

1-1998

Gatekeeping: An Enhanced Foundational Approach to Determining the Admissibility of Scientific Evidence

Charles Nesson

Follow this and additional works at: https://repository.uchastings.edu/hastings_law_journal



Part of the [Law Commons](#)

Recommended Citation

Charles Nesson, *Gatekeeping: An Enhanced Foundational Approach to Determining the Admissibility of Scientific Evidence*, 49 HASTINGS L.J. 335 (1998).

Available at: https://repository.uchastings.edu/hastings_law_journal/vol49/iss2/4

This Article is brought to you for free and open access by the Law Journals at UC Hastings Scholarship Repository. It has been accepted for inclusion in Hastings Law Journal by an authorized editor of UC Hastings Scholarship Repository.

Gatekeeping: An Enhanced Foundational Approach to Determining the Admissibility of Scientific Evidence

by
CHARLES NESSON* AND JOHN DEMERS**

Verdict, *veritatem dicere*, to speak truth. It is the outcome of the law's process for reaching the truth—the jury trial. The credibility of the law depends upon the credibility of verdicts, which in turn depends upon whether society sees verdicts as well-grounded in evidence.¹ Thus, the best way in which to preserve the credibility of the legal system is for judges to insist upon evidence sufficient to support the conclusions that jurors are permitted to draw. This is the responsibility and the goal of the judges' "gatekeeping" function. If judges perform this function effectively, only disputes well-grounded in evidence will be resolved by jury verdict, and the legal system will remain a credible source of truth.

Nowhere is the role of the judge as gatekeeper more important or more difficult to perform than in trials requiring conclusions based on scientific evidence. In such trials, the law, as a source of social truth, has a powerful rival—science. Science has its own methodology for reaching the truth, the scientific method. This methodology has powered our technological progress. It commands great public respect and is enforced by the process of peer review. Additionally, such trials often involve large, well-known corporations, high potential liability, and tragic health circumstances. Thus, these cases are widely reported, making glaringly visible verdicts that may be at odds with the conclusions of science.

Law and science increasingly focus on the same questions: Does autoimmune disease spring from silicone breast implants? Does Bendectin cause birth defects? Does trichloroethylene, vaporized in

* William F. Weld Professor of Law, Harvard Law School. Thanks are owed to Roger Park who organized this conference of Evidence scholars in September 1997, entitled *Truth and Its Rivals* at which I presented some of the ideas discussed in this Article. I am grateful to Roger for his brilliantly focusing title, for assembling an extraordinary set of colleagues to offer their insights, and then, for letting the conference take its course. I would also like to thank Mirjan Damaška, Ronald J. Allen, Kim Lane Scheppele, and Richard O. Lempert.

** J.D. Candidate, Harvard Law School, 1999; A.B., College of the Holy Cross, 1993.

1. See generally Charles Nesson, *The Evidence or the Event? On Judicial Proof and the Acceptability of Verdicts*, 98 HARV. L. REV. 1357 (1985).

shower water and breathed in by pregnant women, blight babies with leukemia? On questions such as these, if jury verdicts contradict those of science, the law lacks any appearance of speaking the truth. A trial that fails to produce social conviction fails one of its essential functions: "reestablishing social peace in the wake of a breach."² Therefore, to enhance law's ability to produce accurate and socially convincing determinations, the law should borrow from the peer review process of science to formulate an enhanced foundational approach to assessing the admissibility of scientific evidence.

I³ have had experience with the admission of scientific evidence from both sides, plaintiff and defense. In the mid-1980s, I represented the plaintiffs as co-counsel with Jan Schlichtmann and others in the Woburn, Massachusetts toxic tort case chronicled by Jonathan Harr in *A Civil Action*.⁴ My role in that case was to ensure that the scientific evidence that the plaintiffs planned to offer on causation was solid enough in form and substance to justify a verdict. I never got that chance. The trial judge bifurcated the case, thereby denying the plaintiffs their right ever to appear and make their claim in court. With the trial stripped of its human context and focused on questions of geology and groundwater flow, the defense could (and did) benefit enormously from dragging it out. Following their closing statement after months of tedium litigating Stage I of the bifurcated trial, the defendants effectively left the jury the choice between either deciding for the plaintiffs and being forced to return to the jury box for Stage II and another six months, or deciding for the defendants and going home.

Even so, the plaintiffs had a chance. In Stage I of the trial, the jury was to decide whether the solvents dumped on the defendants' property reached the plaintiffs' drinking wells. We lost this stage of the trial in part because the judge allowed the defense full latitude in using junk science. For instance, soil chemist Olin Braids testified that he had been able to date the contamination of the land with trichloroethylene by the presence of a related chemical compound in the soil created by the breakdown of the trichloroethylene. From this he concluded that the chemical ingested by plaintiffs could not have come from the defendants.⁵ The judge admitted this testimony de-

2. Charles Nesson & Yochai Benkler, *Constitutional Hearsay: Requiring Foundational Testing and Corroboration under the Confrontation Clause*, 81 VA. L. REV. 149, 150 (1995).

3. All first person references throughout this Article refer to Charles Nesson.

4. JONATHAN HARR, *A CIVIL ACTION* (1995). The case involved the claim that trichloroethylene from the defendants' property had leaked into the plaintiffs' water supply and had caused leukemia. The parties settled the case in 1986 at the conclusion of the first phase of the jury trial, after five months of testimony.

5. *See id.* at 344-45.

spite the fact that Braids could not describe the mechanism by which he claimed microorganisms broke down trichloroethylene, that he had never previously done work on microbiology and the degradation of chemicals, and that he testified that this method of dating contamination may never have been done before.⁶ A trial with a judge acting as a more vigilant gatekeeper might have meant a victory for the plaintiffs.

In the early 1990s, I was co-counsel⁷ for the defense in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*⁸ in the United States Supreme Court. In *Daubert*, the Court articulated the “gatekeeping” idea, stating that the role of judges is to “ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable.”⁹ With respect to expert scientific testimony, the Court charged judges not only with determining the adequacy of expert credentials¹⁰ and the relevance of the expert’s conclusion to the issues at trial,¹¹ but also the adequacy of the expert’s foundation, that is “whether the reasoning or methodology underlying the testimony is scientifically valid and . . . whether that reasoning or methodology properly can be applied to the facts in issue.”¹² In effect, the Court directed that an expert opinion not based on “a reliable foundation”¹³ is “subjective belief or unsupported speculation,”¹⁴ and should be excluded.

The Court, in accordance with the positions of both petitioners and respondents, agreed that the “general acceptance” standard¹⁵ for determining the admissibility of scientific evidence had been superseded by passage of the Federal Rules of Evidence.¹⁶ But what the new standard should be remained an open question. On this ques-

6. *See id.* at 345-46.

7. The other counsel were Charles Fried, Joel Klein, and Richard Taranto.

8. 509 U.S. 579 (1993).

9. *Id.* at 589.

10. *See id.* at 592 n.10 (“Preliminary questions concerning the qualification of a person to be a witness . . . shall be determined by the court . . .” (quoting FED. R. EVID. 104(a))).

11. *See id.* at 591.

12. *Id.* at 592-93.

13. *Id.* at 597. Reliable evidence is defined as that which is “based on scientifically valid principles.” *Id.*

14. *Id.* at 590.

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

16. *See* FED. R. EVID. 702 (“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.”). The Court also reasoned that the “rigid ‘general acceptance’ requirement would be at odds with the ‘liberal thrust’ of the Federal Rules and their ‘general approach to relaxing the traditional barriers to ‘opinion’ testimony.” *Daubert*, 509 U.S. at 588 (quoting *Beech Aircraft Corp. v. Rainey*, 488 U.S. 153, 169 (1988)).

tion, the Court in *Daubert* adopted the position that co-counsel and I had advanced: that expert scientific opinions must be solidly grounded, and that judges must make this foundational judgment as part of their gatekeeping responsibility to admit good evidence and exclude speculation.¹⁷ Having given judges the responsibility to ensure the reliability of verdicts, the Court, in the voice of Justice Blackmun, turned the puzzle of how to do this over to lower court judges,¹⁸ subject to a significant constraint and an important warning from the dissent. First, although the decision elaborates the important gatekeeping function of judges, it leaves to the jury a large role—a role that limits what the judge can decide. Judges, in assessing the foundation for scientific expert opinion, must confine themselves to judging the expert's methodology, not his conclusions.¹⁹ This constraint is consistent with the jury's traditional province of judging the credibility of witnesses and the evidence on ultimate issues. Second, Chief Justice Rehnquist in dissent, admonished judges not to "become amateur scientists in order to perform [their gatekeeping] role."²⁰

The *Daubert* opinion, both majority and dissent, beautifully states its goal and lays down its constraints while expressing a strong faith in the creative imagination of the judiciary to find solutions to the difficult problem of assessing the reliability of scientific evidence. The Justices charted a direction rather than a clear-cut path, confidently placing the task of working out the contours and the details of this "flexible"²¹ inquiry in the hands of the appellate courts, academic commentators, and, most importantly, the trial court judges who will fulfill the gatekeeping function.²²

Through the Berkman Center for Internet and Society at Harvard Law School,²³ of which I am director, I initiated a series of semi-

17. *See id.* at 589. In discussing the tests for admissibility of evidence, the Court cited to my evidence textbook. *See id.* at 585 (citing ERIC D. GREEN & CHARLES R. NESSON, PROBLEMS, CASES, AND MATERIALS ON EVIDENCE 649 (1983)).

18. *See Daubert*, 509 U.S. at 592-93. The Court did suggest some factors for the trial courts to consider, including whether a scientific theory can be and has been tested, whether it has been subjected to peer review, and whether the theory is generally accepted. *See id.* at 593-94.

19. *See id.* at 595. "The focus, of course, must be solely on principles and methodology, not on the conclusions that they generate." *Id.*

20. *Id.* at 601 (Rehnquist, C.J., concurring in part and dissenting in part); *see also* General Elec. Co. v. Joiner, 118 S. Ct. 512, 520 (1997) (Breyer, J., concurring) (pointing out that "judges are not scientists and do not have the scientific training that can facilitate the making of such decisions").

21. *Daubert*, 509 U.S. at 594.

22. *See id.* at 593. "We are confident that federal judges possess the capacity to undertake this review." *Id.*

23. For more information on the Center and its *Daubert* Project, *see*

nars²⁴ with trial judges to promote discussion and understanding of these issues in the state courts.²⁵ Our purpose has been to work out the answer to the Supreme Court's puzzle: How do judges evaluate the foundation for a scientist's expert opinion without assessing its conclusions or the credibility of the expert and without becoming amateur scientists?

The enhanced foundational approach here described helps answer this question. The approach is consistent with the idea that the law should heed the methodology and forms of science in order to maintain its credibility in reaching accurate conclusions regarding scientific evidence. It is encapsulated in a simple rule:

At the discretion of the judge, a party may be ordered to require its expert witnesses to submit the theoretical or methodological foundation of their testimony to the court prior to trial in the form of an article submitted for peer review.

This approach derives from traditional judicial roles, existing procedural requirements, and the Supreme Court's decisions in *Daubert* and *General Electric Co. v. Joiner*.²⁶ First, the approach springs from the judicial tradition of "gatekeeping"—the assessment of the reliability and relevance of the evidence a jury hears. This gatekeeping responsibility includes scrutinizing the proof in proportion to its importance, i.e., gauging the degree of foundation required to the weight of the case to be built upon the evidence. Second, the enhanced foundational approach builds on the existing requirement of Rule 26 of the Federal Rules of Civil Procedure that experts prepare written reports "of all opinions to be expressed and the basis and reasons therefor [as well as] the data or other information considered by the witness in forming the opinions."²⁷ Finally, this approach follows closely the Supreme Court's decisions in *Daubert* and *Joiner*, specifying how the judge is to act as an active and vigilant gatekeeper. In borrowing from science in order to help the judge evaluate science, this approach fits well with *Daubert's* emphasis on and repeated references to the scientific method.²⁸ In fact, *Daubert* explicitly suggested that the trial judge, in assessing the foundation of the evi-

<http://cyber.harvard.edu/daubert.html>.

24. Thus far, support for these seminars has come primarily from corporate sources. A funding request to the plaintiffs' bar was turned down.

25. Many state courts use a *Daubert*-type approach in assessing the admissibility of scientific evidence. See, e.g., *E.I. Du Pont de Nemours & Co. v. Robinson*, 923 S.W.2d 549 (Tex. 1995).

26. 118 S. Ct. 512 (1997) (holding that a district court's determination of admissibility of evidence under *Daubert* is reviewable only for abuse of discretion).

27. FED. R. CIV. P. 26.

28. See, e.g., *Daubert*, 509 U.S. at 590 (In Rule 702 "the adjective 'scientific' implies a grounding in the methods and procedures of science."); see also *id.* at 594-95 (linking "scientific validity" with "evidentiary relevance and reliability").

dence, consider "whether the theory or technique has been subjected to peer review and publication."²⁹

Judges could make the determination to require an enhanced expert report either on their own initiative or following the request of one of the parties. A stringent documentary demonstration of foundation would not be appropriate or necessary for every expert at every trial. But in those cases where expert testimony is introduced to build the legal equivalent of a skyscraper, it is not unreasonable to ask experts to spell out their methodology and basis for their scientific conclusions. In making this decision, the judges would likely consider such factors as the importance of the scientific theory in the context of the dispute; the magnitude of the health and financial implications of the trial; the degree to which the expert's testimony is scientifically controversial; and the expense to the parties and the court.

Following submission by the expert, the judges would assess the form and foundation of the report to ensure, as per *Daubert*, that the evidence is both relevant and reliable.³⁰ The submission would have the form of a traditional peer review article³¹—including methods, data, analysis, and references—and would be as extensive and comprehensive as one submitted for peer review.³² In order to be credible to a well-informed audience, the report should be crafted efficiently to respect the methods and analysis of the particular scientific field in which the evidentiary issue lies.

The expert's submission is to be anonymous so as to leave the assessment of the witness's credibility to the jury. Again, this approach borrows from science, where there has been much discussion of having articles peer reviewed only after stripping them of information which would identify their author. With the author's identity removed from the report, judges would assess the credentials of the expert separate from evaluating the adequacy of the basis for the expert's opinion. Once judges certify the witness as an expert and determine that the basis for the expert's opinion is adequate, the expert's credibility and conclusions remain for the jury to assess, after hearing the testimony and cross-examination.³³

29. *Id.* at 593-94.

30. *See id.* at 597.

31. Actual publication would, of course, not be required. As the Court noted in *Daubert*, "[p]ublication (which is but one element of peer review) is not a sine qua non of admissibility; it does not necessarily correlate with reliability." *Id.* at 593.

32. For a description of the peer review process of one of the leading scientific journals see *The Journal's Peer Review Process*, 321 NEW ENG. J. MED. 837 (1989).

33. *Daubert* recognized the important role of the adversary system's methods—including "vigorous cross-examination [and the] presentation of contrary evidence"—in assisting the jury to reach an accurate conclusion as to credibility of experts and weight to

Judges may evaluate the basis for an expert's opinion as they deem best. Consistent with Rule 706,³⁴ they may appoint an outside expert or a panel of such experts, as suggested by Justice Breyer in his concurrence in *Joiner*.³⁵ These experts mimic the function of the peer reviewers of a scientific journal and allow judges to avoid taking on the role of the scientist. In other cases, it may be sufficient for the judges to review the report on their own.

If judges do not choose to review the foundational adequacy of the evidence themselves, court-appointed scientists would then respond to the expert's report. They would submit to the court their critiques of the testimony's foundation, essentially scientific amicus curiae briefs in support of or opposed to admission. These responses would assist the trial judges in assessing the adequacy of the expert's foundation. In accordance with *Daubert*,³⁶ the judges and the reviewers would not evaluate the expert's conclusions, only the foundation on which they rest. Following *Joiner*,³⁷ however, the judges could scrutinize the report to ensure that the conclusions of the expert are only those that follow logically from the data and methodology used.

This process would help judges evaluate whether the expert has a reliable basis for a scientific opinion and would help expose any weakness, incompleteness, inconsistency, or incoherence in the data and analysis. The enhanced foundational approach simultaneously puts both defendants and plaintiffs on notice of what they must be prepared to provide and assures them that if they meet this standard, they will have the chance to prove their case. Building on the legal practices of discovery reports and amicus curiae briefs and borrowing from science, the approach preserves the traditional complementary roles of judge and jury.

Looking to science for guidance in trials where science is at issue minimizes those situations in which the law's conclusions contradict those of science and thus helps preserve the legitimacy of the legal system as a source of social truth. The Supreme Court has charged judges with protecting the credibility of the system in their role as gatekeepers. Properly performed, this gatekeeping function helps ensure that the courts will continue to provide society with accurate resolutions to legal conflicts and that jury verdicts speak the truth.

be given to their conclusions. See *Daubert*, 509 U.S. at 596.

34. FED. R. EVID. 706.

35. See *Joiner*, 118 S. Ct. at 520-21 (Breyer, J., concurring).

36. See *Daubert*, 503 U.S. at 595.

37. See *Joiner*, 118 S.Ct. at 519.

