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Expert Evidence, Partisanship, and Epistemic Competence

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In various ways, skilled witnesses have been used in courtroom processes since just about the dawn of the jury trial. The expert witness in its modern form—a witness whose presence in court results not from being a percipient witness to material facts, but instead because of education, training, experience, or other specialized knowledge relevant to the case, and who is called by one party to testify, and is typically compensated by that party as well—can be traced back to at least the middle of the nineteenth century.

But the use of adversarial expert witnesses in court has been problematic from just about the moment of its invention. In this brief essay, I will explore two fundamental causes of the awkward fit between expert knowledge and our adjudicatory processes: the twin problems of partisanship and epistemic competence.

The use of expert evidence in court has been criticized for a remarkably long time. Consider the following three quotations:

> But the practice [of using expert witnesses] under the present method has for years exhibited shortcomings which are lamentable. . . . The principal feature of the breakdown seems to be the distrust of the expert witness as one whose testimony is shaped by his bias for the party calling him. That bias itself is due, partly to the special fee which has been paid or promised him, and partly to his prior consultation with the party and his self-committal to a particular view. His candid scientific opinion thus has had no fair opportunity of expression, or even of formation, swerved as he is by this partisan committal.[1]

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[1] 1 JOHN HENRY WIGMORE, A TREATISE ON THE ANGLO-AMERICAN SYSTEM OF EVIDENCE IN TRIALS AT COMMON LAW § 563 (2d ed. 1923) (paragraph break omitted).

> Experts in other fields see lawyers as unprincipled manipulators of their disciplines, and lawyers and experts alike see expert witnesses—those members of other learned professions who will consort with lawyers—as whores.[2]

> Now in the present instance I have, as usual, the evidence of experts on the one side and on the other, and, as usual, the experts do not agree in their opinion. There is no reason why they should. . . . A man may go . . . to half-a-dozen experts. . . . He takes their honest opinions, he finds three in his favor and three against him; he says to the three in his favor, "will you be kind enough to give evidence?" And he pays the three against him their fees and leaves them alone; the other side does the same. It may not be three out of six, it may be three out of fifty. I was told in one case, where a person wanted a certain thing done, that they went to sixty-eight people before they found one. . . . [T]herefore I have always the greatest possible distrust of scientific evidence of this kind.[3]

These views span more than a century, but they sound a remarkably consistent note. Though the rhetorical styles are quite different, the underlying message is strikingly similar: Expert witnesses in court are often not deserving of our confidence. Their conclusions cannot be relied upon, and their words cannot be trusted. Indeed, a century's worth of writing about expert evidence circles around the same themes and consistently reaches the same conclusion: that the use of party-selected expert witnesses in an adversarial legal system is fraught with difficulties.[4]

Why is this so? At root, the use of expertise in our adversarial system raises two equally significant fundamental dilemmas: the problem of partisanship and the problem of epistemic competence. First, given that experts are called by one party and paid by that party, there is an inevitable danger of bias in favor of that party. The less extreme version of this concern is that as the expert prepares for and becomes enmeshed in the case, he will increasingly, if unconsciously,

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[2] Samuel R. Gross, *Expert Evidence*, 1991 WIS. L. REV. 1113, 1115 (1991).

[3] Thorn v. Worthing Skating Rink Co., L.R. 6 Ch.D. 415, 416 (1876) (Jessel, M.R.), *quoted in* Plimpton v. Spiller, L.R. 6 Ch.D. 412, 415 n.2 (1877).

[4] For a look at the history of anxieties surrounding the use of expert evidence in court, see Jennifer L. Mnookin, *Idealizing Science and Demonizing Experts: An Intellectual History of Expert Evidence*, 52 VILLA. L. REV. 763 (2007); *see also* TAL GOLAN, LAWS OF MEN AND LAWS OF NATURE 5-51 (2004); SHEILA JASANOFF, SCIENCE AT THE BAR 42-68 (1995); JAMES C. MOHR, DOCTORS AND THE LAW (1993); Christopher Hamlin, *Scientific Method and Expert Witnessing: Victorian Perspectives on a Modern Problem*, 16 SOC. STUD. SCI. 485, 488-89 (1986); Stephan Landsman, *Of Witches, Madmen, and Products Liability: An Historical Survey of the Use of Expert Testimony*, 13 BEHAV. SCI. & L. 131, 139 (1995).

side with the party that hired him, lose some degree of objectivity, and slant his testimony in that party's favor. The more dramatic version of the same fear is that some unscrupulous experts will literally offer themselves for hire, selling their opinions and their credentials to anyone who meets their price.[5]

Despite these dangers, refusing to permit payment to experts is obviously not a viable option. It is wholly unrealistic to imagine that those highly qualified experts whom we want to have participating in our adjudicatory process would (or should) devote their time and energy to the courts pro bono on a regular basis. Preparing for and testifying for trial can be extremely time consuming, and experts can otherwise be spending that time engaging in other professionally and/or economically remunerative activities, or enjoying their favorite leisure activities. Hardly anyone would view giving expert testimony as one of her favorite leisure-time activities. The reality is that experts must be paid.

The acute difficulty comes not simply from the fact of payment, but rather from the fact that it is the *parties* who choose and pay their experts. What a particular party views as the greatest value for its dollar—effective expert testimony that persuades the factfinder—will often not be commensurate with what a more systemic perspective would see as most valuable, which would presumably be careful, accurate expert testimony rather than testimony most persuasive to a non-expert. What this means is that those witnesses who succeed in the marketplace for experts within our adversarial process will often not be those with the most knowledge or actual expertise in a particular area, but rather those whom parties believe will succeed in persuading the factfinder. The confluence of adversarialism with the need for expert information also has permitted the creation of a class of "professional" expert witnesses, those for whom expert witnessing is no longer a sideline, a once-in-a-while add-on to their primary work as a physician, economist, epidemiologist, statistician, or whatnot, but rather is now a significant, or even primary, source of their

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[5] For the classic (pre-*Daubert*) article on the widespread frustration with the use of expert evidence and the structural problems with the use of expert knowledge in an adversarial system with lay fact-finders, see Gross, *supra* note 2. For a polemical but influential account of the problems with the use of expert evidence in civil cases, see PETER W. HUBER, GALILEO'S REVENGE: JUNK SCIENCE IN THE COURTROOM (1991). For a description of the significant concerns about partisanship in the late nineteenth century, see Mnookin, *supra* note 4.

earnings.[6] This group, obviously, has an especially strong interest in maintaining its marketability by being a "team player," and telling potential employers (that is, parties) what they want to hear. The marketplace for experts cannot, therefore, be trusted to produce reliable information.[7] To whatever extent price can be correlated with quality in other domains, the relationship cannot be counted on with respect to expert witnesses.

The second fundamental problem with the adversarial expert is epistemic. Experts are necessary precisely because of what the jury does not know.[8] They are supposed to provide information useful to the jury's decision-making that goes beyond what a jury would know without their assistance. But if the jury lacks the knowledge that the expert provides, how, then, can it rationally evaluate the expertise on offer?[9] To be

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[6] As part of tort reform efforts, several states have attempted to curb "professional experts" in medical malpractice cases by statutory provisions limiting who can testify as an expert. Kansas, for example, requires that testifying experts have spent at least fifty percent of the two years preceding the incident giving rise to the claim in "actual clinical practice." KAN. STAT. ANN. § 60-3412 (2007). Connecticut requires a testifying expert to have been active in the practice or teaching of medicine within the five years preceding the incident giving rise to the claim. CONN. GEN. STAT. § 52-184c (2007). Michigan requires a testifying medical expert to have spent a majority of the year preceding the incident giving rise to the claim engaged in active clinical practice or teaching. MICH. COMP. LAWS § 600.2169 (2008).

[7] For an interesting look at the dynamics of the expert market, see Jeffrey L. Harrison, *Reconceptualizing the Expert Witness: Social Costs, Current Controls and Proposed Responses*, 18 YALE J. ON REG. 253 (2001). For a more optimistic perspective, see Richard A. Posner, *An Economic Approach to the Law of Evidence*, 51 STAN. L. REV. 1477 (1999); Richard A. Posner, *The Law and Economics of the Economic Expert Witness*, J. ECON. PERSP., Spring 1999, at 91.

[8] Federal Rule of Evidence 702, which controls the use of expert testimony, states:

> If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

FED. R. EVID. 702. In order to "assist the trier of fact," the expert testimony must go beyond what the trier of fact would have known and understood even without the expert.

[9] As Learned Hand wrote in his well-known 1901 article about expert evidence:

> The trouble with all this is that it is setting the jury to decide, where doctors disagree. The whole object of the expert is to tell the jury, not facts, as we have seen, but general truths derived from his specialized experience. But how can the jury judge between two statements each founded upon an experience confessedly foreign in kind to their own? It is just because they

sure, one might not need to be an expert in order to assess expertise, but the main mechanisms for assessing expertise outside of one's domain of knowledge are, by necessity, secondary indicia, proxies: demeanor, perhaps, or credentials, or superficial explanatory plausibility. But because each party has the power to select its experts from the whole universe of experts willing to testify, parties will presumably attempt to select those experts who best satisfy the parties' best guesses about what the jury will use as its proxy criteria. That might be a Ph.D. from a prestigious institution or a lengthy publication record. Perhaps it is certain forms of speech or dress, or an honest face and a winning testimonial manner. Most likely it is a mixture of all of the above and more. Whatever the specific criteria, the point is that parties (sometimes with the help of jury consultants) will deliberately select experts who satisfy their beliefs about the jury's expectations for experts. Parties will, quite rationally, seek out precisely those experts most capable of "performing" the role of expert in just the way that the parties expect that a jury will find credible. Parties do not have infinite latitude, as they will have to choose from whatever array of experts is willing to testify in a way that substantively helps their case. But compared to fact witnesses, they have a great deal of leeway.[10] With fact witnesses, a party is typically severely limited by the happenstance of who was there and who saw what; not so with expert witnesses, who can be selected from a national or even global pool, resources permitting. As a result, the power of proxy criteria, like demeanor or credentials, to discriminate between reliable and unreliable experts is likely to be quite limited indeed.[11]

> are incompetent for such a task that the expert is necessary at all. . . . What hope have the jury, or any other layman, of a rational decision between two such conflicting statements each based upon such experience.

Learned Hand, *Historical and Practical Considerations Regarding Expert Testimony*, 15 HARV. L. REV. 40, 54-55 (1901).

[10] Gross, *supra* note 2, at 1126-28.

[11] Demeanor as a signal for credibility may not be particularly accurate outside of the expert context either. *See generally* Jeremy A. Blumenthal, *A Wipe of the Hands, A Lick of the Lips: The Validity of Demeanor Evidence in Assessing Witness Credibility*, 72 NEB. L. REV. 1157 (1993); Olin Guy Wellborn III, *Demeanor*, 76 CORNELL L. REV. 1075 (1991). My point, however, is not to defend (or attack) demeanor as an accurate means by which to detect honesty, but simply to suggest that whatever degree of utility it has for the assessment of credibility for non-expert evidence, it is significantly diminished vis-à-vis experts themselves because parties can select them precisely for their demeanor.

Moreover, the problem of epistemic competence compounds the problem of partisanship. Because the jury does not have the expertise to evaluate the substance of expert testimony, it is unlikely that it will be an accurate evaluator of partisan bias. If the jury has epistemic competence, we may not need to be overly concerned with partisanship. The jury can independently evaluate the substance of the testimony and will often have the capacity to see through overstatements or inaccuracies that were the result of zealotry. Without epistemic competence, the jury has no choice but to rely on proxies as secondary indicia of bias, and these may often be either inaccurate or difficult to evaluate.

For example, does the $550 per hour received by the expert mean that his testimony should be discounted because he is reaping a tidy profit, or does it reflect his high stature and commensurate ability that commands an appropriately high price? Is it a sign of trouble that an expert has testified dozens of times before, and thus might be an "expert for hire," or is it a positive sign, showing that other judges have already deemed him sufficiently expert to warrant being heard by the jury? Does the fact that the plaintiff's expert seems to testify exclusively for plaintiffs suggest a deep-seated bias, or is the expert who testifies for plaintiffs and defendants alike a bigger concern, possibly suggesting that he will testify for anyone who meets his price? How much, if it all, should a published study in a peer-reviewed journal be discounted because it was funded by a private entity, such as a drug company, with an interest in the outcome of the research conducted? On the one hand, such a funding source could generate a bias; on the other hand, the structure of academic research and the processes of peer review and publication are designed, at least aspirationally, to check such a bias. What about a study conducted especially for this lawsuit? Is its trustworthiness diminished because it did not emerge through the typical research process,[12] or is it the quite appropriate result of an expert, or community of experts, developing an interest in the relevant question precisely because of the lawsuit itself? The point is not that secondary indicia can never provide information relevant to an evaluation of partisanship—rather, it is that evaluating these secondary

[12] This is precisely what Judge Kozinski suggested in his opinion on remand in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 43 F.3d 1311, 1317 (1995).

indicia is a murky and imperfect process given the combination of (1) adversarialism and (2) a lack of epistemic competence.

These are not new problems. They are, in fact, rather old problems. Indeed, the risks posed by expert testimony—the danger of partisanship and the problem of epistemic competence—have long been recognized, but never fully resolved, especially when considered together. And hence we continue to face these problems—in court, in our scholarship, in the jury room. Given these fundamental and seemingly irresolvable problems with experts in court, what is the law to do?

In what follows, Part I will survey the traditional, historical approaches the law has taken in attempting to resolve these central problems of partisanship and epistemic competence. Part II will then consider potential solutions to these fundamental quandaries, evaluating both the theoretical appeal and pitfalls of these approaches.

I. THE HISTORICAL PERSPECTIVE: THE SPORTING THEORY, *FRYE*, AND *DAUBERT*

First, let us look at what the law *has* done. The traditional common law approach to these structural dilemmas was quite simply the adversarial mechanism itself: both parties had an equal opportunity to make use of expert witnesses if they wished to do so. Yes, the witnesses for each party might tend to partisanship, but somehow from their clashing testimony, the jury in its infinite wisdom would distill the truth—or at least that was the hope. It was a "sporting theory of justice" applied to experts: so long as parties had an equal opportunity to bring forward opposing experts, under the same rules and with the same judge as umpire, then whatever the jury made of the competing experts' stories was acceptable.[13]

This approach, however, was roundly criticized as early as the closing decades of the nineteenth century.[14] The problem was the lack of epistemic competence: if juries could be counted on to have the ability to assess the expertise before them, then a level adversarial-playing field might indeed have been all that was needed. But given that juries often lacked the

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[13] On the sporting theory of justice, see Roscoe Pound, *The Causes of Popular Dissatisfaction with the Administration of Justice*, 14 AM. LAW. 445, 447-48 (1906).

[14] For a detailed look at views about expert evidence at the end of the nineteenth century, see generally Mnookin, *supra* note 4.

competence to adequately evaluate the expertise on offer, the "sporting theory of justice" had the effect, as Roscoe Pound noted, of turning "expert witnesses[] into partisans pure and simple."[15]

Although critiques of expert testimony have been both frequent and strongly worded over the course of the twentieth century, the adversarial expert has remained an increasingly significant feature of the adversarial trial. And for the most part, despite criticisms, the adversarial process itself remained the dominant check, such as it was, on expert testimony until quite recently.

There were, to be sure, some earlier fledgling efforts to regulate the content of expert testimony through limitations on admissibility. The *Frye* rule, articulated in 1923, made explicit that for novel kinds of expert testimony, courts could require the knowledge to have gained "general acceptance" in the relevant expert community before permitting it before a jury.[16] But *Frye*, though it became important in the 1970s, was not much noticed at the time it was decided. Through 1970, it was cited only fifty-eight times, and the bulk of those cases involved the lie detector, the same technology at issue in *Frye*.[17]

Instead, the main vehicle for such regulation as the courts wished to exercise was qualifications: in order to testify, the expert had to have qualifications that were adequate to support his claim of expertise. Just how qualified was qualified enough? No doctrinal framework emerged to answer this question, and in practice, most judges, most of the time, did not actually interrogate a proposed experts' bona fides in a detailed or rigorous way. In addition, trial judges' determinations about qualifications were generally viewed as so much a matter of the trial court's discretion as to be virtually unreviewable on

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[15] Pound, *supra* note 13, at 448.

[16] Frye v. United States, 293 F. 1013, 1014 (D.C. Cir. 1923). *Frye*'s now classic and oft-quoted key language says:

> Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle of discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field to which it belongs.

Id.

[17] This is based on a search for cases reported by Lexis decided prior to 1970 that cite *Frye*.

appeal.[18] In practice, then, the only significant check on partisanship or even outright charlatanry was the power of the opposing attorney to cross-examine the expert. Even if one did agree with John Henry Wigmore that, as a general matter, cross-examination counted as "the greatest legal engine ever invented for the discovery of truth,"[19] it was often not terribly effective when applied to expert witnesses.[20]

The net result was that although few defended it as sound, the "sporting theory" as applied to expert witnesses continued to reign even into the last quarter of the twentieth century. Few doubted that this sporting theory sometimes led to embarrassing results.[21] Some critics began suggesting that the inadequate regulation of expert witnesses was even contributing to a liability crisis, in which socially valuable products were being forced off the market because of the cost of defending against baseless tort suits. These critics' idea was that such lawsuits often lacked scientific merit, but plaintiffs' lawyers were nonetheless able to hoodwink the jury into granting sizeable verdicts. And, according to the critics, these suits were able to get past summary judgment and reach trial precisely because of the presence of hubristic experts prepared to testify to causation with little or no basis in fact.[22]

This, then, was the historical backdrop for the Supreme Court's 1993 pronouncement on expert evidence, *Daubert v. Merrell Dow Pharmaceuticals, Inc.*[23] As a formal matter, *Daubert* held that the Federal Rules of Evidence, which became effective in 1975, did not incorporate the *Frye* principle of

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[18] 1 WIGMORE, *supra* note 1, §§ 561, 670.

[19] *Id.* vol. 3, § 1367.

[20] For a satirical look from the late nineteenth century making fun of several kinds of expert witnesses (and illustrating the ineffectiveness of efforts to cross-examine them), see RICHARD HARRIS, HINTS ON ADVOCACY (St. Louis, Central Law Journal Co., 9th ed. 1892) (1880).

[21] For one classic example on the civil side, see Maihafer *ex rel.* Wells v. Ortho Pharm. Corp., 615 F. Supp. 262 (N.D. Ga. 1985). This case, a bench trial in which the judge believed the plaintiffs' experts who alleged that spermicide caused birth defects, has been much criticized. *See, e.g.*, Gross, *supra* note 2, at 1121-24. *But see* Joseph L. Gastwirth, *The Need for Careful Evaluation of Epidemiological Evidence in Product Liability Cases: A Reexamination of* Wells v. Ortho *and Key Pharmaceuticals*, 2 LAW, PROBABILITY & RISK, 151, 163-89 (2003). For some examples of embarrassingly unsupported expert evidence admitted on the criminal side, see, e.g., Paul C. Giannelli, *Wrongful Convictions and Forensic Science: The Need to Regulate Crime Labs*, 86 N.C. L. REV. 163 (2007), and Paul C. Giannelli, *The Abuse of Scientific Evidence in Criminal Cases: The Need for Independent Crime Laboratories*, 4 VA. J. SOC. POL'Y & L. 439 (1997).

[22] The classic account making this argument is HUBER, *supra* note 5.

[23] 509 U.S. 579 (1993).

"general acceptance."[24] While rejecting the allegedly "austere standard" of *Frye*, *Daubert* parsed the language of Rule 702 of the Federal Rules of Evidence, and interpreted the rule's use of the words "scientific . . . knowledge" to mean that federal judges have an obligation to serve as "gatekeepers," who make sure that scientific evidence offered in court is, in fact, "scientific knowledge."[25] By emphasizing a judicial gatekeeping role for the assessment of expert evidence, *Daubert* was a meaningful move away from a pure "sporting theory" with respect to expert evidence.

Tracing the history of expert evidence, *Daubert* completes a shift in perspective whose outlines were already implicitly visible in *Frye*. Prior to *Frye* (and to a great extent afterwards as well), the key concern was qualifications: Is this "expert" an appropriate person to speak to the issue at hand? Does this person, through training, experience, or education have the right kind of expertise? Do his credentials qualify him to give the jury an opinion on this matter? The courts, to be sure, were not typically extremely strict about qualifications—physicians, for example, were often permitted to testify outside their primary area of expertise, and somewhat weak credentials were often seen as going to evidentiary weight rather than admissibility—but still, qualifications were the primary hook by which judges evaluated an expert's authority. The *Frye* test, by contrast, was less concerned with the speaker and his qualifications and was more concerned with the substance being asserted: had the speaker's claims reached general acceptance in the relevant field? At least in theory, an indisputably qualified expert, even though testifying to matters within his sphere of expertise, could still be excluded under *Frye* because his conclusions lacked general acceptance within the appropriate expert community.

But well after 1923 many courts ignored *Frye*, and even those courts that followed it often applied it in a form that reverted back to a qualifications test. They found that the test was satisfied so long as the properly qualified expert *asserted* that the substance of his claims was, in fact, generally accepted. Why should a court believe an expert's say-so about general acceptance? Why, precisely because the expert had the appropriate qualifications. Not only does such logic have a

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[24] *Id.* at 588.

[25] *Id.* at 589-91.

certain unavoidable circularity, but to the extent a credentialed expert's own say-so is deemed adequate to establish general acceptance, a test that seems superficially different in form amounts to nothing but another version of a qualifications test. *Daubert*, by contrast, makes clear that for scientific evidence, qualifications alone ought not to suffice. The speaker's individual expertise is still necessary, but it is no longer sufficient. Rather, the key question is whether the substance offered by the speaker has adequate indicia of reliability.[26] *Daubert* thus marks a doctrinal shift away from a focus on the speaker as a person and toward a focus on the validity of the claims made.

More generally, *Daubert* was certainly a response to the twin concerns about partisanship and the epistemic competence of juries. As always, adequate qualifications remain a necessary prerequisite, but after *Daubert*, it is crystal clear that an expert's qualifications are not, themselves, a sufficient condition for admissibility. Instead, the judge must examine the substance of the expert testimony to see whether it is adequately reliable. Counter-expertise introduced by an opposing party can, after *Daubert*, no longer be said to be an adequate cure for the problem of partisanship; rather, judges must themselves establish that the expert evidence has adequate indicia of reliability.

But even though *Daubert* can be seen as something of a response to the twin concerns of partisanship and epistemic competence, it can hardly be said to resolve these issues. *Daubert*'s approach is to have a non-scientist judge make a preliminary determination about reliability in order to limit what the jury can consider. Nothing in *Daubert* explicitly addresses partisanship (though to be sure, part of the purpose of gate-keeping for reliability is to endeavor to distinguish partisan excess from legitimate expertise). And, as many have suggested, beginning with Rehnquist in his *Daubert* dissent and continuing as a leitmotif, it is far from clear that judges have the epistemic competence to make legitimate decisions about what expert evidence is adequately valid and what is not.[27]

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[26] *Id.* at 589-90.

[27] *See id.* at 600-01 (Rehnquist, C.J., dissenting).

II. PARTISANSHIP AND EPISTEMIC COMPETENCE: CONSIDERING ALTERNATIVE SOLUTIONS

If *Daubert* represents, at best, an indirect and partial effort to address the issues of partisanship and epistemic competence, what would more direct efforts look like? In what follows, I want to suggest, unfortunately, just how difficult it is to solve these problems. I will briefly address the two most obvious and often-proposed solutions for the twin difficulties of partisanship and epistemic competence, and will suggest, alas, that that these solutions offer less than meets the eye—that upon reflection, they are not in fact satisfying solutions to the problems besetting expert testimony.

First, let us look at solutions that face up to these fundamental tensions directly. If the problems with expert evidence in the adversary system are partisanship and epistemic competence, it might seem like the obvious solution is to take on one, the other, or both. How might this be done? For partisanship, it would seem that the obvious solution is to make experts non-partisan—to make them neutral or court appointed, answering to someone other than one of the parties. For epistemic competence, it would seem like the obvious solution would be to employ decision-makers or arbiters with epistemic competence: in other words, expert judges or expert juries.

Each of these solutions has been suggested before. Each will no doubt be suggested again. If history is any guide, we are unlikely to head terribly far down either path within the trial process itself. I want to suggest, however, that while each of these potential solutions does address one piece of the underlying structural dilemma, neither offers a sound alternative for resolving the fundamental structural tensions as a whole.

A. Partisanship, Neutral Experts, and Evidence Synthesis

Back in 1901, the young Learned Hand penned a still-cited article examining the difficulties posed by the use of expert evidence. His proposed solution was to create a system for neutral, court-appointed experts, unbiased advisors who would be able to deliver to the jury "those general truths, applicable to the issue, which they may treat as final and

decisive."[28] Hand was far from the first to think that neutral experts were a promising way to solve the problems associated with experts in court,[29] and throughout the century that followed a great number of subsequent critics proposed variations on the same solution.[30] There have been proposals for court-appointed experts, for government-appointed experts; for neutrals in lieu of party-controlled experts, for neutrals as a supplement to party-controlled experts, for incentive schemes to encourage opposing parties to agree on a neutral expert, and so on. For our purposes, the great variety of possible institutional designs for the use of neutral experts is not the point.[31]

The idea of neutrals is obviously an attractive corrective to the problem of partisanship. If one of the significant problems with the use of expertise in court is that that experts tend to be biased in favor of the party that hired them, then creating a category of expert that lacks this bias would seem like a natural way to improve the information available to the factfinder. The main advantage neutral experts would offer is precisely that they would not be (metaphorically) in bed with one of the parties.

To the extent experts are corrupted by their association with the parties, the use of neutral experts could indeed be beneficial. But to see them as a panacea misunderstands the nature of most scientific disputes that arise at trial. Neutrals will only offer an adequate solution to the problems besetting the use of experts in court when, in fact, there is a reasonably high degree of consensus within the scientific community on the scientific question at issue in the case.

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[28] Learned Hand, *Historical and Practical Considerations Regarding Expert Testimony*, 15 HARV. L. REV. 40, 55 (1901).

[29] For still earlier calls for neutral or court appointed experts, see, e.g., Emory Washburn, *Testimony of Experts*, 1 AM. L. REV. 45, 61-62 (1867); J.B. Ransom, *Medical Expert Testimony*, 16 MEDICO-LEG. J. 30, 31-34 (1899); Henry Mott, *Expert Testimony*, 11 MEDICO-LEG. J. 44, 45 (1893); Clemens Herschel, *Services of Experts in the Conduct of Judicial Inquiries*, 21 AM. L. REV. 571, 577 (1887).

[30] For a sampling of these more contemporary calls for the greater use of neutral or court appointed experts, see MARCIA ANGELL, SCIENCE ON TRIAL: THE CLASH OF MEDICAL EVIDENCE AND THE LAW IN THE BREAST IMPLANT CASE (1996); Gross, *supra* note 2; Daniel W. Shuman & Bruce D. Sales, *The Impact of Daubert and Its Progeny on the Admissibility of Behavioral and Social Science Evidence*, 5 PSYCH. PUB. POL'Y & L. 3 (1999).

[31] Note, however, that under current law, courts do have the power to appoint experts when they deem it necessary. *See* FED. R. EVID. 706. This power, however, is rarely exercised.

Some of the time, this is no doubt the case. By the time *Daubert* went to trial, for example, the question of whether the drug Bendectin, frequently prescribed to treat acute morning sickness during pregnancy, was teratogenic had received an enormous amount of scientific attention (in significant part due to the wave of litigation surrounding it). Though there were still credentialed scientists who disagreed (some of whom were hired by the plaintiffs), it is fair to say that the great weight of scientific opinion interpreted the existing evidence as sufficient in quantity and quality to strongly support the inference that Bendectin was not teratogenic.[32]

But in many cases, there may be genuine disagreement across the scientific community about how to interpret the existing evidence on causation. Take a toxic torts case in which the plaintiff claims that her harm resulted from exposure to a substance produced by the defendant. Often the key issue in such cases is causation; there may be no doubt that the plaintiff was harmed, but the question is whether it was the defendant's product that caused the harm. Frequently, when plaintiffs bring suit, there will not be as much direct evidence on the question of causation as practicing scientists would hope to see before rendering a judgment about causation, because the studies that could, in theory, provide this information have quite simply never been conducted. The plaintiff might have a variety of suggestive pieces of data from a variety of fields—perhaps a mixture of animal studies, chemical structure evidence, toxicology, and epidemiology, though perhaps the epidemiological studies are based on populations dissimilar to the plaintiff, or exposure rates that differ dramatically, or perhaps look at different, but chemically related, substances to the one at issue in the case. This was the case, at least arguably, in *General Electric v. Joiner*, the second of the Supreme Court's trilogy on expert evidence.[33] It is quite often the case in toxic tort litigation that the quantum of data investigating the question of causation is simply less voluminous than one would like. Such was the case with Parlodel, a lactation-suppressing drug removed from the

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[32] *See generally* MICHAEL D. GREEN, BENDECTIN AND BIRTH DEFECTS: THE CHALLENGES OF MASS TOXIC SUBSTANCES LITIGATION (1996); JOSEPH SANDERS, BENDECTIN ON TRIAL (1998); Joseph Sanders, *From Science to Evidence: The Testimony on Causation in the Bendectin Cases*, 46 STAN. L. REV. 1 (1993).

[33] *See* General Electric Co. v. Joiner, 522 U.S. 136, 143-45 (1997). The Court upheld the trial court's decision to exclude the plaintiff's expert evidence and grant summary judgment with respect to PCB exposure. *Id.* at 146-47

market by the Food and Drug Administration when concerns emerged about whether it might be spurring strokes in some women who took it after childbirth.[34]

Moreover, when a toxic tort claim involves a rare event rather than a potential mass tort, research on causation will almost certainly be scarce or even non-existent. In *Zuchowicz v. United States*, for example, the plaintiff claimed that the negligent misprescription of an overdose of the drug Danocrine caused her to develop an extremely rare and often fatal illness, primary pulmonary hypertension ("PPH").[35] Quite apart from the fact that there were, for obvious reasons, no studies of whether overdoses of that drug caused PPH, there was quite scant evidence on the question of whether Danocrine was capable in the first place of causing PPH: nothing more than a set of speculative claims by a pharmacologist who had a theory about how Danocrine could cause a series of hormonal imbalances that could, in combination, cause physical problems leading to PPH, coupled with testimony by the plaintiff's treating physician, a leading pulmonologist, whose conclusions about causation were based in significant part on expertise in *other* drugs that cause pulmonary disease.[36] The lack of other available evidence was in no way the plaintiff's fault. The likelihood that extremely rare events will have been carefully studied is, well, extremely low. And even for toxic tort claims that affect a significant number of people, there may be quite limited evidence available when the first lawsuits are brought; indeed, it may often be the litigation and the ensuing publicity that spurs scientific interest in studying the question of causation more carefully.

In cases where the evidence supporting causation is more limited than one would wish it to be, the questions for the scientist are particularly difficult: How do you aggregate the variety of imperfect evidence into a conclusion about general causation? How do you assess the disparate items and make a judgment about the probability that the substance is capable of causing the harm at issue? Evidence synthesis is an especially

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[34] For discussions of Parlodel, see Margaret A. Berger & Aaron D. Twerski, *Uncertainty and Informed Choice: Unmasking* Daubert, 104 MICH. L. REV. 257, 269-70 (2005); Margaret Cronin Fisk, *Courts Split on Parlodel: Expert Testimony Good in Ala., Rejected in Ill.*, NAT'L L.J., Oct. 8, 2001, at A9.

[35] Zuchowicz v. United States, 140 F.3d 381, 383 (2d Cir. 1998).

[36] *See id.* at 385-86.

difficult and methodologically fraught area.[37] There are certainly field norms about "hierarchies of evidence" (for example, randomly controlled trials, or even better, a meta-analysis of a number of different randomly controlled studies are typically thought of as the "gold standard," and anecdotal case observations the weakest forms of evidence[38]); and there are rules of thumb about how to assess the likelihood of causation by looking at a variety of factors. (The well-known Hill's criteria, for example, in epidemiology, direct attention to matters like temporal relationship, dose-response relationship, biological plausibility, consistency of the observed correlation, and a variety of other factors.[39]) But there are not, for the most part, terribly well-developed methodologies for quantitative synthesizing of disparate kinds and categories of evidence. Engaging in evidence synthesis, many scientists would agree, is as much an art as a science, inevitably involving methods that are not fully specified and the exercise of experience-based—and somewhat subjective—judgment.[40]

Even when the evidence is of a similar kind (perhaps a variety of different epidemiological studies), and meta-analytic techniques for formally synthesizing the evidence might be possible, there must first be a determination about which evidence is valid enough to be worth considering and which is not. Reputable, talented scientists may well disagree in good faith about what evidence is worth counting and what evidence ought to be dismissed from consideration altogether for methodological flaws.

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[37] Although scientists in a variety of fields concern themselves with the dilemmas of evidence synthesis on a regular basis, there has not been a great deal of discussion of this issue in the legal literature. *See generally* COMMITTEE ON DAUBERT STANDARDS & COMMITTEE ON SCIENCE, TECHNOLOGY, AND LAW, NAT'L ACAD. SCI., DISCUSSION OF THE COMMITTEE ON DAUBERT STANDARDS: SUMMARY OF MEETINGS 11-16 (Kathi E. Hanna & Anne-Marie Mazza, rapporteurs, 2006).

[38] *See, e.g.*, ROBERT J. LEVINE, ETHICS AND REGULATION OF CLINICAL RESEARCH 211 (2d ed. 1986); Robin Harbour & Juliet Miller, *A New System for Grading Recommendations in Evidence Based Guidelines*, 323 BRIT. MED. J. 334, 334-36 (2001).

[39] Austin Bradford Hill, *The Environment and Disease: Association or Causation?*, 58 PROC. ROYAL SOC'Y MED. 295, 295-305 (1965).

[40] To recognize that complex tasks of evidence synthesis have an inevitable subjective component using current methodologies is not to disparage the efforts by scientists to engage in such synthesis. There are, to be sure, significant efforts of this kind, especially in medicine, efforts to put together systematic reviews of all that is known and to draw conclusions from them in order to influence clinical practice. The Cochrane Collaboration is one of the best known and most respected of such efforts. *See generally* http://www.cochrane.org/docs/descrip.htm (last visited Feb. 6, 2007).

Take, for example, the important public health question of whether regular mammograms for all women over the age of forty can help to reduce breast cancer mortality rates. This question arose not in the context of litigation, but as a critical public health issue with implications for what advice doctors should give to their female patients. Two groups of scientists carefully studied all the (considerable) available data on the subject.[41] But each group's decisions about what data warranted consideration differed.[42] A review by Danish researchers decided that many of the studies had been too methodologically flawed to warrant consideration, and thus they based their analysis on a more limited number of studies that were deemed adequate; the other review, completed by the United States Preventative Task Force, agreed that many of the studies were flawed, but determined that the studies it deemed only "fair" were not so poor in quality that they should be altogether excluded from consideration.[43] Because of these divergences in what evidence was deemed worthy of consideration, the two studies reached quite disparate conclusions. The first analysis found that women in their forties do not, in the aggregate, benefit from mammograms and in fact have increased risk of harms because of unnecessary treatments and surgeries that mammogram results generate. The second study, by contrast, found that mammography did reduce mortality and was, on balance, beneficial.[44] How could qualified scientists disagree about which studies were even worthy of consideration? As epidemiologist Steve Goodman wrote in an editorial on the controversy:

> Judgment determines what evidence is admissible and how strongly to weigh different forms of admissible evidence. When there is consensus on these judgments and the data are strong, an illusion is created that the evidence is speaking for itself and that the methods are objective. But this episode should raise awareness that judgment cannot be exercised from the process of evidence synthesis and that the variation of this judgment among experts generates uncertainty

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[41] *See* Steve Goodman, Editorial, *The Mammography Dilemma: A Crisis for Evidence-Based Medicine*, 137 ANNALS INT. MED. 363 (2002).

[42] *Id.* at 363.

[43] *Id.*

[44] *See id.*; *see also* Gina Kolata, *New Mammogram Studies Divided on Benefits*, N.Y. TIMES, Sept. 3, 2002.

> just as real as the probabilistic uncertainty of statistical calculations.[45]

What does this public health debate have to do with experts in court and the limitations of neutral experts? It provides a dramatic illustration of a generalizeable point: while the partisanship of experts may create the illusion of disagreement even when little exists in the broader community, even in situations far removed from the use of "hired guns" in court, significant interpretive disagreements can occur among scientists operating in good faith—and this may be so even in instances when the available quantity of data is unusually substantial. Evidence synthesis is an especially complex and fraught area, one in which reputable scientists may simply disagree about the extent to which an imperfect body of data justifies an inference of causation. While partisanship may exacerbate these differences, and the lure of high pay may risk creating the appearance of disagreement when it would be unlikely to exist outside of the courtroom, the converse is simply not true: interpretive disagreement is not necessarily the result of partisanship. It may well be the product of genuine methodological and interpretive differences, not only across scientific disciplines, but even within them.

Evidence synthesis, to be sure, is simply one salient illustration of a still more general point: scientific disagreements are not, in and of themselves, a sign that something is amiss, nor do they necessarily suggest that one or both parties to the dispute are misbehaving partisans. Quite the contrary; disagreement is an integral part of scientific processes. What this means, however, is that the use of neutral experts may bring with it significant risks.[46]

To be sure, in those cases in which one side's experts are truly charlatans or have been led by partisan zeal to dramatically overstate some aspects of their testimony, neutrals could offer an effective and welcome check. But what would the use of neutrals on a more regular basis mean in those cases in which the disagreements among experts reflect legitimate differences, differences that the parties' experts would hold equally fast to outside of the context of litigation or

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[45] Goodman, *supra* note 41, at 364.

[46] On the advantages and disadvantages of court appointed experts, see generally Ellen E. Deason, *Court-Appointed Expert Witnesses, Scientific Positivism Meets Bias and Deference*, 77 OR. L. REV. 59, 99-121 (1998).

even without the incentive of receiving fees? In such an instance, a neutral expert would end up doing one of two things. Perhaps she would support one or the other of the party's positions. This might create for the factfinder the appearance of a consensus view, but this appearance would be illusory. In such circumstances, the jury would potentially be misled into being unduly influenced by the structurally unbiased expert. The jury in such cases might struggle less with the diverging views of the parties' experts and simply choose to rely on the "neutral" expert; while its job might therefore be perceived as easier, it is not at all clear that the quality of its decisions would be meaningfully improved.

Alternatively, the court-appointed expert might lay out the scientific terrain for the factfinder and situate the dispute, without taking sides at all. This could potentially be educational for the jury, and perhaps a court appointed expert would be better suited to elucidating the contours of the debate than the party-selected witnesses.[47] But in the end, the jury would be left in virtually the same place it was before the court-appointed expert assisted it: needing to decide which expert to believe while lacking the epistemic qualifications to assess the merits of the testimony.

Those who call for neutral experts, then, at least partly misunderstand the nature of scientific disputes. For whenever there is a legitimate scientific disagreement at issue in a legal case, a neutral expert would either mask a legitimate dispute or else be unable to offer "those general truths, applicable to the issue, which they may treat as final and decisive,"[48] for which Learned Hand and others have long craved. In other words, while neutrals might indeed offer a useful, strong check on extreme partisanship, this would often be an insufficient solution precisely because of the factfinder's continued lack of epistemic competence.

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[47] On the tension between education and deference with respect to expert witnesses, see Ronald J. Allen & Joseph S. Miller, *The Common Law Theory of Experts: Deference or Education?*, 87 NW. U. L. REV. 1131 (1993). For a case study of experts who "sold" their expertise to the courts in explicitly educational terms, see Jennifer L. Mnookin, *Scripting Expertise: The History of Handwriting Identification Evidence and the Judicial Construction of Reliability*, 87 VA. L. REV. 1723 (2001).

[48] Hand, *supra* note 28, at 55; *see* Allen & Miller, *supra* note 47, at 1133.

B. The Problem of Epistemic Competence

Let us turn, then, directly to the question of epistemic competence. Might there be a way to solve *this* problem? My focus, again, shall be on the most obvious potential solution: attempting to make use of decision-makers who themselves have epistemic competence. How might we do this? One option would of course be juries made up of experts.[49]

Even putting aside any potential constitutional objections (for example, would a jury of experts still be a jury of one's peers? would it meet the requirement that a jury come from "a fair cross section" of the community?), specialized juries would quickly run up against new difficulties. Just consider trying to operationalize a system of special juries designed to deal with concerns about epistemic competence. Who would be on such a jury? Imagine a toxic torts case involving a plaintiff alleging harm resulting from the ingestion of a pharmaceutical. Imagine that the key legal question in the case is causation, as it so often is in such cases, and imagine further that the plaintiff has evidence relating to causation from a variety of sources and scientific disciplines. Let us posit that she has two epidemiological studies, some evidence from chemical studies of the drug and related substances, an animal study or two, and extensive evaluations by several physicians who endeavored to find the cause of her ailments through "differential diagnosis."

If our goal is a decision-maker with epistemic competence, who should be eligible to sit on the jury for such a case? Just how much should a potential juror have to know about the scientific disciplines from which the evidence will come? Should the jury be limited to physicians and professional research scientists? If so, scientists from what disciplines?

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[49] *See, e.g.*, Richard C. Baker, *In Defense of the "Blue Ribbon" Jury*, 35 IOWA L. REV. 409 (1950); Jeannette E. Thatcher, *Why Not Use the Special Jury?*, 31 MINN. L. REV. 232 (1947); William V. Luneberg & Mark A. Nordenberg, *Specially Qualified Juries and Expert Nonjury Tribunals: Alternatives for Coping with the Complexities of Modern Civil Litigation*, 67 VA. L. REV. 887 (1981); Rita Sutton, *A More Rational Approach to Complex Civil Litigation in the Federal Courts: The Special Jury*, 1990 U. CHI. LEGAL F. 575; Dan Drazan, *The Case for Special Juries in Toxic Tort Litigation*, 72 JUDICATURE 292 (1989); Kristy Lee Bertelsen, *From Specialized Courts to Specialized Juries: Calling for Professional Juries in Complex Civil Litigation*, 3 SUFFOLK J. TRIAL & APP. ADVOC. 1 (1998); Note, *The Case for Special Juries in Complex Civil Litigation*, 89 YALE L.J. 1155 (1980). On the history of the use of quasi-expert juries, see generally James Oldham, *The History of the Special (Struck) Jury in the United States and Its Relation to Voir Dire Practices: The Reasonable Cross-Section Requirement, and Peremptory Challenges*, 6 WM. & MARY BILL RTS. J. 623 (1998) [hereinafter Oldham, *History*]; James C. Oldham, *The Origins of the Special Jury*, 50 U. CHI. L. REV. (1983).

Should a paleontologist be permitted, or a theoretical physicist? What about social scientists? Clearly, the boundary-drawing issues would become immediately significant. An empirical social scientist might understand the epidemiological evidence at least as well as many physicians. Moreover, the evidence presented in the case could be disparate enough that in many instances no one at all would be a true epistemic insider to all of the scientific evidence offered. Depending on the matters at issue, the pool of people truly expert in any of the relevant areas might be rather small, and the pool of people expert in all of them might not even exist. Perhaps an epistemically competent jury need not mean that every juror has epistemic competence in every expert area at issue; we might be satisfied with a jury made up of several leading members of each of the subfields in which significant expert evidence was expected.

As a thought experiment, imagining such a jury is an interesting prospect. But, in reality, it would raise enormous practical hurdles. It is simply not realistic to bring the leading experts in as jurors time after time. Certain kinds of expertise arise in trials over and over again, and it is likely that the segment of the population with these forms of expertise would become massively and unequally burdened by their jury obligations. Just how often could we ask busy epidemiologists and toxicologists, for example, to serve on juries? Meeting their civic duty too often could have devastating effects on both their income and their career! In addition, scientific sub-communities can be small and professionally interconnected, so it is likely that some of the most epistemically qualified non-testifying experts would know personally, and have views about, some of the testifying experts, or even have a prior opinion about the particular matter at issue. While these prior views are a direct consequence of the fact of their expertise, they might generate serious problems vis-à-vis our expectations of jurors: an expert with a significant degree of prior relevant knowledge might be unable to hear the evidence presented with a fresh and open mind. Epistemic competence might go hand in hand with preexisting judgments about the merits.

One might argue that the preceding discussion unreasonably overstates the necessary degree of epistemic competence. Perhaps it is not necessary to be a scientist within the relevant field in order to have enough knowledge and training to evaluate the claims made in the courtroom in a rational manner. Perhaps the preceding discussion fails to

recognize the distinction between an intelligent producer and an intelligent consumer of knowledge—the skills necessary to evaluate a claim might be significantly lower than those needed to be a substantive contributor to the debates of the field. Even if we assume this to be true, now who could be included in our epistemically competent jury? If the case involves a good deal of sophisticated statistical analysis, how much familiarity should the jury have to have with statistical thinking in order to be epistemically competent? Some graduate training? A college major in statistics, math, accounting, or some related quantitative field? Successful completion of a college course on the subject? Successful completion of an in-court quiz testing statistical knowledge, or basic numeracy?

Our problem here is a classic dilemma of boundary-drawing. Where do we draw the line between those deemed adequately epistemically competent and those who are not? If epistemic competence is tied with a reasonably high degree of precision to the matters at issue in the case, our jury system would become literally unworkable. By contrast, one could probably implement a system that required jurors to have some undergraduate level science training for cases involving expert scientific evidence. But this would create other problems. No longer would there be a direct tie between the factfinder's knowledge and experience and the central issues in the case. Once that direct tie is broken, a system of this sort both smacks of elitism and begins to look distressingly anti-democratic. How confident are we that those with a minimum of one science class in college would actually be better, as a group, than those who did not meet the standard? How would they compare to those who went to college but did not take science? To those who excelled in some high school science class? To those without a college education but whose present employment relates to science or technology? To those with a particular I.Q., regardless of education?

Unless we have (and perhaps even if we did have) a well-grounded empirical basis for believing that jurors who met a particular standard for prior experience with scientific matters would reach significantly better decisions than those who lacked the relevant experience, we might well think that other public values and commitments should prevent us from

heading down that path.[50] In addition, those jurors who met our epistemic criteria (whatever they were) might be, as a group, demographically different from those who did not, and in ways that might be troubling, not only along gender, race, or ethnicity lines, but also in terms of beliefs relevant to the case—ideas about politics, notions of fault and liability, or other less obvious dimensions. We might be consciously giving up diversity on one dimension (for example, eliminating all those without a certain degree of scientific background), and simultaneously giving up diversity along dimensions about which we were not even aware.

If expert juries may raise difficult concerns, expert judges might offer a less troubling method to ratchet up the legal system's degree of epistemic competence. Judges who develop a specialty might be better positioned to asses the expert evidence adduced by parties and to guide both the parties and the jury through the trial process. Although no state, to my knowledge, has a court dedicated to cases involving complex *expert* evidence in particular, several states are experimenting with specialty courts or specialized judges within general courts devoted to business disputes or to complex civil litigation,[51] and this category of case does typically involve a good deal of expert testimony.

The early response to these innovations appears to be generally positive.[52] However, they cannot be seen as a particularly robust response to the issue of epistemic competence. Even if we imagine (though it is far from certain)

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[50] Delaware has, in fact, a rarely used statute permitting the use of "special juries" in cases involving complex litigation. *See* 10 DEL. CODE ANN. tit. 10, § 4506 (2007). The statute is not specific about who counts as a "special juror" or what cases may qualify for this provision. *Id.* For discussion of this statute, see Oldham, *History*, *supra* note 49.

[51] For an overview of materials from several states relating to specialized complex litigation efforts, see generally National Center for State Courts, http://www.ncsconline.org/WC/CourTopics/ResourceGuide.asp?topic=SpecCt (last visited Feb. 11, 2008). Florida has a dedicated business court in its Ninth Judicial Circuit. *See* Business Court: Ninth Judicial District, *available at* http://www.ninja9.org/Courts/Business/Forms/ BCBrochure.pdf (last visited Feb. 6, 2008). California has a number of judges who now specialize in complex civil litigation. For a brief description of this program, see Judicial Council of California, Fact Sheet: Complex Civil Litigation Program (2007), http://www.courtinfo.ca.gov/reference/documents/factsheets/comlit.pdf; *see also Complex Litigation, Key Findings from the California Pilot Program*, CIVIL ACTION, Winter 2004, at 1; Paul Kiesel & Bryan Borys, *The Cost $avings of the Complex Litigation Program*, CAL. COURTS REV., Summer 2007, at 16.

[52] *See, e.g.*, Kiesel & Borys, *supra* note 51, at 20-21; Ronald M. George, *Complex Civil Litigation Pilot a Success*, COURT NEWS (Judicial Council of Calif.), Sept. 2001, at 2.

that the judges in a court devoted to complex civil litigation increase their sophistication with respect to certain kinds of repeat-play evidence, the fact remains that in a jury trial, the judge does no more than rule on admissibility. The jury still must evaluate the evidence, and the fact that the judge may have grown to be a more sophisticated consumer of the expert evidence at issue than the typical judge will not necessarily translate in any obvious way to increased juror sophistication. To put it differently, at best these courts might lead to an improved set of evidentiary inputs for the jury's consideration—improved in the sense of being more likely to be epistemically valid. But the extent to which that would translate into better outputs is not obvious, given the jury's own lack of epistemic competence. It probably cannot hurt, but it might not help much either. Bench trials with specialized judges would take this a step further—many have suggested, for example, that a "complexity exception" to the constitutional right to the jury trial ought to be permitted.[53]

Could we go one step further and imagine a neutral, epistemically qualified decision-maker? Could we imagine a procedure akin to a bench trial, but in which the adjudicator was not simply a repeat-player judge in a specialized court, but was in fact an epistemic expert in the matters at issue? Of course we can imagine it, but at this point, for better or for worse, we are describing an adjudicatory regime that looks very little like our jury system. As it happens, however, we do have examples of precisely such a procedure in actual use: Some arbitration proceedings make use of an industry expert as an arbitrator in lieu of someone with legal expertise.[54] For disputes with a high degree of technical complexity, or where industry norms are explicitly at issue, it is not uncommon for parties to elect to make use of an epistemically qualified decision-maker.[55] The parties might choose someone with the

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[53] *See* sources cited *supra* note 51.

[54] For discussions of industry-expert arbitrators, see Lisa Bernstein, *Private Commercial Law in the Cotton Industry: Creating Cooperation Through Rules, Norms, and Institutions*, 99 MICH. L. REV. 1724 (2001); Lisa Bernstein, *Merchant Law in a Merchant Court: Rethinking the Code's Search for Immanent Business Norms*, 144 U. PA. L. REV. 1765 (1996) [hereinafter Bernstein, *Merchant Law*]; Jennifer J. Johnson, *Wall Street Meets the Wild West: Bringing Law and Order to Securities Arbitration*, 84 N.C. L. REV. 123 (2005). Discussions with Robert Mnookin about practices in arbitration have also informed my understanding.

[55] Note, however, that Bernstein found that at least in some industries the expert arbitrators made surprisingly little use of their insider knowledge of business norms within the field. Bernstein, *Merchant Law*, *supra* note 54, at 1771-87.

appropriate scientific or technical background rather than someone with a legal background. In a sense, then, for commercial and contracts disputes, or any other kinds of disputes for which arbitration is a viable alternative, there already exists an "opt-in" approach when parties deem an epistemically-competent evaluator to be an especially high priority. But while it would be interesting to know more about how often, and in what circumstances, parties select scientific or technical know-how over a legal background, this approach is likely to be attractive to both parties in only a limited number of cases.

CONCLUSION

Where, then, are we left? Not with solutions, to be sure, but perhaps with a clearer diagnosis of the dilemmas surrounding the use of expert evidence within an adversary system, and their tradeoffs. And perhaps we are left, too, with a bit more sympathy for *Daubert*, or at least a recognition that so long as we have our adversarial system in much its present form, we are inevitably going to be stuck with approaches to expert evidence that are imperfect, conceptually unsatisfying, and awkward. It may well be that the real lesson is this: those who believe that we might ever fully resolve—rather than imperfectly manage—the deep structural tensions surrounding both partisanship and epistemic competence that permeate the use of scientific evidence within our legal system are almost certainly destined for disappointment. This ought not to lead us to quiescence. It ought instead to guide us to a certain degree of realism and modesty about how much we can change about the use of expert evidence, unless we are prepared to make fundamental modifications to our adversarial system.