline, be validated before the testimony is found reliable.⁴⁴ Assume that, during a specified period of time, prices for a particular product were higher in the geographic market under suspicion than they were in another "benchmark" market. A multiple regression analysis that determines the relationship between the product's price (the dependent variable) and potential explanatory factors such as raw material costs, transportation costs, and quantities sold (the independent variables) might accurately demonstrate that the higher prices in the market under suspicion cannot be explained by differences in the independent variables present in each of the two markets. Assume, though, that the firms charged with fixing prices concede that the independent variables did not influence their pricing decisions and that each firm maintains that, without colluding, it simply calculated its own prices solely on the basis of the prices being charged by its competitors. Assume further that the regression analysis is then offered by the plaintiff to show that the higher prices in the defendants' market were the product of collusion rather than noncollusive oligopoly.

The trial court in this example should require the econometrician to demonstrate the validity of the general premise on which his proffered testimony rests—i.e., that a regression analysis may be used to make an accurate distinction between collusion and noncollusive oligopolistic price coordination. The court should impose upon the plaintiff the burden of showing that an econometrician faithfully adhering to the standards demanded by her profession would use the same methodology to differentiate between a collusive and noncollusive oligopoly.⁴⁵

Id. at 1203.

44. "Neither economics [n]or statistics seems [sic] to completely qualify as 'scientific knowledge.'" *Ohio ex rel. Montgomery v. Louis Trauth Dairy, Inc.*, 925 F. Supp. 1247, 1252 (S.D. Ohio 1996).

45. *Cf. Trauth Dairy*, 925 F. Supp. at 1254 (holding that testimony based on a re-

Just as substantial evidentiary support can sometimes be required to render nonscientific testimony reliable, relatively little in the way of evidentiary support can sometimes support a finding that scientific testimony is reliable. Take for example the aeronautical engineer who offers scientific testimony on how a bumblebee flies (hypothesized in *Berry v. City of Detroit* to serve as a contrast to the previously discussed beekeeper.)⁴⁶ Although the engineer is applying testable aeronautical principles in explaining how bees remain aloft, a court surely would not require him to validate these long-standing aeronautical principles with peer review studies and similar evidence as a prerequisite to demonstrating the reliability of his testimony. When, in other words, the expert seeks to apply to the specific facts of a case general scientific principles that are themselves well settled, the expert's peers, when adhering to the standards of intellectual rigor demanded by their profession, would not, and thus the court should not, require re-validation of those settled general scientific principles before conferring reliability-status on the proffered testimony.

The opposite conclusion must be reached, of course, when the expert is applying scientific principles whose validity is not settled. Assume, for example, that, in a prosecution for driving under the influence of intoxicants, the state offers expert testimony that the defendant driver's alleged intoxication is revealed by the results of a Horizontal Gaze Nystagmus (HGN) test. The determinative question should be what level of inquiry would reasonably be expected of an expert genuinely interested in ascertaining alcohol's effect on eye movements. Would specialists who conduct their research independently of litigation

gression analysis was admissible and that the plaintiff's experts could explain how their analysis was consistent with other evidence of conspiracy, but that the experts could not express the opinion that the defendants actually engaged in a conspiracy because that is a legal conclusion). The *Trauth Dairy* court cited *Petruzzi's IGA Supermarkets, Inc. v. Darling-Delaware Co.*, 998 F.2d 1224, 1241 (3d Cir. 1993), noting that *Petruzzi's* had held that a regression analysis was admissible, although (in dictum) probably not adequate, standing alone, to survive summary judgment. See *Trauth Dairy*, 925 F. Supp. at 1254.

46. See *supra* notes 33-35 and accompanying text.

Just as substantial evidentiary support can sometimes be required to render nonscientific testimony reliable, relatively little in the way of evidentiary support can sometimes support a finding that scientific testimony is reliable. Take for example the aeronautical engineer who offers scientific testimony on how a bumblebee flies (hypothesized in *Berry v. City of Detroit* to serve as a contrast to the previously discussed beekeeper.)⁴⁶ Although the engineer is applying testable aeronautical principles in explaining how bees remain aloft, a court surely would not require him to validate these long-standing aeronautical principles with peer review studies and similar evidence as a prerequisite to demonstrating the reliability of his testimony. When, in other words, the expert seeks to apply to the specific facts of a case general scientific principles that are themselves well settled, the expert's peers, when adhering to the standards of intellectual rigor demanded by their profession, would not, and thus the court should not, require re-validation of those settled general scientific principles before conferring reliability-status on the proffered testimony.

The opposite conclusion must be reached, of course, when the expert is applying scientific principles whose validity is not settled. Assume, for example, that, in a prosecution for driving under the influence of intoxicants, the state offers expert testimony that the defendant driver's alleged intoxication is revealed by the results of a Horizontal Gaze Nystagmus (HGN) test. The determinative question should be what level of inquiry would reasonably be expected of an expert genuinely interested in ascertaining alcohol's effect on eye movements. Would specialists who conduct their research independently of litigation

gression analysis was admissible and that the plaintiff's experts could explain how their analysis was consistent with other evidence of conspiracy, but that the experts could not express the opinion that the defendants actually engaged in a conspiracy because that is a legal conclusion). The *Trauth Dairy* court cited *Petruzzi's IGA Supermarkets, Inc. v. Darling-Delaware Co.*, 998 F.2d 1224, 1241 (3d Cir. 1993), noting that *Petruzzi's* had held that a regression analysis was admissible, although (in dictum) probably not adequate, standing alone, to survive summary judgment. See *Trauth Dairy*, 925 F. Supp. at 1254.

46. See *supra* notes 33-35 and accompanying text.

consider the HGN test to be an accurate predictor of a person's intoxication? If the court should find from the pertinent literature and other relevant information that the experts harbor serious doubts about the validity of the general scientific premise that underlies the results of the HGN test (i.e., that persons who consume quantities of alcohol sufficient to impair their ability to drive are substantially more likely to exhibit certain eye-movement characteristics than persons who have not consumed such quantities), the court should require the state to validate that general principle before ruling that the results of the test are sufficiently reliable to be of assistance to the jury.⁴⁷ It would be unconscionable to permit a jury verdict to be based on expert testimony that has not yet satisfied the standards of intellectual rigor demanded by the profession most qualified to assess the efficacy of the expertise being proffered in the courtroom.

47. See *State v. Murphy*, 953 S.W.2d 200, 203 (Tenn. 1997) (holding that the testimony concerning an HGN test must meet the requirements of Rules 702 and 703 and remanding the case for a determination of the reliability of the testimony).

Murphy also provides further illustration of the proposition, discussed *supra* page 1067-68, that expert testimony must be presented in a manner that will enable the jury to understand it. The jury cannot properly weigh evidence that it cannot understand. Evidence incapable of being understood by the jury cannot be of assistance to the jury and thus fails to satisfy the requirements of Rule 702.

In *Murphy*, the witness who testified about the results of the HGN test was the arresting officer who administered the test. The officer was not conversant with the general scientific principles that underlie the HGN test. See *Murphy*, 953 S.W.2d at 201-02. Even if those general principles ultimately were sufficiently validated to make HGN test results reliable, the officer's testimony, standing alone, would not have been enough to allow the opinion based on the test results to satisfy Rule 702's requirement that it be capable of assisting the jury. In order to properly weigh the results of a specific HGN test, the jury would need to understand the general principles underlying the HGN test. This is undoubtedly what the court meant when it stated:

[I]f a police officer testifies that the defendant exhibited nystagmus, that testimony has no significance to the average juror without an additional explanation of the scientific correlation between alcohol consumption and nystagmus. In effect, the juror must rely upon the specialized knowledge of the testifying witness and likely has no independent knowledge with which to evaluate the witness's testimony.

Id. at 203. Before the results of a defendant's HGN test will be admitted into evidence, therefore, the state must present the testimony of a witness sufficiently conversant with the scientific basis for the HGN test to explain that scientific basis to the jury.

As the examples discussed in this section illustrate, whether an expert opinion comprises "scientific knowledge" or "technical or other specialized" knowledge should not dictate the evidentiary showing required to establish the opinion's reliability. The evidentiary showing required in any particular case to establish an opinion's reliability should instead be dictated only by what is necessary to demonstrate that the expert has faithfully adhered to the standards of intellectual rigor demanded by her profession.

IV. CONCLUSION

Universal adoption of the "same intellectual rigor" test would ensure that trial and appellate courts alike use the same "map" as they navigate the often choppy waters of expert-admissibility determinations. The use of this common map should, in the long run, produce sufficient harmony among the decisions to provide litigants with a basis for predicting the judicial treatment of Rule 702 disputes over the reliability of expert testimony. This ability to predict the judicial treatment of such disputes, however, will be impossible, and the arbitrary results thus engendered will be intolerable, if the trial courts are not given a clear understanding of precisely what is required by Rule 702. The "same intellectual rigor" test provides an analysis for Rule 702 reliability determinations that effectuates Rule 702's purpose of ensuring jury consideration of only—and all—reliable expert testimony.

A good trial judge would sooner turn her courtroom into a circus stage than subvert the truth-seeking process by, say, allowing a jury to consider rank hearsay. Just as the trial judge is required to exclude inadmissible hearsay, so also is she commanded to exclude unreliable expert testimony. Just as a party must not be permitted to put before a jury the speculative assertions of a lay witness lacking personal knowledge of the matters on which she wishes to speak, so also must a party be prohibited from calling an expert to peddle sophistry that the expert would be unable or unwilling to express with confidence to her peers.

Exclusion of expert testimony need not undermine the

policy that the jury alone should perform the task of weighing the evidence—a policy that is every bit as fundamental to serving the ends of justice as is excluding inadmissible evidence. Faithful compliance with this policy of jury deferment dictates that, under Rule 702, a jury must be allowed to assess the merits of expert testimony offered by a properly qualified expert witness who holds, on a genuinely debated issue, a minority view that enjoys some objectively verifiable support outside the courtroom.⁴⁸ This is particularly true when the expert has herself exhibited the strength of conviction to espouse the same view, independent of litigation, in pursuit of her profession.⁴⁹ It is only when the expert, in the development of her courtroom conclusions, has failed to “adhere to the same standards of intellectual rigor that are demanded in [the expert’s] professional work” that the expert’s opinion should be withdrawn from jury consideration.⁵⁰

48. See, e.g., *Daubert v. Merrell Dow Pharm., Inc.*, 43 F.3d 1311, 1318-19 (9th Cir. 1995) (*Daubert-Remand*).

49. See, e.g., *id.*; *McDaniel v. CSX Transp., Inc.*, 955 S.W.2d 257, 266 (Tenn. 1997).

50. *Braun v. Lorillard Inc.*, 84 F.3d 230, 234 (7th Cir. 1996).