FEDERAL

Daubert v. Merrell Dow Pharms., Inc.

Supreme Court of the United States

March 30, 1993, Argued ; June 28, 1993, Decided

No. 92-102

Reporter
509 U.S. 579 *; 113 S. Ct. 2786 **; 125 L. Ed. 2d 469 ***; 1993 U.S. LEXIS 4408 ****; 27 U.S.P.Q.2D (BNA) 1200; 61 U.S.L.W. 4805; 93 Cal. Daily Op. Service 4825; 93 Daily Journal DAR 8148; 23 ELR 20979; CCH Prod. Liab. Rep. P13,494; 7 Fla. L. Weekly Fed. S 632

WILLIAM DAUBERT, ET UX., ETC., ET AL., PETITIONERS V. MERRELL DOW PHARMACEUTICALS, INC.

Prior History: [****1] ON WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE NINTH CIRCUIT.

Disposition: 951 F.2d 1128, vacated and remanded.

Core Terms

scientific, admissibility, rules of evidence, reliability, expert testimony, scientific evidence, general acceptance, studies, scientific knowledge, methodology, scientific testimony, trier of fact, birth defect, courts, observations, peer review, petitioners', special knowledge, common law, epidemiological, questions, subjected, grounds, testing, Amici, scientific community, expert opinion, authorities, evidentiary, confidence

Case Summary

Procedural Posture

Petitioners appealed an order from the United States Court of Appeals for the Ninth Circuit, which affirmed the trial court's grant of summary judgment for respondent drug company. Petitioners challenged the finding that its experts' opinions were inadmissible as unreliable where opinions were based on recalculations of study data and such recalculations had not been subjected to peer review or published.

Overview

The summary judgment was reversed where expert opinions were admissible to show respondent's drug caused birth defects despite the fact that the experts' analysis had not been published or subject to peer review. Petitioners were children with serious birth defects. Their parents alleged that the mothers' ingestion of respondent's drug caused defects. Respondent brought a motion for summary judgment, supported by proof that the drug did not cause defects. Petitioners responded with expert opinions that the drug did cause defects. The opinions were based on a reanalysis of previously published studies stating the drug did not cause defects. The trial court granted respondent's motion, holding petitioners' scientific evidence was inadmissible because the reanalyzed studies were not reliable where they had not been published. Petitioners appealed. The Court vacated and remanded, holding that a technique upon which an expert opinion was based did not have to be generally accepted as reliable as a precondition to the opinion's admission as long as the standards of reliability and relevance under the federal evidence rules were met.

Outcome

The Court vacated and reversed the appellate court's affirmance of a judgment granting respondent summary judgment. Where petitioners' expert evidence was reliable under federal rules, the evidence was admissible. The common law standard for determining reliability of scientific evidence was inapplicable where federal evidence rules superceded the common law. Publication or peer review of the experts' recalculation was thus unnecessary.

LexisNexis® Headnotes

Evidence > Rule Application & Interpretation

HN1[] **Evidence, Rule Application & Interpretation**

The court must interpret the legislatively enacted Federal Rules of Evidence as it would any statute.

Evidence > Relevance > Relevant Evidence

HN2[] Relevance, Relevant Evidence

See Fed. R. Evid. 402.

Evidence > Relevance > Relevant Evidence

HN3[] Relevance, Relevant Evidence

"Relevant evidence" is defined as that which has any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence. Fed. R. Evid. 401. The Rules' basic standard of relevance thus is a liberal one.

Evidence > ... > Testimony > Expert Witnesses > General Overview

HN4[] Testimony, Expert Witnesses

See Fed. R. Evid. 702.

Evidence > Admissibility > Scientific Evidence > General Overview

Evidence > ... > Testimony > Expert Witnesses > General Overview

HN5[] Admissibility, Scientific Evidence

Nothing in the text of Fed. R. Evid. 702 establishes "general acceptance" as an absolute prerequisite to admissibility of scientific evidence.

Civil Procedure > Judicial Officers > Judges > General Overview

Evidence > Relevance > Relevant Evidence

Evidence > Admissibility > Scientific Evidence > General Overview

Evidence > Admissibility > Scientific Evidence > Standards for Admissibility

Evidence > ... > Testimony > Expert Witnesses > General Overview

HN6[] Judicial Officers, Judges

Under the Federal Rules of Evidence, the trial judge must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable.

Evidence > ... > Testimony > Expert Witnesses > General Overview

Evidence > Relevance > Relevant Evidence

HN7[] Testimony, Expert Witnesses

The requirement that an expert's testimony pertain to scientific knowledge establishes a standard of evidentiary reliability.

Civil Procedure > Judicial Officers > Judges > General Overview

Evidence > ... > Procedural Matters > Preliminary Questions > General Overview

Evidence > ... > Testimony > Expert Witnesses > General Overview

Evidence > Admissibility > Expert Witnesses > Helpfulness

HN8[] Judicial Officers, Judges

Faced with a proffer of expert scientific testimony, the trial judge must determine at the outset, pursuant to Fed. R. Evid. 104(a), whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue. This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue.

Evidence > ... > Testimony > Expert

Witnesses > General Overview

HN9[] Testimony, Expert Witnesses

Ordinarily, a key question to be answered in determining whether a theory or technique is scientific knowledge under Fed. R. Evid. 702 that will assist the trier of fact will be whether it can be (and has been) tested. Scientific methodology today is based on generating hypotheses and testing them to see if they can be falsified; indeed, this methodology is what distinguishes science from other fields of human inquiry. Another pertinent consideration is whether the theory or technique has been subjected to peer review and publication. Publication (which is but one element of peer review) is not a sine qua non of admissibility; it does not necessarily correlate with reliability, and in some instances well-grounded but innovative theories will not have been published. Some propositions, moreover, are too particular, too new, or of too limited interest to be published. But submission to the scrutiny of the scientific community is a component of "good science," in part because it increases the likelihood that substantive flaws in methodology will be detected.

Evidence > ... > Testimony > Expert Witnesses > General Overview

HN10[] Testimony, Expert Witnesses

For purposes of determining whether a theory or technique is scientific knowledge under Fed. R. Evid. 702, in the case of a particular scientific technique, the court ordinarily should consider the known or potential rate of error, and the existence and maintenance of standards controlling the technique's operation. Finally, "general acceptance" can yet have a bearing on the inquiry. A reliability assessment does not require, although it does permit, explicit identification of a relevant scientific community and an express determination of a particular degree of acceptance within that community. Widespread acceptance can be an important factor in ruling particular evidence admissible, and a known technique which has been able to attract only minimal support within the community, may properly be viewed with skepticism. The inquiry envisioned by Rule 702 is a flexible one. Its overarching subject is the scientific validity -- and thus the evidentiary relevance and reliability -- of the principles that underlie a proposed submission. The focus, of course, must be solely on principles and methodology, not on the conclusions that they generate.

Evidence > ... > Testimony > Examination > General Overview

Evidence > Relevance > Relevant Evidence

HN11[] Testimony, Examination

Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.

Civil Procedure > ... > Summary Judgment > Entitlement as Matter of Law > General Overview

Evidence > Admissibility > Scientific Evidence > General Overview

Civil Procedure > Trials > Judgment as Matter of Law > General Overview

HN12[] Summary Judgment, Entitlement as Matter of Law

In the event the trial court concludes that the scintilla of evidence presented supporting a position is insufficient to allow a reasonable juror to conclude that the position more likely than not is true, the court remains free to direct a judgment, Fed. R. Civ. P. 50(a), and likewise to grant summary judgment, Fed. R. Civ. P. 56.

Evidence > Admissibility > Expert Witnesses

Evidence > Admissibility > Scientific Evidence > General Overview

Evidence > ... > Testimony > Expert Witnesses > General Overview

HN13[] Admissibility, Expert Witnesses

"General acceptance" is not a necessary precondition to the admissibility of scientific evidence under the Federal Rules of Evidence, but the Rules of Evidence, Fed. R. Evid. 702, do assign to the trial judge the task of ensuring that an expert's testimony both rests on a

reliable foundation and is relevant to the task at hand. Pertinent evidence based on scientifically valid principles will satisfy those demands.

Lawyers' Edition Display

Decision

"General acceptance" of principle underlying scientific evidence held not to be necessary precondition to admissibility of such evidence under Federal Rules of Evidence.

Summary

A minor child and his parents, together with another minor child and his mother, brought suit in a California state court against a drug company which had marketed the prescription drug Bendectin. The plaintiffs alleged that the children's birth defects had been caused by the mothers' ingestion of Bendectin during pregnancy. The suit was removed, on diversity grounds, to the United States District Court for the Southern District of California. The company moved for summary judgment and submitted, in support of the motion, the affidavit of an epidemiologist to the effect that no published epidemiological (human statistical) study had demonstrated a statistically significant association between Bendectin and birth defects. In response, the plaintiffs offered expert opinion testimony based on (1) test-tube and live-animal studies that had allegedly found a link between Bendectin and birth defects; (2) pharmacological studies that allegedly showed similarities between the chemical structure of Bendectin and that of substances known to cause birth defects; and (3) the reanalysis, or recalculation, of previously published epidemiological studies. The District Court, granting summary judgment in favor of the company, expressed the view that (1) scientific evidence is admissible under the Federal Rules of Evidence only if the principle on which such evidence is based is sufficiently established to have general acceptance in the field to which it belongs; (2) epidemiological studies were the most reliable evidence of causation of birth defects; (3) the testimony based on test-tube, live-animal, and pharmacological studies was inadmissible because such testimony was not based on epidemiological evidence; and (4) the testimony based on reanalyses was inadmissible because the reanalyses (a) apparently had never been published or subjected to peer review, and (b) failed to show a statistically significant association between Bendectin and birth defects (727 F Supp 570). The United States Court of Appeals for the Ninth Circuit, affirming on appeal, expressed the view that (1) expert opinion based on a scientific technique is inadmissible if the technique is not generally accepted as reliable in the relevant scientific community; and (2) under the general acceptance standard, the plaintiffs' evidence provided an insufficient foundation to allow admission of expert testimony that Bendectin caused birth defects (951 F2d 1128).

On certiorari, the United States Supreme Court vacated the Court of Appeals' judgment and remanded the case for further proceedings. In an opinion by Blackmun, J., expressing the unanimous view of the court as to holding 1 below, and joined by White, O'Connor, Scalia, Kennedy, Souter, and Thomas, JJ., as to holdings 2 and 3 below, it was held that (1) the "general acceptance" test of Frye v United States (1923) 54 App DC 46, 293 F 1013, 34 ALR 145, was superseded by the Federal Rules of Evidence (FRE), and thus general acceptance is not a necessary precondition to the admissibility of scientific evidence under the FRE, given that (a) nothing in the text of Rule 702 of the FRE, governing expert testimony, establishes general acceptance as an absolute prerequisite to admissibility, and (b) there is no indication that Rule 702 or the FRE as a whole were intended to incorporate a general acceptance standard; (2) under the FRE, a federal trial judge must insure that any and all scientific testimony or evidence is not only relevant but reliable; and (3) in a federal case involving scientific evidence, evidentiary reliability is based on scientific validity.

Rehnquist, Ch. J., joined by Stevens, J., concurring in part and dissenting in part, (1) agreed that (a) the Frye "general acceptance" rule did not survive the enactment of the FRE, and (b) Rule 702 of the FRE confides to the trial judge some gatekeeping responsibility in deciding questions of the admissibility of proffered expert testimony; but (2) expressed the view that the Supreme Court should have left the further development of the area of the law in question to future cases.

Headnotes

EVIDENCE §641 > expert scientific testimony -- admissibility -- general acceptance standard -- > Headnote: LEdHN[1A] [1A] LEdHN[1B] [1B] LEdHN[1C] [1C] LEdHN[1D] [1D] LEdHN[1E] [1E]

A standard under which the exclusive test for admitting expert scientific testimony is whether the principle on which such testimony is based has general acceptance in the field to which it belongs is not to be applied in federal trials; the "general acceptance" test of *Frye v United States (1923) 54 App DC 46, 293 F 1013, 34 ALR 145*, is superseded by the Federal Rules of Evidence (FRE), and thus general acceptance is not a necessary precondition to the admissibility of scientific evidence under the FRE, given that (1) nothing in the text of *Rule 702 of the FRE*, governing expert testimony, establishes general acceptance as an absolute prerequisite to admissibility; and (2) there is no indication that *Rule 702* or the FRE as a whole are intended to incorporate a general acceptance standard, as (a) the drafting history makes no mention of the Frye decision, and (b) a rigid general acceptance requirement would be at odds with the liberal thrust of the FRE and their general approach of relaxing the traditional barriers to opinion testimony.

COURTS §538.11 > construction of rules -- > Headnote:
LEdHN[2][] [2]

A court properly interprets the legislatively enacted Federal Rules of Evidence as the court would interpret any statute.

EVIDENCE §641 > expert scientific testimony -- reliability -- > Headnote:
LEdHN[3A][] [3A]***LEdHN[3B]***[] [3B]***LEdHN[3C]***[] [3C]

Under the Federal Rules of Evidence (FRE), a federal trial judge is not disabled from screening purportedly scientific evidence; rather, the trial judge must insure that any and all scientific testimony or evidence admitted is not only relevant but reliable; the primary locus of this obligation is *Rule 702 of the FRE*, which governs expert testimony as to scientific knowledge; for purposes of *Rule 702*, "scientific" implies a grounding in the methods and procedure of science, and "knowledge" connotes more than subjective belief or unsupported speculation; although it would be unreasonable to conclude that the subject of scientific testimony must be known to a certainty, *Rule 702* requires that proposed scientific testimony be supported by appropriate validation--that is, good grounds--based on what is known; *Rule 702*'s requirement that an expert's scientific testimony pertain to "scientific knowledge" establishes a standard of evidentiary reliability, that is, trustworthiness; in a federal case involving scientific evidence, evidentiary reliability is based on scientific validity. (Rehnquist, Ch. J., and Stevens, J., dissented in part from this holding.)

EVIDENCE §641 > expert scientific testimony -- relevance -- > Headnote:
LEdHN[4A][] [4A]***LEdHN[4B]***[] [4B]

The "helpfulness" standard of *Rule 702 of the Federal Rules of Evidence (FRE)*, which requires that scientific evidence or testimony assist the trier of fact to understand the evidence or to determine a fact in issue--a condition that goes primarily to relevance--requires a valid scientific connection to the pertinent inquiry as a precondition to admissibility; for purposes of *Rule 702*, expert testimony which does not relate to any issue in the case at hand is not relevant and thus is nonhelpful.

EVIDENCE §641 > expert witnesses -- > Headnote:
LEdHN[5][] [5]

Unlike an ordinary witness, an expert witness is permitted wide latitude, under the Federal Rules of Evidence, to offer opinions, including those that are not based on firsthand knowledge or observation.

EVIDENCE §641 > expert scientific testimony -- > Headnote:
LEdHN[6][] [6]

Pursuant to *Rule 104(a) of the Federal Rules of Evidence*, governing preliminary questions concerning the admissibility of evidence, a federal trial judge who is faced with a proffer of expert scientific testimony must determine at the outset whether the expert is proposing to testify to scientific knowledge that will assist the trier of fact to understand or determine a fact in issue; this determination entails a preliminary assessment of (1) whether the reasoning or methodology underlying the testimony is scientifically valid, and (2) whether that

reasoning or methodology properly can be applied to the facts in issue. (Rehnquist, Ch. J., and Stevens, J., dissented in part from this holding.)

EVIDENCE §383 > burden of proof -- > Headnote:
LEdHN[7A][] [7A]LEdHN[7B][] [7B]

Matters to be determined by a federal trial court pursuant to Rule 104(a) of the Federal Rules of Evidence--that is, preliminary questions concerning the qualification of a person to be a witness, the existence of a privilege, or the admissibility of evidence--are to be established by a preponderance of proof.

EVIDENCE §67 > science -- admissibility -- judicial notice -- > Headnote:
LEdHN[8A][] [8A]LEdHN[8B][] [8B]

The requirements of Rule 702 of the Federal Rules of Evidence (FRE) for the admissibility of expert scientific evidence do not apply specially or exclusively to unconventional evidence; however, theories that are so firmly established as to have attained the status of scientific law, such as the laws of thermodynamics, properly are subject to judicial notice under Rule 201 of the FRE.

EVIDENCE §641 > expert scientific testimony -- admissibility -- > Headnote:
LEdHN[9][] [9]

In determining whether a theory or technique is scientific knowledge that will assist the trier of fact, so as to be the basis of admissible evidence under Rule 702 of the Federal Rules of Evidence, (1) a key question to be answered is, ordinarily, whether the theory or technique can be and has been tested; (2) a pertinent consideration is whether the theory or technique has been subjected to peer review and publication, although the fact of publication, or lack thereof, in a peer-reviewed journal is not a dispositive consideration; (3) the court should ordinarily consider the known or potential rate of error of a particular scientific technique; (4) the assessment of reliability permits, but does not require, explicit identification of a relevant scientific community and an express determination of a particular degree of acceptance of the theory or technique within that community, as (a) widespread acceptance can be an important factor in ruling particular evidence admissible, and (b) a known technique that has been able to attract only minimal support within the scientific community may properly be viewed with skepticism; and (5) the inquiry is a flexible one, and the focus must be solely on principles and methodology, not on the conclusions that such principles and methodology generate. (Rehnquist, Ch. J., and Stevens, J., dissented in part from this holding.)

TRIAL §15 > witnesses -- control -- > Headnote:
LEdHN[10][] [10]

Since expert evidence can be both powerful and misleading because of the difficulty in evaluating such evidence, a federal trial judge--in weighing, under Rule 403 of the Federal Rules of Evidence, the possible danger of unfair prejudice resulting from such evidence against the evidence's probative force--exercises more control over experts than over lay witnesses.

EVIDENCE §641 > SUMMARY JUDGMENT AND JUDGMENT ON PLEADINGS §1 > TRIAL §199 > WITNESSES §59 > scientific testimony -- attack -- > Headnote:
LEdHN[11][] [11]

In federal cases, the appropriate means of attacking scientific testimony, where the basis of such testimony meets the admissibility standards of Rule 702 of the Federal Rules of Evidence, are (1) vigorous cross-examination, (2) presentation of contrary evidence, and (3) careful instruction on the burden of proof; additionally, in the event that the trial court concludes that a scintilla of such evidence presented to support a position is insufficient to allow a reasonable juror to conclude that the position more likely than not is true, the court remains free to direct a judgment under Rule 50(a) of the Federal Rules of Civil Procedure (FRCP) and to grant summary judgment under Rule 56 of the FRCP.

APPEAL §1692.3 > remand -- misconception of law -- > Headnote:
LEdHN[12] [12]

On certiorari to review a United States Court of Appeals judgment which upheld a United States District Court's ruling that proffered scientific evidence as to the alleged causation of birth defects was inadmissible, the United States Supreme Court will vacate the Court of Appeals' judgment and remand the case for further proceedings, where (1) the inquiries of the District Court and the Court of Appeals as to the admissibility of the evidence focused almost exclusively on whether the principle on which the evidence was based had gained "general acceptance," as gauged by publication and the decisions of other courts; and (2) the Supreme Court holds that general acceptance is not a necessary precondition to the admissibility of scientific evidence under the Federal Rules of Evidence.

Syllabus

Petitioners, two minor children and their parents, alleged in their suit against respondent that the children's serious birth defects had been caused by the mothers' prenatal ingestion of Bendectin, a prescription drug marketed by respondent. The District Court granted respondent summary judgment based on a well-credentialed expert's affidavit concluding, upon reviewing the extensive published scientific literature on the subject, that maternal use of Bendectin has not been shown to be a risk factor for human birth defects. Although petitioners had responded with the testimony of eight other well-credentialed experts, who based their conclusion that Bendectin can cause birth defects on animal studies, chemical structure analyses, and the unpublished "reanalysis" **[****2]** of previously published human statistical studies, the court determined that this evidence did not meet the applicable "general acceptance" standard for the admission of expert testimony. The Court of Appeals agreed and affirmed, citing *Frye v. United States, 54 App. D.C. 46, 47, 293 F. 1013, 1014*, for the rule that expert opinion based on a scientific technique is inadmissible unless the technique is "generally accepted" as reliable in the relevant scientific community.

Held: The Federal Rules of Evidence, not *Frye*, provide the standard for admitting expert scientific testimony in a federal trial. Pp. 585-597.

(a) *Frye*'s "general acceptance" test was superseded by the Rules' adoption. The Rules occupy the field, *United States v. Abel, 469 U.S. 45, 49, 83 L. Ed. 2d 450, 105 S. Ct. 465*, and, although the common law of evidence may serve as an aid to their application, *id., at 51-52*, respondent's assertion that they some-how assimilated *Frye* is unconvincing. Nothing in the Rules as a whole or in the text and drafting history of *Rule 702*, which specifically governs expert testimony, gives any indication **[****3]** that "general acceptance" is a necessary precondition to the admissibility of scientific evidence. Moreover, such a rigid standard would be at odds with the Rules' liberal thrust and their general approach of relaxing the traditional barriers to "opinion" testimony. Pp. 585-589.

(b) The Rules -- especially *Rule 702* -- place appropriate limits on the admissibility of purportedly scientific evidence by assigning to the trial judge the task of ensuring that an expert's testimony both rests on a reliable foundation and is relevant to the task at hand. The reliability standard is established by *Rule 702*'s requirement that an expert's testimony pertain to "scientific . . . knowledge," since the adjective "scientific" implies a grounding in science's methods and procedures, while the word "knowledge" connotes a body of known facts or of ideas inferred from such facts or accepted as true on good grounds. The Rule's requirement that the testimony "assist the trier of fact to understand the evidence or to determine a fact in issue" goes primarily to relevance by demanding a valid scientific connection to the pertinent inquiry as a precondition to admissibility. Pp. 589-592.

(c) Faced **[****4]** with a proffer of expert scientific testimony under *Rule 702*, the trial judge, pursuant to *Rule 104(a)*, must make a preliminary assessment of whether the testimony's underlying reasoning or methodology is scientifically valid and properly can be applied to the facts at issue. Many considerations will bear on the inquiry, including whether the theory or technique in question can be (and has been) tested, whether it has been subjected to peer review and publication, its known or potential error rate and the existence and maintenance of standards controlling its operation, and whether it has attracted widespread acceptance within a relevant scientific community. The inquiry is a flexible one, and its focus must be solely on principles and methodology, not on the conclusions that they generate. Throughout, the judge should also be mindful of other applicable Rules. Pp. 592-595.

(d) Cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof, rather than wholesale exclusion under an uncompromising "general acceptance" standard, is the appropriate means by which evidence based on valid principles may be challenged. That even limited screening **[****5]** by the trial judge, on occasion, will prevent the jury from hearing of authentic scientific breakthroughs is simply a consequence of the fact that the Rules are not designed to seek cosmic understanding but, rather, to resolve legal disputes. Pp. 595-597.

Counsel: Michael H. Gottesman argued the cause for petitioners. With him on the briefs were Kenneth J. Chesebro, Barry J. Nace, David L. Shapiro, and Mary G. Gillick.

Charles Fried argued the cause for respondent. With him on the brief were Charles R. Nesson, Joel I. Klein, Richard G. Taranto, Hall R. Marston, George E. Berry, Edward H. Stratemeier, and W. Glenn Forrester. *

[**6]**

Judges: BLACKMUN, J., delivered the opinion for a unanimous Court with respect to Parts I and II-A, and the opinion of the Court with respect to Parts II-B, II-C, III, and IV, in which WHITE, O'CONNOR, SCALIA, KENNEDY, SOUTER, and THOMAS, JJ., joined. REHNQUIST, C. J., filed an opinion concurring in part and dissenting in part, in which STEVENS, J., joined, post, p. 598.

Opinion by: BLACKMUN

Opinion

[1201] [*582] [*476] [**2791]** JUSTICE **BLACKMUN** delivered the opinion of the Court.

LEdHN[1A][] [1A]In this case we are called upon to determine the standard for admitting expert scientific testimony in a federal trial.

I

Petitioners Jason Daubert and Eric Schuller are minor children born with serious birth defects. They and their parents sued respondent in California state court, alleging that the birth defects had been caused by the mothers' ingestion of Bendectin, a prescription antinausea drug marketed by respondent. Respondent removed the suits to federal court on diversity grounds.

After extensive discovery, respondent moved for summary judgment, contending that Bendectin does not cause birth defects in humans and **[****7]** that petitioners would be unable to come forward with any admissible evidence that it does. In support of its motion, respondent submitted an affidavit of Steven H. Lamm, physician and epidemiologist, who is a well-credentialed expert on the risks from exposure to

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* Briefs of amici curiae urging reversal were filed for the State of Texas et al. by Dan Morales, Attorney General of Texas, Mark Barnett, Attorney General of South Dakota, Marc Racicot, Attorney General of Montana, Larry EchoHawk, Attorney General of Idaho, and Brian Stuart Koukoutchos; for the American Society of Law, Medicine and Ethics et al. by Joan E. Bertin, Marsha S. Berzon, and Albert H. Meyerhoff; for the Association of Trial Lawyers of America by Jeffrey Robert White and Roxanne Barton Conlin; for Ronald Bayer et al. by Brian Stuart Koukoutchos, Priscilla Budeiri, Arthur Bryant, and George W. Conk; and for Daryl E. Chubin et al. by Ron Simon and Nicole Schultheis.

Briefs of amici curiae urging affirmance were filed for the United States by Acting Solicitor General Wallace, Assistant Attorney General Gerson, Miguel A. Estrada, Michael Jay Singer, and John P. Schnitker; for the American Insurance Association by William J. Kilberg, Paul Blankenstein, Bradford R. Clark, and Craig A. Berrington; for the American Medical Association et al. by Carter G. Phillips, Mark D. Hopson, and Jack R. Bierig; for the American Tort Reform Association by John G. Kester and John W. Vardaman, Jr.; for the Chamber of Commerce of the United States by Timothy B. Dyk, Stephen A. Bokat, and Robin S. Conrad; for the Pharmaceutical Manufacturers Association by Louis R. Cohen and Daniel Marcus; for the Product Liability Advisory Council, Inc., et al. by Victor E. Schwartz, Robert P. Charrow, and Paul F. Rothstein; for the Washington Legal Foundation by Scott G. Campbell, Daniel J. Popeo, and Richard A. Samp; and for Nicolaas Bloembergen et al. by Martin S. Kaufman.

Briefs of amici curiae were filed for the American Association for the Advancement of Science et al. by Richard A. Meserve and Bert Black; for the American College of Legal Medicine by Miles J. Zaremski; for the Carnegie Commission on Science, Technology, and Government by Steven G. Gallagher, Elizabeth H. Esty, and Margaret A. Berger; for the Defense Research Institute, Inc., by Joseph A. Sherman, E. Wayne Taff, and Harvey L. Kaplan; for the New England Journal of Medicine et al. by Michael Malina and Jeffrey I. D. Lewis; for A Group of American Law Professors by Donald N. Bersoff; for Alvan R. Feinstein by Don M. Kennedy, Loretta M. Smith, and Richard A. Oetheimer; and for Kenneth Rothman et al. by Neil B. Cohen.

various chemical substances. [1] Doctor Lamm stated that he had **[1202]** reviewed all the literature on Bendectin and human birth defects -- more than 30 published studies involving over 130,000 patients. No study had found Bendectin to be a human teratogen (*i.e.*, a substance capable of causing malformations in fetuses). On the basis of this review, Doctor Lamm concluded that maternal use of Bendectin during the first trimester of pregnancy has not been shown to be a risk factor for human birth defects.

[**8] [*583]** Petitioners did not (and do not) contest this characterization of the published record regarding Bendectin. Instead, they responded to respondent's motion with the testimony of eight experts of their own, each of whom also possessed impressive credentials. [2] These experts had concluded that Bendectin can cause birth defects. Their conclusions were based upon "in vitro" (test tube) and "in vivo" (live) animal studies that **[***477]** found a link between Bendectin and malformations; pharmacological studies of the chemical structure of Bendectin that purported to show similarities between the structure of the drug and that of other substances known to cause birth defects; and the "reanalysis" of previously **[**2792]** published epidemiological (human statistical) studies.

[**9]** The District Court granted respondent's motion for summary judgment. The court stated that scientific evidence is admissible only if the principle upon which it is based is "'sufficiently established to have general acceptance in the field to which it belongs.'" 727 F. Supp. 570, 572 (SD Cal. 1989), quoting United States v. Kilgus, 571 F.2d 508, 510 (CA9 1978). The court concluded that petitioners' evidence did not meet this standard. Given the vast body of epidemiological data concerning Bendectin, the court held, expert opinion which is not based on epidemiological evidence **[*584]** is not admissible to establish causation. 727 F. Supp. at 575. Thus, the animal-cell studies, live-animal studies, and chemical-structure analyses on which petitioners had relied could not raise by themselves a reasonably disputable jury issue regarding causation. *Ibid.* Petitioners' epidemiological analyses, based as they were on recalculations of data in previously published studies that had found no causal link between the drug and birth defects, were ruled to be inadmissible because they had not been published or subjected to peer review. **[****10]** *Ibid.*

The United States Court of Appeals for the Ninth Circuit affirmed. 951 F.2d 1128 (1991). Citing Frye v. United States, 54 App. D.C. 46, 47, 293 F. 1013, 1014 (1923), the court stated that expert opinion based on a scientific technique is inadmissible unless the technique is "generally accepted" as reliable in the relevant scientific community. 951 F.2d at 1129-1130. The court declared that expert opinion based on a methodology that diverges "significantly from the procedures accepted by recognized authorities in the field . . . cannot be shown to be 'generally accepted as a reliable technique.'" *Id., at 1130*, quoting United States v. Solomon, 753 F.2d 1522, 1526 (CA9 1985).

The court emphasized that other Courts of Appeals considering the risks of Bendectin had refused to admit reanalyses of epidemiological studies that had been neither published nor subjected to peer review. 951 F.2d at 1130-1131. Those courts had found unpublished reanalyses "particularly problematic in light of the massive weight of the original published studies supporting [respondent's] position, **[****11]** all of which had undergone full scrutiny from the scientific community." *Id., at 1130*. Contending that reanalysis is generally accepted by the scientific community only when it is subjected to verification and scrutiny by others in the field, the Court of Appeals rejected petitioners' reanalyses as "unpublished, not subjected to the normal peer review process and generated solely for use in litigation." *Id., at 1131*. The **[*585]** court concluded that petitioners' evidence provided an insufficient foundation to allow admission of expert testimony that Bendectin

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[1] Doctor Lamm received his master's and doctor of medicine degrees from the University of Southern California. He has served as a consultant in birth-defect epidemiology for the National Center for Health Statistics and has published numerous articles on the magnitude of risk from exposure to various chemical and biological substances. App. 34-44.

[2] For example, Shanna Helen Swan, who received a master's degree in biostatistics from Columbia University and a doctorate in statistics from the University of California at Berkeley, is chief of the section of the California Department of Health and Services that determines causes of birth defects and has served as a consultant to the World Health Organization, the Food and Drug Administration, and the National Institutes of Health. *Id., at 113-114, 131-132*. Stuart A. Newman, who received his bachelor's degree in chemistry from Columbia University and his master's and doctorate in chemistry from the University of Chicago, is a professor at New York Medical College and has spent over a decade studying the effect of chemicals on limb development. *Id., at 54-56*. The credentials of the others are similarly impressive. See *id., at 61-66, 73-80, 148-153, 187-192*, and Attachments 12, 20, 21, 26, 31, and 32 to Petitioners' Opposition to Summary Judgment in No. 84-2013-G(I) (SD Cal.).

caused their injuries and, accordingly, that petitioners could not satisfy their burden of proving causation at trial.

[1203] We granted certiorari, *506 U.S. 914 [***478] (1992)*, in light of sharp divisions among the courts regarding the proper standard for the admission of expert testimony. Compare, *e.g.*, *United States v. Shorter, 257 U.S. App. D.C. 358, 363-364, 809 F.2d 54, 59-60* (applying the "general acceptance" standard), cert. denied, *484 U.S. 817, 98 L. Ed. 2d 35, 108 S. Ct. 71 (1987)*, with *DeLuca v. Merrell Dow Pharmaceuticals, Inc., 911 F.2d 941, 955 (CA3 1990)* **[****12]** (rejecting the "general acceptance" standard).

II

A

In the 70 years since its formulation in the *Frye* case, the "general acceptance" test has been the dominant standard for determining the admissibility of novel scientific evidence at trial. See E. Green & C. Nesson, Problems, Cases, and Materials on Evidence 649 (1983). Although under increasing attack of late, the rule continues to be followed by a **[**2793]** majority of courts, including the Ninth Circuit. [3]

The *Frye* test has its origin in a short and citation-free 1923 decision concerning the admissibility of evidence derived from a systolic blood pressure deception test, a crude precursor to the polygraph machine. In what has become a famous (perhaps infamous) passage, the then Court of Appeals for the District of Columbia described the device and its operation and declared: **[****13]**

> "Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages **[*586]** is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, *the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.*" *54 App. D.C. at 47, 293 F. at 1014* (emphasis added).

Because the deception test had "not yet gained such standing and scientific recognition among physiological and psychological authorities as would justify the courts in admitting expert testimony deduced from the discovery, development, and experiments thus far made," evidence of its results was ruled inadmissible. *Ibid.*

LEdHN[1B][↑] [1B]The merits of the *Frye* test have been much debated, and scholarship on its proper scope and application is legion. [4] **[****15]** **[*587]** Petitioners' primary **[***479]** attack, however, **[****14]** is not on the content but on the continuing authority of the rule. They contend that the *Frye* test was superseded by the adoption of the Federal Rules of Evidence. [5] We agree.

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[3] For a catalog of the many cases on either side of this controversy, see P. Giannelli & E. Imwinkelried, Scientific Evidence § 1-5, pp. 10-14 (1986 and Supp. 1991).

[4] See, *e.g.*, Green, Expert Witnesses and Sufficiency of Evidence in Toxic Substances Litigation: The Legacy of *Agent Orange* and Bendectin Litigation, *86 Nw. U. L. Rev. 643 (1992)* (hereinafter Green); Becker & Orenstein, The Federal Rules of Evidence After Sixteen Years -- The Effect of "Plain Meaning" Jurisprudence, the Need for an Advisory Committee on the Rules of Evidence, and Suggestions for Selective Revision of the Rules, *60 Geo. Wash. L. Rev. 857, 876-885 (1992)*; Hanson, James Alphonzo Frye is Sixty-Five Years Old; Should He Retire?, 16 West. St. U. L. Rev. 357 (1989); Black, A Unified Theory of Scientific Evidence, *56 Ford. L. Rev. 595 (1988)*; Imwinkelried, The "Bases" of Expert Testimony: The Syllogistic Structure of Scientific Testimony, *67 N. C. L. Rev. 1 (1988)*; Proposals for a Model Rule on the Admissibility of Scientific Evidence, 26 Jurimetrics J. 235 (1986); Giannelli, The Admissibility of Novel Scientific Evidence: *Frye* v. *United States*, a Half-Century Later, 80 Colum. L. Rev. 1197 (1980); The Supreme Court, 1986 Term, *101 Harv. L. Rev. 7, 119, 125-127 (1987)*.

Indeed, the debates over *Frye* are such a well-established part of the academic landscape that a distinct term -- "*Frye*-ologist" -- has been advanced to describe those who take part. See Behringer, Introduction, Proposals for a Model Rule on the Admissibility of Scientific Evidence, 26 Jurimetrics J. 237, 239 (1986), quoting Lacey, Scientific Evidence, 24 Jurimetrics J. 254, 264 (1984).

[5] Like the question of *Frye*'s merit, the dispute over its survival has divided courts and commentators. Compare, *e.g.*, *United States v. Williams, 583 F.2d 1194 (CA2 1978)* (*Frye* is superseded by the Rules of Evidence), cert. denied, ***439 U.S. 1117, 59 L. Ed. 2d 77, 99 S. Ct. 1025 (1979)***, with *Christophersen v. Allied-Signal Corp., 939 F.2d 1106, 1111, 1115-1116 (CA5 1991)* (en banc) (*Frye* and the Rules coexist), cert. denied, ***503 U.S. 912, 117 L. Ed. 2d 506, 112 S. Ct. 1280 (1992)***, 3 J. Weinstein & M. Berger, Weinstein's Evidence P702[03], pp. 702-36 to 702-37 (1988) (hereinafter

superseded.

LEdHN[2][] [2]We HN1[] interpret the legislatively enacted **[****16]** Federal Rules of Evidence as we would any statute. Beech Aircraft Corp. v. Rainey, 488 U.S. 153, 163, 102 L. Ed. 2d 445, 109 S. Ct. 439 (1988). Rule 402 provides the baseline:

> HN2[] "All relevant evidence is admissible, except as otherwise provided by the Constitution **[1204]** of the United States, by Act of Congress, **[**2794]** by these rules, or by other rules prescribed by the Supreme Court pursuant to statutory authority. Evidence which is not relevant is not admissible."

HN3[] "Relevant evidence" is defined as that which has "any tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence." Rule 401. The Rules' basic standard of relevance thus is a liberal one.

Frye, of course, predated the Rules by half a century. In United States v. Abel, 469 U.S. 45, 83 L. Ed. 2d 450, 105 S. Ct. 465 (1984), we considered the pertinence of background common **[****17]** law in interpreting the Rules of Evidence. We noted that the Rules occupy the field, id., at 49, but, quoting Professor Cleary, the Reporter, **[*588]** explained that the common law nevertheless could serve as an aid to their application:

> "'In principle, under the Federal Rules no common law of evidence remains. "All relevant evidence is admissible, except as otherwise provided . . . ." In reality, of course, the body of common law knowledge continues to exist, though in the somewhat altered form of a source of guidance in the exercise of delegated powers.'" Id., at 51-52.

We found the common-law precept at issue in the *Abel* case entirely consistent with Rule 402's general requirement of admissibility, and considered it unlikely that the drafters had intended to change the rule. Id., at 50-51. In Bourjaily v. United States, 483 U.S. 171, 97 L. Ed. 2d 144, 107 S. **[***480]** Ct. 2775 (1987), on the other hand, the Court was unable to find a particular common-law doctrine in the Rules, and so held it superseded.

LEdHN[1C][] [1C] **[****18]** Here there is a specific Rule that speaks to the contested issue. Rule 702, governing expert testimony, provides:

> HN4[] "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."

HN5[] Nothing in the text of this Rule establishes "general acceptance" as an absolute prerequisite to admissibility. Nor does respondent present any clear indication that Rule 702 or the Rules as a whole were intended to incorporate a "general acceptance" standard. The drafting history makes no mention of *Frye*, and a rigid "general acceptance" requirement would be at odds with the "liberal thrust" of the Federal Rules and their "general approach of relaxing the traditional barriers to 'opinion' testimony." Beech Aircraft Corp. v. Rainey, 488 U.S. at 169 (citing **[****19]** Rules 701 to 705). See also Weinstein, Rule 702 of the Federal Rules of Evidence is **[*589]** Sound; It Should Not Be Amended, 138 F.R.D. 631 (1991) ("The Rules were designed to depend primarily upon lawyer-adversaries and sensible triers of fact to evaluate conflicts"). Given the Rules' permissive backdrop and their inclusion of a specific rule on expert testimony that does not mention "general acceptance," the assertion that the Rules somehow assimilated *Frye* is unconvincing. *Frye* made "general acceptance" the exclusive test for admitting expert scientific testimony. That austere standard, absent from, and incompatible with, the Federal Rules of Evidence, should not be applied in federal trials. [6]

LEdHN[1D][] [1D]

[**20]** B

Weinstein & Berger) (*Frye* is dead), and M. Graham, Handbook of Federal Evidence § 703.2 (3d ed. 1991) (*Frye* lives). See generally P. Giannelli & E. Imwinkelried, Scientific Evidence § 1-5, at 28-29 (citing authorities).

[6] Because we hold that *Frye* has been superseded and base the discussion that follows on the content of the congressionally enacted Federal Rules of Evidence, we do not address petitioners' argument that application of the *Frye* rule in this diversity case, as the application of a judgemade rule affecting substantive rights, would violate the doctrine of Erie R. Co. v. Tompkins, 304 U.S. 64, 82 L. Ed. 1188, 58 S. Ct. 817 (1938).

LEdHN[3A][] [3A]That the *Frye* test was displaced by the Rules of Evidence does not mean, **[**2795]** however, that the Rules themselves place no limits on the admissibility of purportedly scientific evidence. [7] Nor is the trial judge disabled from screening such evidence. To the contrary, HN6[] under the Rules the trial judge must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable.

The primary locus of this obligation is Rule 702, which clearly contemplates some degree of regulation of the subjects and theories about which an expert **[****21]** may testify. "*If scientific*, technical, or other specialized *knowledge will assist the trier of fact* to understand the evidence or to determine a fact in issue" an expert "may testify *thereto*." (Emphasis added.) The subject of an expert's testimony must **[*590]** be "scientific . . . **[***481]** knowledge." [8] The adjective "scientific" implies a grounding in the methods and procedures of science. Similarly, the word "knowledge" connotes more **[1205]** than subjective belief or unsupported speculation. The term "applies to any body of known facts or to any body of ideas inferred from such facts or accepted as truths on good grounds." Webster's Third New International Dictionary 1252 (1986). Of course, it would be unreasonable to conclude that the subject of scientific testimony must be "known" to a certainty; arguably, there are no certainties in science. See, *e.g.*, Brief for Nicolaas Bloembergen et al. as *Amici Curiae* 9 ("Indeed, scientists do not assert that they know what is immutably 'true' -- they are committed to searching for new, temporary, theories to explain, as best they can, phenomena"); Brief for American Association for the Advancement of Science et al. as **[****22]** *Amici Curiae* 7-8 ("Science is not an encyclopedic body of knowledge about the universe. Instead, it represents a *process* for proposing and refining theoretical explanations about the world that are subject to further testing and refinement" (emphasis in original)). But, in order to qualify as "scientific knowledge," an inference or assertion must be derived by the scientific method. Proposed testimony must be supported by appropriate validation -- *i.e.*, "good grounds," based on what is known. In short, HN7[] the requirement that an expert's testimony pertain to "scientific knowledge" establishes a standard of evidentiary reliability. [9]

LEdHN[3B][] [3B]

[**23]**

[*591] LEdHN[4A][] [4A]Rule 702 further requires that the evidence or testimony "assist the trier of fact to understand the evidence or to determine a fact in issue." This condition goes primarily to relevance. "Expert testimony which does not relate to any issue in the case is not relevant and, ergo, non-helpful." 3 Weinstein & Berger P702[02], p. 702-18. See also United States v. Downing, 753 F.2d 1224, 1242 (CA3 1985) ("An additional consideration **[**2796]** under Rule 702 -- and another aspect of relevancy -- is whether expert testimony proffered in the case is sufficiently tied to the facts of the case that it will aid the jury in resolving a factual dispute"). The consideration has been aptly described by Judge Becker as one of "fit." *Ibid*. "Fit" is not always obvious, **[***482]** and scientific validity for one purpose is not necessarily scientific validity for other, unrelated purposes. See Starrs, *Frye v. United States* Restructured and Revitalized: A Proposal to Amend Federal Evidence Rule 702, 26 Jurimetrics J. 249, 258 (1986). The study of the phases **[****24]** of the moon, for example, may provide valid scientific "knowledge" about whether a certain night was dark,

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[7] THE CHIEF JUSTICE "do[es] not doubt that Rule 702 confides to the judge some gatekeeping responsibility," *post*, at 600, but would neither say how it does so nor explain what that role entails. We believe the better course is to note the nature and source of the duty.

[8] Rule 702 also applies to "technical, or other specialized knowledge." Our discussion is limited to the scientific context because that is the nature of the expertise offered here.

[9] We note that scientists typically distinguish between "validity" (does the principle support what it purports to show?) and "reliability" (does application of the principle produce consistent results?). See Black, 56 Ford. L. Rev., at 599. Although "the difference between accuracy, validity, and reliability may be such that each is distinct from the other by no more than a hen's kick," Starrs, *Frye v. United States* Restructured and Revitalized: A Proposal to Amend Federal Evidence Rule 702, 26 Jurimetrics J. 249, 256 (1986), our reference here is to *evidentiary* reliability -- that is, trustworthiness. Cf., *e.g.*, Advisory Committee's Notes on Fed. Rule Evid. 602, 28 U.S.C. App., p. 755 ("'The rule requiring that a witness who testifies to a fact which can be perceived by the senses must have had an opportunity to observe, and must have actually observed the fact' is a 'most pervasive manifestation' of the common law insistence upon 'the most reliable sources of information'" (citation omitted)); Advisory Committee's Notes on Art. VIII of Rules of Evidence, 28 U.S.C. App., p. 770 (hearsay exceptions will be recognized only "under circumstances supposed to furnish guarantees of trustworthiness"). In a case involving scientific evidence, *evidentiary reliability* will be based upon *scientific validity*.

and if darkness is a fact in issue, the knowledge will assist the trier of fact. However (absent creditable grounds supporting such a link), evidence that the moon was full on a certain night will not assist the trier of fact in determining whether an individual was unusually likely to have behaved irrationally on that night. Rule 702's "helpfulness" **[*592]** standard requires a valid scientific connection to the pertinent inquiry as a precondition to admissibility.

LEdHN[5][↑] [5]That these requirements are embodied in Rule 702 is not surprising. Unlike an ordinary witness, see Rule 701, an expert is permitted wide latitude to offer opinions, including those that are not based on firsthand knowledge or observation. See Rules 702 and 703. Presumably, this relaxation of the usual requirement of firsthand knowledge -- a rule which represents "a 'most pervasive manifestation' of the common law insistence upon 'the most reliable sources of information,'" Advisory Committee's Notes on Fed. Rule Evid. 602, 28 U.S.C. App., p. 755 **[****25]** (citation omitted) -- is premised on an assumption that the expert's opinion will have a reliable basis in the knowledge and experience of his discipline.

C

LEdHN[6][↑] [6] LEdHN[7A][↑] [7A] LEdHN[8A][↑] [8A]HN8[↑] Faced with a proffer of expert scientific testimony, then, the trial judge must determine at the outset, pursuant to Rule 104(a), [10] **[1206]** whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue. [11] This entails a preliminary assessment of whether the reasoning or methodology **[*593]** underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue. We are confident that federal judges possess the capacity to undertake this review. Many factors will bear on the inquiry, and we do not presume to set out a definitive checklist or test. But **[****26]** some general observations are appropriate.

LEdHN[7B][↑] [7B]

LEdHN[8B][↑] [8B]

[**27]**

LEdHN[9][↑] [9]HN9[↑] Ordinarily, a key question to be answered in determining whether **[***483]** a theory or technique is scientific knowledge that will assist the trier of fact will be whether it can be (and has been) tested. "Scientific methodology today is based on generating hypotheses and testing them to see if they can be falsified; indeed, this methodology is what distinguishes science from other fields of human inquiry." Green 645. See also C. Hempel, Philosophy of Natural Science 49 (1966) **[**2797]** ("The statements constituting a scientific explanation must be capable of empirical test"); K. Popper, Conjectures and Refutations: The Growth of Scientific Knowledge 37 (5th ed. 1989) ("The criterion of the scientific status of a theory is its falsifiability, or refutability, or testability") (emphasis deleted).

Another pertinent consideration is whether the theory or technique has been subjected to peer review and publication. Publication (which is but one element of peer review) is not a *sine qua non* of admissibility; it does not necessarily correlate with reliability, see S. Jasanoff, The Fifth Branch: **[****28]** Science Advisors as Policymakers 61-76 (1990), and in some instances well-grounded but innovative theories will not have been published, see Horrobin, The Philosophical Basis of Peer Review and the Suppression of Innovation, 263 JAMA 1438 (1990). Some propositions, moreover, are too particular, too new, or of too limited interest to be published. But submission to the scrutiny of the scientific community is a component of "good science," in part because it increases the likelihood that substantive flaws in methodology will be detected. See J. Ziman, Reliable Knowledge: An Exploration **[*594]** of the Grounds for Belief in Science 130-133 (1978);

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[10] Rule 104(a) provides:

"Preliminary questions concerning the qualification of a person to be a witness, the existence of a privilege, or the admissibility of evidence shall be determined by the court, subject to the provisions of subdivision (b) [pertaining to conditional admissions]. In making its determination it is not bound by the rules of evidence except those with respect to privileges." These matters should be established by a preponderance of proof. See Bourjaily v. United States, 483 U.S. 171, 175-176, 97 L. Ed. 2d 144, 107 S. Ct. 2775 (1987).

[11] Although the *Frye* decision itself focused exclusively on "novel" scientific techniques, we do not read the requirements of Rule 702 to apply specially or exclusively to unconventional evidence. Of course, well-established propositions are less likely to be challenged than those that are novel, and they are more handily defended. Indeed, theories that are so firmly established as to have attained the status of scientific law, such as the laws of thermodynamics, properly are subject to judicial notice under Federal Rule of Evidence 201.

Relman & Angell, How Good Is Peer Review?, 321 New Eng. J. Med. 827 (1989). The fact of publication (or lack thereof) in a peer reviewed journal thus will be a relevant, though not dispositive, consideration in assessing the scientific validity of a particular technique or methodology on which an opinion is premised.

Additionally, *HN10*[↑] in the case of a particular scientific technique, the court ordinarily should consider the known or potential rate of error, see, *e.g.*, *United States v. Smith, 869 F.2d 348, 353-354 (CA7 1989)* **[****29]** (surveying studies of the error rate of spectrographic voice identification technique), and the existence and maintenance of standards controlling the technique's operation, see *United States v. Williams, 583 F.2d 1194, 1198 (CA2 1978)* (noting professional organization's standard governing spectrographic analysis), cert. denied, *439 U.S. 1117, 59 L. Ed. 2d 77, 99 S. Ct. 1025 (1979)*.

Finally, "general acceptance" can yet have a bearing on the inquiry. A "reliability assessment does not require, although it does permit, explicit identification of a relevant scientific community and an express determination of a particular degree of acceptance within that community." *United States v. Downing, 753 F.2d at 1238*. See also 3 Weinstein & Berger P702[03], pp. 702-41 to 702-42. Widespread acceptance can be an important factor in ruling particular evidence admissible, and "a known technique which has been able to attract only minimal support within the community," *Downing, 753 F.2d at 1238*, may properly be viewed with skepticism.

The inquiry envisioned by *Rule [***484] 702* is, we emphasize, a flexible one. [12] **[****30]** Its overarching **[1207]** subject is the scientific validity **[*595]** -- and thus the evidentiary relevance and reliability -- of the principles that underlie a proposed submission. The focus, of course, must be solely on principles and methodology, not on the conclusions that they generate.

[**31]** *LEdHN[10]*[↑] [10]Throughout, a judge assessing a proffer of expert scientific testimony under *Rule 702* should also be mindful of other applicable rules. *Rule 703* provides that expert opinions based on otherwise inadmissible **[**2798]** hearsay are to be admitted only if the facts or data are "of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject." Rule 706 allows the court at its discretion to procure the assistance of an expert of its own choosing. Finally, *Rule 403* permits the exclusion of relevant evidence "if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury . . . ." Judge Weinstein has explained: "Expert evidence can be both powerful and quite misleading because of the difficulty in evaluating it. Because of this risk, the judge in weighing possible prejudice against probative force under *Rule 403* of the present rules exercises more control over experts than over lay witnesses." Weinstein, 138 F.R.D. at 632.

III

LEdHN[11][↑] [11] **[****32]** We conclude by briefly addressing what appear to be two underlying concerns of the parties and *amici* in this case. Respondent expresses apprehension that abandonment of "general acceptance" as the exclusive requirement for admission will result in a "free-for-all" in which befuddled juries are confounded by absurd and irrational pseudoscientific assertions. **[*596]** In this regard respondent seems to us to be overly pessimistic about the capabilities of the jury and of the adversary system generally. *HN11*[↑] Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence. See *Rock v. Arkansas, 483 U.S. 44, 61, 97 L. Ed. 2d 37, 107 S. Ct. 2704 (1987)*. Additionally, *HN12*[↑] in the event the trial court concludes that the scintilla of evidence presented supporting a position is insufficient to allow a reasonable juror to conclude that the position more likely than not is true, the court remains free to direct a judgment, *Fed. Rule Civ. Proc. 50(a)*, and likewise to grant summary judgment, *Fed. Rule Civ. Proc. 56*. Cf., *e.g.*, *Turpin v. Merrell Dow Pharmaceuticals, Inc., 959 F.2d 1349* **[****33]** (CA6) (holding that scientific evidence that provided foundation for expert testimony, viewed in the light most favorable to plaintiffs, was not sufficient to allow a jury to find it more probable than not that

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[12] A number of authorities have presented variations on the reliability approach, each with its own slightly different set of factors. See, *e.g.*, *Downing, 753 F.2d at 1238-1239* (on which our discussion draws in part); 3 Weinstein & Berger P702[03], pp. 702-41 to 702-42 (on which the *Downing* court in turn partially relied); McCormick, Scientific Evidence: Defining a New Approach to Admissibility, 67 Iowa L. Rev. 879, 911-912 (1982); and *Symposium on Science and the Rules of Evidence, 99 F.R.D. 187, 231 (1983)* (statement by Margaret Berger). To the extent that they focus on the reliability of evidence as ensured by the scientific validity of its underlying principles, all these versions may well have merit, although we express no opinion regarding any of their particular details.

defendant **[***485]** caused plaintiff's injury), cert. denied, *506 U.S. 826, 121 L. Ed. 2d 47, 113 S. Ct. 84 (1992)*; *Brock v. Merrell Dow Pharmaceuticals, Inc., 874 F.2d 307 (CA5 1989)* (reversing judgment entered on jury verdict for plaintiffs because evidence regarding causation was insufficient), modified, *884 F.2d 166 (CA5 1989)*, cert. denied, *494 U.S. 1046 (1990)*; Green 680-681. These conventional devices, rather than wholesale exclusion under an uncompromising "general acceptance" test, are the appropriate safeguards where the basis of scientific testimony meets the standards of *Rule 702*.

Petitioners and, to a greater extent, their *amici* exhibit a different concern. They suggest that recognition of a screening role for the judge that allows for the exclusion of "invalid" evidence will sanction a stifling and repressive scientific orthodoxy and will be inimical to the search for truth. See, *e.g.*, **[****34]** Brief for Ronald Bayer et al. as *Amici Curiae*. It is true that open debate is an essential part of both legal and scientific analyses. Yet there are important differences between the quest for truth in the courtroom and the quest **[*597]** for truth in the laboratory. Scientific conclusions are subject to perpetual revision. Law, on the other hand, must resolve disputes finally and quickly. The scientific project is advanced by broad and wide-ranging consideration of a multitude of hypotheses, for those that are incorrect will eventually be shown to be so, and that in itself is an advance. Conjectures that are probably wrong are of little use, however, in the project of reaching a quick, final, and binding legal judgment -- often of great consequence -- about a particular set of events in the past. We recognize that, in practice, a gatekeeping role for the judge, no matter how flexible, inevitably on occasion will prevent the jury from learning of authentic **[**2799]** insights and innovations. That, nevertheless, is the balance **[1208]** that is struck by Rules of Evidence designed not for the exhaustive search for cosmic understanding but for the particularized resolution of legal **[****35]** disputes. [13]

IV

LEdHN[1E][] [1E] *LEdHN[3C]*[] [3C] *LEdHN[4B]*[] [4B]To summarize: *HN13*[] "General acceptance" is not a necessary precondition to the admissibility of scientific evidence under the Federal Rules of Evidence, but the Rules of Evidence -- especially *Rule 702* -- do assign to the trial **[****36]** judge the task of ensuring that an expert's testimony both rests on a reliable foundation and is relevant to the task at hand. Pertinent evidence based on scientifically valid principles will satisfy those demands.

LEdHN[12][] [12]The inquiries of the District Court and the Court of Appeals focused almost exclusively on "general acceptance," as gauged by publication and the decisions of other courts. Accordingly, **[*598]** the judgment of the Court of Appeals is vacated, and the case is remanded for further proceedings consistent with this opinion.

It is so ordered.

Concur by: REHNQUIST (In Part)

Dissent by: REHNQUIST (In Part)

Dissent

[*486]** CHIEF JUSTICE **REHNQUIST**, with whom JUSTICE **STEVENS** joins, concurring in part and dissenting in part.

The petition for certiorari in this case presents two questions: first, whether the rule of *Frye v. United States, 54 App. D.C. 46, 293 F. 1013 (1923)*, remains good law after the enactment of the Federal Rules of Evidence; and second, if *Frye* remains valid, whether it requires expert scientific testimony to have been subjected **[****37]** to a peer review process in order to be admissible. The Court concludes, correctly in my view, that the *Frye* rule did not survive the enactment of the Federal Rules of Evidence, and I therefore join Parts I and II-A of its opinion. The second question presented in the petition for certiorari necessarily is mooted by this holding, but the Court nonetheless proceeds to construe *Rules 702* and *703* very much in the abstract, and then offers some "general observations." *Ante*, at 593.

"General observations" by this Court customarily carry great weight with lower federal courts, but the ones offered here suffer from the flaw common to most such observations -- they are not applied to deciding whether particular testimony was or was not admissible, and

[13] This is not to say that judicial interpretation, as opposed to adjudicative factfinding, does not share basic characteristics of the scientific endeavor: "The work of a judge is in one sense enduring and in another ephemeral. . . . In the endless process of testing and retesting, there is a constant rejection of the dross and a constant retention of whatever is pure and sound and fine." B. Cardozo, The Nature of the Judicial Process 178-179 (1921).

therefore they tend to be not only general, but vague and abstract. This is particularly unfortunate in a case such as this, where the ultimate legal question depends on an appreciation of one or more bodies of knowledge not judicially noticeable, and subject to different interpretations in the briefs of the parties and their *amici*. Twenty-two *amicus* briefs have been filed in the case, and indeed the Court's opinion contains **[****38]** no fewer than 37 citations to *amicus* briefs and other secondary sources.

[*599] The various briefs filed in this case are markedly different from typical briefs, in that large parts of them do not deal with decided cases or statutory language -- the sort of material we customarily interpret. Instead, they deal with definitions of scientific knowledge, scientific method, scientific validity, and peer review -- in short, matters far afield from the expertise of judges. This is not to say that such materials are not useful or even necessary in deciding how Rule 702 should be applied; but it is to say that the unusual subject matter should cause us to proceed with great caution in deciding more than we have to, because our reach can so easily exceed our grasp.

But even if it were desirable to make "general observations" not necessary to decide **[**2800]** the questions presented, I cannot subscribe to some of the observations made by the Court. In Part II-B, the Court concludes that reliability and relevancy are the touchstones of the admissibility of expert testimony. *Ante*, at 590-592. Federal Rule of Evidence 402 provides, as the Court points out, that "evidence which **[****39]** is not relevant is not admissible." But there is no similar reference in the Rule to "reliability." The Court constructs its argument by parsing the language "if scientific, technical, or other specialized **[***487]** knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, . . . an expert . . . may testify thereto . . . ." Fed. Rule Evid. 702. It stresses that the subject of the expert's testimony must be "scientific . . . knowledge," and points out that "scientific" "implies a grounding in the methods and procedures of science" and that the word "knowledge" "connotes more than subjective belief or unsupported speculation." *Ante*, at 590. From this it concludes that "scientific knowledge" must be "derived by the scientific method." *Ibid.* Proposed testimony, we are told, **[1209]** must be supported by "appropriate validation." *Ibid.* Indeed, in footnote 9, the Court decides that "in a case involving scientific evidence, *evidentiary* ***[*600]*** *reliability* will be based upon *scientific validity.*" *Ante*, at 591, n. 9 (emphasis in original).

Questions arise simply from reading this part of the Court's opinion, and countless more questions **[****40]** will surely arise when hundreds of district judges try to apply its teaching to particular offers of expert testimony. Does all of this *dicta* apply to an expert seeking to testify on the basis of "technical or other specialized knowledge" -- the other types of expert knowledge to which Rule 702 applies -- or are the "general observations" limited only to "scientific knowledge"? What is the difference between scientific knowledge and technical knowledge; does Rule 702 actually contemplate that the phrase "scientific, technical, or other specialized knowledge" be broken down into numerous subspecies of expertise, or did its authors simply pick general descriptive language covering the sort of expert testimony which courts have customarily received? The Court speaks of its confidence that federal judges can make a "preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue." *Ante*, at 592-593. The Court then states that a "key question" to be answered in deciding whether something is "scientific knowledge" "will be whether it can be (and **[****41]** has been) tested." *Ante*, at 593. Following this sentence are three quotations from treatises, which not only speak of empirical testing, but one of which states that the "'criterion of the scientific status of a theory is its falsifiability, or refutability, or testability.'" *Ibid.*

I defer to no one in my confidence in federal judges; but I am at a loss to know what is meant when it is said that the scientific status of a theory depends on its "falsifiability," and I suspect some of them will be, too.

I do not doubt that Rule 702 confides to the judge some gatekeeping responsibility in deciding questions of the admissibility of proffered expert testimony. But I do not think **[*601]** it imposes on them either the obligation or the authority to become amateur scientists in order to perform that role. I think the Court would be far better advised in this case to decide only the questions presented, and to leave the further development of this important area of the law to future cases.

References

32B Am Jur 2d, Federal Rules of Evidence 435

12 Federal Procedure, L Ed, Evidence 33:131; 33 Federal Procedure, L Ed, Witnesses 80: **[****42]** 133

2 Am Jur Trials 585, Selecting and Preparing Expert

Witness; 3 Am Jur Trials 427, Preparing and Using Experimental Evidence

28 USCS Appx, *Federal Rules of Evidence, Rule 702*

Am Law Prod Liab 3d 54:70, 54:71, 89:38

Ausman & Snyder's Medical Library, L Ed, Pediatrics 5:102

L Ed Digest, Evidence 641

L Ed Index, Experiments or Tests; Expert and Opinion Evidence; Rules of Evidence

ALR Index, Evidence Rules; Experiments and Tests; Expert and Opinion Evidence; Frye Test; Science and Scientific Matters

Annotation References:

Reliability of scientific technique and its acceptance within scientific community as affecting admissibility, at federal trial, of expert testimony as to result of test or study based on such technique--modern cases. *105 ALR Fed 299*.

When will expert testimony "assist trier of fact" so as to be admissible at federal trial under *Rule 702 of Federal Rules of Evidence. 75 ALR Fed 461*.

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GE v. Joiner

Supreme Court of the United States

October 14, 1997, Argued ; December 15, 1997, Decided

No. 96-188

Reporter
522 U.S. 136 *; 118 S. Ct. 512 **; 139 L. Ed. 2d 508 ***; 1997 U.S. LEXIS 7503 ****; 66 U.S.L.W. 4036; 97 Cal. Daily Op. Service 9355; 18 OSHC (BNA) 1097; 97 Daily Journal DAR 15051; 48 Fed. R. Evid. Serv. (Callaghan) 1; 28 ELR 20227; CCH Prod. Liab. Rep. P15,120; 1997 Colo. J. C.A.R. 3361; 11 Fla. L. Weekly Fed. S 284

GENERAL ELECTRIC COMPANY, ET AL., PETITIONERS v. ROBERT K. JOINER ET UX.

Prior History: [****1] ON WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE ELEVENTH CIRCUIT.

Disposition: *78 F.3d 524*, reversed and remanded.

Core Terms

exposure, studies, cancer, district court, lung cancer, conclusions, court of appeals, methodology, dioxins, furans, exposed, admissibility, expert testimony, scientific, abuse of discretion, reliable, animal, promoted, admit, fluid, plant, scientific evidence, court's decision, manufactured, contributed, gatekeeper, proffered, genuine, statistically significant, scientific testimony

Case Summary

Procedural Posture

Petitioner companies were granted a writ of certiorari to review the judgment of the United States Court of Appeals for the Eleventh Circuit that reversed a summary judgment for the companies upon application of "a particularly stringent standard of review" to the district court's exclusion of expert testimony offered by respondent worker in a products liability action and upon ruling that a factual dispute precluded summary judgment.

Overview

After the worker was diagnosed with cancer, he brought a products liability action, claiming exposure to polychlorinated biphenyls (PCBs), furans, and dioxins produced by the companies caused his cancer. After finding the testimony of the worker's experts speculative and unsupported, the district court excluded their testimony and entered summary judgment for the companies upon ruling that, although there was a genuine issue as to whether the worker was exposed to PCBs, there was no factual dispute that he had not been exposed to furans and dioxins. The court of appeals reversed, applying "a particularly stringent standard of review" in ruling that the exclusion of expert testimony was error, in light of the Daubert doctrine, and finding that there was a genuine issue as to whether the worker had been exposed to furans and dioxins. The companies sought review of the expert testimony ruling only. In reversing the ruling on that issue, the Supreme Court held that the proper standard of review was abuse of discretion and it was within the district court's discretion to exclude unreliable expert testimony.

Outcome

The judgment of the court of appeals applying a standard of review greater than abuse of discretion was reversed, the exclusion of expert testimony by the district court under the proper abuse of discretion standard was upheld, and the case was remanded for further consideration given the unchallenged ruling of the court of appeals that a genuine issue of fact precluded summary judgment.

LexisNexis® Headnotes

Civil Procedure > Appeals > Standards of Review > Abuse of Discretion

Evidence > Admissibility > Expert Witnesses > Daubert Standard

Evidence > Admissibility > Scientific
Evidence > Standards for Admissibility

Evidence > ... > Testimony > Expert Witnesses > General Overview

Evidence > Admissibility > Expert Witnesses

HN1[] Standards of Review, Abuse of Discretion

The appropriate standard an appellate court should apply in reviewing a trial court's decision to admit or exclude expert testimony under the Daubert rule is abuse of discretion.

Criminal Law & Procedure > ... > Standards of Review > Abuse of Discretion > Evidence

Evidence > Admissibility > Expert Witnesses > Daubert Standard

Civil Procedure > Appeals > Standards of Review > Abuse of Discretion

Evidence > Admissibility > Procedural Matters > Rulings on Evidence

Evidence > Admissibility > Scientific Evidence > General Overview

Evidence > Admissibility > Scientific Evidence > Standards for Admissibility

Evidence > ... > Testimony > Expert Witnesses > General Overview

Evidence > Admissibility > Expert Witnesses

HN2[] Abuse of Discretion, Evidence

Abuse of discretion is the proper standard of review of a district court's evidentiary rulings. It is very much a matter of discretion with the court whether to receive or exclude the evidence; but the appellate court will not reverse in such a case, unless the ruling is manifestly erroneous. With respect to expert testimony under the Daubert standard and the rules of evidence, the trial judge must ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable. Thus, the rules leave in place the gatekeeper role of the trial judge in screening such evidence. A court of appeals applying abuse of discretion review to such rulings may not categorically distinguish between rulings allowing expert testimony and rulings which disallow it.

Civil Procedure > ... > Summary Judgment > Motions for Summary Judgment > General Overview

Evidence > Admissibility > Expert Witnesses

Civil Procedure > Appeals > Summary Judgment Review > General Overview

Civil Procedure > Appeals > Summary Judgment Review > Standards of Review

Civil Procedure > ... > Summary Judgment > Entitlement as Matter of Law > General Overview

Civil Procedure > Appeals > Standards of Review > Abuse of Discretion

Evidence > ... > Testimony > Expert Witnesses > General Overview

HN3[] Summary Judgment, Motions for Summary Judgment

Where the granting of summary judgment in a case involving proffered expert testimony is outcome determinative, it is not subjected to a more searching standard of review. On a motion for summary judgment, disputed issues of fact are resolved against the moving party. But the question of admissibility of expert testimony is not such an issue of fact, and is reviewable under the abuse of discretion standard.

Evidence > Admissibility > Expert Witnesses > Daubert Standard

Evidence > Admissibility > Scientific Evidence > Standards for Admissibility

Evidence > ... > Testimony > Expert Witnesses > General Overview

HN4[] Expert Witnesses, Daubert Standard

The focus under the Daubert standard, of course, must be solely on the expert's principles and methodology, not on the conclusions that they generate. But

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 that is connected to existing data only by the ipse dixit of the expert. A court may conclude that there is simply too great an analytical gap between the data and the opinion proffered.

Lawyers' Edition Display

Decision

Abuse of discretion held to be proper standard for review of Federal District Court's decision to admit or exclude expert scientific testimony, and court held not to have abused discretion in excluding such testimony.

Summary

An electrician, who alleged that his small cell lung cancer was promoted by on-the-job exposure to polychlorinated biphenyls (PCBs) and to furans and dioxins (some PCB derivatives), sued in a Georgia state court the manufacturers of the products through which the exposure had occurred. After the manufacturers removed the case to the United States District Court for the Northern District of Georgia, the District Court--in excluding the proffered scientific testimony of the electrician's experts indicating a link between exposure to PCBs and small cell lung cancer, and in granting the manufacturers' summary judgment motion--expressed the view that (1) there was no genuine issue as to whether the electrician had been exposed to furans and dioxins, and (2) the expert testimony did not rise above subjective belief or unsupported speculation (*864 F. Supp 1310*). The United States Court of Appeals for the Eleventh Circuit, in reversing the District Court's judgment, expressed the view that (1) the Court of Appeals would apply a particularly stringent standard of review to a trial judge's exclusion of expert testimony, and (2) under that standard, the District Court had erred in excluding the testimony of the electrician's experts (*78 F.3d 524*).

On certiorari, the United States Supreme Court reversed and remanded. In an opinion by Rehnquist, Ch. J., expressing the unanimous view of the court as to holding 1 below, and joined by O'Connor, Scalia, Kennedy, Souter, Thomas, Ginsburg, and Breyer, JJ,, as to holding 2 below, it was held that (1) abuse of discretion is the proper standard for an appellate court to apply in reviewing a Federal District Court's decision to admit or exclude expert scientific testimony at trial; and (2) because it was within the discretion of the District Court in the instant case to conclude that the animal studies and the four epidemiological studies upon which the experts relied were not sufficient, whether individually or in combination, to support the experts' conclusions that the electrician's exposure to PCBs contributed to his cancer, the District Court did not abuse its discretion in excluding the experts' testimony.

Breyer, J., concurring, expressed the view that given the offer of cooperative effort from the scientific to the legal community, and given the various methods authorized under the Federal Rules of Evidence and the Federal Rules of Civil Procedure for facilitating the trial courts' task as the gatekeepers insuring that scientific testimony or evidence admitted at trial is relevant and reliable, the gatekeeping requirement would not prove inordinately difficult to implement.

Stevens, J., concurring in part and dissenting in part, (1) agreed that abuse of discretion was the proper standard for an appellate court's review of a Federal District Court's admission or exclusion of expert scientific evidence at trial, but (2) as to the question whether the District Court in the instant case had properly held the expert testimony to be inadmissible, expressed the view that (a) it was not certain that the parties had adequately briefed the question or that the Supreme Court had adequately explained why the Court of Appeals' disposition was erroneous, and (b) the case ought to have been remanded to the Court of Appeals for application of the proper standard of review.

Headnotes

APPEAL §1391 > expert scientific testimony -- admission or exclusion -- abuse of discretion -- > Headnote: *LEdHN[1A]*[] [1A]*LEdHN[1B]*[] [1B]*LEdHN[1C]*[] [1C]

Abuse of discretion is the proper standard for an appellate court to apply in reviewing a Federal District Court's decision to admit or exclude expert scientific testimony at trial, because all evidentiary decisions are reviewed under an abuse-of-discretion standard, where the United States Supreme Court has held that abuse of

discretion is the proper standard of review of a District Court's evidentiary rulings.

EVIDENCE §643 > expert scientific testimony -- linkage -- exclusion -- > Headnote:
LEdHN[2A][↓] [2A]LEdHN[2B][↓] [2B]LEdHN[2C][↓] [2C]LEdHN[2D][↓] [2D]

A Federal District Court, in entering summary judgment for the manufacturers who have been sued by an electrician who alleges that the electrician's small cell lung cancer was promoted by on-the-job exposure to the manufacturer's products that contained polychlorinated biphenyls (PCBs), does not abuse the court's discretion by excluding at trial the testimony of the electrician's scientific experts indicating a link between PCB exposure and small cell lung cancer, because it is within the court's discretion to conclude that the animal studies and the four epidemiological studies on which the experts rely are not sufficient, whether individually or in combination, to support the experts' conclusions that the electrician's exposure to PCBs contributed to the electrician's cancer, where (1) the animal studies, which involved the injection of massive doses of highly concentrated PCBs directly into the peritoneums or stomachs of infant mice, were so dissimilar to the facts presented in the instant litigation; and (2) as to the epidemiological studies, (a) the authors of the first study, which involved capacitor plant workers who had been exposed to PCBs, were unwilling to say that PCB exposure had caused cancer among the workers the authors examined, (b) the increase in lung cancer among the PCB production plant workers involved in the second study was not statistically significant, and the authors of the study did not suggest a link between the increase in lung cancer deaths and the exposure to PCBs, (c) the third study, which involved cable manufacturing workers who had been exposed to mineral oil, made no mention of PCBs and was expressly limited to the type of mineral oil involved in that study, and (d) although the fourth study involved a PCB-exposed group, the subjects of that study had been exposed to numerous potential carcinogens, including toxic rice oil that the subjects had ingested. (Stevens, J., dissented from this holding.)

APPEAL §1391 > EVIDENCE §641 > scientific testimony -- admission or exclusion -- discretion -- > Headnote:
LEdHN[3][↓] [3]

With respect to the admission of scientific testimony in Federal District Courts, the Federal Rules of Evidence leave in place the "gatekeeper" role of the trial judge in screening such evidence; a Federal Court of Appeals applying abuse-of-discretion review to such rulings may not categorically distinguish between rulings allowing expert testimony and rulings which disallow it.

APPEAL §1392 > SUMMARY JUDGMENT AND JUDGMENT ON PLEADINGS §3 > resolving motion -- exclusion of expert testimony -- abuse of discretion -- > Headnote:
LEdHN[4][↓] [4]

On certiorari to review a Federal Court of Appeals' judgment--which, in reversing a Federal District Court's granting of a summary judgment motion by the manufacturers who were sued by an electrician who alleged that the electrician's small cell lung cancer was promoted by on-the-job exposure to the manufacturer's products that contained polychlorinated biphenyls (PCBs), held that the District Court had erred in concluding that the testimony of the electrician's experts indicating a link between PCB exposure and small cell lung cancer was inadmissible for failure to rise above subjective belief or unsupported speculation--although on a motion for summary judgment, disputed issues of fact are resolved against the moving party, the question of admissibility of expert testimony is not such an issue of fact; thus, the United States Supreme Court will reject the electrician's argument that because the granting of summary judgment for the manufacturers was outcome determinative, it should have been subjected to a more searching standard of appellate review than the abuse-of-discretion standard that the Supreme Court holds to be the proper standard.

APPEAL §1392 > exclusion of expert testimony -- abuse of discretion -- > Headnote:
LEdHN[5][↓] [5]

In a suit in which a cancer victim seeks to link the victim's development of cancer to the victim's exposure to polychlorinated biphenyls (PCBs) and their

derivatives, a Federal Court of Appeals--which states that it will apply a particularly stringent standard of review to the trial judge's exclusion of expert testimony--errs in the Court of Appeals' review of a Federal District Court's exclusion, at trial, of the victim's expert testimony, as, in applying an overly stringent review to the trial court's ruling, the Court of Appeals fails to give the trial court the deference that is the hallmark of abuse-of-discretion review.

EVIDENCE §641 > expert opinion -- admission at trial -- > Headnote:
LEdHN[6] [6]

With respect to the issue of admission of expert testimony at trial, although trained experts commonly extrapolate from existing data, nothing in either a United States Supreme Court decision--indicating that the focus must be solely on principles and methodology, not on the conclusions that they generate--or the Federal Rules of Evidence requires a Federal District Court to admit opinion evidence that is connected to existing data by only the expert's own statement, as a court may conclude that there is simply too great an analytical gap between the data and the opinion proffered. (Stevens, J., dissented from this holding.)

APPEAL §1681 > reversal -- remand -- leaving question open -- > Headnote:
LEdHN[7] [7]

On certiorari to determine what standard a federal appellate court should apply in reviewing a federal trial court's decision to admit or exclude expert testimony, the United States Supreme Court, in holding that abuse of discretion is the appropriate standard and that the Federal District Court involved in the instant case did not abuse its discretion when it excluded certain proffered expert testimony that indicated a link between exposure to polychlorinated biphenyls (PCBs) and small cell lung cancer, will reverse a Federal Court of Appeals judgment--which, in reversing a summary judgment for some manufacturers who were sued by an electrician who alleged that the electrician's small cell lung cancer was promoted by on-the-job exposure to PCBs and to furans and dioxins (some PCB derivatives), held that the District Court had erred in concluding that (1) there was no genuine issue of material fact as to whether the electrician had been exposed to furans and dioxins, and (2) the linkage testimony of the electrician's experts was inadmissible for failure to rise above subjective belief or unsupported speculation--and will remand the case for proceedings consistent with the Supreme Court's opinion, where the manufacturers, in their petition to the Supreme Court, have not challenged the Court of Appeals' reversal of the District Court's determination that there was no genuine issue as to whether the electrician had been exposed to furans and dioxins; thus, whether the electrician was exposed to furans and dioxins and whether if there was such exposure, the opinions of the electrician's experts would then be admissible remain open questions.

Syllabus

After he was diagnosed with small-cell lung cancer, respondent Joiner sued in Georgia state court, alleging, *inter alia*, that his disease was "promoted" by his workplace exposure to chemical "PCBs" and derivative "furans" and "dioxins" that were manufactured by, or present in materials manufactured by, petitioners. Petitioners removed the case to federal court and moved for summary judgment. Joiner responded with the depositions of expert witnesses, who testified that PCBs, furans, and dioxins can promote cancer, and opined that Joiner' exposure to those chemicals was likely responsible for his cancer. The District Court **[****2]** ruled that there was a genuine issue of material fact as to whether Joiner had been exposed to PCBs, but granted summary judgment for petitioners because (1) there was no genuine issue as to whether he had been exposed to furans and dioxins, and (2) his experts' testimony had failed to show that there was a link between exposure to PCBs and small-cell lung cancer and was therefore inadmissible because it did not rise above "subjective belief or unsupported speculation." In reversing, the Eleventh Circuit applied "a particularly stringent standard of review" to hold that the District Court had erred in excluding the expert testimony.

Held:

1. Abuse of discretion -- the standard ordinarily applicable to review of evidentiary rulings -- is the proper standard by which to review a district court's decision to admit or exclude expert scientific evidence. Contrary to the Eleventh Circuit's suggestion, *Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 125 L.*

Ed. 2d 469, 113 S. Ct. 2786, did not somehow alter this general rule in the context of a district court's decision to exclude scientific evidence. *Daubert* did not address the appellate review standard for evidentiary rulings at all, but [****3] did indicate that, while the Federal Rules of Evidence allow district courts to admit a somewhat broader range of scientific testimony than did pre-existing law, they leave in place the trial judge's "gatekeeper" role of screening such evidence to ensure that it is not only relevant, but reliable. Id., at 589. A court of appeals applying "abuse of discretion" review to such rulings may not categorically distinguish between rulings allowing expert testimony and rulings which disallow it. Compare Beech Aircraft Corp. v. Rainey, 488 U.S. 153, 172, 102 L. Ed. 2d 445, 109 S. Ct. 439, with United States v. Abel, 469 U.S. 45, 54, 83 L. Ed. 2d 450, 105 S. Ct. 465. This Court rejects Joiner's argument that because the granting of summary judgment in this case was "outcome determinative," it should have been subjected to a more searching standard of review. On a summary judgment motion, disputed issues of fact are resolved against the moving party -- here, petitioners. But the question of admissibility of expert testimony is not such an issue of fact, and is reviewable under the abuse of discretion standard. In applying an overly "stringent" standard, the Eleventh Circuit failed to give the trial court the deference that is the hallmark of [****4] abuse of discretion review. Pp. 4-5.

2. A proper application of the correct standard of review indicates that the District Court did not err in excluding the expert testimony at issue. The animal studies cited by respondent's experts were so dissimilar to the facts presented here -- *i.e.*, the studies involved infant mice that developed alveologenic adenomas after highly concentrated, massive doses of PCBs were injected directly into their peritoneums or stomachs, whereas Joiner was an adult human whose small-cell carcinomas allegedly resulted from exposure on a much smaller scale -- that it was not an abuse of discretion for the District Court to have rejected the experts' reliance on those studies. Nor did the court abuse its discretion in concluding that the four epidemiological studies on which Joiner relied were not a sufficient basis for the experts' opinions, since the authors of two of those studies ultimately were unwilling to suggest a link between increases in lung cancer and PCB exposure among the workers they examined, the third study involved exposure to a particular type of mineral oil not necessarily relevant here, and the fourth involved exposure to numerous potential [****5] carcinogens in addition to PCBs. Nothing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert. Pp. 6-9.

3. These conclusions, however, do not dispose of the entire case. The Eleventh Circuit reversed the District Court's conclusion that Joiner had not been exposed to furans and dioxins. Because petitioners did not challenge that determination in their certiorari petition, the question whether exposure to furans and dioxins contributed to Joiner's cancer is still open. Pp. 9-10.

78 F.3d 524, reversed and remanded.

Counsel: Steven R. Kuney argued the cause for petitioners. With him on the briefs were John G. Kester, David H. Flint, Alexander J. Simmons, Jr., Henry W. Ewalt, and Gerard H. Davidson, Jr.

Deputy Solicitor General Wallace argued the cause for the United States as amicus curiae urging reversal. With him on the brief were Acting Solicitor General Dellinger, Assistant Attorney General Hunger, Edward C. DuMont, and John P. Schnitker.

Michael H. Gottesman argued the cause for respondents. With him on the brief were Kenneth J. Chesebro, David L. Shapiro, and Michael J. Warshauer.

Briefs of amici curiae urging reversal were filed for the Chamber of Commerce of the United States by Thomas S. Martin, Stephen A. Bokat, and Robin S. Conrad; for the American Medical Association by Jack R. Bierig, Carter G. Phillips, Kirk B. Johnson, and Michael L. Ile; for the Chemical Manufacturers Association by Bert Black, David J. Schenck, and Donald D. Evans; for the Dow Chemical Company by John E. Muench and Robert M. Dow, Jr.; for the Pharmaceutical Research and Manufacturers of America by Bruce N. Kuhlik; for the Washington Legal Foundation by Arvin Maskin, Gerald A. Stein, Daniel J. Popeo, and Paul D. Kamenar; and for Bruce Ames et al. by Martin S. Kaufman and Douglas Foster.

Briefs of amici curiae urging affirmance were filed for the Trial Lawyers for Public Justice by Steven E. Fineman and Arthur H. Bryant; for the Association of Trial Lawyers of America by Jeffrey Robert White; for Ardith Cavallo by William A. Beeton, Jr.; and for Peter Orris, M.D., et al. by Gerson H. Smoger.

Briefs of amici curiae were filed for the New England Journal of Medicine et al. by Margaret S. Woodruff and Arlin M. Adams; and for the Product Liability Advisory Council, Inc., et al. by Mary A. Wells, Jan S. Amundson, and Quentin Riegel.

Judges: REHNQUIST, C. J., delivered the opinion for a unanimous Court with respect to Parts I and II, and the opinion of the Court with respect to Part III, in which O'CONNOR, SCALIA, KENNEDY, SOUTER, THOMAS, GINSBURG, and BREYER, JJ., joined. BREYER, J., filed a concurring opinion. STEVENS, J., filed an opinion concurring in part and dissenting in part.

Opinion by: REHNQUIST

Opinion

[515] [***514] [*138]** CHIEF JUSTICE **REHNQUIST** delivered the opinion of the Court.

LEdHN[1A][⬆] [1A] *LEdHN[2A]*[⬆] [2A]We granted certiorari in this case to determine *HN1*[⬆] what standard an appellate court should apply in reviewing **[****6]** a trial **[*139]** court's decision to admit or exclude expert testimony under *Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 125 L. Ed. 2d 469, 113 S. Ct. 2786 (1993)*. We hold that abuse of discretion is the appropriate standard. We apply this standard and conclude that the District Court in this case did not abuse its discretion when it excluded certain proffered expert testimony.

I

Respondent Robert Joiner began work as an electrician in the Water & Light Department of Thomasville, Georgia (City) in 1973. This job required him to work with and around the City's electrical transformers, which used a mineral-based dielectric fluid **[**516]** as a coolant. Joiner often had to stick his hands and arms into the fluid to make repairs. The fluid would sometimes splash onto him, occasionally getting into his eyes and mouth. In 1983 the City discovered that the fluid in some of the transformers was contaminated with polychlorinated biphenyls (PCBs). PCBs are widely considered to be hazardous to human health. Congress, with limited exceptions, banned the production and sale of PCBs in 1978. See 90 Stat. 2020, *15 U.S.C. § 2605(e)(2)(A)*.

Joiner was diagnosed with small cell lung cancer in 1991. He [1] sued petitioners in Georgia **[****7]** state court the following year. Petitioner Monsanto manufactured PCBs from 1935 to 1977; petitioners General Electric and Westinghouse Electric manufactured transformers and dielectric fluid. In his complaint Joiner linked his development of cancer to his exposure to PCBs and their derivatives, polychlorinated dibenzofurans (furans) and polychlorinated dibenzodioxins (dioxins). Joiner had been a smoker for approximately eight years, his parents had both been smokers, and there was a history of lung cancer in his family. He was thus perhaps already at a heightened risk of developing lung cancer eventually. The suit alleged that his exposure to PCBs "promoted" **[*140]** his cancer; **[***515]** had it not been for his exposure to these substances, his cancer would not have developed for many years, if at all.

Petitioners removed the case to federal court. Once there, they moved for summary judgment. They **[****8]** contended that (1) there was no evidence that Joiner suffered significant exposure to PCBs, furans, or dioxins, and (2) there was no admissible scientific evidence that PCBs promoted Joiner's cancer. Joiner responded that there were numerous disputed factual issues that required resolution by a jury. He relied largely on the testimony of expert witnesses. In depositions, his experts had testified that PCBs alone can promote cancer and that furans and dioxins can also promote cancer. They opined that since Joiner had been exposed to PCBs, furans, and dioxins, such exposure was likely responsible for Joiner's cancer.

The District Court ruled that there was a genuine issue of material fact as to whether Joiner had been exposed to PCBs. But it nevertheless granted summary judgment for petitioners because (1) there was no genuine issue as to whether Joiner had been exposed to furans and dioxins, and (2) the testimony of Joiner's experts had failed to show that there was a link between exposure to PCBs and small cell lung cancer. The court believed that the testimony of respondent's experts to the contrary did not rise above "subjective belief or unsupported speculation." *864 F. Supp. 1310, [****9] 1326 (ND Ga. 1994)*. Their testimony was therefore inadmissible.

The Court of Appeals for the Eleventh Circuit reversed. *78 F.3d 524 (1996)*. It held that "because 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." *Id. at 529*. Applying that standard, the Court of Appeals held that the District Court had

[1] Joiner's wife was also a plaintiff in the suit and is a respondent here. For convenience, we refer to respondent in the singular.

erred in excluding the testimony of Joiner's expert witnesses. The **[*141]** District Court had made two fundamental errors. First, it excluded the experts' testimony because it "drew different conclusions from the research than did each of the experts." The Court of Appeals opined that a district court should limit its role to determining the "legal reliability of proffered expert testimony, leaving the jury to decide the correctness of competing expert opinions." *Id. at 533*. Second, the District Court had held that there was no genuine issue of material fact as to whether Joiner had been exposed to furans and dioxins. This was also incorrect, said the Court of Appeals, because testimony in the record supported the proposition that there **[****10]** had been such exposure.

We granted petitioners' petition for a writ of certiorari, 520 U.S. __ (1997), and we now reverse.

[517]** II

LEdHN[1B] [1B]Petitioners challenge the standard applied by the Court of Appeals in reviewing the District Court's decision to exclude respondent's experts' proffered testimony. They argue that that court should have applied traditional "abuse of discretion" review. Respondent agrees that abuse of discretion is the correct standard of review. He contends, however, that the Court of Appeals applied an abuse of discretion standard **[***516]** in this case. As he reads it, the phrase "particularly stringent" announced no new standard of review. It was simply an acknowledgement that an appellate court can and will devote more resources to analyzing district court decisions that are dispositive of the entire litigation. All evidentiary decisions are reviewed under an abuse of discretion standard. He argues, however, that it is perfectly reasonable for appellate courts to give particular attention to those decisions that are outcome-determinative.

We have held that HN2 abuse of discretion is the proper standard of review of a district court's evidentiary rulings. *Old Chief* v. *United* **[****11]** *States*, 519 U.S. __, __ n. 1, *117 S. Ct. 644, 136 L. Ed. 2d 574 (1997)* (slip op., at 1-2, n.1), *United States v. Abel, 469 U.S. 45, 54, 83 L. Ed. 2d 450, 105 S. Ct. 465 (1984)*. Indeed, our cases on **[*142]** the subject go back as far as *Spring Co.* v. *Edgar, 99 U.S. 645, 658, 25 L. Ed. 487 (1879)* where we said that "cases arise where it is very much a matter of discretion with the court whether to receive or exclude the evidence; but the appellate court will not reverse in such a case, unless the ruling is manifestly erroneous." The Court of Appeals suggested that *Daubert* somehow altered this general rule in the context of a district court's decision to exclude scientific evidence. But *Daubert* did not address the standard of appellate review for evidentiary rulings at all. It did hold that the "austere" *Frye* standard of "general acceptance" had not been carried over into the Federal Rules of Evidence. But the opinion also said:

"That the *Frye* test was displaced by the Rules of Evidence does not mean, however, that the Rules themselves place no limits on the admissibility of purportedly scientific evidence. Nor is the trial judge disabled from screening such evidence. To the contrary, under the Rules the trial judge must ensure that any **[****12]** and all scientific testimony or evidence admitted is not only relevant, but reliable." *509 U.S. at 589* (footnote omitted).

LEdHN[3] [3]LEdHN[4] [4]Thus, while the Federal Rules of Evidence allow district courts to admit a somewhat broader range of scientific testimony than would have been admissible under *Frye*, they leave in place the "gatekeeper" role of the trial judge in screening such evidence. A court of appeals applying "abuse of discretion" review to such rulings may not categorically distinguish between rulings allowing expert testimony and rulings which disallow it. Compare *Beech Aircraft Corp v. Rainey, 488 U.S. 153, 172, 102 L. Ed. 2d 445, 109 S. Ct. 439 (1988)* (applying abuse of discretion review to a lower court's decision to exclude evidence) with *United States v. Abel, supra at 54* (applying abuse of discretion review to a lower court's decision to admit evidence). HN3 We likewise reject respondent's argument that because the granting of summary judgment in this case **[*143]** was "outcome determinative," it should have been subjected to a more searching standard of review. On a motion for summary judgment, disputed issues of fact are resolved against the moving party -- here, petitioners. But the question of admissibility **[****13]** of expert testimony is not such an issue of fact, and is reviewable under the abuse of discretion standard.

[*517]** LEdHN[5] [5]We hold that the Court of Appeals erred in its review of the exclusion of Joiner's experts' testimony. In applying an overly "stringent" review to that ruling, it failed to give the trial court the deference that is the hallmark of abuse of discretion review. See, *e.g.*, *Koon v. United States, 518 U.S. 81, __, 135 L. Ed. 2d 392, 116 S. Ct. 2035 (1996)*(slip op., at

14-15).

III

LEdHN[2B][↑] [2B]We believe that a proper application of the correct standard of review here indicates that the District Court did not abuse its **[**518]** discretion. Joiner's theory of liability was that his exposure to PCBs and their derivatives "promoted" his development of small cell lung cancer. In support of that theory he proffered the deposition testimony of expert witnesses. Dr. Arnold Schecter testified that he believed it "more likely than not that Mr. Joiner's lung cancer was causally linked to cigarette smoking and PCB exposure." App. at 107. Dr. Daniel Teitelbaum testified that Joiner's "lung cancer was caused by or contributed to in a significant degree by the materials with which he worked." *Id. at 140*.

Petitioners contended that **[****14]** the statements of Joiner's experts regarding causation were nothing more than speculation. Petitioners criticized the testimony of the experts in that it was "not supported by epidemiological studies . . . [and was] based exclusively on isolated studies of laboratory animals." Joiner responded by claiming that his experts had identified "relevant animal studies which support their opinions." **[*144]** He also directed the court's attention to four epidemiological studies [2] on which his experts had relied.

The District Court agreed with petitioners that the animal studies on which respondent's experts relied did not support his contention that exposure to PCBs had contributed to his cancer. The studies involved infant mice that had developed cancer after being exposed to PCBs. The infant mice in the studies had had massive doses of PCBs injected directly into their peritoneums [3] or stomachs. Joiner was an adult human being whose alleged **[****15]** exposure to PCBs was far less than the exposure in the animal studies. The PCBs were injected into the mice in a highly concentrated form. The fluid with which Joiner had come into contact generally had a much smaller PCB concentration of between 0-500 parts per million. The cancer that these mice developed was alveologenic adenomas; Joiner had developed small-cell carcinomas. No study demonstrated that adult mice developed cancer after being exposed to PCBs. One of the experts admitted that no study had demonstrated that PCBs lead to cancer in any other species.

Respondent failed to reply to this criticism. Rather than explaining how and why the experts could have extrapolated their opinions from these seemingly far-removed animal studies, respondent chose "to proceed as if the only issue [was] whether animal studies can ever be a proper foundation for an expert's opinion." *Joiner*, 864 F. Supp. at 1324. Of course, whether animal studies can ever **[****16]** be a proper foundation for an expert's opinion was not the issue. **[***518]** The issue was whether *these* experts' opinions were sufficiently supported by the animal studies on which they purported to rely. The studies were so dissimilar to the facts presented in this litigation **[*145]** that it was not an abuse of discretion for the District Court to have rejected the experts' reliance on them.

The District Court also concluded that the four epidemiological studies on which respondent relied were not a sufficient basis for the experts' opinions. The first such study involved workers at an Italian capacitor [4] plant who had been exposed to PCBs. Bertazzi, Riboldi, Pesatori, Radice, & Zocchetti, Cancer Mortality of Capacitor Manufacturing Workers, 11 American Journal of Industrial Medicine 165 (1987). The authors noted that lung cancer deaths among ex-employees at the plant were higher than might have been expected, but concluded that "there were apparently no grounds for associating lung cancer deaths (although increased above expectations) and exposure in the plant." *Id. at 172*. Given that Bertazzi et al. were unwilling to say that PCB exposure had caused cancer among the workers they examined, **[****17]** their study did not support the experts' conclusion that Joiner's exposure to PCBs caused his cancer.

The second study followed employees who had worked at Monsanto's PCB production plant. J. Zack & D. Munsch, Mortality **[**519]** of PCB Workers at the Monsanto Plant in Sauget, Illinois (Dec. 14, 1979)(unpublished report), 3 Rec., Doc. No. 11. The authors of this study found that the incidence of lung cancer deaths among these workers was somewhat higher than would ordinarily be expected. The increase, however, was not statistically significant and the authors of the study did not suggest a link between the increase in lung cancer deaths and the exposure to PCBs.

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[2] Epidemiological studies examine the pattern of disease in human populations.

[3] The peritoneum is the lining of the abdominal cavity.

[4] A capacitor is an electrical component that stores an electric charge.

The third and fourth studies were likewise of no help. The third involved workers at a Norwegian cable manufacturing company who had been exposed to mineral oil. Ronneberg, Andersen, Skyberg, Mortality and Incidence of Cancer Among Oil-Exposed Workers in a Norwegian Cable Manufacturing Company, **[****18]** 45 British Journal of Industrial **[*146]** Medicine 595 (1988). A statistically significant increase in lung cancer deaths had been observed in these workers. The study, however, (1) made no mention of PCBs and (2) was expressly limited to the type of mineral oil involved in that study, and thus did not support these experts' opinions. The fourth and final study involved a PCB-exposed group in Japan that had seen a statistically significant increase in lung cancer deaths. Kuratsune, Nakamura, Ikeda, & Hirohata, Analysis of Deaths Seen Among Patients with Yusho -- A Preliminary Report, 16 Chemosphere, Nos. 8/9, 2085 (1987). The subjects of this study, however, had been exposed to numerous potential carcinogens, including toxic rice oil that they had ingested.

LEdHN[2C][↑] [2C]LEdHN[6][↑] [6]Respondent points to *Daubert*'s language that HN4[↑] the "focus, of course, must be solely on principles and methodology, not on the conclusions that they generate." 509 U.S. at 595.He claims that because the District Court's disagreement was with the **[***519]** conclusion that the experts drew from the studies, the District Court committed legal error and was properly reversed by the Court of Appeals. But conclusions and methodology are not entirely **[****19]** 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 that is connected to existing data only by the *ipse dixit* of the expert. A court may conclude that there is simply too great an analytical gap between the data and the opinion proffered. See Turpin v. Merrell Dow Pharmaceuticals, Inc., 959 F.2d 1349, 1360 (CA 6), cert. denied, *506 U.S. 826, 121 L. Ed. 2d 47, 113 S. Ct. 84 (1992)*. That is what the District Court did here, and we hold that it did not abuse its discretion in so doing.

LEdHN[1C][↑] [1C] LEdHN[2D][↑] [2D]We hold, therefore, that abuse of discretion is the proper standard by which to review a district court's decision to admit or exclude scientific evidence. We further hold that, because it was within the District Court's discretion to conclude that the studies upon which the experts relied were not **[*147]** sufficient, whether individually or in combination, to support their conclusions that Joiner's exposure to PCBs contributed to his cancer, the District Court did not abuse its discretion in excluding their testimony. These conclusions, however, do not dispose of this entire case.

LEdHN[7][↑] [7]Respondent's **[****20]** original contention was that his exposure to PCBs, furans, and dioxins contributed to his cancer. The District Court ruled that there was a genuine issue of material fact as to whether Joiner had been exposed to PCBs, but concluded that there was no genuine issue as to whether he had been exposed to furans and dioxins. The District Court accordingly never explicitly considered if there was admissible evidence on the question whether Joiner's alleged exposure to furans and dioxins contributed to his cancer. The Court of Appeals reversed the District Court's conclusion that there had been no exposure to furans and dioxins. Petitioners did not challenge this determination in their petition to this Court. Whether Joiner was exposed to furans and dioxins, and whether if there was such exposure, the opinions of Joiner's experts would then be admissible, remain open questions. We accordingly reverse the judgment of the Court of Appeals and remand this case for proceedings consistent with this opinion.

It is so ordered.

Concur by: BREYER; STEVENS (In Part)

Concur

[520]** JUSTICE BREYER, concurring.

The Court's opinion, which I join, emphasizes *Daubert*'s statement that a trial judge, acting as "gatekeeper," **[****21]** must "'ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable.'" *Ante*, at 5 (quoting Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 589, 125 L. Ed. 2d 469, 113 S. Ct. 2786 (1993)). This requirement will sometimes ask judges to make subtle and sophisticated determinations about scientific methodology and its relation to the conclusions an expert witness seeks to offer -- particularly when a case arises in an area where **[***520]** the science itself is tentative or **[*148]** uncertain, or where testimony about general risk levels in human beings or animals is offered to prove individual causation. Yet, as *amici* have pointed out, judges are not scientists and do not have the scientific training that can facilitate the making of such decisions. See, *e.g.*,

Brief for Trial Lawyers for Public Justice as *Amicus Curiae* 15; Brief for The New England Journal of Medicine et al. as *Amici Curiae* 2 ("Judges . . . are generally not trained scientists ").

Of course, neither the difficulty of the task nor any comparative lack of expertise can excuse the judge from exercising the "gatekeeper" duties that the Federal Rules impose -- determining, for example, whether particular **[****22]** expert testimony is reliable and "will assist the trier of fact," Fed. Rule Evid. 702, or whether the "probative value" of testimony is substantially outweighed by risks of prejudice, confusion or waste of time. Fed. Rule Evid. 403. To the contrary, when law and science intersect, those duties often must be exercised with special care.

Today's toxic tort case provides an example. The plaintiff in today's case says that a chemical substance caused, or promoted, his lung cancer. His concern, and that of others, about the causes of cancer is understandable, for cancer kills over one in five Americans. See U.S. Dept. of Health and Human Services, National Center for Health Statistics, Health United States 1996-97 and Injury Chartbook 117 (1997) (23.3% of all deaths in 1995). Moreover, scientific evidence implicates some chemicals as potential causes of some cancers. See, *e.g.,* U.S. Dept. of Health and Human Services, Public Health Service, National Toxicology Program, 1 Seventh Annual Report on Carcinogens, pp. v-vi (1994). Yet modern life, including good health as well as economic well-being, depends upon the use of artificial or manufactured substances, such as chemicals. And it **[****23]** may, therefore, prove particularly important to see that judges fulfill their *Daubert* gatekeeping function, so that they help assure that the powerful engine of tort liability, which can generate **[*149]** strong financial incentives to reduce, or to eliminate, production, points towards the right substances and does not destroy the wrong ones. It is, thus, essential in this science-related area that the courts administer the Federal Rules of Evidence in order to achieve the "ends" that the Rules themselves set forth, not only so that proceedings may be "justly determined," but also so "that the truth may be ascertained." Fed. Rule Evid. 102.

I therefore want specially to note that, as cases presenting significant science-related issues have increased in number, see Judicial Conference of the United States, Report of the Federal Courts Study Committee 97 (Apr. 2, 1990) ("Economic, statistical, technological, and natural and social scientific data are becoming increasingly important in both routine and complex litigation"), judges have increasingly found in the Rules of Evidence and Civil Procedure ways to help them overcome the inherent difficulty of making determinations about complicated **[****24]** scientific or otherwise technical evidence. Among these techniques are an increased use of Rule 16's pretrial conference authority to narrow the scientific issues in dispute, pretrial hearings where potential experts are subject **[***521]** to examination by the court, and the appointment of special masters and specially trained law clerks. See J. Cecil & T. Willging, Court-Appointed Experts: Defining the Role of Experts Appointed Under Federal Rule of Evidence 706, pp. 83-88 (1993); J. Weinstein, Individual Justice in Mass Tort Litigation 107-110 (1995); cf. Kaysen, In Memoriam: Charles E. Wyzanski, Jr., 100 Harv. L. Rev. 713, 713-715 (1987) (discussing a judge's use of an economist as a law clerk in United States v. United Shoe Machinery Corp., 110 F. Supp. 295 **[**521]** (D Mass 1953), aff'd, 347 U.S. 521, 98 L. Ed. 910, 74 S. Ct. 699 (1954)).

In the present case, the New England Journal of Medicine has filed an *amici* brief "in support of neither petitioners nor respondents" in which the Journal writes:

> "[A] judge could better fulfill this gatekeeper function if he or she had help from scientists. Judges should be **[*150]** strongly encouraged to make greater use of their inherent authority . . . to appoint experts . . . . Reputable **[****25]** experts could be recommended to courts by established scientific organizations, such as the National Academy of Sciences or the American Association for the Advancement of Science."

Brief for The New England Journal of Medicine 18-19; cf. Fed. Rule Evid. 706 (court may "on its own motion or on the motion of any party" appoint an expert to serve on behalf of the court, and this expert may be selected as "agreed upon by the parties" or chosen by the court); see also Weinstein, *supra,* at 116 (a court should sometimes "go beyond the experts proffered by the parties" and "utilize its powers to appoint independent experts under Rule 706 of the Federal Rules of Evidence"). Given this kind of offer of cooperative effort, from the scientific to the legal community, and given the various Rules-authorized methods for facilitating the courts' task, it seems to me that *Daubert*'s gatekeeping requirement will not prove inordinately difficult to implement; and that it will help secure the basic objectives of the Federal Rules of Evidence; which are, to repeat, the ascertainment of truth and the just

determination of proceedings. Fed. Rule Evid. 102.

Dissent by: STEVENS (In Part)

Dissent

JUSTICE STEVENS, **[****26]** concurring in part and dissenting in part.

The question that we granted certiorari to decide is whether the Court of Appeals applied the correct standard of review. That question is fully answered in Parts I and II of the Court's opinion. Part III answers the quite different question whether the District Court properly held that the testimony of plaintiff 's expert witnesses was inadmissible. Because I am not sure that the parties have adequately briefed that question, or that the Court has adequately explained why the Court of Appeals' disposition was erroneous, I do not join Part III. Moreover, because a proper answer to that question requires a study of the record that can be **[*151]** performed more efficiently by the Court of Appeals than by the nine members of this Court, I would remand the case to that court for application of the proper standard of review.

One aspect of the record will illustrate my concern. As the Court of Appeals pointed out, Joiner's experts relied on "the studies of at least **[***522]** thirteen different researchers, and referred to several reports of the World Health Organization that address the question of whether PCBs cause cancer." 78 F.3d 524, 533 (CA11 1996). Only **[****27]** one of those studies is in the record, and only six of them were discussed in the District Court opinion. Whether a fair appraisal of either the methodology or the conclusions of Joiner's experts can be made on the basis of such an incomplete record is a question that I do not feel prepared to answer.

It does seem clear, however, that the Court has not adequately explained why its holding is consistent with Federal Rule of Evidence 702, [1] as interpreted in Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 125 L. Ed. 2d 469, 113 S. Ct. 2786 (1993). [2] In general, scientific testimony that is both relevant and reliable must be admitted and testimony that is irrelevant or unreliable **[**522]** must be excluded. Id., at 597. In this case, the District Court relied on both grounds for exclusion.

[**28]** The relevance ruling was straightforward. The District Court correctly reasoned that an expert opinion that exposure **[*152]** to PCBs, "furans" and "dioxins" together may cause lung cancer would be irrelevant unless the plaintiff had been exposed to those substances. Having already found that there was no evidence of exposure to furans and dioxins, 864 F. Supp. 1310, 1318-1319 (ND Ga. 1994), it necessarily followed that this expert opinion testimony was inadmissible. Correctly applying *Daubert,* the District Court explained that the experts' testimony "manifestly does not fit the facts of this case, and is therefore inadmissible." 864 F. Supp. at 1322. Of course, if the evidence raised a genuine issue of fact on the question of Joiner's exposure to furans and dioxins -- as the Court of Appeals held that it did -- then this basis for the ruling on admissibility was erroneous, but not because the district judge either abused her discretion or misapplied the law. [3]

[**29]** The reliability ruling was more complex and arguably is not faithful to the statement in *Daubert* that "the focus, of course, must be solely on principles and methodology, not on the conclusions that they generate." 509 U.S. at 595. Joiner's experts used a "weight of the evidence" **[***523]** methodology to assess whether Joiner's exposure to transformer fluids

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[1] Rule 702 states: "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."

[2] The specific question on which the Court granted certiorari in *Daubert* was whether the rule of Frye v. United States, 54 App. D.C. 46, 293 F. 1013 (1923), remained valid after the enactment of the Federal Rules of Evidence, but the Court went beyond that issue and set forth alternative requirements for admissibility in place of the *Frye* test. Even though the *Daubert* test was announced in dicta, see 509 U.S. at 598-601 (REHNQUIST, C. J., concurring in part and dissenting in part), we should not simply ignore its analysis in reviewing the District Court's rulings.

[3] Petitioners do not challenge the Court of Appeals' straightforward review of the District Court's summary judgment ruling on exposure to furans and dioxins. As today's opinion indicates, *ante*, at 10, it remains an open question on remand whether the District Court should admit expert testimony that PCBs, furans and dioxins *together* promoted Joiner's cancer.

promoted his lung cancer. [4] They did not suggest that any **[*153]** one study provided adequate support for their conclusions, but instead relied on all the studies taken together (along with their interviews of Joiner and their review of his medical records). The District Court, however, examined the studies one by one and concluded that none was sufficient to show a link between PCBs and lung cancer. *864 F. Supp. at 1324-1326*. The focus of the opinion was on the separate studies and the conclusions of the experts, not on the experts' methodology. *Id., at 1322* ("Defendants . . . persuade the court that Plaintiffs' expert testimony would not be admissible . . . by attacking the conclusions that Plaintiffs' experts draw from the studies they cite").

[**30]** Unlike the District Court, the Court of Appeals expressly decided that a "weight of the evidence" methodology was scientifically acceptable. [5] To this extent, the Court of Appeals' opinion is persuasive. It is not intrinsically "unscientific" for experienced professionals to arrive at a conclusion by weighing all available scientific evidence -- this is not the sort of "junk science" with which *Daubert* was concerned. [6] After all, as Joiner points out, the Environmental Protection Agency (EPA) uses the same methodology to assess risks, albeit using a somewhat **[**523]** different threshold than that required in a trial. Brief for Respondents 40-41 (quoting **[*154]** EPA, Guidelines for Carcinogen Risk Assessment, *51 Fed. Reg. 33992, 33996 (1986)*). Petitioners' own experts used the same scientific approach as well. [7] And using this methodology, it would seem that an expert could reasonably have concluded that the study of workers at an Italian capacitor plant, coupled with data from Monsanto's study and other studies, **[***524]** raises an inference that PCBs promote lung cancer. [8] **[****31]**

[**32]** The Court of Appeals' discussion of admissibility is faithful to the dictum in *Daubert* that the reliability inquiry must focus on methodology, not conclusions. Thus, even though I fully agree with both the District Court's and this Court's explanation of why each of the studies on which the experts relied was by itself unpersuasive, a critical question remains unanswered: When qualified experts have reached relevant conclusions on the basis of an acceptable methodology, why are their opinions inadmissible?

Daubert quite clearly forbids trial judges from assessing the validity or strength of an expert's scientific conclusions, which is a matter for the jury. [9] Because I

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[4] Dr. Daniel Teitelbaum elaborated on that approach in his deposition testimony: "As a toxicologist when I look at a study, I am going to require that that study meet the general criteria for methodology and statistical analysis, but that when all of that data is collected and you ask me as a patient, 'Doctor, have I got a risk of getting cancer from this?' That those studies don't answer the question, that I have to put them all together in my mind and look at them in relation to everything I know about the substance and everything I know about the exposure and come to a conclusion. I think when I say, 'To a reasonable medical probability as a medical toxicologist, this substance was a contributing cause,' . . . to his cancer, that that is a valid conclusion based on the totality of the evidence presented to me. And I think that that is an appropriate thing for a toxicologist to do, and it has been the basis of diagnosis for several hundred years, anyway." Supp. App. to Brief for Respondents 19.

[5] The court explained: "Opinions of any kind are derived from individual pieces of evidence, each of which by itself might not be conclusive, but when viewed in their entirety are the building blocks of a perfectly reasonable conclusion, one reliable enough to be submitted to a jury along with the tests and criticisms cross-examination and contrary evidence would supply." *78 F.3d 524, 532 (CA11 1996)*.

[6] An example of "junk science" that should be excluded under *Daubert* as too unreliable would be the testimony of a phrenologist who would purport to prove a defendant's future dangerousness based on the contours of the defendant's skull.

[7] See, *e.g.*, Deposition of Dr. William Charles Bailey, Supp. App. to Brief for Respondents 56 ("I've just reviewed a lot of literature and come to some conclusions . . . .").

[8] The Italian capacitor plant study found that workers exposed to PCBs had a higher-than-expected rate of lung cancer death, though "the numbers were small [and] the value of the risk estimate was not statistically significant." *864 F. Supp. 1310, 1324 (ND Ga. 1994)*. The Monsanto study also found a correlation between PCB exposure and lung cancer death, but the results were not statistically significant. *Id., at 1325*. Moreover, it should be noted that under Georgia law, which applies in this diversity suit, Joiner need only show that his exposure to PCBs "promoted" his lung cancer, not that it was the sole cause of his cancer. Brief for Respondents 7, n. 16 (quoting Brief for Appellants in No. 94-9131 (CA 11), pp. 7-10).

[9] The Court stated in *Daubert*: "Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence. . . . Additionally, in the event the trial court concludes that the scintilla of evidence presented supporting a position is insufficient to allow a reasonable juror to conclude that the position more likely than not is true, the court remains free to direct a judgment, *Fed.*

am persuaded [*155] that the difference between methodology and conclusions is just as categorical as the distinction between means and ends, I do not think the statement that "conclusions and methodology are not entirely distinct from one another," *ante*, at 9, is either accurate or helps us answer the difficult admissibility question presented by this record.

[****33] In any event, it bears emphasis that the Court has not held that it would have been an abuse of discretion to admit the expert testimony. The very point of today's holding is that the abuse of discretion standard of review applies whether the district judge has excluded or admitted evidence. *Ante*, at 5. And nothing in either *Daubert* or the Federal Rules of Evidence requires a district judge to reject an expert's conclusions and keep them from the jury when they fit the facts of the case and are based on reliable scientific methodology.

Accordingly, while I join Parts I and II of the Court's opinion, I do not concur in the judgment or in Part III of its opinion.

References

5 Am Jur 2d, Appellate Review 695, 700; 31A Am Jur 2d, Expert and Opinion Evidence 6

L Ed Digest, Appeal 1391, 1392; Evidence 641, 643

L Ed Index, Abuse of Discretion or Power; Experiments or Tests; Expert and Opinion Evidence; Rules of Evidence

Annotation References:

What issues [****34] will the Supreme Court consider, though not, or not properly, raised by the parties. 42 L Ed 2d 946.

Reliability of scientific technique and its acceptance within scientific community as affecting admissibility, at federal trial, of expert testimony as to result of test or study based on such technique--modern cases. 105 ALR Fed 299.

When will expert testimony "assist trier of fact" so as to be admissible at federal trial under Rule 702 of Federal Rules of Evidence. 75 ALR Fed 461.

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Rule Civ. Proc. 50(a), and likewise to grant summary judgment, Fed. Rule Civ. Proc. 56. . . . These conventional devices, rather than wholesale exclusion under an uncompromising 'general acceptance' test, are the appropriate safeguards where the basis of scientific testimony meets the standards of Rule 702." 509 U.S. at 596.

Kumho Tire Co. v. Carmichael

Supreme Court of the United States

December 7, 1998, Argued ; March 23, 1999, Decided

No. 97-1709

Reporter
526 U.S. 137 *; 119 S. Ct. 1167 **; 143 L. Ed. 2d 238 ***; 1999 U.S. LEXIS 2189 ****; 50 U.S.P.Q.2D (BNA) 1177; 67 U.S.L.W. 4179; 99 Cal. Daily Op. Service 2059; 50 Fed. R. Evid. Serv. (Callaghan) 1373; 29 ELR 20638; CCH Prod. Liab. Rep. P15,470; 1999 Colo. J. C.A.R. 1518; 12 Fla. L. Weekly Fed. S 141

KUMHO TIRE COMPANY, LTD., ET AL., PETITIONERS v. PATRICK CARMICHAEL, ETC., ET AL.

Prior History: [****1] ON WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE ELEVENTH CIRCUIT.

Disposition: *131 F.3d 1433*, reversed.

Core Terms

tire, reliability, scientific, factors, expert testimony, tread, engineering, bead, trial judge, district court, specialized, inspection, overdeflection, visual, cases, wear, admissibility, gatekeeping, methodology, shoulder, applies, particular case, groove, questions, carcass, rested, rim, trial court, make clear, principles

Case Summary

Procedural Posture

On writ of certiorari, petitioner tire maker appealed the judgment of the United States Court of Appeals for the Eleventh Circuit, which reversed the district court's decision to exclude the testimony of respondent customers' tire expert because the expert relied on experience-based observations instead of the application of scientific principles.

Overview

Respondent customers sued petitioner tire maker after a tire blew out on their minivan. Respondents' expert in tire failure analysis intended to testify that a defect in the tire's manufacture or design caused the blow-out. The district court excluded the expert's testimony after an examination of Daubert's reliability-related factors. The court of appeals reversed. On appeal, the Court held that the Daubert standard of evidentiary reliability was not limited to scientific testimony but extended to all expert testimony. A trial judge could have considered Daubert's specific factors to assess reliability and to determine admissibility. However, the Court emphasized that while a trial judge may consider those factors, the factors may or may not apply in a particular case. The Court found that some of Daubert's questions were helpful in evaluating the reliability even of experience-based testimony. The Court concluded that refusal to admit the testimony of respondents' expert was not an abuse of discretion where no evidence existed that any other tire expert accepted the methodology of respondent's expert.

Outcome

The Court reversed the judgment of the court of appeals which allowed the testimony of respondent customers' tire expert because the court was permitted to ask reliability questions even though respondents' expert relied on experience-based observations. The standards of evidentiary reliability applied to all expert testimony.

LexisNexis® Headnotes

Evidence > Admissibility > Expert Witnesses > Daubert Standard

Evidence > Admissibility > Scientific
Evidence > Standards for Admissibility

Evidence > Types of
Evidence > Testimony > General Overview

Evidence > ... > Testimony > Expert Witnesses > General Overview

HN1[] Expert Witnesses, Daubert Standard

Daubert's general holding-setting forth the trial judge's general "gatekeeping" obligation-applies not only to testimony based on "scientific" knowledge, but also to testimony based on "technical" and "other specialized" knowledge. Fed. Rule Evid. 702. A trial court may consider one or more of the more specific factors that Daubert mentioned when doing so will help determine that testimony's reliability. But, the test of reliability is "flexible," and Daubert's list of specific factors neither necessarily nor exclusively applies to all experts or in every case. Rather, the law grants a district court the same broad latitude when it decides how to determine reliability as it enjoys in respect to its ultimate reliability determination.

Evidence > Admissibility > Expert Witnesses > Daubert Standard

Evidence > Admissibility > Scientific Evidence > Standards for Admissibility

Evidence > Types of Evidence > Testimony > General Overview

Evidence > ... > Testimony > Expert Witnesses > General Overview

HN2[] Expert Witnesses, Daubert Standard

Fed. R. Evid. 702 imposes a special obligation upon a trial judge to ensure that any and all scientific testimony is not only relevant, but reliable.

Evidence > Admissibility > Expert Witnesses > Helpfulness

Evidence > Admissibility > Scientific Evidence > Standards for Admissibility

Evidence > ... > Testimony > Expert Witnesses > General Overview

Evidence > Admissibility > Expert Witnesses > Daubert Standard

Evidence > ... > Testimony > Expert Witnesses > Qualifications

HN3[] Expert Witnesses, Helpfulness

Fed. R. Evid. 702 itself says that 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. This language makes no relevant distinction between scientific knowledge and technical or other specialized knowledge. It makes clear that any such knowledge might become the subject of expert testimony. It is the rule's word, knowledge, not the words like scientific that modify that word, that establishes a standard of evidentiary reliability. Hence, as a matter of language, the rule applies its reliability standard to all scientific, technical, or other specialized matters within its scope.

Civil Procedure > Judicial Officers > Judges > General Overview

Evidence > Admissibility > Expert Witnesses > Daubert Standard

Evidence > Types of Evidence > Testimony > General Overview

Evidence > ... > Testimony > Expert Witnesses > General Overview

HN4[] Judicial Officers, Judges

Daubert's general principles apply to the expert matters described in Fed. R. Evid. 702. The Rule, in respect to all such matters, establishes a standard of evidentiary reliability. It requires a valid connection to the pertinent inquiry as a precondition to admissibility. And where such testimony's factual basis, data, principles, methods, or their application are called sufficiently into question, the trial judge must determine whether the testimony has a reliable basis in the knowledge and experience of the relevant discipline.

Civil Procedure > Judicial Officers > Judges > General Overview

Evidence > Admissibility > Expert Witnesses

Evidence > Admissibility > Scientific Evidence > Standards for Admissibility

Evidence > ... > Testimony > Expert

Witnesses > General Overview

Evidence > Admissibility > Expert Witnesses > Daubert Standard

HN5[] Judicial Officers, Judges

A trial judge determining the admissibility of an engineering expert's testimony may consider several more specific factors that Daubert said might bear on a judge's gate-keeping determination. These factors include: whether a theory or technique can be (and has been) tested; whether it has been subjected to peer review and publication; whether, in respect to a particular technique, there is a high known or potential rate of error and whether there are standards controlling the technique's operation; and whether the theory or technique enjoys general acceptance within a relevant scientific community.

Evidence > Admissibility > Expert Witnesses > Daubert Standard

Evidence > Admissibility > Scientific Evidence > Standards for Admissibility

Evidence > ... > Testimony > Expert Witnesses > General Overview

HN6[] Expert Witnesses, Daubert Standard

The *Fed. R. Evid. 702* inquiry is a flexible one. Daubert makes clear that the factors it mentions do not constitute a definitive checklist or test. And Daubert adds that the gatekeeping inquiry must be tied to the facts of a particular case. The factors identified in Daubert may or may not be pertinent in assessing reliability, depending on the nature of the issue, the expert's particular expertise, and the subject of his testimony. The conclusion, in the United States Supreme Court's view, is that the court can neither rule out, nor rule in, for all cases and for all time the applicability of the factors mentioned in Daubert, nor can the court do so for subsets of cases categorized by category of expert or by kind of evidence. Too much depends upon the particular circumstances of the particular case at issue.

Evidence > Admissibility > Expert Witnesses > Daubert Standard

Evidence > Admissibility > Scientific Evidence > Standards for Admissibility

Evidence > ... > Testimony > Expert Witnesses > General Overview

HN7[] Expert Witnesses, Daubert Standard

The trial judge must have considerable leeway in deciding in a particular case how to go about determining whether particular expert testimony is reliable. That is to say, a trial court should consider the specific factors identified in Daubert where they are reasonable measures of the reliability of expert testimony.

Civil Procedure > Appeals > Standards of Review > Abuse of Discretion

Evidence > Admissibility > Expert Witnesses

Evidence > Rule Application & Interpretation

Evidence > ... > Testimony > Expert Witnesses > General Overview

HN8[] Standards of Review, Abuse of Discretion

The trial court must have the same kind of latitude in deciding how to test an expert's reliability, and to decide whether or when special briefing or other proceedings are needed to investigate reliability, as it enjoys when it decides whether that expert's relevant testimony is reliable. A court of appeals is to apply an abuse-of-discretion standard when it reviews a trial court's decision to admit or exclude expert testimony. That standard applies as much to the trial court's decisions about how to determine reliability as to its ultimate conclusion. Otherwise, the trial judge would lack the discretionary authority needed both to avoid unnecessary reliability proceedings in ordinary cases where the reliability of an expert's methods is properly taken for granted, and to require appropriate proceedings in the less usual or more complex cases where cause for questioning the expert's reliability arises.

Evidence > ... > Testimony > Expert Witnesses > General Overview

Evidence > Rule Application & Interpretation

Evidence > Admissibility > Scientific
Evidence > Standards for Admissibility

HN9[] Testimony, Expert Witnesses

The Federal Rules of Evidence seek to avoid unjustifiable expense and delay as part of their search for truth and the just determination of proceedings. Fed. Rule Evid. 102. Thus, whether Daubert's specific factors are, or are not, reasonable measures of reliability in a particular case is a matter that the law grants the trial judge broad latitude to determine.

Evidence > Admissibility > Expert Witnesses > Daubert Standard

Evidence > Admissibility > Procedural Matters > Rulings on Evidence

Evidence > ... > Testimony > Expert Witnesses > General Overview

Evidence > Admissibility > Expert Witnesses

HN10[] Expert Witnesses, Daubert Standard

Nothing in either Daubert or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the ipse dixit of the expert.

Lawyers' Edition Display

Decision

Federal trial judge's gatekeeping obligation under Federal Rules of Evidence--to insure that expert witness' testimony rests on reliable foundation and is relevant to task at hand--held to apply to all expert testimony, not only scientific.

Summary

In Daubert v Merrell Dow Pharmaceuticals, Inc. (1993) 509 US 579, 125 L Ed 2d 469, 113 S Ct 2786, a case involving the admissibility of scientific expert testimony, the United States Supreme Court held that (1) such testimony was admissible only if relevant and reliable; (2) the Federal Rules of Evidence (FRE) assigned to the trial judge the task of insuring that an expert's testimony rested on a reliable foundation and was relevant to the task at hand; and (3) some or all of certain specific factors--such as testing, peer review, error rates, and acceptability in the relevant scientific community--might possibly prove helpful in determining the reliability of a particular scientific theory or technique. In 1993, after a tire on a minivan blew out and the minivan overturned, one passenger died and the others were injured. The survivors and the decedent's representative, claiming that the failed tire had been defective, brought a diversity suit in the United States District Court for the Southern District of Alabama against the tire's maker and distributor. The plaintiffs rested their case in significant part upon the depositions of a mechanical engineer--an expert in tire failure analysis--who intended to testify that, in his expert opinion, a defect in the tire's manufacture or design caused the blowout. The expert's opinion was based upon (1) a visual and tactile inspection of the tire, and (2) the theory that in the absence of at least two of four specific physical symptoms indicating tire abuse, the tire failure of the sort that occurred in the case at hand was caused by a defect. The District Court--in granting a motion to exclude the expert's testimony as well as a motion for summary judgment against the plaintiffs--(1) agreed with the defendants that the District Court ought to act as a Daubert-type reliability "gatekeeper," even though the testimony at issue could be considered "technical" rather than "scientific"; (2) examined the expert's methodology in light of the reliability-related factors that Daubert had mentioned; and (3) concluded that all those factors argued against the reliability of the expert's methods (923 F Supp 1514, 1996 US Dist LEXIS 5706). On reconsideration, the District Court--although acknowledging that the Daubert factors ought to be applied flexibly and were simply illustrative--affirmed the earlier rulings on the ground that there were insufficient indications of the reliability of the expert's methodology of tire failure analysis. The United States Court of Appeals for the Eleventh Circuit, in reversing and remanding, expressed the view that the District Court had erred as a matter of law in applying the Daubert factors to the tire expert's testimony, as (1) Daubert was limited to the scientific context, and (2) the testimony in question relied on experience rather than the application of scientific principles (131 F3d 1433, 1997 US App LEXIS 35981).

On certiorari, the Supreme Court reversed. In an opinion by Breyer, J., joined by Rehnquist, Ch. J., and O'Connor, Scalia, Kennedy, Souter, Thomas, and Ginsburg, JJ., and joined (as to points 1 and 2 below) by

Stevens, J., it was held that (1) a federal trial judge's gatekeeping obligation under the FRE--to insure that an expert witness' testimony rests on a reliable foundation and is relevant to the task at hand--applies not only to testimony based on scientific knowledge, but rather to all expert testimony, that is, testimony based on technical and other specialized knowledge; (2) in determining the admissibility of an expert's testimony--including the testimony of an engineering expert--a federal trial judge may properly consider one or more of the specific Daubert factors, where doing so will help determine that testimony's reliability; and (3) in the case at hand, the District Court's decision not to admit the expert testimony in question was within the District Court's discretion.

Scalia, J., joined by O'Connor and Thomas, JJ., concurring, expressed the view that (1) a trial court's discretion in choosing the manner of testing expert reliability is not discretion to abandon the gatekeeping function or to perform that function inadequately; and (2) in a particular case, the failure to apply one or another of the Daubert factors may possibly be unreasonable and hence an abuse of discretion.

Stevens, J., concurring in part and dissenting in part, (1) agreed that a federal trial judge may properly consider the Daubert factors in analyzing the admissibility of an engineering expert's testimony, and (2) expressed the view that the case ought to have been remanded to the Court of Appeals for a study of the record to determine whether the trial judge abused his discretion in excluding the expert testimony in question.

Headnotes

EVIDENCE §641 > -- expert testimony -- judge's gatekeeping obligation > Headnote:
LEdHN[1A] [1A] LEdHN[1B] [1B] LEdHN[1C] [1C] LEdHN[1D] [1D]

A federal trial judge's gatekeeping obligation under the Federal Rules of Evidence (FRE)--to insure that an expert witness' testimony rests on a reliable foundation and is relevant to the task at hand--applies not only to testimony based on scientific knowledge, but rather to all expert testimony, that is, testimony based on technical and other specialized knowledge, for (1) the language of *Rule 702 of the FRE*, which allows expert witnesses to give opinion testimony as to scientific, technical, or other specialized knowledge under some circumstances, (a) makes no relevant distinction between "scientific" knowledge and "technical" or "other specialized" knowledge, and (b) makes clear that any such knowledge might become the subject of expert testimony; (2) the FRE grant to all experts--not just to "scientific" ones--testimonial latitude unavailable to other witnesses on the assumption that an expert's opinion will have a reliable basis in the knowledge and experience of the expert's discipline; (3) it would prove difficult, if not impossible, for judges to administer evidentiary rules under which a gatekeeping obligation depended upon a distinction between scientific knowledge and technical or other specialized knowledge, and (4) there is no convincing need to make such distinctions.

EVIDENCE §641 > -- expert testimony -- reliability factors > Headnote:
LEdHN[2A] [2A] LEdHN[2B] [2B] LEdHN[2C] [2C] LEdHN[2D] [2D]

In determining the admissibility of an expert's testimony, including the testimony of an engineering expert, under *Rule 702 of the Federal Rules of Evidence*, a federal trial judge may properly consider one or more of some specific factors--whether the theory or technique (1) can be and has been tested, (2) has been subjected to peer review or publication, (3) has (a) a high known or potential rate of error, and (b) standards controlling the technique's operation, and (4) enjoys general acceptance within a relevant scientific community--where such factors are reasonable measures of the testimony's reliability; the trial judge may ask questions of this sort not only where an expert relies on the application of scientific principles, but also where an expert relies on skill- or experience-based observation.

EVIDENCE §643 > -- expert testimony -- cause of tire failure > Headnote:
LEdHN[3A] [3A] LEdHN[3B] [3B] LEdHN[3C] [3C] LEdHN[3D] [3D] LEdHN[3E] [3E]

A Federal District Court's decision not to admit expert testimony as to the cause of an automobile tire's blowout is within the court's discretion, where (1) the testimony consists of the depositions of a witness who

intends to testify that, in the witness' expert opinion, a defect in the tire's manufacture or design caused the tire to blow out; (2) the witness' opinion is based upon (a) a visual and tactile inspection of the tire, and (b) a theory that in the absence of at least two of four specific physical symptoms indicating tire abuse, the tire failure of the sort that occurred in the case at hand is caused by a defect; (3) the question before the court is not the reliability of the witness' methodology in general, but rather whether the witness can reliably determine the cause of failure of the particular tire at issue; (4) the witness concedes, among other matters, that this tire bore some of the very marks that were said to indicate abuse rather than a defect; (5) the witness' own testimony casts considerable doubt upon the reliability of (a) the witness' explicit theory, and (b) the implicit proposition about the significance of visual inspection in the case at hand; (6) there is no indication in the record that (a) other experts in the industry use the witness' particular approach, or (b) tire experts normally make the very fine distinctions necessary to support the witness' conclusions; (7) there are no references to articles or papers that validate the witness' approach; and (8) the court's decision is ultimately based upon the witness' failure to satisfy either (a) specific factors involving testing, peer review, error rates, and acceptability in the relevant scientific community, or (b) any other set of reasonable reliability criteria. (Stevens, J., dissented in part from this holding.)

EVIDENCE §641 > -- expert testimony > Headnote:
LEdHN[4A] [4A] LEdHN[4B] [4B] LEdHN[4C] [4C]

For purposes of determining the admissibility, under Rule 702 of the Federal Rules of Evidence, of expert testimony that is based on a theory or technique, the test of the testimony's reliability is flexible; some specific factors that may possibly bear on the reliability determination--whether the theory or technique (1) can be and has been tested, (2) has been subjected to peer review or publication, (3) has (a) a high known or potential rate of error, and (b) standards controlling the technique's operation, and (4) enjoys general acceptance within a relevant scientific community--do not constitute a definitive checklist or test; depending on the nature of the issue, the expert's particular expertise, and the subject of the expert's testimony, such factors may or may not be pertinent in assessing the testimony's reliability; because too much depends upon the particular circumstances of the particular case at issue, the United States Supreme Court can neither rule out nor rule in the applicability of these factors (1) for all cases and for all time, or (2) for subsets of cases categorized by category of expert or by kind of evidence; these factors do not all necessarily apply in every instance in which the reliability of scientific testimony is challenged.

EVIDENCE §641 > -- expert testimony > Headnote:
LEdHN[5A] [5A] LEdHN[5B] [5B]

In determining the admissibility of expert testimony under Rule 702 of the Federal Rules of Evidence, a trial court must have the same kind of latitude in deciding how to test an expert's reliability--and to decide whether or when special briefing or other proceedings are needed to investigate reliability--as the trial court enjoys in deciding whether that expert's relevant testimony is reliable; thus, in determining the admissibility under Rule 702 of expert testimony that is based on a theory or technique, the question whether some specific factors--whether the theory or technique (1) can be and has been tested, (2) has been subjected to peer review or publication, (3) has (a) a high known or potential rate of error, and (b) standards controlling the technique's operation, and (4) enjoys general acceptance within a relevant scientific community--are reasonable measures of reliability in a particular case is a matter that the law grants the trial judge broad latitude to determine.

APPEAL §1296 > -- presumptions -- expert testimony > Headnote:
LEdHN[6] [6]

On certiorari to review a Federal Court of Appeals' judgment in a suit against an automobile tire's maker and distributor--in which suit an expert witness, in concluding that a defect in the tire's manufacture or design caused the tire to blow out, rests this conclusion in part upon the premises that (1) a tire's carcass should stay bound to the inner side of the tread for a significant period of time after the tread depth has worn away, (2) the tread of the tire at issue separated from the tire's inner steel-belted carcass prior to the accident, and (3) this separation caused the blowout--the United States Supreme Court must assume that these premises are

not in dispute, where the witness' conclusion also rests upon some other propositions, several of which the maker and distributor dispute.

EVIDENCE §641 > -- expert testimony > Headnote:
LEdHN[7] [7]

Rule 702 of the Federal Rules of Evidence, which allows expert witnesses to give opinion testimony as to scientific, technical, or other specialized knowledge under some circumstances, establishes a standard of evidentiary reliability and requires a valid connection to the pertinent inquiry as a precondition to admissibility; where such testimony's factual basis, data, principles, methods, or their application are called sufficiently into question, the trial judge must determine whether the testimony has a reliable basis in the knowledge and experience of the relevant discipline.

EVIDENCE §641 > -- expert testimony > Headnote:
LEdHN[8] [8]

For purposes of determining the admissibility, under Rule 702 of the Federal Rules of Evidence, of expert testimony that is based on a theory or technique, the fact that the theory or technique has general acceptance within a relevant expert community does not help to show that the expert's testimony is reliable where the discipline itself lacks reliability, as, for example, theories grounded in any so-called generally accepted principles of astrology or necromancy.

EVIDENCE §641 > -- expert testimony > Headnote:
LEdHN[9] [9]

For purposes of determining the admissibility, under Rule 702 of the Federal Rules of Evidence, of expert testimony that is based on the expert's experience, (1) it is appropriate in some cases for a trial judge to ask, for example, (a) how often an engineering expert's experience-based methodology has produced erroneous results, or (b) whether such a method is generally accepted in the relevant engineering community; and (2) it is useful at times to ask even of a witness whose expertise is based purely on experience--as, for example, a perfume tester able to distinguish among 140 odors at a sniff--whether the witness' preparation is of a kind that others in the field would recognize as acceptable.

EVIDENCE §641 > -- expert testimony > Headnote:
LEdHN[10] [10]

The objective of a trial judge's gatekeeping requirement--in determining the admissibility, under Rule 702 of the Federal Rules of Evidence, of expert testimony--is to insure the reliability and relevancy of expert testimony, that is, to make certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field.

APPEAL §1391 > -- discretion -- expert testimony > Headnote:
LEdHN[11A] [11A] LEdHN[11B] [11B]

A Federal Court of Appeals is to apply an abuse-of-discretion standard when reviewing a federal trial court's decision to admit or exclude expert testimony; this standard applies as much to the trial court's decisions about how to determine reliability as to the trial court's ultimate conclusion, for otherwise, the trial judge would lack the discretionary authority needed to (1) avoid unnecessary reliability proceedings in ordinary cases where the reliability of an expert's methods is properly taken for granted, and (2) require appropriate proceedings in the less usual or more complex cases where cause for questioning the expert's reliability arises.

EVIDENCE §641 > -- expert testimony > Headnote:
LEdHN[12] [12]

Nothing in a United States Supreme Court decision involving the admissibility of expert testimony or in the Federal Rules of Evidence requires a Federal District Court to admit opinion evidence that is connected to

existing data by only the expert's own statement.

Syllabus

[1178] When a tire on the vehicle driven by Patrick Carmichael blew out and the vehicle overturned, one passenger died and the others were injured. The survivors and the decedent's representative, respondents here, brought this diversity suit against the tire's maker and its distributor (collectively Kumho Tire), claiming that the tire that failed was defective. They rested their case in significant part upon the depositions of a tire failure analyst, Dennis Carlson, Jr., who intended to testify that, in his expert opinion, a defect in the tire's manufacture or design caused the blow out. That opinion was based upon a visual and tactile inspection of the tire and upon the theory that in the absence of at least two of four specific, physical symptoms **[****2]** indicating tire abuse, the tire failure of the sort that occurred here was caused by a defect. Kumho Tire moved to exclude Carlson's testimony on the ground that his methodology failed to satisfy Federal Rule of Evidence 702, which says: "If scientific, technical, or other specialized knowledge will assist the trier of fact . . . , a witness qualified as an expert . . . may testify thereto in the form of an opinion." Granting the motion (and entering summary judgment for the defendants), the District Court acknowledged that it should act as a reliability "gatekeeper" under Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 589, 125 L. Ed. 2d 469, 113 S. Ct. 2786, in which this Court held that Rule 702 imposes a special obligation upon a trial judge to ensure that scientific testimony is not only relevant, but reliable. The court noted that *Daubert* discussed four factors -- testing, peer review, error rates, and "acceptability" in the relevant scientific community -- which might prove helpful in determining the reliability of a particular scientific theory or technique, 509 U.S. at 593-594, and found that those factors argued against the reliability of Carlson's **[****3]** methodology. On the plaintiffs' motion for reconsideration, the court agreed that *Daubert* should be applied flexibly, that its four factors were simply illustrative, and that other factors could argue in favor of admissibility. However, the court affirmed its earlier order because it found insufficient indications of the reliability of Carlson's methodology. In reversing, the Eleventh Circuit held that the District Court had erred as a matter of law in applying *Daubert*. Believing that *Daubert* was limited to the scientific context, the court held that the *Daubert* factors did not apply to Carlson's testimony, which it characterized as skill- or experience-based.

Held:

1. The Daubert factors may apply to the testimony of engineers and other experts who are not scientists. Pp. 7-13.

[1179] (a) The *Daubert* "gatekeeping" obligation applies not only to "scientific" testimony, but to all expert testimony. Rule 702 does not distinguish between "scientific" knowledge and "technical" or "other specialized" knowledge, but makes clear that any such knowledge might become the subject of expert testimony. It is the Rule's word "knowledge," not the words (like **[****4]** "scientific") that modify that word, that establishes a standard of evidentiary reliability. 509 U.S. at 589-590. *Daubert* referred only to "scientific" knowledge because that was the nature of the expertise there at issue. Id. at 590, n. 8. Neither is the evidentiary rationale underlying *Daubert*'s "gatekeeping" determination limited to "scientific" knowledge. Rules 702 and 703 grant all expert witnesses, not just "scientific" ones, testimonial latitude unavailable to other witnesses on the assumption that the expert's opinion will have a reliable basis in the knowledge and experience of his discipline. Id. at 592. Finally, it would prove difficult, if not impossible, for judges to administer evidentiary rules under which a "gatekeeping" obligation depended upon a distinction between "scientific" knowledge and "technical" or "other specialized" knowledge, since there is no clear line dividing the one from the others and no convincing need to make such distinctions. Pp. 7-9.

(b) A trial judge determining the admissibility of an engineering expert's testimony *may* consider one or more of the specific *Daubert* factors. The emphasis on the word "may" reflects **[****5]** *Daubert*'s description of the Rule 702 inquiry as "a flexible one." 509 U.S. at 594. The *Daubert* factors do *not* constitute a definitive checklist or test, id. at 593, and the gatekeeping inquiry must be tied to the particular facts, id. at 591. Those factors may or may not be pertinent in assessing reliability, depending on the nature of the issue, the expert's particular expertise, and the subject of his testimony. Some of those factors may be helpful in evaluating the reliability even of experience-based expert testimony, and the Court of Appeals erred insofar as it ruled those factors out in such cases. In determining whether particular expert testimony is reliable, the trial court should consider the specific

Daubert factors where they are reasonable measures of reliability. Pp. 10-12.

(c) The court of appeals must apply an abuse-of-discretion standard when it reviews the trial court's decision to admit or exclude expert testimony. *General Electric Co. v. Joiner, 522 U.S. 136, 138-139, 139 L. Ed. 2d 508, 118 S. Ct. 512*. That standard applies as much to the trial court's decisions about how to determine reliability as to its ultimate conclusion. **[****6]** Thus, whether *Daubert*'s specific factors are, or are not, reasonable measures of reliability in a particular case is a matter that the law grants the trial judge broad latitude to determine. See *id. at 143*. The Eleventh Circuit erred insofar as it held to the contrary. P. 13.

2. Application of the foregoing standards demonstrates that the District Court's decision not to admit Carlson's expert testimony was lawful. The District Court did not question Carlson's qualifications, but excluded his testimony because it initially doubted his methodology and then found it unreliable after examining the transcript in some detail and considering respondents' defense of it. The doubts that triggered the court's initial inquiry were reasonable, as was the court's ultimate conclusion that Carlson could not reliably determine the cause of the failure of the tire in question. The question was not the reliability of Carlson's methodology in general, but rather whether he could reliably determine the cause of failure of *the particular tire at issue.* That tire, Carlson conceded, had traveled far enough so that some of the tread had been worn bald, it should have been taken out of service, **[****7]** it had been repaired (inadequately) for punctures, and it bore some of the very marks that he said indicated, not a defect, but abuse. Moreover, Carlson's own testimony cast considerable doubt upon the reliability of both his theory about the need for at least two signs of abuse and his proposition about the significance of visual inspection in this case. Respondents stress that other tire failure experts, like Carlson, rely on visual and tactile examinations of tires. But there is no indication in the record that other experts in the industry use Carlson's *particular* approach or that tire experts normally make the very fine distinctions necessary to support his conclusions, nor are there references to articles or papers that validate his approach. Respondents' argument that the District Court too rigidly applied *Daubert* might have had some validity with respect to the court's initial opinion, but fails because the court, on reconsideration, recognized that the relevant reliability inquiry should be "flexible," and ultimately based its decision upon Carlson's failure to satisfy either *Daubert*'s factors *or any other* set of reasonable reliability criteria. Pp. 13-19.

[**8]** *131 F.3d 1433*, reversed.

Counsel: Joseph H. Babington argued the cause for petitioners.

Jeffrey P. Minear argued the cause for the United States, as amicus curiae, by special leave of court.

Sidney W. Jackson argued the cause for respondents.

Judges: BREYER, J., delivered the opinion of the Court, in which REHNQUIST, C. J., and O'CONNOR, SCALIA, KENNEDY, SOUTER, THOMAS, and GINSBURG, JJ., joined, and in which STEVENS, J., joined as to Parts I and II. SCALIA, J., filed a concurring opinion, in which O'CONNOR and THOMAS, JJ., joined. STEVENS, J., filed an opinion concurring in part and dissenting in part.

Opinion by: BREYER

Opinion

[1180] [*141] [1171] [***246]** JUSTICE BREYER delivered the opinion of the Court.

LEdHN[1A][↑] [1A] In *Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 125 L. Ed. 2d 469, 113 S. Ct. 2786 (1993)*, this Court focused upon the admissibility of scientific expert testimony. It pointed out that such testimony is admissible only if it is both relevant and reliable. And it held that the Federal Rules of Evidence "assign to the trial judge the task of ensuring that an expert's testimony both rests on a reliable foundation and is relevant to the task at hand." *Id. at 597*. The Court also discussed certain more specific factors, such as testing, peer review, error rates, and "acceptability" in the relevant scientific community, some or all of which might prove helpful in determining the reliability of a particular scientific **[****9]** "theory or technique." *509 U.S. at 593-594*.

LEdHN[1B][↑] [1B] *LEdHN[2A]*[↑] [2A] *LEdHN[3A]*[↑] [3A] *LEdHN[4A]*[↑] [4A] *LEdHN[5A]*[↑] [5A]This case requires us to decide how *Daubert* applies to the testimony of engineers and other experts who are not scientists. We conclude that *HN1*[↑] *Daubert*'s general holding -- setting forth the trial judge's general "gatekeeping" obligation -- applies not only to testimony based on "scientific" knowledge, but also to testimony

based on "technical" and "other specialized" knowledge. See Fed. Rule Evid. 702. We also conclude that a trial court *may* consider one or more of the more specific factors that *Daubert* mentioned when doing so will help determine that testimony's reliability. But, as the Court stated in *Daubert*, the test of reliability is "flexible," and *Daubert*'s list of specific factors neither necessarily nor exclusively applies to all experts or in every case. **[*142]** Rather, the law grants a district court the same broad latitude when it decides *how* to determine reliability as it enjoys in respect to its ultimate reliability determination. See General Electric Co. v. Joiner, 522 U.S. 136, 143, 139 L. Ed. 2d 508, 118 S. Ct. 512 (1997) (courts of **[***247]** appeals are to apply "abuse of discretion" standard when reviewing district **[****10]** court's reliability determination). Applying these standards, we determine that the District Court's decision in this case -- not to admit certain expert testimony -- was within its discretion and therefore lawful.

I

On July 6, 1993, the right rear tire of a minivan driven by Patrick Carmichael blew out. In the accident that followed, one of the passengers died, and others were severely injured. In October 1993, the Carmichaels brought this diversity suit against the tire's maker and its distributor, whom we refer to collectively as Kumho Tire, claiming that the tire was defective. The plaintiffs rested their case in significant part upon deposition testimony provided by an expert in tire failure analysis, Dennis Carlson, Jr., who intended to testify in support of their conclusion.

Carlson's depositions relied upon certain features of tire technology that are not in dispute. A steel-belted radial tire like the Carmichaels' is made up of a "carcass" containing many layers of flexible cords, called "plies," along which (between the cords and the outer tread) are laid steel strips called "belts." Steel wire loops, called "beads," hold the cords together at the plies' bottom edges. **[****11]** An outer layer, called the "tread," encases the carcass, and the entire tire is bound together in rubber, through the application of heat and various chemicals. See generally, *e.g.*, J. Dixon, Tires, Suspension and Handling 68-72 (2d ed. 1996). The bead of the tire sits upon a "bead seat," which is part of the wheel assembly. That assembly contains a "rim flange," which extends over the bead and rests against the side of the **[*143]** tire. See M. Mavrigian, Performance Wheels & Tires 81, 83 (1998) (illustrations).

[Graphic omitted; see printed opinion.]

A. Markovich, How To Buy and Care For Tires 4 (1994).

[1172]** **[1181]** Carlson's testimony also accepted certain background facts about the tire in question. He assumed that before the blowout the tire had traveled far. (The tire was made in 1988 and had been installed some time before the Carmichaels bought the used minivan in March 1993; the Carmichaels had driven the van approximately 7,000 additional miles in the two months they had owned it.) Carlson noted that the tire's tread depth, which was 11/32 of an inch when new, App. 242, had been worn down to depths that ranged from 3/32 of an inch along some parts of the tire, to nothing at all along **[****12]** others. Id. at 287. He conceded that the tire tread had at least two punctures which had been inadequately repaired. Id. at 258-261, 322.

LEdHN[6] [6]Despite the tire's age and history, Carlson concluded that a defect in its manufacture or design caused the blow-out. He rested this conclusion in part upon three premises which, **[*144]** for present purposes, we must assume are not in dispute: First, a tire's carcass should stay **[***248]** bound to the inner side of the tread for a significant period of time after its tread depth has worn away. Id. at 208-209. Second, the tread of the tire at issue had separated from its inner steel-belted carcass prior to the accident. Id. at 336. Third, this "separation" caused the blowout. *Ibid.*

Carlson's conclusion that a defect caused the separation, however, rested upon certain other propositions, several of which the defendants strongly dispute. First, Carlson said that if a separation is *not* caused by a certain kind of tire misuse called "overdeflection" (which consists of underinflating the tire or causing it to carry too much weight, thereby generating heat that can undo the chemical tread/carcass bond), then, ordinarily, its cause is a tire defect. Id. at 193-195, 277-278. **[****13]** Second, he said that if a tire has been subject to sufficient overdeflection to cause a separation, it should reveal certain physical symptoms. These symptoms include (a) tread wear on the tire's shoulder that is greater than the tread wear along the tire's center, id. at 211; (b) signs of a "bead groove," where the beads have been pushed too hard against the bead seat on the inside of the tire's rim, id. at 196-197; (c) sidewalls of the tire with physical signs of deterioration, such as discoloration, id. at 212; and/or (d) marks on the tire's rim flange, id. at 219-220. Third, Carlson said that where he does not find *at least two* of the four physical signs just mentioned (and

presumably where there is no reason to suspect a less common cause of separation), he concludes that a manufacturing or design defect caused the separation. *Id. at 223-224*.

Carlson added that he had inspected the tire in question. He conceded that the tire to a limited degree showed greater wear on **[**1173]** the shoulder than in the center, some signs of "bead groove," some discoloration, a few marks on the rim flange, and inadequately filled puncture holes (which can also cause heat that might lead to separation). **[****14]** Id. at 256-257, 258-261, **[*145]** 277, 303-304, 308. But, in each instance, he testified that the symptoms were not significant, and he explained why he believed that they did not reveal overdeflection. For example, the extra shoulder wear, he said, appeared primarily on one shoulder, whereas an overdeflected tire would reveal equally abnormal wear on both shoulders. Id. at 277. Carlson concluded that the tire did not bear at least two of the four overdeflection symptoms, nor was there any less obvious cause of separation; and since neither overdeflection nor the punctures caused the blowout, a defect must have done so.

Kumho Tire moved the District Court to exclude Carlson's testimony on the ground that his methodology failed *Rule 702*'s reliability requirement. The court agreed with Kumho that it should act as a *Daubert*-type reliability "gatekeeper," even though one might consider Carlson's testimony as "technical," rather than "scientific." See *Carmichael v. Samyang Tires, Inc., 923 F. Supp. 1514, 1521-1522 (SD Ala. 1996)*. The court then examined Carlson's methodology in light of the reliability-related factors that *Daubert* mentioned, such as a theory's testability, whether **[****15]** it "has been a subject of peer review or publication," the "known or potential rate of error," and the "degree of acceptance . . . within the relevant scientific community." *923 F. Supp. at 1520* (citing *Daubert, 509 U.S. 579 at 592-594*). **[***249]** The District Court found that all those factors argued against the reliability of Carlson's methods, and it granted the motion to exclude **[1182]** the testimony (as well as the defendants' accompanying motion for summary judgment).

The plaintiffs, arguing that the court's application of the *Daubert* factors was too "inflexible," asked for reconsideration. And the Court granted that motion. *Carmichael v. Samyang Tires, Inc., 1996 U.S. Dist. LEXIS 22431*, Civ. Action No. 93-0860-CB-S (June 5, 1996), App. to Pet. for Cert. 1c. After reconsidering the matter, the court agreed with the plaintiffs that *Daubert* should be applied flexibly, that its four factors were **[*146]** simply illustrative, and that other factors could argue in favor of admissibility. It conceded that there may be widespread acceptance of a "visual-inspection method" for some relevant purposes. But the court found insufficient indications of the reliability of

> "the component of Carlson's tire failure **[****16]** analysis which most concerned the Court, namely, the methodology employed by the expert in analyzing the data obtained in the visual inspection, and the scientific basis, if any, for such an analysis." Id. at 6c.

It consequently affirmed its earlier order declaring Carlson's testimony inadmissable and granting the defendants' motion for summary judgment.

The Eleventh Circuit reversed. See *Carmichael v. Samyang Tire, Inc., 131 F.3d 1433 (1997)*. It "reviewed . . . *de novo*" the "district court's legal decision to apply *Daubert*." *131 F.3d at 1435*. It noted that "the Supreme Court in *Daubert* explicitly limited its holding to cover only the 'scientific context,'" adding that "a *Daubert* analysis" applies only where an expert relies "on the application of scientific principles," rather than "on skill- or experience-based observation." *131 F.3d at 1435-1436*. It concluded that Carlson's testimony, which it viewed as relying on experience, "falls outside the scope of *Daubert*," that "the district court erred as a matter of law by applying *Daubert* in this case," and that the case must be remanded for further (non-*Daubert*-type) consideration under *Rule 702*. **[****17]** *Id. at 1436*.

Kumho Tire petitioned for certiorari, asking us to determine whether a trial court "may" consider *Daubert*'s specific "factors" when determining the "admissibility of an engineering expert's testimony." Pet. for Cert. i. We granted certiorari in light of uncertainty among the lower courts about whether, or how, *Daubert* applies to expert testimony that might be characterized as based not upon "scientific" knowledge, but rather upon "technical" or "other specialized" **[*147]** knowledge. *Fed. Rule Evid. 702*; compare, *e.g.*, *Watkins v. Telsmith, Inc., 121 F.3d 984, 990-991 (CA5 1997)*, with, *e.g.*, *Compton v. Subaru of America, Inc., 82 F.3d 1513, 1518-1519* **[**1174]** (CA10), cert. denied, *519 U.S. 1042, 136 L. Ed. 2d 536, 117 S. Ct. 611 (1996)*.

II

A

LEdHN[1C][↑] [1C]In *Daubert*, this Court held that HN2[↑] Federal Rule of Evidence 702 imposes a special obligation upon a trial judge to "ensure that any and all scientific testimony . . . is not only relevant, but reliable." 509 U.S. at 589. The initial question before us is whether this basic gatekeeping obligation applies only to "scientific" [***250] testimony or to all expert testimony. We, like the parties, believe that it applies to all expert [****18] testimony. See Brief for Petitioners 19; Brief for Respondents 17.

For one thing, HN3[↑] Rule 702 itself says:

> "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."

This language makes no relevant distinction between "scientific" knowledge and "technical" or "other specialized" knowledge. It makes clear that any such knowledge might become the subject of expert testimony. In *Daubert*, the Court specified that it is the Rule's word "knowledge," not the words (like "scientific") that modify that word, that "establishes a standard of evidentiary reliability." 509 U.S. at 589-590. Hence, as a matter of language, the Rule applies its reliability standard to all "scientific," "technical," or "other specialized" matters within its scope. We concede that the Court in *Daubert* referred only to "scientific" knowledge. But as the Court there said, it referred to "scientific" [*148] testimony "because that was the nature of the expertise" at issue. [****19] 509 U.S. at 590, n.8.

Neither is the evidentiary rationale that underlay the Court's basic *Daubert* "gatekeeping" determination limited to "scientific" knowledge. *Daubert* pointed out that Federal Rules 702 and 703 grant expert witnesses testimonial latitude unavailable to other witnesses on the "assumption that the expert's opinion will have a reliable basis in the knowledge and experience of his discipline." 509 U.S. at 592 (pointing out that experts may testify to opinions, including those that are not based on firsthand knowledge or [1183] observation). The Rules grant that latitude to all experts, not just to "scientific" ones.

Finally, it would prove difficult, if not impossible, for judges to administer evidentiary rules under which a gatekeeping obligation depended upon a distinction between "scientific" knowledge and "technical" or "other specialized" knowledge. There is no clear line that divides the one from the others. Disciplines such as engineering rest upon scientific knowledge. Pure scientific theory itself may depend for its development upon observation and properly engineered machinery. And conceptual efforts to distinguish the two are unlikely to produce clear legal lines [****20] capable of application in particular cases. Cf. Brief for National Academy of Engineering as *Amicus Curiae* 9 (scientist seeks to understand nature while the engineer seeks nature's modification); Brief for Rubber Manufacturers Association as *Amicus Curiae* 14-16 (engineering, as an "applied science," relies on "scientific reasoning and methodology"); Brief for John Allen et al. as *Amici Curiae* 6 (engineering relies upon "scientific knowledge and methods").

Neither is there a convincing need to make such distinctions. Experts of all kinds tie observations to conclusions through the use of what Judge Learned Hand called "general truths derived from . . . specialized experience." Hand, Historical and Practical Considerations Regarding Expert Testimony, [*149] 15 Harv. L. Rev. 40, 54 (1901). And whether the specific [***251] expert testimony focuses upon specialized observations, the specialized translation of those observations into theory, a specialized theory itself, or the application of such a theory in a particular case, the expert's testimony often will rest "upon an experience confessedly foreign in kind to [the jury's] own." *Ibid.* The trial judge's effort to assure that the [****21] specialized testimony is reliable and relevant can help the jury evaluate [**1175] that foreign experience, whether the testimony reflects scientific, technical, or other specialized knowledge.

LEdHN[1D][↑] [1D]LEdHN[7][↑] [7]We conclude that HN4[↑] *Daubert*'s general principles apply to the expert matters described in Rule 702. The Rule, in respect to all such matters, "establishes a standard of evidentiary reliability." 509 U.S. at 590. It "requires a valid . . . connection to the pertinent inquiry as a precondition to admissibility." 509 U.S. at 592. And where such testimony's factual basis, data, principles, methods, or their application are called sufficiently into question, see Part III, *infra*, the trial judge must determine whether the testimony has "a reliable basis in the knowledge and experience of [the relevant] discipline." 509 U.S. at 592.

B LEdHN[2B][↑] [2B]The petitioners ask more specifically whether HN5[↑] a trial judge determining the "admissibility of an engineering expert's testimony" *may* consider several more specific factors that *Daubert*

said might "bear on" a judge's gate-keeping determination. These factors include:

> -- Whether a "theory or technique . . . can be (and has been) tested";
>
> -- Whether it "has **[****22]** been subjected to peer review and publication";
>
> -- Whether, in respect to a particular technique, there is a high "known or potential rate of error" and whether there are "standards controlling the technique's operation"; and **[*150]**
>
> -- Whether the theory or technique enjoys "general acceptance" within a "relevant scientific community." *509 U.S. at 592-594*.

Emphasizing the word "may" in the question, we answer that question yes.

LEdHN[4B][↑] [4B]Engineering testimony rests upon scientific foundations, the reliability of which will be at issue in some cases. See, *e.g.*, Brief for Stephen Bobo et al. as *Amici Curiae* 23 (stressing the scientific bases of engineering disciplines). In other cases, the relevant reliability concerns may focus upon personal knowledge or experience. As the Solicitor General points out, there are many different kinds of experts, and many different kinds of expertise. See Brief for United States as *Amicus Curiae* 18-19, and n. 5 (citing cases involving experts in drug terms, handwriting analysis, criminal *modus operandi*, land valuation, agricultural practices, railroad procedures, attorney's fee valuation, and others). Our emphasis on the word "may" thus reflects **[****23]** *Daubert*'s description of *HN6*[↑] the *Rule 702* inquiry as "a flexible one." *509 U.S. at 594*. *Daubert* makes clear that the factors it mentions do *not* constitute a "definitive checklist or test." *509 U.S. at 593*. And *Daubert* adds that the gatekeeping inquiry must be "'tied to the facts'" of a particular "case." *509 U.S. at 591* (quoting *United States v. Downing, 753 F.2d 1224, 1242 (CA3 1985)*). We agree with the Solicitor General that "the factors identified in *Daubert* may or may not be pertinent in assessing reliability, depending **[***252]** on the nature of the issue, the expert's particular expertise, and the subject of his testimony." Brief for United States as *Amicus Curiae* 19. The conclusion, in our view, is that we can neither rule out, nor rule in, for all cases and for all time the applicability of the factors mentioned in *Daubert*, nor can we now do so for subsets of cases categorized by **[1184]** category of expert or by kind of evidence. Too much depends upon the particular circumstances of the particular case at issue. **[*151]** *LEdHN[4C]*[↑] [4C] *LEdHN[8]*[↑] [8]*Daubert* itself is not to the contrary. It made clear that its list of factors was meant to be helpful, not definitive. Indeed, those factors do not all necessarily **[****24]** apply even in every instance in which the reliability of scientific testimony is challenged. It might not be surprising in a particular case, for example, that a claim made by a scientific witness has never been the subject of peer review, for the particular application at issue may never previously have interested any scientist. Nor, on the other hand, does the presence of *Daubert*'s general acceptance factor help show that an expert's testimony is reliable where the discipline itself lacks reliability, as, for example, do theories grounded in any so-called generally accepted principles of astrology or necromancy.

[1176]** *LEdHN[9]*[↑] [9]At the same time, and contrary to the Court of Appeals' view, some of *Daubert*'s questions can help to evaluate the reliability even of experience-based testimony. In certain cases, it will be appropriate for the trial judge to ask, for example, how often an engineering expert's experience-based methodology has produced erroneous results, or whether such a method is generally accepted in the relevant engineering community. Likewise, it will at times be useful to ask even of a witness whose expertise is based purely on experience, say, a perfume tester able to distinguish **[****25]** among 140 odors at a sniff, whether his preparation is of a kind that others in the field would recognize as acceptable.

LEdHN[2C][↑] [2C]We must therefore disagree with the Eleventh Circuit's holding that a trial judge may ask questions of the sort *Daubert* mentioned only where an expert "relies on the application of scientific principles," but not where an expert relies "on skill- or experience-based observation." *131 F.3d at 1435*.We do not believe that *Rule 702* creates a schematism that segregates expertise by type while mapping certain kinds of questions to certain kinds of experts. Life and the legal cases that it generates are too complex to warrant so definitive a match.

[*152] *LEdHN[2D]*[↑] [2D] *LEdHN[10]*[↑] [10]To say this is not to deny the importance of *Daubert*'s gatekeeping requirement. The objective of that requirement is to ensure the reliability and relevancy of expert testimony. It is to make certain that an expert, whether basing testimony upon professional studies or

personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field. Nor do we deny that, as stated in *Daubert*, the particular questions that it mentioned will often **[****26]** be appropriate for use in determining the reliability of challenged expert testimony. Rather, we conclude that HN7[↑] the trial judge must have considerable leeway in deciding in a particular case how to go about determining whether particular expert testimony is reliable. That is to say, a trial court should consider the specific factors identified in *Daubert* where they are reasonable measures of the reliability of expert testimony.

C

LEdHN[5B][↑] [5B]LEdHN[11A][↑] [11A]HN8[↑] The trial court must have the same kind of latitude in deciding *how* to test an expert's reliability, and to decide whether or when special briefing or other proceedings are **[***253]** needed to investigate reliability, as it enjoys when it decides *whether* that expert's relevant testimony is reliable. Our opinion in *Joiner* makes clear that a court of appeals is to apply an abuse-of-discretion standard when it "reviews a trial court's decision to admit or exclude expert testimony." 522 U.S. at 138-139. That standard applies as much to the trial court's decisions about how to determine reliability as to its ultimate conclusion. Otherwise, the trial judge would lack the discretionary authority needed both to avoid unnecessary "reliability" proceedings in **[****27]** ordinary cases where the reliability of an expert's methods is properly taken for granted, and to require appropriate proceedings in the less usual or more complex cases where cause for questioning the expert's reliability arises. Indeed, HN9[↑] the Rules seek to avoid "unjustifiable expense and delay" as part of their search for **[*153]** "truth" and the "just determination" of proceedings. Fed. Rule Evid. 102. Thus, whether *Daubert*'s specific factors are, or are not, reasonable measures of reliability in a particular case is a matter that the law grants the trial judge broad latitude to determine. See Joiner, supra, at 143. And the Eleventh Circuit erred insofar as it held to the contrary.

III

LEdHN[3B][↑] [3B]We further explain the way in which a trial judge "may" consider *Daubert*'s factors by applying these considerations to the case at hand, a matter that has been briefed exhaustively by the parties and their 19 *amici*. The District Court did not doubt Carlson's qualifications, which included a masters degree in mechanical engineering, 10 years' work at Michelin America, Inc., and testimony as a tire failure consultant in other tort cases. Rather, it excluded the testimony because, despite **[****28]** those qualifications, **[1185]** it initially **[**1177]** doubted, and then found unreliable, "the methodology employed by the expert in analyzing the data obtained in the visual inspection, and the scientific basis, if any, for such an analysis." Civ. Action No. 93-0860-CB-S (SD Ala., June 5, 1996), App. to Pet. for Cert. 6c. After examining the transcript in "some detail," 923 F. Supp. at 1518-519, n. 4, 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." Daubert, 509 U.S. at 596. In our view, the doubts that triggered the District Court's initial inquiry here were reasonable, as was the court's ultimate conclusion.

For one thing, and contrary to respondents' suggestion, the specific issue before the court was not the reasonableness *in general* of a tire expert's use of a visual and tactile inspection to determine whether overdeflection had caused **[*154]** the tire's tread to separate from its steel-belted carcass. Rather, it was the reasonableness **[****29]** of using such an approach, along with Carlson's particular method of analyzing the data thereby obtained, to draw a conclusion regarding *the particular matter to which the expert testimony was directly relevant*. That matter concerned the likelihood that a defect in the tire at issue caused its tread to separate from its carcass. The tire in question, the expert conceded, had traveled far enough so that some of the tread had been worn bald; it should have been taken out of service; it had been repaired (inadequately) for punctures; and it bore some of the very marks that the **[***254]** expert said indicated, not a defect, but abuse through overdeflection. See *supra*, at 3-5; App. 293-294. The relevant issue was whether the expert could reliably determine the cause of *this* tire's separation. Nor was the basis for Carlson's conclusion simply the general theory that, in the absence of evidence of abuse, a defect will normally have caused a tire's separation. Rather, the expert employed a more specific theory to establish the existence (or absence) of such abuse. Carlson testified precisely that in the absence of *at least two* of four signs of abuse (proportionately greater tread wear **[****30]** on the

shoulder; signs of grooves caused by the beads; discolored sidewalls; marks on the rim flange) he concludes that a defect caused the separation. And his analysis depended upon acceptance of a further implicit proposition, namely, that his visual and tactile inspection could determine that the tire before him had not been abused despite some evidence of the presence of the very signs for which he looked (and two punctures).

For another thing, the transcripts of Carlson's depositions support both the trial court's initial uncertainty and its final conclusion. Those transcripts cast considerable doubt upon the reliability of both the explicit theory (about the need for two signs of abuse) and the implicit proposition (about the significance of visual inspection in this case). Among other things, the expert could not say whether the tire had traveled **[*155]** more than 10, or 20, or 30, or 40, or 50 thousand miles, adding that 6,000 miles was "about how far" he could "say with any certainty." Id. at 265. The court could reasonably have wondered about the reliability of a method of visual and tactile inspection sufficiently precise to ascertain with some certainty the abuse-related significance **[****31]** of minute shoulder/center relative tread wear differences, but insufficiently precise to tell "with any certainty" from the tread wear whether a tire had traveled less than 10,000 or more than 50,000 miles. And these concerns might have been augmented by Carlson's repeated reliance on the "subjectiveness" of his mode of analysis in response to questions seeking specific information regarding how he could differentiate between a tire that actually had been overdeflected and a tire that merely looked as though it had been. *Id. at 222, 224-225, 285-286*. They would have been further augmented by the fact that Carlson said he had inspected the tire itself for the first time the morning of his first deposition, and then only for a few hours. (His initial conclusions were based on photographs.) *Id. at 180*.

[1178]** Moreover, prior to his first deposition, Carlson had issued a signed report in which he concluded that the tire had "not been . . . overloaded or underinflated," not because of the absence of "two of four" signs of abuse, but simply because "the rim flange impressions . . . were normal." Id. at 335-336. That report also said that the "tread depth remaining was 3/32 inch," id. at 336, though **[****32]** the opposing expert's (apparently undisputed) measurements indicate that the tread depth taken at various positions around the tire actually ranged from .5/32 of an inch to 4/32 of an inch, with the tire apparently showing greater wear along *both* shoulders than along the center, id. at 432-433.

Further, in respect to one sign of **[***255]** abuse, bead grooving, the expert seemed to deny the sufficiency of his own simple visual-inspection methodology. He testified that most tires have some bead groove pattern, that where there is reason **[*156]** to suspect an abnormal **[1186]** bead groove he would ideally "look at a lot of [similar] tires" to know the grooving's significance, and that he had not looked at many tires similar to the one at issue. *Id. at 212-213, 214, 217*.

Finally, the court, after looking for a defense of Carlson's methodology as applied in these circumstances, found no convincing defense. Rather, it found (1) that "none" of the *Daubert* factors, including that of "general acceptance" in the relevant expert community, indicated that Carlson's testimony was reliable, *923 F. Supp. at 1521*; (2) that its own analysis "revealed no countervailing factors operating in favor of admissibility which **[****33]** could outweigh those identified in *Daubert*," App. to Pet. for Cert. 4c; and (3) that the "parties identified no such factors in their briefs," *ibid.* For these three reasons *taken together,* it concluded that Carlson's testimony was unreliable.

Respondents now argue to us, as they did to the District Court, that a method of tire failure analysis that employs a visual/tactile inspection is a reliable method, and they point both to its use by other experts and to Carlson's long experience working for Michelin as sufficient indication that that is so. But no one denies that an expert might draw a conclusion from a set of observations based on extensive and specialized experience. Nor does anyone deny that, as a general matter, tire abuse may often be identified by qualified experts through visual or tactile inspection of the tire. See Affidavit of H. R. Baumgardner 1-2, cited in Brief for National Academy of Forensic Engineers as *Amici Curiae* 16 (Tire engineers rely on visual examination and process of elimination to analyze experimental test tires). As we said before, *supra,* at 14, the question before the trial court was specific, not general. The trial court had to **[****34]** decide whether this particular expert had sufficient specialized knowledge to assist the jurors "in deciding the particular issues in the case." 4 J. McLaughlin, *Weinstein's Federal Evidence P702.05[1]*, p. 702-33 (2d ed. 1998); see also Advisory **[*157]** Committee's Note on Proposed *Fed. Rule Evid. 702*, Preliminary Draft of Proposed Amendments to the Federal Rules of Civil Procedure and Evidence: Request for Comment 126 (1998) (stressing that district courts must "scrutinize" whether the "principles and methods" employed by an expert "have been properly applied to the facts of the case").

LEdHN[3C] [3C] LEdHN[12] [12]The particular issue in this case concerned the use of Carlson's two-factor test and his related use of visual/tactile inspection to draw conclusions on the basis of what seemed small observational differences. We have found no indication in the record that other experts in the industry use Carlson's two-factor test or that tire experts such as Carlson normally make the very fine distinctions about, say, the symmetry of comparatively greater shoulder tread wear that were necessary, on Carlson's own theory, to support his conclusions. Nor, despite the prevalence of tire testing, does anyone refer to any **[****35]** articles or papers that validate Carlson's approach. Compare Bobo, Tire Flaws and Separations, in Mechanics of Pneumatic Tires 636-637 (S. Clark ed. 1981); C. Schnuth et al., Compression Grooving and Rim Flange Abrasion **[***256]** as Indicators of Over-Deflected Operating Conditions in Tires, presented to Rubber Division of the American Chemical Society, Oct. 21-24, 1997; J. Walter & R. Kiminecz, Bead **[**1179]** Contact Pressure Measurements at the Tire-Rim Interface, presented to Society of Automotive Engineers, Feb. 24-28, 1975. Indeed, no one has argued that Carlson himself, were he still working for Michelin, would have concluded in a report to his employer that a similar tire was similarly defective on grounds identical to those upon which he rested his conclusion here. Of course, Carlson himself claimed that his method was accurate, but, as we pointed out in *Joiner*, "HN10 nothing in either *Daubert* or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert." 522 U.S. at 146.

[*158] LEdHN[3D] [3D]Respondents additionally argue that the District Court too rigidly applied *Daubert*'s criteria. They read its opinion **[****36]** to hold that a failure to satisfy any one of those criteria automatically renders expert testimony inadmissible. The District Court's initial opinion might have been vulnerable to a form of this argument. There, the court, after rejecting respondents' claim that Carlson's testimony was "exempted from *Daubert*-style scrutiny" because it was "technical analysis" rather than "scientific evidence," simply added that "none of the four admissibility criteria outlined by the *Daubert* court are satisfied." 923 F. Supp. at 1522. Subsequently, however, the court granted respondents' motion for reconsideration. It then explicitly recognized that the relevant reliability inquiry "should be 'flexible,'" that its "'overarching subject [should be] . . . validity' and reliability," and that "*Daubert* was intended neither to be exhaustive nor to apply in every case." App. to Pet. for Cert. 4c (quoting *Daubert*, 509 U.S. at 594-595). And the court ultimately based its decision upon Carlson's failure to satisfy either *Daubert*'s factors *or any other* set of reasonable reliability **[1187]** criteria. In light of the record as developed by the parties, that conclusion was within the District **[****37]** Court's lawful discretion.

LEdHN[3E] [3E] LEdHN[11B] [11B]In sum, Rule 702 grants the district judge the discretionary authority, reviewable for its abuse, to determine reliability in light of the particular facts and circumstances of the particular case. The District Court did not abuse its discretionary authority in this case. Hence, the judgment of the Court of Appeals is

Reversed.

Concur by: SCALIA

Concur

JUSTICE SCALIA, with whom JUSTICE **O'CONNOR** and JUSTICE **THOMAS** join, concurring.

I join the opinion of the Court, which makes clear that the discretion it endorses- trial-court discretion in choosing the manner of testing expert reliability- is not discretion to **[*159]** abandon the gatekeeping function. I think it worth adding that it is not discretion to perform the function inadequately. Rather, it is discretion to choose among *reasonable* means of excluding expertise that is *fausse* and science that is junky. Though, as the Court makes clear today, the *Daubert* factors are not holy writ, in a particular case the **[***257]** failure to apply one or another of them may be unreasonable, and hence an abuse of discretion.

Dissent by: STEVENS (In Part)

Dissent

JUSTICE **STEVENS**, concurring in part and dissenting **[****38]** in part.

The only question that we granted certiorari to decide is whether a trial judge "may . . . consider the four factors set out by this Court in Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 125 L. Ed. 2d 469,

113 S. Ct. 2786 (1993), in a Rule 702 analysis of admissibility of an engineering expert's testimony." Pet. for Cert. i. That question is fully and correctly answered in Parts I and II of the Court's opinion, which I join.

Part III answers the quite different question whether the trial judge abused his discretion when he excluded the testimony of Dennis Carlson. Because a proper answer to that question requires a study of the record that can be performed more efficiently by the Court of Appeals than by the nine Members of this Court, I would remand the case to the Eleventh Circuit to perform that task. There are, of course, exceptions to most rules, but I firmly believe that it is neither fair to litigants nor good practice for this Court to reach out to decide questions not raised by the certiorari petition. See General Electric Co. v. Joiner, 522 U.S. 136, 150-151, 139 L. Ed. 2d 508, 118 S. Ct. 512 (1997) **[**1180]** (STEVENS, J., concurring in part **[****39]** and dissenting in part).

Accordingly, while I do not feel qualified to disagree with the well-reasoned factual analysis in Part III of the Court's opinion, I do not join that Part, and I respectfully dissent from the Court's disposition of the case.

End of Document

References

31A Am Jur 2d, Expert and Opinion Evidence 342; 63B Am Jur 2d, Products Liability 1852, 1871, 1873

USCS Court Rules, Federal Rules of Evidence, Rule 702

L Ed Digest, Evidence 641, 643

L Ed Index, Expert and Opinion Evidence; Products Liability; Rules of Evidence; Tires and Wheels

Annotation References:

Reliability of scientific technique and its acceptance within scientific community as affecting admissibility, at federal trial, of expert testimony as to result of test or **[****40]** study based on such technique--modern cases. 105 ALR Fed 299.

When will expert testimony "assist trier of fact" so as to be admissible at federal trial under Rule 702 of Federal Rules of Evidence. 75 ALR Fed 461.

Products liability: admissibility of expert or opinion evidence that product is or is not defective, dangerous, or unreasonably dangerous. 4 ALR4th 651.

USCS Fed Rules Evid R 702, Part 1 of 3

Current through changes received August 9, 2018.

USCS Court Rules > Federal Rules of Evidence > Article VII. Opinions and Expert Testimony

Rule 702. Testimony by Expert Witnesses

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

(a)the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;

(b)the testimony is based on sufficient facts or data;

(c)the testimony is the product of reliable principles and methods; and

(d)the expert has reliably applied the principles and methods to the facts of the case.

History

Jan. 2, 1975, P. L. 93-595, § 1, *88 Stat. 1937*; April 17, 2000, eff. Dec. 1, 2000; April 26, 2011, eff. Dec. 1, 2011.

Annotations

Notes

HISTORY; ANCILLARY LAWS AND DIRECTIVES

Other provisions:

Notes of Advisory Committee on Rules. An intelligent evaluation of facts is often difficult or impossible without the application of some scientific, technical, or other specialized knowledge. The most common source of this knowledge is the expert witness, although there are other techniques for supplying it.

Most of the literature assumes that experts testify only in the form of opinions. The assumption is logically unfounded. The rule accordingly recognizes that an expert on the stand may give a dissertation or exposition of scientific or other principles relevant to the case, leaving the trier of fact to apply them to the facts. Since much of the criticism of expert testimony has centered upon the hypothetical question, it seems wise to recognize that opinions are not indispensable and to encourage the use of expert testimony in non-opinion form when counsel believes the trier can itself draw the requisite inference. The use of opinions is not abolished by the rule, however. It will continue to be permissible for the experts to take the further step of suggesting the inference which should be drawn from applying the specialized knowledge to the facts. See Rules 703 to 705.

Whether the situation is a proper one for the use of expert testimony is to be determined on the basis of assisting the trier. "There is no more certain test for determining when experts may be used than the common sense inquiry whether the untrained layman would be qualified to determine intelligently and to the best possible degree the particular issue without enlightenment from those having a specialized understanding of the subject involved in the

dispute." Ladd, Expert Testimony, 5 Vand.L.Rev. 414, 418 (1952). When opinions are excluded, it is because they are unhelpful and therefore superfluous and a waste of time. 7 Wigmore § 1918.

The rule is broadly phrased. The fields of knowledge which may be drawn upon are not limited merely to the "scientific" and "technical" but extend to all "specialized" knowledge. Similarly, the expert is viewed, not in a narrow sense, but as a person qualified by "knowledge, skill, experience, training or education." Thus within the scope of the rule are not only experts in the strictest sense of the word, e.g., physicians, physicists, and architects, but also the large group sometimes called "skilled" witnesses, such as bankers or landowners testifying to land values.

Committee notes on proposed revision. This revision is intended to limit the use, but increase the utility and reliability, of party-initiated opinion testimony bearing on scientific and technical issues.

The use of such testimony has greatly increased since enactment of the Federal Rules of Evidence. This result was intended by the drafters of the rule, who were responding to concerns that the restraints previously imposed on expert testimony were artificial and an impediment to the illumination of technical issues in dispute. See, e.g., McCormick on Evidence, § 203 (3d ed., 1984). While much expert testimony now presented is illuminating and useful, much is not. Virtually all is expensive, if not to the proponent then to adversaries. Particularly in civil litigation with high financial stakes, large expenditures for marginally useful expert testimony has become commonplace. Procurement of expert testimony is occasionally used as a trial technique to wear down adversaries. In short, while testimony from experts may be desirable if not crucial in many cases, excesses cannot be doubted and should be curtailed.

While concern for the quality and even integrity of hired testimony is not new, *Winans v. New York & Erie R.R., 62 U.S. 88, 101 (1858)*; Hand, Historical and Practical Considerations Regarding Expert Testimony, 15 Harv. L. Rev. 40 (1901), the hazards to the judicial process have increased as more technical evidence is presented:

When the evidence relates to highly technical matters and each side has shopped for experts favorable to its position, it is naive to expect the jury to be capable of assessing the validity of dramatically opposed testimony.

3J. WEINSTEIN & M. BERGER, WEINSTEIN'S EVIDENCE, § 706[01] at 706–07 (1985).

While the admissibility of such evidence is, and remains, subject to the general principles of Rule 403, the revision requires that expert testimony be "reasonably reliable" and "substantially assist" the fact-finder. The rule does not mandate a return to the strictures of *Frye v. United States, 293 F.2d 1013* (D.C. Cir., 1923) (requiring general acceptance of the scientific premises on which the testimony is based). However, the court is called upon to reject testimony that is based upon premises lacking any significant support and acceptance within the scientific community, or that otherwise would be only marginally helpful to the fact-finder. In civil cases the court is authorized and expected under revised *Rule 26(c)(4) of the Federal Rules of Civil Procedure* to impose in advance of trial appropriate restrictions on the use of expert testimony. In exercising this responsibility, the court should not only consider the potential admissibility of the testimony under Rule 702 but also weigh the need and utility of the testimony against the time and expense involved.

In deciding whether the opinion evidence is reasonably reliable and will substantially assist the trier of fact, as well as in deciding whether the proposed witness has sufficient expertise to express such opinions, the court, as under present Rule 702, is governed by Rule 104(a).

The rule is also revised to complement changes in the Federal Rules of Civil Procedure requiring pretrial disclosure of the expert testimony to be presented at trial. The rule precludes the offering on direct examination in civil actions of expert opinions, or the reasons or bases for opinions, that have not been adequately and timely disclosed in advance of trial. It has not been unusual for the testimony given at trial by an expert to vary substantially from that provided under former *Fed. R. Civ. P. 26(b)(4)(A)(i)* or at a deposition of the expert. At a minimum, any significant changes in an expert's expected testimony should be disclosed before trial, and this revision of Rule 702 provides an appropriate incentive for such disclosure in addition to those contained in the Rules of Civil Procedure.

Additions or other changes to an expert's opinions must, under *Fed. R. Civ. P. 26(e)(1)*, be disclosed no later than the time the proponent is required to disclose its witnesses and exhibits that are to be used at trial. Unless the court has specified another time, these revisions must be disclosed at least 30 days before trial.

Of course, a witness should not be required to testify contrary to the person's oath or affirmation. If the witness is unable, consistent with the oath or affirmation, to testify in a manner consistent with the earlier disclosure, then—unless the court grants leave to deviate from the earlier testimony—the witness should not testify.

By its terms the new sentence applies only in civil cases. The consequences of the failure to make disclosures of expert testimony which may be required under new *Fed. R. Crim. P. 16(a)(1)(E)* and *16(b)(1)(C)* will be determined in accordance with the principles that govern enforcement of the requirements of *Fed. R. Crim. P. 16*.

Notes of Advisory Committee on 2000 amendments. Rule 702 has been amended in response to *Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 [125 L. Ed. 2d 469] (1993)*, and to the many cases applying *Daubert,* including *Kumho Tire Co. v. Carmichael, [143 L. Ed. 2d 238,] 119 S.Ct. 1167 (1999)*. In *Daubert* the Court charged trial judges with the responsibility of acting as gatekeepers to exclude unreliable expert testimony, and the Court in *Kumho* clarified that this gatekeeper function applies to all expert testimony, not just testimony based in science. *See also Kumho, 119 S.Ct. at 1178* (citing the Committee Note to the proposed amendment to Rule 702, which had been released for public comment before the date of the *Kumho* decision). The amendment affirms the trial court's role as gatekeeper and provides some general standards that the trial court must use to assess the reliability and helpfulness of proffered expert testimony. Consistently with Kumho, the Rule as amended provides that all types of expert testimony present questions of admissibility for the trial court in deciding whether the evidence is reliable and helpful. Consequently, the admissibility of all expert testimony is governed by the principles of Rule 104(a). Under that Rule, the proponent has the burden of establishing that the pertinent admissibility requirements are met by a preponderance of the evidence. *See Bourjaily v. United States, 483 U.S. 171 [97 L. Ed. 2d 144]* (1987).

Daubert set forth a non-exclusive checklist for trial courts to use in assessing the reliability of scientific expert testimony. The specific factors explicated by the *Daubert* Court are (1) whether the expert's technique or theory can be or has been tested—that is, whether the expert's theory can be challenged in some objective sense, or whether it is instead simply a subjective, conclusory approach that cannot reasonably be assessed for reliability; (2) whether the technique or theory has been subject to peer review and publication; (3) the known or potential rate of error of the technique or theory when applied; (4) the existence and maintenance of standards and controls; and (5) whether the technique or theory has been generally accepted in the scientific community. The Court in *Kumho* held that these factors might also be applicable in assessing the reliability of non-scientific expert testimony, depending upon "the particular circumstances of the particular case at issue." *119 S.Ct. at 1175*.

No attempt has been made to "codify" these specific factors. Daubert itself emphasized that the factors were neither exclusive nor dispositive. Other cases have recognized that not all of the specific Daubert factors can apply to every type of expert testimony. In addition to *Kumho, 119 S.Ct. at 1175*, *see Tyus v. Urban Search Management, 102 F.3d 256* (7th Cir. 1996) (noting that the factors mentioned by the Court in *Daubert* do not neatly apply to expert testimony from a sociologist). *See also Kannankeril v. Terminix Int'l, Inc., 128 F.3d 802, 809* (3d Cir. 1997) (holding that lack of peer review or publication was not dispositive where the expert's opinion was supported by "widely accepted scientific knowledge"). The standards set forth in the amendment are broad enough to require consideration of any or all of the specific Daubert factors where appropriate.

Courts both before and after *Daubert* have found other factors relevant in determining whether expert testimony is sufficiently reliable to be considered by the trier of fact. These factors include:

(1) Whether experts are "proposing to testify about matters growing naturally and directly out of research they have conducted independent of the litigation, or whether they have developed their opinions expressly for purposes of testifying." *Daubert v. Merrell Dow Pharmaceuticals, Inc., 43 F.3d 1311, 1317* (9th Cir. 1995).

(2) Whether the expert has unjustifiably extrapolated from an accepted premise to an unfounded conclusion. *See* General Elec. Co. v. Joiner, 522 U.S. 136 [139 L. Ed. 2d 508], 146 (1997) (noting that in some cases a trial court "may conclude that there is simply too great an analytical gap between the data and the opinion proffered").

(3) Whether the expert has adequately accounted for obvious alternative explanations. *See* Claar v. Burlington N.R.R., 29 F.3d 499 (9th Cir. 1994) (testimony excluded where the expert failed to consider other obvious causes for the plaintiffs condition). *Compare* Ambrosini v. Labarraque, 101 F.3d 129 (D.C.Cir. 1996) (the possibility of some uneliminated causes presents a question of weight, so long as the most obvious causes have been considered and reasonably ruled out by the expert).

(4) Whether the expert "is being as careful as he would be in his regular professional work outside his paid litigation consulting." Sheehan v. Daily Racing Form, Inc., 104 F.3d 940, 942 (7th Cir. 1997). *See* Kumho Tire Co. v. Carmichael, [143 L. Ed. 2d 238,] 119 S.Ct. 1167, 1176 (1999) (*Daubert* requires the trial court to assure itself that the expert "employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field").

(5) Whether the field of expertise claimed by the expert is known to reach reliable results for the type of opinion the expert would give. *See* Kumho Tire Co. v. Carmichael, [143 L. Ed. 2d 238,] 119 S.Ct. 1167, 1175 (1999) (Daubert's general acceptance factor does not "help show that an expert's testimony is reliable where the discipline itself lacks reliability, as, for example, do theories grounded in any so-called generally accepted principles of astrology or necromancy."); Moore v. Ashland Chemical, Inc., 151 F.3d 269 (5th Cir. 1998) (en banc) (clinical doctor was properly precluded from testifying to the toxicological cause of the plaintiffs respiratory problem, where the opinion was not sufficiently grounded in scientific methodology); Sterling v. Velsicol Chem. Corp., 855 F.2d 1188 (6th Cir. 1988) (rejecting testimony based on "clinical ecology" as unfounded and unreliable).

All of these factors remain relevant to the determination of the reliability of expert testimony under the Rule as amended. Other factors may also be relevant. *See* Kumho, [143 L. Ed. 2d 238,] 119 S.Ct. 1167, 1176 ("[W]e conclude that the trial judge must have considerable leeway in deciding in a particular case how to go about determining whether particular expert testimony is reliable."). Yet no single factor is necessarily dispositive of the reliability of a particular expert's testimony. *See, e.g.,* Heller v. Shaw Industries, Inc., 167 F.3d 146, 155 (3d Cir. 1999) ("not only must each stage of the expert's testimony be reliable, but each stage must be evaluated practically and flexibly without bright-line exclusionary (or inclusionary) rules."); Daubert v. Merrell Dow Pharmaceuticals, Inc., 43 F.3d 1311, 1317, n.5 (9th Cir. 1995) (noting that some expert disciplines "have the courtroom as a principal theatre of operations" and as to these disciplines "the fact that the expert has developed an expertise principally for purposes of litigation will obviously not be a substantial consideration.").

A review of the caselaw after *Daubert* shows that the rejection of expert testimony is the exception rather than the rule. *Daubert* did not work a "seachange over federal evidence law," and "the trial court's role as gatekeeper is not intended to serve as a replacement for the adversary system." United States v. 14.38 Acres of Land Situated in Leflore County, Mississippi, 80 F.3d 1074, 1078 (5th Cir. 1996). As the Court in Daubert stated: "Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence." 509 U.S. at 595. Likewise, this amendment is not intended to provide an excuse for an automatic challenge to the testimony of every expert. *See* Kumho Tire Co. v. Carmichael, [143 L. Ed. 2d 238,] 119 S.Ct. 1167, 1176 (1999) (noting that the trial judge has the discretion "both to avoid unnecessary 'reliability' proceedings in ordinary cases where the reliability of an expert's methods is properly taken for granted, and to require appropriate proceedings in the less usual or more complex cases where cause for questioning the expert's reliability arises.").

When a trial court, applying this amendment, rules that an expert's testimony is reliable, this does not necessarily mean that contradictory expert testimony is unreliable. The amendment is broad enough to permit testimony that is the product of competing principles or methods in the same field of expertise. *See, e.g.,* Heller v. Shaw Industries, Inc., 167 F.3d 146, 160 (3d Cir. 1999) (expert testimony cannot be excluded simply because the expert uses one test rather than another, when both tests are accepted in the field and both reach reliable results). As the court stated in In re Paoli R.R. Yard PCB Litigation, 35 F.3d 717, 744 (3d Cir. 1994), proponents "do not have to

demonstrate to the judge by a preponderance of the evidence that the assessments of their experts are correct, they only have to demonstrate by a preponderance of evidence that their opinions are reliable. . . . The evidentiary requirement of reliability is lower than the merits standard of correctness." *See also* Daubert v. Merrell Dow Pharmaceuticals, Inc., 43 F.3d 1311, 1318 (9th Cir. 1995) (scientific experts might be permitted to testify if they could show that the methods they used were also employed by "a recognized minority of scientists in their field."); Ruiz-Troche v. Pepsi Cola, 161 F.3d 77, 85 (1st Cir. 1998) ("*Daubert* neither requires nor empowers trial courts to determine which of several competing scientific theories has the best provenance.").

The Court in *Daubert* declared that the "focus, of course, must be solely on principles and methodology, not on the conclusions they generate." 509 U.S. at 595. Yet as the Court later recognized, "conclusions and methodology are not entirely distinct from one another." General Elec. Co. v. Joiner, 522 U.S. 136 [139 L. Ed. 2d 508], 146 (1997). Under the amendment, as under *Daubert,* when an expert purports to apply principles and methods in accordance with professional standards, and yet reaches a conclusion that other experts in the field would not reach, the trial court may fairly suspect that the principles and methods have not been faithfully applied. *See* Lust v. Merrell Dow Pharmaceuticals, Inc., 89 F.3d 594, 598 (9th Cir. 1996). The amendment specifically provides that the trial court must scrutinize not only the principles and methods used by the expert, but also whether those principles and methods have been properly applied to the facts of the case. As the court noted in In re Paoli R.R. Yard PCB Litig., 35 F.3d 717, 745 (3d Cir. 1994), "any step that renders the analysis unreliable . . . renders the expert's testimony inadmissible. *This is true whether the step completely changes a reliable methodology or merely misapplies that methodology."*

If the expert purports to apply principles and methods to the facts of the case, it is important that this application be conducted reliably. Yet it might also be important in some cases for an expert to educate the factfinder about general principles, without ever attempting to apply these principles to the specific facts of the case. For example, experts might instruct the factfinder on the principles of thermodynamics, or bloodclotting, or on how financial markets respond to corporate reports, without ever knowing about or trying to tie their testimony into the facts of the case. The amendment does not alter the venerable practice of using expert testimony to educate the factfinder on general principles. For this kind of generalized testimony, Rule 702 simply requires that: (1) the expert be qualified; (2) the testimony address a subject matter on which the factfinder can be assisted by an expert; (3) the testimony be reliable; and (4) the testimony "fit" the facts of the case.

As stated earlier, the amendment does not distinguish between scientific and other forms of expert testimony. The trial court's gatekeeping function applies to testimony by any expert. *See* Kumho Tire Co. v. Carmichael, [143 L. Ed. 2d 238,] 119 S.Ct. 1167, 1171 (1999) ("We conclude that Daubert's general holding—setting forth the trial judge's general 'gatekeeping' obligation—applies not only to testimony based on 'scientific' knowledge, but also to testimony based on 'technical' and 'other specialized' knowledge."). While the relevant factors for determining reliability will vary from expertise to expertise, the amendment rejects the premise that an expert's testimony should be treated more permissively simply because it is outside the realm of science. An opinion from an expert who is not a scientist should receive the same degree of scrutiny for reliability as an opinion from an expert who purports to be a scientist. *See* Watkins v. Telsmith, Inc., 121 F.3d 984, 991 (5th Cir. 1997) ("[I]t seems exactly backwards that experts who purport to rely on general engineering principles and practical experience might escape screening by the district court simply by stating that their conclusions were not reached by any particular method or technique."). Some types of expert testimony will be more objectively verifiable, and subject to the expectations of falsifiability, peer review, and publication, than others. Some types of expert testimony will not rely on anything like a scientific method, and so will have to be evaluated by reference to other standard principles attendant to the particular area of expertise. The trial judge in all cases of proffered expert testimony must find that it is properly grounded, well-reasoned, and not speculative before it can be admitted. The expert's testimony must be grounded in an accepted body of learning or experience in the expert's field, and the expert must explain how the conclusion is so grounded. See, e.g., American College of Trial Lawyers, *Standards and Procedures for Determining the Admissibility of Expert Testimony after* Daubert, 157 F.R.D. 571, 579 (1994) ("[W]hether the testimony concerns economic principles, accounting standards, property valuation or other non-scientific subjects, it should be evaluated by reference to the 'knowledge and experience' of that particular field.").

The amendment requires that the testimony must be the product of reliable principles and methods that are reliably applied to the facts of the case. While the terms "principles" and "methods" may convey a certain impression when applied to scientific knowledge, they remain relevant when applied to testimony based on technical or other specialized knowledge. For example, when a law enforcement agent testifies regarding the use of code words in a drug transaction, the principle used by the agent is that participants in such transactions regularly use code words to conceal the nature of their activities. The method used by the agent is the application of extensive experience to analyze the meaning of the conversations. So long as the principles and methods are reliable and applied reliably to the facts of the case, this type of testimony should be admitted.

Nothing in this amendment is intended to suggest that experience alone—or experience in conjunction with other knowledge, skill, training or education—may not provide a sufficient foundation for expert testimony. To the contrary, the text of Rule 702 expressly contemplates that an expert may be qualified on the basis of experience. In certain fields, experience is the predominant, if not sole, basis for a great deal of reliable expert testimony. *See, e.g., United States v. Jones, 107 F.3d 1147* (6th Cir. 1997) (no abuse of discretion in admitting the testimony of a handwriting examiner who had years of practical experience and extensive training, and who explained his methodology in detail); *Tassin v. Sears Roebuck, 946 F.Supp. 1241, 1248 (M.D.La. 1996)* (design engineer's testimony can be admissible when the expert's opinions "are based on facts, a reasonable investigation, and traditional technical/mechanical expertise, and he provides a reasonable link between the information and procedures he uses and the conclusions he reaches"). See also *Kumho Tire Co. v. Carmichael, [143 L. Ed. 2d 238,] 119 S.Ct. 1167, 1178 (1999)* (stating that "no one denies that an expert might draw a conclusion from a set of observations based on extensive and specialized experience.").

If the witness is relying solely or primarily on experience, then the witness must explain how that experience leads to the conclusion reached, why that experience is a sufficient basis for the opinion, and how that experience is reliably applied to the facts. The trial court's gatekeeping function requires more than simply "taking the expert's word for it." *See Daubert v. Merrell Dow Pharmaceuticals, Inc., 43 F.3d 1311, 1319* (9th Cir. 1995) ("We've been presented with only the experts' qualifications, their conclusions and their assurances of reliability. Under *Daubert*, that's not enough."). The more subjective and controversial the expert's inquiry, the more likely the testimony should be excluded as unreliable. *See O'Conner v. Commonwealth Edison Co., 13 F.3d 1090* (7th Cir. 1994) (expert testimony based on a completely subjective methodology held properly excluded). *See also Kumho Tire Co. v. Carmichael, [143 L. Ed. 2d 238,] 119 S.Ct. 1167, 1176 (1999)* ("[I] will at times be useful to ask even of a witness whose expertise is based purely on experience, say, a perfume tester able to distinguish among 140 odors at a sniff, whether his preparation is of a kind that others in the field would recognize as acceptable.").

Subpart (1) of Rule 702 calls for a quantitative rather than qualitative analysis. The amendment requires that expert testimony be based on sufficient underlying "facts or data." The term "data" is intended to encompass the reliable opinions of other experts. See the original Advisory Committee Note to Rule 703. The language "facts or data" is broad enough to allow an expert to rely on hypothetical facts that are supported by the evidence. *Id.*

When facts are in dispute, experts sometimes reach different conclusions based on competing versions of the facts. The emphasis in the amendment on "sufficient facts or data" is not intended to authorize a trial court to exclude an expert's testimony on the ground that the court believes one version of the facts and not the other.

There has been some confusion over the relationship between Rules 702 and 703. The amendment makes clear that the sufficiency of the basis of an expert's testimony is to be decided under Rule 702. Rule 702 sets forth the overarching requirement of reliability, and an analysis of the sufficiency of the expert's basis cannot be divorced from the ultimate reliability of the expert's opinion. In contrast, the "reasonable reliance" requirement of Rule 703 is a relatively narrow inquiry. When an expert relies on inadmissible information, Rule 703 requires the trial court to determine whether that information is of a type reasonably relied on by other experts in the field. If so, the expert can rely on the information in reaching an opinion. However, the question whether the expert is relying on a sufficient basis of information—whether admissible information or not—is governed by the requirements of Rule 702.

The amendment makes no attempt to set forth procedural requirements for exercising the trial court's gatekeeping function over expert testimony. *See* Daniel J. Capra, *The Daubert Puzzle*, *38 Ga.L.Rev. 699, 766 (1998)* ("Trial courts should be allowed substantial discretion in dealing with Daubert questions; any attempt to codify procedures will likely give rise to unnecessary changes in practice and create difficult questions for appellate review."). Courts have shown considerable ingenuity and flexibility in considering challenges to expert testimony under Daubert, and it is contemplated that this will continue under the amended Rule. *See, e.g., Cortes-Irizarry v. Corporacion Insular, 111 F.3d 184* (1st Cir. 1997) (discussing the application of Daubert in ruling on a motion for summary judgment); *In re Paoli R.R. Yard PCB Litig., 35 F.3d 717, 736, 739* (3d Cir. 1994) (discussing the use of in limine hearings); *Claar v. Burlington N.R.R., 29 F.3d 499, 502-05* (9th Cir. 1994) (discussing the trial court's technique of ordering experts to submit serial affidavits explaining the reasoning and methods underlying their conclusions).

The amendment continues the practice of the original Rule in referring to a qualified witness as an "expert." This was done to provide continuity and to minimize change. The use of the term "expert" in the Rule does not, however, mean that a jury should actually be informed that a qualified witness is testifying as an "expert." Indeed, there is much to be said for a practice that prohibits the use of the term "expert" by both the parties and the court at trial. Such a practice "ensures that trial courts do not inadvertently put their stamp of authority" on a witness's opinion, and protects against the jury's being "overwhelmed by the so-called 'experts'." *Hon. Charles Richey, Proposals to Eliminate the Prejudicial Effect of the Use of the Word "Expert" Under the Federal Rules of Evidence in Criminal and Civil Jury Trials, 154 F.R.D. 537, 559 (1994)* (setting forth limiting instructions and a standing order employed to prohibit the use of the term "expert" in jury trials).

Notes of Advisory Committee on 2011 amendments. The language of Rule 702 has been amended as part of the restyling of the Evidence Rules to make them more easily understood and to make style and terminology consistent throughout the rules. These changes are intended to be stylistic only. There is no intent to change any result in any ruling on evidence admissibility.

INTERPRETIVE NOTES AND DECISIONS

I.IN GENERAL

1.Generally

2.Relationship to other rules and laws

3.—*FRE 403*—Excludable evidence

4.—*FRE 701*—Lay opinions

5.Discretion of court, generally

6.Factors in determining admissibility, generally

7.Reliability and relevancy of testimony, generally

8.Helpfulness to trier of fact

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10.—Particular cases

11.Opinion of expert

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