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Robert L. Schwartz
University of New Mexico - School of Law

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COMMENT

THERE IS NO ARCHBISHOP OF SCIENCE—A COMMENT ON ELLIOTT'S *TOWARD INCENTIVE-BASED PROCEDURE: THREE APPROACHES FOR REGULATING SCIENTIFIC EVIDENCE*

ROBERT L. SCHWARTZ*

As is usual when Professor Elliott writes about turning retrospective judge-oriented procedural rules into prospective attorney-oriented procedural incentives,¹ his proposal for dealing with scientific testimony not accepted within the scientific community is both interesting and provocative. It also serves as an apology for those judges who are so in awe of science that they believe that only they or their peers in the scientific establishment—and not the common folk selected for jury service—are likely to understand the complex truths that science yields.

Professor Elliott starts with the assumption that there is a need for some kind of judicial intervention to control jury access to scientific evidence that is unacceptable to the scientific establishment: evidence that currently prestigious scientists consider "quackery" or "junk science."² However, his presumption in favor of screening scientific evidence (a perspective widely held by judges and others who have addressed the issue)³ remains un-

* Professor of Law, University of New Mexico. The author is indebted to Professors Richard Gonzales and Ted Occhialino, who listened to early descriptions of the thesis of this paper and offered several instructive suggestions. The author also appreciated the encouragement provided by Professor George Priest.

¹ See, e.g., Elliott, *Managerial Judging and the Evolution of Procedure*, 53 U. CHI. L. REV. 306 (1986); see also Elliott, *Regulating Deficit After Bowsher v. Synar*, 4 YALE J. ON REG. 317 (1987); Elliott, *Goal Analysis versus Institutional Analysis of Toxic Compensation Systems*, 73 GEO. L.J. 1357 (1985).

² This presumption, which is apparently self-evident to Professor Elliott, permeates *Toward Incentive-Based Procedure: Three Approaches For Regulating Scientific Evidence*, 69 B.U.L. REV. 487 (1989) (hereinafter Elliott, *Scientific Evidence*). See, e.g., *infra* notes 4-5 and accompanying text.

³ See, for example, *Richardson v. Richardson-Merrell, Inc.*, 857 F.2d 823 (D.C. Cir. 1988) and *Sterling v. Veliscol Chemical Corp.*, 855 F.2d 1188 (6th Cir. 1988) for two Court of Appeals cases decided in the past year supporting this presumption. At a recent symposium convened by the ABA Section on Science and Technology, Committee on the Legal Resolution of Scientific Evidence, to discuss appropriate changes to the screening rule for scientific evidence developed in *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923), all of the diverse proposals suggested that some form of screening was appropriate. See, e.g., Lederer, *Resolving the Frye Dilemma—A Reliability Approach*, 115 F.R.D. 84 (1987); Berger, *A Relevancy Approach to Novel Scientific Evidence*, 115 F.R.D. 89 (1987); Starrs, *Frye v. United*

ported by any substantial legal argument or meaningful data. It is based on the paternalistic notion that judges are capable of understanding that which will mislead jurors and, in fact, that judges can determine which scientific evidence will mislead jurors into finding a scientific "truth" that is not there. Those who support the presumption in favor of screening scientific evidence (the "screeners") misapprehend the role of science in the courtroom, disregard the abilities of juries as fact finders (while overestimating that of judges), fail to consider the inherent (rather than instrumental) value of procedures that provide for admission of scientifically questionable evidence, and fail to distinguish between the use of novel scientific evidence in civil and criminal cases.

I. THE ROLE OF SCIENCE IN THE COURTROOM

The screeners misunderstand the role of science in the courtroom in two ways. First, they have too much respect for science.⁴ There is no reason to

States *Restructured and Revitalized: A Proposal to Amend Federal Evidence Rule 702*, 115 F.R.D. 92 (1987); Giannelli, *Scientific Evidence: A Proposed Amendment to Federal Rule 702*, 115 F.R.D. 102 (1987); *Symposium on Proposed Rules for Admission of Scientific Evidence*, 115 F.R.D. 108 (1987). Professor Saltzburg, moderator of this symposium, conducted a straw vote of participants to answer the question "[H]ow many think that the judge should conduct a threshold inquiry into whether proffered scientific evidence is generally accepted within the particular field in which it belongs?" He found that "an overwhelming majority favors judicial screening." *Open Discussion*, 115 F.R.D. 133, 141 (1987). See also *Symposium on Science and the Rules of Evidence*, 99 F.R.D. 187 (1983); *Symposium on Science and the Rules of Legal Procedure*, 101 F.R.D. 599 (1987). For two superbly annotated histories of American judicial analysis of the admissibility of novel scientific evidence, see Imwinkelried, *Judge Versus Jury: Who Should Decide Questions of Preliminary Facts Conditioning the Admissibility of Scientific Evidence?* 25 WM. & MARY L. REV. 577 (1984); and Giannelli, *The Admissibility of Novel Scientific Evidence: Frye v. United States, a Half-Century Later*, 80 COLUM. L. REV. 1197 (1980).

⁴ They also think that they can define science and distinguish non-scientific expertise from scientific expertise. In fact, neither judges nor scientists have been able to do this in any consistent way. As Professor McCord points out by way of example:

The vast body of case law on psychological evidence may be considered scientific by some courts but not by others. . . . Perhaps one-fourth of the courts that consider [rape trauma syndrome, battered women syndrome, child abuse syndrome, and premenstrual stress syndrome] apply *Frye* because the evidence is scientific, one-fourth do not employ *Frye* because the evidence apparently is not scientific, and one-half do not deal with the underlying issue.

McCord, in *Open Discussion*, 115 F.R.D. 133, 140 (1987), citing McCord, *Syndromes, Profiles and Other Mental Exotica: A New Approach to the Admissibility of Nontraditional Psychological Evidence in Criminal Cases*, 66 OR. L. REV. 19 (1987). One judge's scientific testimony may be another's "self-taught gypsy-woodooism." See *Zani v. Texas*, 758 S.W.2d 233, 250 (Tex. Crim. App. 1988) (Teague, J., concurring and dissenting).

believe that scientific evidence is as objective and neutral as the screeners presume, and there is no reason to believe that exposing jurors to allegedly bad science is as harmful as the screeners think. Second, the screeners do not realize that scientific conclusions, that are inadequate from the viewpoint of scientists, may still be useful in judicial proceeding.

This society is so in awe of science that courts have come to believe that the truth of scientific statements, unlike that of other statements, can be measured with precision, and that this objective knowledge of science is within the understanding of the scientific elite but not the rest of us. Some judges attribute to scientific knowledge an objectivity (and, consequently, an importance) not attributed to knowledge of history, economics, or anthropology, or any other expert or nonexpert evidence. There have been times and places in which other disciplines—for example, theology, history, and economics—were presumed to possess the kind of objective and absolute truth that our culture currently attributes to science. In such societies, dissenting views about theology, history, or economics would have been looked upon with as much horror as scientific quackery. What theology provides to Islamic Iran, science provides to America. When the judiciary develops rules to limit the admissibility of bad (or, at least, unpopular) science, it fails to recognize that science is no more “true” than theology, economics, anthropology, or psychology, and that scientific expert witnesses are no different from experts in other areas.⁵

⁵ Indeed, perhaps the first reported use of an expert witness in the courtroom occurred in *R. v. Culander and Duny* [“A Trial of Witches”], 6 State Trials (17 Charles II) 687 (1665), in which the defendants were convicted of witchcraft and sentenced to death. The expert’s testimony that was considered by the court would have been admissible as expert scientific testimony under the Federal Rules of Evidence (and the *Frye* test), if we can imagine them applied to English society of 1665:

There was also Dr. Brown of Norwich, a person of great knowledge; who after this evidence given, and upon view of the three persons in Court, was desired to give his opinion, what he did conceive of them; and he was clearly of opinion, that the persons were bewitched; and said, That in Denmark there had been lately a great discovery of witches, who used the very same way of afflicting persons, by conveying pins into them, and crooked as these pins were, with needles and nails. And his opinion was, That the devil in such cases did work upon the bodies of men and women, upon a natural foundation, (that is) to stir up, and excite such humors super-abounding in their bodies to a great excess, whereby he did in an extraordinary manner afflict them with such distempers as their bodies were most subject to, as particularly appeared in these children; for he conceived, that these swooning fits were natural, and nothing else but that they call the mother, but only heightened to a great excess by the subtilty [sic] of the devil, cooperating with the malice of these which we term witches, at whose instance he doth these villainies.

6 State Trials (17 Charles II) at 697. In fact, if the defendants had proffered expert testimony that there was no such thing as witchcraft, it probably would have been considered unscientific, contrary to well-accepted and well-recognized principles, and, of course, heretical.

Because judges (like others in the mainstream of our society) believe that scientific evidence is objective, neutral, and particularly powerful, they have been unwilling to allow juries to review "wrong" scientific evidence. They fear that the presentation of such evidence would be too powerful a potion for lay jurors. The screening solutions—from *Frye* through Professor Elliott's truth squad proposal—aim to ensure that jurors receive only "correct" science or, at least, are informed through court-appointed truth squads about which science is "correct" and which is quackery.

The problem is that there is no adequate way to screen good science from bad science. We do not have to look to Galileo⁶ or Lysenko⁷ to see the danger in recognizing orthodoxy in science; we do not even have to look to the eugenics theories that were generally accepted when *Frye* was decided in 1923.⁸ We can look to modern neonatology (and its now-discredited practices of giving oxygen or sulfa drugs to newborns) or psychiatry (and its history of using insulin shock and lobotomy) or oncology to see misguided orthodoxy overthrown almost weekly. Whether science is good or bad is no different from other contested factual issues that are routinely submitted to juries. Indeed, our unstated assumptions about the objectivity, neutrality, and truth of anything purporting to be scientific drive us to limit jury access to scientific testimony just when that access is most important: when there is a genuine dispute between litigants that depends upon the truth of a scientific assertion. Judicial screening for scientific acceptability, whatever form that screening may take, is usurpation of the jury's fact-finding role by the judge or by the judge's delegate (usually some scientist who is respected by the judge).

Even if there were "right science" and "wrong science," and even if there were an American Archbishop of Science to tell them apart and declare scientific truth, "bad" science, from the scientist's viewpoint, might still be helpful to a court faced with a particular issue. The goals of the scientific and judicial processes are different; their procedures and techniques are different. Not surprisingly, the certainty they require in order to do their work is different.

Scientists, working to reach generalizable and universal knowledge without any externally imposed time deadline, are not willing to tolerate half-completed research or poorly tested hypotheses. To scientists, such research is nothing more than bad science. The judicial system, however,

⁶ See G. DE SANTILLANA, *THE CRIME OF GALILEO* (1955); E. McMULLIN, *GALILEO, MAN OF SCIENCE* (1967).

⁷ See Z. MEDVEDEV, *THE RISE AND FALL OF T.D. LYSENKO* (1969); D. JORAVSKY, *THE LYSENKO AFFAIR* (1970).

⁸ For a good analysis of the role of scientific experts in the development of the eugenics movement, see Allen, *The Role of Experts in Scientific Controversy*, in *SCIENTIFIC CONTROVERSIES: CASE STUDIES IN THE RESOLUTION AND CLOSURE OF DISPUTES IN SCIENCE AND TECHNOLOGY* 169 (H.T. Englehardt & A. Caplan eds. 1987).

driven to quickly resolve matters of concern to defined parties, with *res judicata* effects on those parties alone and not on society as a whole, will be better served by incomplete scientific work than by none at all.

Courts must answer each question "yes" or "no"; it is as harmful for the court (at least in civil cases) to err in answering any question "yes" as to err in answering it "no." Scientists can answer analogous questions "yes," "no," or "we don't know yet." A great many of the "we don't know yet" answers given by scientists are really "probably yes" or "probably no" answers. While in such cases science is best advanced if scientists continue to say "we don't know yet," litigation would be substantially improved if scientists were willing to admit that the underlying question could be considered "probably yes" or "probably no." Stated another way, the confidence level necessary to make scientific research useful in the courtroom may be much lower than the level necessary to make it generally acceptable for scientific purposes. This is not to say that scientific truth is better than legal truth. Rather, it is different, because scientists and courts have different functions. A scientist may properly decry as bad science some research that will result in good law.

II. SCREENERS DO NOT PROPERLY RESPECT JURORS AS FACT FINDERS

If we start with the fundamental precept that relevant evidence is unconditionally admissible unless there is some good reason to exclude or condition it⁹—and that premise is fundamental to adequate jury consideration of any case—we must determine whether there is any substantial reason to limit or condition the admissibility of novel scientific testimony merely because it is novel or scientific. Two arguments generally are advanced to support a limitation on the use of novel scientific evidence. First, it is argued that lay jurors will be enveloped in the "aura of certainty"¹⁰ or "mystic infallibility"¹¹ of anything that purports to be scientific and thus give it more weight

⁹ See FED. R. EVID. 402:

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

Rule 702 of the Federal Rules of Evidence explicitly permits testimony by experts:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.

¹⁰ United States v. Brawner, 471 F.2d 969, 1101 (D.C. Cir. 1972) (Bazelon, J., concurring in part and dissenting in part) (dealing with psychiatric testimony).

¹¹ United States v. Addison, 498 F.2d 741, 744 (D.C. Cir. 1974), citing *in Barefoot v. Estelle*, 463 U.S. 880, 926 n.8, (1983), *reh.'g denied* 464 U.S. 874 (1983) (Blackmun, J., dissenting). One court has also commented that such evidence "is

than scientists (and, apparently, judges) know it deserves.¹² Second, it is suggested that novel scientific evidence should not be unconditionally admissible because of the existence of other, better evidence—namely, the traditionally accepted scientific analysis of the same issue.

The first argument fails because scientific evidence is especially amenable to the traditional techniques used to cast doubt upon credibility of testimony.¹³ Typical cross-examination of a scientific expert will involve an inquiry into any financial bias the witness might have in the case and the fee charged for testifying. It will also explore the professional standing and affiliation of the witness, raise questions about the prevailing alternative views derived from the scientific literature, and review the acceptability of the principles, techniques, and conclusions of the expert within the peer community.¹⁴ Some of these issues (such as the standing of the witness in the peer scientific community) may also be explored through rebuttal testimony.¹⁵ There is simply no reason to believe that adequate cross-examination and use of rebuttal witnesses will fail to pierce the aura or mysticism of scientific testimony.

Second, the fact that there may be other more generally reliable evidence is usually not grounds for excluding inconsistent evidence. The existence of an eyewitness who saw an event from a distance of five feet does not render inadmissible the testimony of an eyewitness who saw the same event from fifty or five hundred feet, although it would probably affect the weight that the jury gives to that testimony.¹⁶ Similarly, the existence of traditional

likely to be shrouded with an aura of near infallibility, akin to the ancient oracle of Delphi." *United States v. Alexander*, 526 F.2d 161, 168 (8th Cir. 1975). Professor Imwinkelried refers to the "special aura of credibility" of scientific testimony. E. IMWINKELRIED, *SCIENTIFIC AND EXPERT EVIDENCE* (1981). Professor Giannelli calls it "an aura of scientific infallibility" that "shrouds" the evidence. Giannelli, *supra* note 3, at 1237.

¹² Essentially, this objection to the admissibility of evidence is based in Rule 403 of the Federal Rules, which provides:

Although relevant, evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence.

Justice Blackmun, too, has noted that "unreliable scientific evidence is widely acknowledged to be prejudicial." *Barefoot v. Estelle*, 463 U.S. 880, 926 (1983), *reh.'g denied* 464 U.S. 874 (1983) (Blackmun, J., dissenting).

¹³ There are dozens of lawyers' practice aids describing ways to attack the testimony of expert scientific witnesses. *See, e.g.*, D. DANNER, *EXPERT WITNESS CHECKLISTS* (1983); E. IMWINKELRIED, *THE METHODS OF ATTACKING SCIENTIFIC EVIDENCE* (1982).

¹⁴ *Id.*

¹⁵ E. IMWINKELRIED, *supra* note 13, at 22-23, 241-42.

¹⁶ The fact that it is hard to distinguish scientific evidence from ordinary eyewitness evidence is manifested in one of the leading, recent cases involving the applica-

science ought not to make a novel theory or practice inadmissible or only conditionally admissible, even if it does reduce the weight jurors are likely to give to that novel theory or practice.

In any case, before judges are allowed to screen novel scientific evidence, there ought to be some basis to conclude that judges are better able to understand such evidence than are juries. The literature supporting *Frye* is replete with examples of embarrassing scientific mistakes made in the judicial process—mistakes made by trial judges and often even by appellate court judges.¹⁷ There is simply no basis for the belief that judges are better than juries in making a preliminary assessment of the scientific merit or “general acceptance” of scientific evidence. Undoubtedly, some scientifically trained judges know more about the substance of scientific evidence than do some jurors; undoubtedly, sometimes the collective wisdom of twelve jurors will exceed that of the judge. There is no reason to presume that judges should intervene to condition admissibility of scientific evidence when they are not permitted to screen other kinds of expert testimony in which neither they nor the jury have backgrounds.

III. SCREENERS UNDERESTIMATE THE INHERENT VALUE OF THE UNCONDITIONED ADMISSION OF NOVEL SCIENTIFIC EVIDENCE IN CIVIL CASES

In many kinds of civil cases in which novel scientific evidence is likely to be proffered—toxic tort cases against large corporations or governmental agencies, for example—the plaintiffs are likely to be powerless workers who perceive the battle as one against the establishment. Toxic tort actions typically are commenced by low level workers who believe they have been injured by exposure to toxic agents. Such lawsuits are generally commenced after those workers have failed to receive any serious consideration or respect for their problems from the company doctor, the company, the union, and the state or federal agency charged with supervision of the site of the alleged injury. It is important that these plaintiffs believe that they are being taken seriously by somebody; it is important to them that someone powerful, yet neutral and open-minded, hear their full story.

Unless their unlikely scientific evidence is heard and rejected (or accepted, of course) by a jury of lay people, they will continue to feel power-

tion of the *Frye* test. In *United States v. Downing*, 753 F.2d 1224 (3d Cir. 1985), *on remand* 609 F. Supp. 784 (E.D. Pa. 1985), *aff'd mem.* 780 F.2d 1017 (3d Cir. 1985), the Third Circuit considered the admissibility of expert scientific testimony about the unreliability of eyewitness evidence. The Court rejected the *Frye* test but applied an alternative form of screening. *Downing*, 753 F.2d at 1237.

¹⁷ See, e.g., *State v. Sharbono*, 175 Mont. 373, 563 P.2d 61 (1971); *Mills v. State*, 476 So. 2d 172 (Fla. 1985). For what Professor Starrs calls a “catalogue of appellate court horrors,” see Moenssens, *Admissibility of Scientific Evidence—An Alternative to the Frye Rule*, 25 WM. & MARY L. REV. 545, 548-64 (1984).

less and unfairly treated by an establishment conspiracy of corporate, scientific, and judicial powers. The apparent fairness of the resolution of such cases is an important social value, one that requires the jury to be allowed full and unconditional access to otherwise competent and probative evidence proffered by the plaintiffs.

IV. PROFESSOR ELLIOTT'S PROPOSAL IS UNNECESSARY IN CIVIL CASES

Most of the literature addressing the evidentiary treatment of the admission of novel scientific evidence makes no distinction between the use of such evidence in civil and criminal cases.¹⁸ There are substantial reasons for making such a distinction, however. The burden of proof is different in civil and criminal cases, as are the interests at stake and the procedural tools available to the parties and the judges. Whatever value early revelation of scientific testimony to a truth squad witness might have in criminal cases, that device is unnecessary in civil litigation.

The Federal Rules of Civil Procedure provide for discovery by interrogatories of all the information that would be revealed through Professor's Elliott's proposal.¹⁹ Further, as a practical matter, full deposition of any proposed expert—scientific or otherwise—is permitted in every substantial civil case in the federal courts.²⁰ Finally, a party who believes that quackery is being presented to a jury by an adversary is able to call a rebuttal witness (or as many as are reasonably necessary) to show the small value of the expert's testimony. Of course, the expert witness fees of these rebuttal witnesses on the quackery issue would be taxed as costs.²¹

The only differences between Professor Elliott's proposal and the currently permitted civil practice are the requirement that the judge hold a hearing to determine whether a truth squad witness should be called and the appointment of the witness by the judge rather than by the parties themselves. Professor Elliott believes that there will not be any substantial trial consequences arising out of a presentation of such witnesses.²² If he is right, the process is unnecessary (even if not harmful); if he is wrong, the process is a harmful judicial intrusion into the fact finding role of the jury.

¹⁸ Of course, some scholars have been concerned primarily with their use in one context or another. For two criminal lawyers' analysis of the issue, see Hollander, *Proposed Amendments to the Federal Rules on Admissibility of Scientific Evidence: A Defense Counsel's Perspective*, 115 F.R.D. 121 (1987); and Melson, *Proposed Amendments to the Federal Rules on Admissibility of Scientific Evidence: A Prosecutor's Perspective*, 115 F.R.D. 126 (1987). See also Moenssens, *supra* note 17, at 568 (recognizing the difference between discovery rules in civil and criminal cases).

¹⁹ FED. R. CIV. P. 26(b)(4)(A)(i).

²⁰ This is consistent with the theory behind discovery under the Federal Rules of Civil Procedure. This kind of discovery is explicitly allowed by Rule 26(b)(4)(A)(ii).

²¹ FED. R. CIV. P. 54(d).

²² Elliott, *Scientific Evidence*, *supra* note 2, at 509-11.

Professor Elliott's truth squad proposal is an improvement on *Frye*, but it has four substantial problems shared by all other screening proposals: it is based on a misunderstanding of the role of science in the courtroom and an unwarranted reverence for science; it is based upon an undeserved lack of respect and disregard for juries; it does not even consider the inherent value of the open procedure necessary to appear neutral to all parties—even those with weak evidence to present to a jury; and, it fails to distinguish between use of scientific evidence in criminal and civil cases. If there were an Archbishop of Science who, by definition, knew all scientific truths, and who spoke these truths only to judges, it would be appropriate for judges to screen scientific evidence before allowing juries to have unrestricted access to it. There is no such person, and screening is thus inappropriate.

