TOWARD INCENTIVE-BASED PROCEDURE: THREE APPROACHES FOR REGULATING SCIENTIFIC EVIDENCE

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[W]e should think about civil procedure less from the perspective of powers granted to judges and more from the perspective of incentives created for lawyers and clients. ¹

The problem to be discussed is hardly the most important facing the law today. Expert testimony about technical and scientific issues is presented in a relatively small percentage of cases. ² It plays a central role in an even smaller proportion: for example, in toxic torts, medical malpractice, and occasionally in criminal cases in which new forensic techniques are offered as evidence.

The management of expert testimony on scientific and technical issues in litigation is of special interest, however, on two different levels. First, law at the frontiers of science and technology challenges our ingenuity to adapt traditional judicial procedures to controversies far removed from those for which they were developed. ³ Many commentators believe that case-by-case

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It is important to remember, however, that when we speak of the "facts" at issue in toxic tort litigation we are talking about issues of a very different sort than those that our traditional litigation procedures were developed to resolve. Traditionally, common law litigation turned on issues of historical fact—what Professor Alexander Bickel used to call "who struck John" issues—and issues of credibility were left to the common sense of juries. Although traditional jury trial procedures may be well suited to resolving issues of this type, it is questionable
litigation before lay judges and juries is not the best way to resolve scientific and technical controversies; however, absent reforms to substitute other institutions for traditional adjudication, judges must struggle to improve procedures for handling technical matters as best they can. In the meantime, the courts' ability to handle controversies about scientific and technical facts does have a major effect on verdicts and settlements in areas such as toxic torts, products liability, and medical malpractice. Practical results in these fields are more likely to be influenced by the evidentiary rulings on innovative theories of fact than by substantive law. Consequently, the problem of how to manage scientific and technical expert testimony is important in its own right, particularly in discrete areas of law.

But I am interested in the problem of scientific testimony for a second, more general, reason. I use this issue as a concrete illustration of a general approach to procedural reform that I call incentive-based procedure. The

whether traditional courtroom litigation procedures are equally appropriate for resolving issues of toxicology and epidemiology which arise in toxic tort cases. By their very nature, disciplines such as toxicology rely on specialized techniques that run counter to a lay person's intuitions. A scientific "fact" is not a fact in the same sense that "who struck John" is a fact. As Kuhn [T. KUHN, THE STRUCTURE OF SCIENTIFIC REVOLUTIONS (2d ed. 1970)] reminds us, a scientific "fact" is essentially the consensus judgment of a specialized community. It is highly doubtful, however, that our present procedures in toxic tort litigation give juries an accurate picture of the consensus judgment of the scientific community on technical and scientific issues.

Id. at 117-18. See Elliott, Goal Analysis versus Institutional Analysis of Toxic Compensation Systems, 73 GEO. L.J. 1357, 1372-75 (1985) (recommending that other institutions, such as the legislature or administrative agencies, should be used to address most toxic compensation claims); see also Huber, Safety and the Second Best: The Hazards of Public Risk Management in the Courts, 85 COLUM. L. REV. 277, 307-14 (1985) (favoring expert administrative agencies); Huber, The Bhopalization of U.S. Tort Law, ISSUES SCI. & TECH., Fall, 1985, at 73, 79; Jasanko & Nelkin, Science, Technology, and the Limits of Judicial Competence, 68 A.B.A. J. 1094, 1098-1100 (1982); Yellin, High Technology and the Courts: Nuclear Power and the Need for Institutional Reform, 94 HARV. L. REV. 489, 559-60 (1981).

My own preference is not to substitute other institutions for courts but to develop "hybrids" that capitalize on the advantages of courts and alternative procedures. See infra notes 83-93 and accompanying text.

Elsewhere I have expressed the opinion that the decisions of juries in toxic tort cases are seldom based solely on medical or scientific "facts" relating to whether chemical exposure can be proved to have caused the plaintiff's injuries; the perceived blameworthiness of the defendant's conduct is likely to play a larger role in verdicts. See Elliott, Why Courts? Comment on Robinson, 14 J. LEGAL STUD. 799, 801-02 (1985). Nonetheless medical and scientific testimony does play an important role in determining which cases get to juries, and technical issues of causation are not entirely irrelevant to the size of jury verdicts.
central idea, summarized in the epigraph, is that we should think of rules of procedure not only as grants of discretionary powers to judges but also as establishing the framework within which lawyers make strategic decisions. If we wish to change the behavior of litigants with regard to subjects such as discovery, delay, or the use of experts, we must structure our procedural system so that the incentives it creates regulate conduct by litigants in most cases without the need for discretionary judicial intervention. We can effectively change behavior in litigation only by creating appropriate incentives ex ante, not by first stimulating problems through perverse incentives and then trying to correct them ex post through discretionary judicial policing or sanctions.

I. THE PROBLEM OF MARGINAL SCIENCE: CLINICAL ECOLOGY

Before examining the relative merits of various means of regulating scientific testimony in litigation, I illustrate the nature of the problem by considering the strategic role that "clinical ecology" plays in toxic tort litigation. The willingness of courts to accept expert testimony from a small group of professional witnesses who call themselves "clinical ecologists"—even though the medical establishment has explicitly repudiated their views as unscientific—has dramatically changed the strategic balance in toxic tort cases. Only a few years ago, most lawyers knowledgeable in the field of toxic torts thought that it would be next to impossible to win chemical exposure

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7 The principal drafter of the Federal Rules of Civil Procedure, for example, conceived of the rules as "enabling grants" that confer various powers on trial judges. See Clark, Special Problems in Drafting and Interpreting Procedural Codes and Rules, 3 Vand. L. Rev. 493, 496 (1950).

8 Cf. Elliott, Regulating the Deficit After Bowsher v. Synar, 4 Yale J. on Reg. 317, 346 (1987) ("The essential defining characteristic of regulation is that while preserving nominal freedom of individuals to make private decisions, regulation attempts to alter the course of decisions in the aggregate by altering the structure of incentives individuals face when making their decisions.").

9 For a general argument that judges should view legal rules from an ex ante rather than an ex post perspective, see Easterbrook, Foreword: The Court and the Economic System, 98 Harv. L. Rev. 4, 10-12 (1984). Analyzing legal rules in terms of the incentives they create is an approach that is more firmly established in other areas of the law than it is in procedure; nonetheless, some previous work recognizes the incentives created by particular procedural rules. See, e.g., Posner, An Economic Approach to Legal Procedure and Judicial Administration, 2 J. Legal Stud. 399, 400 (1973); Note, Discovery Abuse Under the Federal Rules: Causes and Cures, 92 Yale L.J. 352, 360-61 (1982) (authored by John K. Setear).

cases under traditional principles of tort law.11 Unless exposure to a toxic substance causes a disease with virtually no other known causes,12 conventional science generally cannot support the showing traditionally required by tort law—that it is more likely than not that a particular plaintiff's illness was caused by exposure to a particular substance.13

Testimony from clinical ecologists has effectively overruled this requirement, dramatically changing the balance of advantage between plaintiffs and defendants in toxic tort cases. For a price,14 some clinical ecologists will testify that exposure to even very small amounts of a wide range of chemicals suppresses the immune system, thereby weakening the body's ability to ward off disease. This weakening, in turn, allegedly makes the plaintiff vulnerable to virtually all diseases known to humankind, including "nervousness," "malaise," and other conditions that present only subjective symptoms.15 Conventional scientists generally reject the opinions of clinical...
ecologists, question their methods, and emphasize the natural variability and reserve capacity of the human immune system.\(^\text{\textsuperscript{16}}\)

Despite its status as a "junk" science, clinical ecology has become increasingly important in toxic tort litigation because it gives plaintiffs' lawyers important strategic and economic advantages. The economic value of a toxic tort case to a plaintiff's attorney is a function of the number of claimants in the case.\(^\text{\textsuperscript{17}}\) If a plaintiff's lawyer bases her case on conventional science, the number of claimants who can be joined in the suit is limited to the small subset of exposed persons who actually suffer from particular diseases that the chemical in question has been shown to be capable of causing in animal tests or epidemiological studies. If, however, courts are willing to admit "expert" testimony from ecologists, the plaintiff's lawyer can probably reach the jury on behalf of everyone who was (or conceivably might have been) exposed to the substance. A clinical ecologist will testify that whatever happens to ail the plaintiffs, from asthma to cancer, was probably caused by chemically-induced suppression of their immune systems.

A concrete example clarifies the practical importance of this difference. Suppose a landfill is leaking TCE (trichloroethylene), a common industrial chemical used for decreasing metal parts before electroplating them. Suppose further that 300 people live close enough to the landfill that they could have been exposed to trace amounts of the chemical through well water. Recent animal studies suggest that TCE may increase slightly the rate of certain types of cancer, but there are great difficulties in translating these high-dose experiments in animals to low-dose exposure in humans. It is likely that, among the 300 neighbors of the landfill, no more than one or two persons will have the kinds of cancer that TCE allegedly causes. There may be no cases at all.\(^\text{\textsuperscript{18}}\) Using arguments grounded in conventional science, a plaintiff's attorney can sue for personal injuries on behalf of the one or two people with cancer and, perhaps, for fear of cancer or enhanced risk of cancer on behalf of the others.\(^\text{\textsuperscript{19}}\) If the plaintiff's lawyer chooses to take the

\(^{\text{16}}\) Both the American Academy of Allergy and Immunology and the California Medical Association have issued official statements repudiating clinical ecology as unscientific. See Marshall, supra note 10, at 1491; see also Immune System Theories on Trial, 234 SCIENCE 1490, 1491 (1986).

\(^{\text{17}}\) The "going rate" for settlements is $10,000 to $100,000 per plaintiff.

\(^{\text{18}}\) It is important to understand that studies proving that a chemical causes a particular disease, such as cancer, do not establish that everyone who was exposed to the chemical will contract the disease; rather, such works establish that their risk of getting the disease is somewhat increased. See generally S. Epstein, THE POLITICS OF CANCER 3 (1978); Black & Lilienfeld, supra note 12, at 762 n.126.

\(^{\text{19}}\) Some courts have permitted awards for the future risk of developing cancer if the plaintiff could demonstrate that his risk was greater than 50%. See, e.g., Jackson v. Johns-Manville Sales Corp., 781 F.2d 394, 413-15 (5th Cir. 1986) (en banc), cert.
clinical ecology route, however, the claim will be much more valuable. Under a clinical ecology theory, the complaint can allege damages not only for the cancers but also for whatever else happens to be wrong with all 300 people living near the landfill—from kidney disease and chronic lower back pain to frequent colds, depression, and sexual dysfunction. The theory will be that low level exposure to chemicals suppressed the victims' immune systems and caused every one of these injuries. From a purely economic perspective, the clinical ecology witness offers his lawyer employer a larger return on investment than his conventional science counterparts.

Testimony by clinical ecologists also provides distinct advantages at trial. The most effective among this group of witnesses use the term "chemical AIDS" to describe their theory, whereby subtly linking in the jury’s mind two modern nightmares: contamination by toxic chemicals and acquired-immune deficiency syndrome ("AIDS"). These tactics have produced several multi-million dollar jury verdicts and numerous large settlements.

Resolving whether "clinical ecologists" are really misunderstood geniuses who, like Galileo and Semmelweis, are persecuted by the scientific establishment because they are generations ahead of their time, or merely charlatans who will testify to anything for a buck, is beyond the scope of this paper. The point is not to condemn clinical ecologists or other experts-for-hire; some are probably sincere in their conclusions. The point is rather that our current system of litigation creates strong incentives for lawyers to select experts with views outside the mainstream of scientific opinion. I have analyzed the nature of these incentives elsewhere in detail; but for present purposes suffice it to say that the current system "extends equal dignity to the opinions of charlatans and Nobel Prize winners, with only a lay jury to distinguish between the two."22 As a result, lawyers are driven to select

\[\text{denied, 478 U.S. 1022 (1986). In another case, the same court upheld an award for a plaintiff's fear of getting cancer even though there was no proof of a "medical probability" that he would actually develop the disease. Dartez v. Fibreboard Corp., 765 F.2d 456, 468 (5th Cir. 1985).}\]


\[\text{22 Elliott, supra note 3, at 117. Our reliance on lay juries to assess the credibility of technical experts is not a problem, of course, if one is willing to assume that something magical happens in the jury room so that ordinary people can suddenly unravel complex technical and scientific issues that would baffle the rest of us.}\]
experts from the extremes on the assumption that the jury will guess that the truth lies somewhere between the two.

Abuse of expert testimony for hire is not the exclusive province of plaintiffs. Judge Weinstein recently summed up the more general problem of expert testimony in toxic tort cases:

An expert can be found to testify to the truth of almost any factual theory, no matter how frivolous, thus validating the case sufficiently to avoid summary judgment and forcing the matter to trial. At the trial itself, an expert's testimony can be used to obfuscate what would otherwise be a simple case... Juries and judges can be, and sometimes are, misled by such experts-for-hire.

II. Approach One: Judicial Exclusion

The primary means of addressing a broad range of problems in our contemporary procedural system is ad hoc discretionary control by judges. For example, our system of civil procedure delegates enormous discovery power to lawyers and then seeks to control potential abuses by giving judges discretionary powers to issue protective orders and impose sanctions.

The discretionary judicial control philosophy is expressed in the area of scientific and technical testimony by what we may call the judicial exclusion strategy. Traditionally, the law's main line of defense against misleading scientific and technical testimony was the judge's power to screen what the jury may consider. There are three different versions of the judicial exclusion or "screening" approach. The first version is the "Frye"
rule. Formerly, this approach dominated legal thinking, but it is currently in decline. Two new variants have arisen to take its place. One new variant of the judicial exclusion strategy was pioneered by Judge Weinstein in the Agent Orange litigation. This approach uses summary judgment to exclude expert testimony that fails to meet minimal standards of trustworthiness and credibility. The third judicial exclusion strategy, recently suggested by several commentators, would amend the Federal Rules of Evidence to bring back a revised version of the Frye test for admissibility. While there are subtle differences between these three techniques, they share many of the same drawbacks—drawbacks inherent in the judicial exclusion or “screening” strategy as a technique for regulating litigants’ practices.

A. The Frye Rule

In 1923, the United States Court of Appeals for the District of Columbia Circuit decided in Frye v. United States that testimony regarding novel scientific and technical issues could only be introduced if the principles underlying the testimony “have gained general acceptance in the particular field in which it belongs.” Many state and federal courts were applying this so-called Frye rule when the Federal Rules of Evidence were adopted in 1975. Recently, however, courts have tended to reject or modify Frye on the grounds that it is “at odds with the spirit, if not the precise language, of the Federal Rules of Evidence,” which generally encourage admitting support to go to the jury—not screen them out—but with a clear indication that mainstream science disagrees. In my view, judges should only exclude expert testimony when it is so patently unsubstantiated that it does not qualify as science at all. My approach is not to withhold minority opinion from the jury (as advocated by the real “screeners”) but, instead, to admit minority opinion and, at the same time, to give the jury an accurate picture of how that opinion fits into the overall distribution of scientific opinion on the subject.

28 See Frye v. United States, 293 F. 1013 (D.C. Cir. 1923), discussed infra at notes 31-37 and accompanying text.
30 See, e.g., Rules for Admissibility of Scientific Evidence, 115 F.R.D. 79 (1987) (presenting various proposals to amend the Federal Rules of Evidence); see also infra notes 52-57 and accompanying text.
31 Frye, 293 F. at 1014.
33 United States v. Downing, 753 F.2d 1224, 1237 (3rd Cir. 1985); see also United States v. Williams, 583 F.2d 1194, 1198 (2d Cir. 1978) (finding the Frye test inadequate to determine the admissibility of offered scientific evidence), cert. denied, 439 U.S. 1117 (1979); 3 J. WEINSTEIN & M. BERGER, WEINSTEIN'S EVIDENCE ¶ 702[02], at 702-36 (1988) (stating that “[e]limination of the Frye test is consistent with the underlying policies of Article VII”).
expert testimony whenever it would be helpful to the jury.\textsuperscript{34}

The \textit{Frye} rule has been criticized on both practical and theoretical grounds. \textit{Frye} is admittedly a "conservative approach"\textsuperscript{35} that precludes courts from admitting potentially relevant testimony until the underlying scientific theory or technique achieves acceptance within the scientific community.\textsuperscript{36} A good case can be made, however, that the rule has served the judicial system well.\textsuperscript{37} There is very little that the courts have kept out under \textit{Frye} that, in retrospect, should have been admitted.\textsuperscript{38}

\textit{Frye} puts judges, who are not known for their scientific literacy, in the unfortunate position of appearing to rule on the validity of scientific theories. At least in principle, the courts are not really attempting to determine for themselves whether particular scientific theories are correct; rather, they are asking whether theories have achieved a minimum level of acceptance by the scientific community. Application of the \textit{Frye} approach presents a number of practical difficulties, however. First, which "principle" must be accepted before admitting testimony — the specific tenet or the broader scientific principle upon which it is based? That the laws of Newtonian physics are generally accepted does not mean that testimony by an "accidentologist" who applies these laws to a particular accident should necessarily be admitted. Second, how should the court define the relevant "community of scientists" which it looks to in gauging acceptability?

Clinical ecology provides an illustration of these two problems. Arguably, evidence based on clinical ecology could pass the \textit{Frye} test with flying colors even though it has been officially repudiated by at least two professional societies.\textsuperscript{39} Two "principles" that might be said to underlie clinical ecology are: (1) that certain chemicals suppress the immune system and (2) that a suppressed immune system is less effective in fighting off disease. At this level of generality, virtually no scientist would disagree; it is the application

\textsuperscript{34} 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.").

\textsuperscript{35} Downing, 753 F.2d at 1237.

\textsuperscript{36} For examples of the types of testimony that have been excluded under \textit{Frye}, see Imwinkelried, The Standard for Admitting Scientific Evidence: A Critique from the Perspective of Juror Psychology, 28 Vill. L. Rev. 554, 557 (1982-83).


\textsuperscript{39} See supra note 16.
of these valid general principles that conventional scientists dispute. But Frye has very little to say about how valid general principles are applied to particular circumstances.

Another difficulty encountered in trying to apply Frye is that there is no single "scientific community"; there are many different sub-communities. How should a court determine which "particular field" of science must have generally accepted the theory for it to be admissible under Frye? Suppose that clinical ecologists start their own professional society and journal; does their agreement with one another amount to acceptance "in the particular field"? Courts have struggled to develop answers to these questions, but however they are answered, Frye remains a blunt, imperfect instrument for assessing the reliability of scientific testimony. The root of the problem is that one cannot reduce what constitutes "good science" to a simple formula that judges, who generally know nothing about science, can apply.

B. Summary Judgment: Agent Orange

Frye is but one variant of the judicial exclusion or "screening" strategy for dealing with scientific and technical testimony. An alternative approach that has gained prominence recently is for the court to grant a motion in limine excluding expert testimony as immaterial or lacking adequate foundation as a matter of law and then to grant summary judgment.\footnote{See J. Weinstein, supra note 24, at 30-31 (footnotes omitted): Under the Federal Rules of Evidence, a judge can exclude expert testimony and thus grant summary judgment in one of two ways. First there is Rule 703, which allows an expert to base his opinion on the type of evidence reasonably relied upon by experts in his field. In some cases examination of the basis of an expert's opinion reveals that it is supported by no reliable evidence at all. In such cases exclusion of the expert's opinion under Rule 703 and a grant of summary judgment to the opposing party might be appropriate. In other cases, an expert's opinion is supported by some credible evidence, but further investigation reveals that there is other, much more persuasive evidence available which undermines the expert's opinion and which the expert is ignoring. In these cases, the court might exclude the expert's testimony either under Rule 702, as not being helpful to the trier of fact, or under Rule 403, as being likely to mislead the jury. See also Carlson, Policing the Bases of Modern Expert Testimony, 39 Vand. L. Rev. 577 (1986). For a recent case that applies these approaches, see In re Paoli Railroad Yard PCB Litigation, 706 F. Supp. 358 (E.D. Pa. 1988) (excluding testimony of plaintiffs' experts and granting summary judgment in 24 PCB personal injury cases), appeals filed Nos. 88-1973 to 88-1992, 89-1070 to 89-1079, and 89-1097.} Rather than focusing on whether the testifying expert's principles are accepted by the scientific community (as Frye does), this approach measures the criteria used by an expert in forming her conclusions against the standards of substantive law. Judge Weinstein used this general approach in granting summary judgment against the plaintiffs who opted-out of the $180 million class settlement in Agent Orange to pursue their individual claims.\footnote{In re Agent Orange Prods. Liab. Litig., 611 F. Supp. at 1242-43.}
In *Agent Orange*, the defendants' motion for summary judgment on the issue of causation relied primarily on a series of government epidemiological studies that found no significant correlation between exposure to Agent Orange and injuries similar to those of the plaintiffs. The plaintiffs responded with long, carefully-drafted affidavits from several experts. At least some of these affidavits used a version of the traditional "magic formula" for expert medical testimony: in the expert's opinion, with reasonable medical certainty, the plaintiffs' injuries were caused by exposure to Agent Orange.\(^4\)

The mere existence of such an affidavit stating an expert's opinion on the ultimate issue of causation had been regarded by most courts as sufficient to defeat a motion for summary judgment and to send a case to trial. Judge Weinstein went behind the concluding paragraph of the expert affidavits, however, to analyze the basis for the expert's conclusory opinions and found them insufficient as a matter of law. He noted, *inter alia*, that while experts stated general conclusions on causation, these conclusions were guarded; the experts merely opined that many of the plaintiffs' complaints were "consistent with" afflictions that had been attributed to Agent Orange in the literature; they stopped short of opining that Agent Orange had actually caused the plaintiffs' problems. Judge Weinstein also emphasized that the plaintiffs' experts failed to consider and exclude other known causes for the health problems they attributed to Agent Orange (a process which doctors call "differential diagnosis").\(^4\) Based on these and related deficiencies, Judge Weinstein concluded that the affidavit's "conclusory allegations [on the ultimate issue of causation] lack any foundation in fact . . . [and are] so guarded as to be worthless."\(^4\) Judge Weinstein therefore excluded the expert affidavits as inadmissible and, finding no other evidence in the record sufficient to support a conclusion that Agent Orange had caused the plaintiffs' health problems, granted the defendants' motion for summary judgment. The Second Circuit recently affirmed Judge Weinstein's disposition of the *Agent Orange* case, but on an alternative ground, without endorsing his reasoning in granting the defendants' motion for summary judgment.\(^4\)

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\(^{42}\) See id. at 1237 (affidavit of Dr. Singer, concluding that "it is my opinion to a reasonable degree of medical probability (that is, more likely than not) that the medical difficulties described by the affiants were proximately caused by exposure to Agent Orange").

\(^{43}\) In re Paoli Railroad Yard PCB Litigation, 706 F. Supp. at 369-70 (excluding testimony by a toxicologist *inter alia* because she was not trained in differential diagnosis).

\(^{44}\) Id. at 1238 (regarding Dr. Singer's affidavit); see also id. at 1239 (stating that "[a]t most [Dr. Epstein's affidavits] collectively have the probative force of a scintilla of evidence").

Judge Weinstein's approach in *Agent Orange* may have been sound but, in
general, summary judgment is of only limited value as a technique for
controlling expert testimony. Essentially, Judge Weinstein's methodology
treats the experts' affidavits as pleadings and finds them defective, as a
matter of form, for failing to allege the elements required for a finding of
causation in tort.

The proper objection to Judge Weinstein's approach is not that he went
too far by subjecting the experts' affidavits to a hostile, legalistic reading, but
that he could not go far enough. As a practical matter, experts' affidavits in a
case such as *Agent Orange* are drafted by counsel. If the affidavit does not
contain a definitive opinion that the chemical caused a particular disease but
merely states that symptoms are "consistent with" what has been reported
in the literature, the difference is undoubtedly significant. The expert would
have gone the extra mile if she could have.

Judge Weinstein's approach is flawed not because it scrutinizes the ex-
erts' conclusions too closely but because it does not go far enough. Ulti-
mately, summary judgment cannot probe the expert's credibility or the
scientific validity of her reasoning. The judge is restricted to detecting
whether the expert's affidavit "covers all the bases" as a matter of form. Summary judgment really tests the skill of the lawyer who drafted the
affidavit, not the trustworthiness of the expert's testimony.

The first time that a Judge Weinstein delves more deeply in scrutinizing
expert affidavits than most judges have traditionally gone, he may catch
lawyers by surprise. But in future cases, on similar facts, it will be relatively
easy to correct the flaws in affidavit-drafting that Judge Weinstein found fatal
in *Agent Orange*. If the *Agent Orange* experts had examined the medical
records of individual plaintiffs (and perhaps conducted some group inter-
views to exclude alternative causes), they could have expressed an opinion
based on "clinical judgment" that chemical exposure was the most likely
cause of the plaintiffs' maladies. This is precisely the approach that clinical
ecologists are adopting in the wake of *Agent Orange*.

In an important recent decision, *Richardson v. Richardson-Merrell, Inc.*,7
the D.C. Circuit announced a rule that may tend to preclude experts
from basing their testimony on unsubstantiated opinions that run contrary to
"a wealth of published epidemiological data."/48 This decision is clearly
correct in principle. An expert scientific witness is not admitted to testify to

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46 Levin, *Environmental Illness: A Scientific Reality, A Legal Boondoggle, A
Potential American Tragedy Proceedings*, in ICET SYMPOSIUM III IMMUNO-
TOXICOLOGY: FROM LAB TO LAW 88 (1987).

(upholding judgment n.o.v. for defendant in a Bendectin case on the ground that the
district court properly excluded conclusions by the plaintiff's expert as contrary to a
substantial body of published epidemiological literature).

48 Id. at 832.
his or her personal beliefs and opinions; rather, the philosophy of expert testimony is that science itself is testifying through a particular expositor of a discipline. The only proper focus of an expert witness, therefore, is on the collective views of a scientific discipline as perceived by a person trained in the methods and conclusions of that discipline. At some point, a scientist who testifies to personal opinions that have no support in the methods of the discipline is going beyond his proper role as an expert and should not be permitted to testify. On the other hand, practical application of the Richardson v. Richardson-Merrell, Inc. approach brings judges perilously close to deciding which scientific views are valid and which are not. This is a task for which judges and courts are clearly unsuited.

The deeper underlying issue in decisions such as Agent Orange and Richardson v. Richardson-Merrell, Inc. is whether summary judgment can play an important role in toxic tort cases, or whether the mere presence of a trained expert willing to pronounce formulaic conclusions will suffice to force cases to the jury. It would be desirable for summary judgment to play an important role in toxic tort cases, particularly in light of the recent Celotex decision\textsuperscript{49} in which the Supreme Court encouraged wider use of summary judgment to dispose of meritless cases.\textsuperscript{50} Summary judgment can be used to dispose of cases where there is evidence that plaintiffs were not exposed to significant amounts of a chemical.\textsuperscript{51} Summary judgment is not a very useful tool for probing conflicting scientific judgments, however.

C. Neo-Frye Rules

While the trend of decisions is against Frye, commentators have begun to warn of the dangers of admitting expert testimony on scientific matters without any check on trustworthiness.\textsuperscript{52} This has led to a series of proposals to "reinvent" Frye. In 1986, an ABA committee of Science and Technology produced four versions of an amendment to the Federal Rules of Evidence to revise and reinvigorate Frye.\textsuperscript{53} Professor Frederic Lederer suggested amend-

\textsuperscript{50} Id. at 323-24.
\textsuperscript{51} For example, where tests for body burdens show that a group of plaintiffs have no more of a chemical in their bodies than the normal background level for the population as a whole, courts should grant summary judgment, absent some legitimate dispute about the validity of the tests or rates of bio-elimination. Whatever else the causation requirement in tort may mean, plaintiffs should at least be required to prove that they have been exposed to the offending substance in a way that distinguishes them from the general population.
ing Rule 702 to require a finding that scientific evidence is "reliable." Professor Margaret Berger would allow testimony "about a scientific principle or other technique that has not previously been accorded judicial recognition" only "if the court determines that its probative value outweighs the dangers specified in Rule 403." Professor James Starrs would require a finding that the "scientific theory or technique" upon which expert testimony is based is "scientifically valid." Professor Paul Giannelli would leave the substance of the rules unchanged but would require parties who intend to rely on scientific evidence to give advance written notice of their intent to allow opposing parties to file a motion in limine.

Whatever the respective technical merits or demerits of the various proposals, they share the common premise that the main line of defense should be a preliminary inquiry by the court to ensure that scientific evidence meets minimal standards of trustworthiness as a precondition for admitting it. Hence, we may group these four proposals together as examples of "neo-Frye" approaches to the problem of scientific testimony. Another version of the neo-Frye approach was employed in United States v. Downing, in which the Third Circuit rejected the Frye test and substituted a more flexible, balancing test for admissibility.

Such proposals all follow the basic approach of Frye but seek to improve the substantive test that courts apply in screening scientific testimony for admissibility. Neo-Frye rules may ameliorate some of the difficulties and ambiguities that courts have encountered in administering Frye, but they cannot surmount the more basic problems inherent in employing the judicial exclusion or "screening" strategy as a means of controlling expert testimony.

Ultimately, the judicial exclusion strategy is limited by two factors. First, it must be applied by judges, who know very little about the underlying merits of the scientific controversies at issue. Second, for judges to have any control over the admission of the testimony, there must be a flaw in the expert's testimony so gross that total exclusion of the testimony is warranted. These two requirements limit the usefulness of the judicial exclusion strategy to particularly clear abuses (or to situations that the courts can be

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56 See Starrs, supra note 37, at 97-99.
58 753 F.2d 1224, 1237 (3d Cir. 1985) (rejecting the Frye test as a "conservative approach to the admissibility of scientific evidence that is at odds with the spirit, if not the precise language, of the Federal Rules of Evidence").
made to perceive as particularly clear abuses). There are undoubtedly many hypothetical cases—and surely some real world cases—in which judicial exclusion is appropriate. But judicial exclusion merely scratches the surface. Many more abuses of scientific expertise in litigation will pass muster under any imaginable judicial exclusion approach than will be weeded out of the process.

III. Approach Two: Information Enhancement

The inherent limitations of the judicial exclusion approach have stimulated a search for alternatives that might reach more subtle abuses of scientific expertise. The traditional alternative to the judicial exclusion strategy for controlling testimony by technical experts has been the information enhancement approach. The basic idea is that rather than—or, in addition to—limiting the admissibility of information offered by the parties, the court should obtain additional information from "neutral" sources to assist the jury in evaluating the experts' testimony. I consider here three versions of the information enhancement strategy: court-appointed experts, science panels, and administrative-court hybrids.

A. Court-Appointed Experts

The idea that courts should appoint neutral experts to aid the jury in evaluating testimony of partisan experts is not new in American civil procedure. In 1901, for example, Judge Learned Hand advocated advisory panels of experts as the solution to the battle of experts for hire. See Hand, Historical and Practical Considerations Regarding Expert Testimony, 15 Harv. L. Rev. 40, 56 (1901). Since that time, numerous judges and commentators have endorsed the concept of court-appointed experts. See, e.g., Sink, The Unused Power of a Federal Judge to Call His Own Experts, 29 S. Cal. L. Rev. 195 (1956).

Despite the virtual consensus that court-appointed experts should be used more frequently, they rarely are. Why judges so rarely appoint "impartial" experts remains a mystery. It is not because they lack the power. "The inherent power of a trial judge to appoint an expert of his own choosing is virtually unquestioned" and is also codified in Rule 706 of the Federal Rules of Evidence, the Uniform Rules of Evidence (Model Expert Testimony Act), and the rules of most states.

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59 Hand, Historical and Practical Considerations Regarding Expert Testimony, 15 Harv. L. Rev. 40, 56 (1901).
60 See, e.g., Sink, The Unused Power of a Federal Judge to Call His Own Experts, 29 S. Cal. L. Rev. 195 (1956).
61 See J. Weinstein & M. Berger, supra note 33, at ¶ 706[01], 706-8 to -12 (Supp. 1988); Botter, The Court Appointed Impartial Expert, in Using Experts in Civil Cases 53, 58 & n.17 (M. Kraft 2d ed. 1982).
62 Advisory Committee Note, Fed. R. Evid. 706.
63 Fed. R. Evid. 706.
One commentator has pointed out that a judge can be reversed if she does appoint a neutral expert but not if she refuses to appoint one. That disparity, while real, probably does not explain judges' reluctance to appoint neutral experts. In the first place, the risks of reversal are not great either way. In any event, few trial judges are so concerned about the possibility of appellate reversal that they would hesitate to act if they felt that a court-appointed expert would make a substantial contribution.

Another suggested explanation for judicial reluctance to appoint neutral experts is the fear that the court-appointed expert's opinion will unduly influence the jury's determination. There is some anecdotal evidence supporting this concern but it is easy to exaggerate the extent to which juries are swayed by expert testimony, even by court-appointed experts. One study showed that juries returned verdicts consistent with the court-appointed expert's opinion in only twelve out of nineteen cases, or approximately sixty-three percent of the time. These limited data suggest that juries do not feel compelled to adopt the court-appointed expert's position.

Professor John Langbein suggests another explanation for judicial reluctance to appoint neutral expert witnesses. He argues that effective use of court-appointed experts "presupposes early and extensive judicial involvement in shaping the whole of the proofs" and that American judges rarely have "detailed acquaintance with the facts of the case until the parties present their evidence at trial." Professor Langbein speculates that with

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65 Botter, supra note 61, at 76.
66 See Imwinkelried, supra note 36, at 566 (arguing that "there is little or no objective support for the assertion" that jurors attach too much weight to scientific evidence and that "almost all the available data point to the contrary conclusion").
68 Other things being equal, one would expect 50% of the cases that go to verdict to be decided for plaintiffs, and 50% for defendants. See Priest & Klein, The Selection of Disputes for Litigation, 13 J. LEGAL STUD. 1, 5 (1984). Extending this logic, if testimony by court-appointed experts had no effect on jury verdicts, one would expect the jury's verdict to agree with the court-appointed expert's testimony 50% of the time. The finding of 63% agreement would seem on the surface to suggest that the court-appointed expert's testimony has a slight effect on the outcome. To draw such a conclusion would be incorrect, however, because we do not know how the cases would have been decided without expert testimony. It is equally plausible that a jury will agree with the court-appointed expert more than 50% of the time because the expert is choosing to support the party who has the stronger case and is more likely to win a jury verdict in any event.
70 Id. at 841.
the rise of "managerial judging," the use of court-appointed experts may also increase.\textsuperscript{71}

In my opinion, the problem is deeper than Langbein suggests. "Managerial judging" and earlier judicial involvement are unlikely by themselves to lead to increased utilization of court-appointed experts. Imagine a judge determined to acquire the information necessary to decide whether to appoint a neutral expert; what should she search for? The problem is not simply that judges lack information; they lack criteria for determining when a case is appropriate for a court-appointed expert.

The confusion about when, if ever, courts should appoint an expert arises out of a fundamental American skepticism about the value of neutral, objective expertise.\textsuperscript{72} Most Americans do not believe that "neutral objective experts" exist on any subject, and particularly not on scientific issues.\textsuperscript{73} This skepticism about expertise undermines the traditional rationale for court-appointed experts.\textsuperscript{74} If every expert comes to court with "an axe to grind," then why add the court's expert, with his or her own partisan beliefs and commitments, to those of the parties.

I do not agree with the prevailing skepticism in our culture about the value of neutral expertise. While no one is without values and preconceptions, it seems to me that experts picked by the court for their lack of bias must be more neutral and objective than those hired by attorneys for their biases. Nonetheless, I recognize that many judges are deeply concerned that all experts come to court with "an axe to grind."

\textsuperscript{71} Id.

\textsuperscript{72} Contemporary American skepticism toward expertise becomes more evident if we contrast our attitudes with those in Germany. The usual standard of proof in a German civil case is "with a probability that approaches certainty." This reflects an underlying assumption that objective truth exists and is reasonably ascertainable through the judicial process. The same assumption apparently carries over into the area of testimony by experts, Sachverstaendige, literally "those who understand a thing." In cases where expert testimony is relevant, the court selects an expert from a list drawn up in advance by governmental or industrial bodies. The litigants are free to present testimony from an expert of their own who disagrees with the official expert, but they rarely do. When they do, the court will often appoint a third expert to resolve any disagreement. Langbein, supra note 69, at 839-40. Again, the underlying assumption seems to be that knowledgeable people ought to share a common understanding of reality. Contrast this with the typical American attitudes that you can hire an expert to testify to anything you want on any subject.


\textsuperscript{74} For discussions of the problem of court appointed experts' partisan beliefs, see Botter, supra note 61, at 60; Berry, Impartial Medical Testimony, 32 F.R.D. 481, 539-46 (1962).
In the final section of this paper, I propose a rule that views the role of the court-appointed expert in a new way. I believe that my proposal makes a virtue of the fact that every expert inevitably brings his or her own biases and points of view into the courtroom. It also attempts to articulate standards defining when judges should appoint expert witnesses.\(^7\)

B. Science Panels

The perception that on many issues scientific opinion is not uniform has led to the view that courts should refrain from endorsing any one view by appointing a single expert witness and to the suggestion that courts should, instead, appoint a panel of scientists. The panel is intended to give the jury a picture of the range and distribution of scientific opinion.\(^7\)

A similar device, "scientific advisory committees," are commonly used in the administrative process. These panels have been reasonably successful. For example, one study found that, in states where medical advisory panels are active in workers' compensation claims, all concerned reported "a high degree of satisfaction."\(^7\) Why haven't science panels, used so successfully in the administrative process, been more widely used in court?\(^7\) At least three problems with using scientific expert panels in traditional litigation come to mind.

First, adapting the scientific consensus panel to courtroom use poses some procedural difficulties. One can imagine that a judge might appoint a group

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\(^7\) For the moment, however, it should be noted that all experts seem to have a point of view, which has traditionally been a powerful justification for not appointing a single expert to testify with the implicit endorsement of the court.

\(^7\) Cf. Kaysen, An Economist as the Judge's Law Clerk in Sherman Act Cases, 12 A.B.A. SEC. ANTITRUST L. 43, 46-47 (1958) ("There is also the possibility that the view of any single man [sic] may suffer from unconscious biases and prejudices and that a panel of two or three economists might do better . . . .").

\(^7\) P. BARTH, RESOLVING OCCUPATIONAL DISEASE CLAIMS: THE USE OF MEDICAL PANELS 7 (Workers Compensation Research Institute 1985).

\(^8\) A few courts have experimented with science panels. See McGovern, Management of Multiparty Toxic Tort Litigation: Case Law and Trends Affecting Case Management, 19 FORUM 1, 14 (1983) (citing systems using experts and expert panels with moderate success). Regarding his use of science panels, Judge Weinstein notes that:

In bench trials, I from time to time use a technique of swearing all the experts, seating them at the table together with counsel and the judge and engaging them in recorded colloquy under court direction. These discussions have sometimes produced a more reasonable attitude by the experts and considerable narrowing of disagreement among them.

J. Weinstein, supra note 24, at 22. Broader use of expert panels is advocated in Wessel, Alternative Dispute Resolution for the Socioscientific Dispute, 1 J.L. & TECH. 1, 6-7 (1986).
as an expert panel, or a special master, or even as a non-binding jury. But it is not clear how the group would function and present its conclusions in court. A panel is a collegial body whose members discuss ideas and reach a consensus. In order to protect litigants' procedural rights, would these deliberations need to take place in the courtroom with attorneys for the parties present?

A second obvious problem is presented by the need to determine who should be appointed to the panel. If the science panel is intended to represent a microcosm of scientific opinion, its members must be selected by persons with reasonable knowledge of the range of scientific opinion in a particular field. This is less of a problem for an administrative agency such as the EPA, which deals with issues of toxicology, epidemiology, and oncology on an on-going basis, than it is for a judge who may confront these subjects only once in a career.

Even assuming these first two problems could be resolved (and I believe that they could), a third problem with court-appointed science panels may prove more intractable: cost. It is expensive to convene eight or ten highly-qualified scientists. While a court-appointed science panel may have substantial value in a "big case," where the amounts at issue dwarf the expense involved, it would be completely unfeasible to employ ad hoc science panels in the thousands of toxic tort and medical malpractice cases that are now pending. The economic costs associated with science panels reflect the underlying scarcity of scientific talent. Organizations such as the National Academy of Sciences and the EPA may be able to assemble an advisory panel of ten or twelve of the country's top scientists to reach a consensus judgment on generic issues; it would be almost impossible, however, to assemble a comparable panel every time a technical case goes to a jury. Science panels can be a practical solution to the problem of the partisan expert only if Congress passes new statutory authority to consolidate cases (including state court cases) into a single forum.

C. Administrative-Court Hybrids

The practical difficulties of managing science panels in case-by-case litigation have led to the idea that perhaps administrative bodies could develop

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79 Various procedural devices for utilizing science panels in toxic tort litigation are explored in Elliott, supra note 3, at 115-17.
81 Cf. Federal Advisory Committee Act, 5 U.S.C. app. § 10 (1982) (establishing procedures for committees that advise officers and agencies in the executive branch, among them a requirement that the public must be given advance notice of meetings and the meetings must be open to them).
82 The ABA Mass Torts Commission is reportedly considering a recommendation for greater consolidation of cases and expanded use of science panels.
generic risk assessments for use in toxic tort cases.\textsuperscript{83} I call this technique the \textit{hybrid compensation system}. Because courts and administrative agencies each have distinct advantages and disadvantages, we should try to combine the best of both systems.\textsuperscript{84} One possibility is to use an administrative science panel to develop generic risk assessments that can be introduced as evidence in court, rather than constituting a separate panel to opine directly on the issues in each individual case. Like the \textit{ad hoc} science panels appointed by judges for a particular case, administrative science panels can present the judgment of scientists who represent a broader range of opinion than does any one expert. But because the administrative panel addresses issues generically rather than on a case-by-case basis, it may prove more feasible than assembling a new science panel for each case.

A number of these hybrid arrangements already exist.\textsuperscript{85} Epidemiological studies by the Federal Center for Disease Control (CDC) have been accepted by the courts as evidence and have become the mainstays of plaintiffs' cases for toxic syndrome\textsuperscript{86} and swine flu.\textsuperscript{87} A recent statute requires the United States Department of Health and Human Services (HHS) to compile estimates of the probability that persons exposed to radiation from atmospheric testing of nuclear weapons will develop cancer.\textsuperscript{88} The 1986 amendments to the "Superfund" statute require the Agency for Toxic Substances and Disease Registry (the "ATSDR") to compile "toxicological profiles" on the 100 most significant hazardous substances.\textsuperscript{89} In essence, the ATSDR must distill the scientific literature, define the health problems known to be caused by hazardous chemicals, and determine the exposure levels that may cause these problems. This amounts to generic expert testimony by a neutral administrative science panel that may be admitted to guide the jury's consideration of partisan expert testimony in individual cases. The ATSDR is also

\footnotesize{\textsuperscript{83} See, e.g., Elliott, \textit{ supra} note 4, at 1358-60; see also \textit{ Superfund Section 301(e) Study Group}, \textit{ supra} note 11.


\textsuperscript{89} \textit{Superfund Amendments and Reauthorization Act}, Pub. L. 99-499, Sec. 110(3)(A), 100 Stat. 1613, 1637 (1986). These "toxicological profiles" are to include an "interpretation of available toxicological information and epidemiological evaluations . . . in order to ascertain the levels of significant human exposure . . . and the associated . . . health effects." \textit{Id.}
granted discretionary authority to "perform health assessments" for hazardous waste releases and "facilities where individuals have been exposed." This suggests that a trial judge could call in the ATSDR to study plaintiffs who claim injury from exposure to hazardous wastes.

It remains to be seen how useful generic risk assessment by administrative agencies will prove to be. There are obvious difficulties with drawing conclusions from generic information in specific cases. In addition, administrative agencies do not have a good record—at least in the regulatory context—of making decisions based on "good science" rather than political considerations. Moreover, courts have been hostile and unreceptive to administrative science panels in the past, even though such panels could aid courts in their reviewing function by providing a neutral evaluation of scientific and technical issues.

While the development of administrative science panels to work in conjunction with courts and juries holds some promise, they are obviously no panacea. It remains unclear whether the full potential of hybrid compensation systems will be realized.

IV. APPROACH THREE: INCENTIVES

As an alternative, I propose the following model rule to supplement the existing judicial exclusion and information enhancement strategies for controlling expert testimony:

(1) In any case in which it is anticipated that expert testimony of a scientific nature may be introduced, the expert shall write a report stating his conclusions and summarizing the data and analysis considered in reaching those conclusions. This report and a description of the expert's qualifications shall be produced to all other parties at the time established by the court.

(2) Upon the motion of any party at or prior to the pretrial, or upon its own motion at any time, the court shall determine whether expert testimony offered or anticipated to be offered relies on principles, techniques, or conclusions the validity of which would be subject to substantial doubt in peer review by the scientific community.

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91 For a case in which an ATDSR study played a crucial role in supporting a successful motion for summary judgment by the defendants, see In re Paoli Railroad Yard PCB Litigation, 706 F. Supp. 358 (E.D. Pa. 1988).
(3) If the court finds substantial doubt as to the testimony of an expert, it shall appoint a peer review expert learned in the relevant fields to testify at trial concerning whether the principles, techniques, and conclusions by the experts for the parties would be generally accepted as valid by persons learned in the field. The fees for the court-appointed peer review expert shall be taxed as costs.

The proposed peer review rule has three stages. In the first stage, the rule requires that any party who contemplates introducing expert testimony shall obtain a written report from the expert stating the substance and basis of the conclusions. In the report, the expert must summarize the materials considered and the analysis that supports her conclusions. The report should include (or refer to, if available elsewhere) all materials necessary to explain the expert’s analysis, including a description of any tests or other procedures performed, the test results, and citations to the literature relied on by the expert. The purpose of the report is to give the opposing party and the court a fair summary of the expert’s testimony and the basis for her conclusions. The rule requires that a written summary of the expert’s qualifications, such as a curriculum vitae, shall accompany the report. If a party fails to produce such a report, or if the report is incomplete or misleading, the court shall impose appropriate sanctions, such as excluding the expert’s testimony in whole or in part.

Exchange of expert reports triggers the second stage of the rule. Any party, or the court on its own motion, may initiate a peer review proceeding to determine whether there would be “substantial doubt” among qualified scientists concerning the basis for an expert’s testimony. The “substantial doubt” standard is not satisfied simply because experts for opposing parties reach different conclusions. Experts frequently disagree because they have been asked different questions, made different assumptions, or considered different materials in reaching their conclusions. Additionally, on some issues, the scientific community may regard more than one school of thought as plausible. If several theories currently command widespread support, and it is uncertain which (if any) will ultimately prove correct, the “substantial doubt” standard would not necessarily be satisfied.

If, however, most qualified scientists regard a conclusion or theory as speculative, unscientific, or unsupported, the “substantial doubt” standard would be satisfied. Where one view on a scientific issue commands a strong consensus, but small minorities hold dissenting views, the court should make the jury aware of which scientists are speaking for themselves and which are speaking for science as a collective enterprise. A “substantial doubt” finding is essentially a conclusion by the court that there is probable cause to believe that the conclusions offered would be regarded in peer review as questionable, unscientific, or lacking significant scientific support.

A “substantial doubt” finding does not require that testimony be excluded (as it would be under the judicial “screening” approach). The court does not determine whether the expert’s testimony is valid or invalid; rather, it
determines whether the testimony is sufficiently in doubt that a neutral peer review expert might help the jury determine the standing and scientific acceptability of the expert's testimony. This approach does not exclude the testimony of the person who believes that he is the new Galileo, but it does require that the jury be told that the expert for one side stands virtually alone against the prevailing consensus of scientific opinion. Judges should make a "substantial doubt" finding whenever testimony by a neutral peer review expert might help a jury evaluate testimony more objectively.94

Many people object to appointing a single expert to testify as a witness for the court because all experts have their own views which, if presented with the court's implicit imprimatur, may be given undue weight by a jury. While it is undoubtedly true that an expert witness does not become either "objective" or "neutral" merely because she is court-appointed, the proposed rule provides several answers to this objection. First, the problem is ameliorated somewhat because the court asks the peer review expert to assess how the scientific community would regard the analysis by the parties' experts, not to present his or her own views on the merits of the controversy. To those who would claim that it is impossible to distinguish between the expert's personal opinion and the opinions of the scientific community, I would answer that lawyers do something similar all the time in advising clients about existing law as distinct from their personal view of what the law should be. Second, at least where a "substantial doubt" finding has been made, there is already a risk that the parties experts may mislead the jury as to the status of scientific opinion. A court-appointed expert will provide a needed corrective, even if her testimony is not a perfect representation of the range of scientific opinion. Finally, a court-appointed expert's distinctive point of view plays a useful role under the proposed rule. Because of the risk that the court-appointed expert will be unfavorable to them, parties will have a strong incentive to try to avoid having the court appoint a peer review expert. Parties can do this by selecting experts whose testimony, while favorable to their case, is not vulnerable to a "substantial doubt" finding. Thus, the threat of the appointment of peer review experts may induce lawyers to select experts closer to the mainstream of scientific opinion.

The court should base its decision whether to appoint a peer review expert on the partisan experts' reports and other written submissions. The court may also hear testimony from the experts themselves or from other scientists concerning the expert's qualifications and the scientific validity of her testimony. The proceeding to determine whether to appoint a peer review expert should be held during the final preparations for trial, such as at the final pre-trial conference, or even, in the courts' discretion, after an expert has given his testimony. The decision to appoint a peer review expert should be delayed as long as possible for two reasons. First, the incentive to

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94 Of course, even if the "substantial doubt" standard is not satisfied, the court would retain its general, discretionary power to name court-appointed witnesses.
self-police experts will be greatest if a party is uncertain whether a particular expert's testimony will trigger the court's appointment of a peer review expert. Second, delaying the decision to appoint a peer review expert until the eve of trial will conserve the court's time. A hearing on a motion to appoint a peer review expert may consume substantial court (or a magistrate's or master's) time, because it requires "previewing" the scientific controversies raised by expert testimony.

Because the decision whether to appoint a peer review expert should come just before (or even during) trial, the court will generally not have sufficient time to identify an appropriate person to serve as expert; nor will the court-appointed peer review expert have time to prepare for trial. Therefore, when a party files a motion asking the court to appoint a peer review expert, he should also submit the names of two or more persons qualified and willing to serve as court-appointed peer review experts. The court should not be reluctant to select a party's nominee, provided that the court determines that the nominee is knowledgeable and does not have ties to a party that would preclude her from testifying as a neutral expert.

The court-appointed peer review expert's function is to explain to the jury the scientific community's regard for the party-appointed expert's assertions. It is not the function of the peer review expert to express an opinion on the issues in the case. The judge should explain that the peer review expert is not affiliated with either of the parties and that she was appointed by the court to aid the jury in assessing the testimony of experts hired by the litigants. The court-appointed peer review expert would testify and be subject to cross-examination in the same manner as would any other expert witness, except that it may often be appropriate for the court to conduct the initial examination of the peer review expert.

The proposed rule for court-appointed peer review experts builds on both the judicial exclusion and the information enhancement strategies, but attempts to go further. Like Frye and its progeny, the proposed rule focuses on whether the expert's opinion has achieved general acceptance within the scientific community. Like information enhancement strategies, however, the proposed rule does not withhold information from the jury. Rather it seeks to put debatable testimony into perspective by providing juries with additional information to help them in evaluating testimony. Because the "sanction" under the proposed rule is less extreme than under the Frye rule or related doctrines, courts should be willing to invoke the proposed rule in borderline or questionable cases where they would be reluctant to exclude testimony outright.

The most important difference between the proposed rule for court-appointed peer review experts and existing approaches, however, is that the proposed rule aims to work on two levels at once. The rule works on one level in cases in which the court appoints peer review experts to testify. More importantly, the rule aims to improve the functioning of the system on a second level by encouraging parties not to use experts whose testimony would appear questionable to mainstream scientific opinion.
This dual aspect characterizes and defines the incentive-based approach to procedure. The idea behind incentive-based procedure is that "the most effective kind of power is the power which need not be used to be effective." Under the existing system, attorneys sometimes have strong incentives to select experts representing the extremes in the range of scientific opinion. The proposed rule does not preclude, but imposes a cost on selecting an expert whose views are outside the mainstream of scientific opinion. Extreme expert testimony may damage a party’s case if it provokes a court to appoint a peer review expert who condemns the testimony as unscientific and unsubstantiated by accepted scientific theories or techniques.

To perform effectively as an ex ante incentive, a rule must be announced in advance so that litigants can consider it in formulating their strategies. The rule must also present a credible threat of an unacceptable consequence. To satisfy these criteria, it is not necessary to amend the Federal Rules of Civil Procedure. It would be sufficient for a judge to announce in advance his or her intention to name court-appointed witnesses in accordance with the provisions of the proposed rule. Ideally, a court could issue a standing order or local rule declaring this policy for all to see.

Whether the threat of testimony by peer review experts would be a sufficiently powerful incentive to alter attorneys’ choices of expert witnesses remains to be seen. There are, however, some reasons for optimism. Many experienced trial attorneys and judges believe that the surest way for an attorney to lose a jury case is to appear to be trying to deceive or mislead the jury. Experienced trial attorneys would not willingly take on the risk of having the judge’s expert tell the jury that the attorney’s case depended on an expert whose views were unscientific and rejected by most reputable scientists.

The key idea behind the proposed rule is simple: judges are not in the best position to affect the presentation of expert testimony in litigation; attorneys are.

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96 At one time the United States District Court for the Western District of Pennsylvania had a rule somewhat similar to that proposed in the text. Under that local rule, an impartial medical expert would be identified to the jury as a court appointee only if the expert certified in his report that the proposed testimony of a partisan expert was “so slanted that in the present state of medical science a reasonable medical scientist could not accept it either as to diagnosis, causal connection or prognosis.” Western District of Pennsylvania, U.S. District Court Rules, Rule 5(III)(B) (1961), quoted in Gallagher v. Latrobe Brewing Co., 31 F.R.D. 36, 37-38 (W.D. Pa. 1962).