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# Appellate Review of Scientific Evidence Under *Daubert* And *Joiner*

by  
DAVID L. FAIGMAN\*

## Introduction

*"That's the reason they're called lessons," the Gryphon remarked: "because they lessen from day to day."*<sup>1</sup>

In the Fall of 1997, the United States Supreme Court heard oral argument in *General Electric Co. v. Joiner*.<sup>2</sup> This is a comment on that case. Although it is not unusual to comment on Supreme Court cases, it is perhaps a little unusual to do so before the decision is handed down. The typical post-mortem either applauds the Court for a job well done, if the scholar likes the result, or decries the outcome, if the scholar's position did not prevail. This Essay is rather different; it is, instead, a pre-mortem. The advantage of writing before the decision is made, of course, is that my judgment is unclouded by the Court's analysis. The disadvantage lies in the possibility of a short shelf-life for the piece. Having attended the oral argument in *Joiner* I am confident that the former advantage permits enough benefit to make the endeavor worthwhile and that the latter disadvantage is not very likely.<sup>3</sup> In truth, a post-mortem differs from a pre-mortem only in the doctor's confidence that the patient is dead. Their purposes, however, are the same. Both endeavor to identify lessons from one case in order to save others. That is my objective here.

In *Joiner*, the Court confronts the question of what standard of review appellate courts should apply to trial court decisions regarding the admissibility of scientific evidence. The Court will thus consider, for the second time in five years, the scope of judges' responsibility for over-

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1. LEWIS CARROLL, *ALICE'S ADVENTURES IN WONDERLAND & THROUGH THE LOOKING GLASS*, ch.9 at 74 (Bantam Classic ed. 1981) (1865 & 1871).

2. 117 S. Ct. 1243 (1997).

3. Although I had the pleasure of attending the oral argument in *Joiner*, I am not affiliated with any of the parties or *amici* who participated in the case.

seeing the admission of scientific expert testimony. In *Daubert v. Merrell Dow Pharmaceuticals, Inc.*,<sup>4</sup> the Court held that federal trial court judges have “gatekeeping” responsibilities when science comes to court. *Daubert* requires trial judges to determine whether the scientific basis for proffered expert testimony is more likely than not *valid*. This “validity test,” in practice, has generally increased trial courts’ diligence in evaluating and excluding weak, sloppy or bad scientific expert testimony. In *Joiner*, the Court will consider whether the active gatekeeping role established for trial courts in *Daubert* also extends to appellate courts. Unfortunately, a great deal of confusion swirls around the issue of appellate review of scientific evidence. Much of this confusion comes from the difficulty of fitting scientific evidence into the traditional evidentiary boxes. The remainder of the confusion stems from judges’ and lawyers’ limited understanding of the nature of science. The first source of confusion is relatively easy to address and resolve. It is the subject of this brief Essay. The second subject will likely take many years to resolve. It is the subject of a lifetime of work.

## I. The *Joiner* Case

“*Curiouser and curiouser!*” cried Alice.<sup>5</sup>

### A. The Lower Courts’ Opinions

“*Contrariwise,*” continued Tweedledee, “*if it was so, it might be; and if it were so, it would be; but as it isn’t, it ain’t. That’s logic.*”<sup>6</sup>

In *Joiner*, the trial judge applied *Daubert*’s gatekeeping requirement and excluded the plaintiffs’ proffer of medical testimony in a suit for damages allegedly arising out of Robert Joiner’s exposure to PCBs that had been manufactured by the defendants (the other plaintiff in the case was Karen Joiner, Robert’s wife).<sup>7</sup> The plaintiff, a long-time cigarette smoker, suffered from lung cancer and claimed that his exposure to PCBs hastened the onset of the cancer. The trial court ruled that the experts’ opinions linking PCB exposure to promotion of lung cancer lacked scientific support and concluded that they could not testify. Without this evidence the plaintiffs’ suit collapsed and the trial court granted a motion

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4. 509 U.S. 579 (1993).

5. CARROLL, ALICE’S ADVENTURES IN WONDERLAND, *supra* note 1, ch.2, at 8.

6. CARROLL, THROUGH THE LOOKING GLASS, *supra* note 1, ch.4, at 141.

7. *Joiner v. General Elec. Co.*, 864 F. Supp. 1310, 1326-27 (N.D. Ga. 1994).

the Wheelwright appeal, he had simply added an ambiguous “etc.” to his argument about the patent.<sup>241</sup> In *A Short Story*, Winthrop explicitly expanded the “etc.”:

[N]either did an appeal lie from any Court in an County or Corporation in England, but if a party will remove his cause to any of the King's higher Courts, he must bring the King's Writ for it; neither did he tender any appeal, nor call any witnesses, nor desired any Act to be entered of it.<sup>242</sup>

Parallel to this common-law reservation argument, Winthrop also advanced a common-law understanding of redress. If one wanted to remove a case, one had to bring a writ of error, not an appeal. If one had failed to follow the proper procedures, then the appeal must never have existed. Winthrop seemed to hope that he could define away the appeals.<sup>243</sup>

All these technical common-law arguments, however, could not convincingly disguise the fact that when Massachusetts refused to permit appeals, it denied England's supreme authority. Winthrop's efforts did not stop the English commissioners for foreign plantations from investigating the Gorton situation nor from showing interest in another group of dissenters who wrote the Child Remonstrance.<sup>244</sup> The culture of appeal was too strong to be distinguished or reinterpreted away.

Finally, in a 1646 petition to the English commissioners, Winthrop abandoned the common-law arguments. Accepting the culture of appeal, he confronted the issue of authority. He explicitly stated that the colony recognized the supremacy of England. In an eerie historical twist, Winthrop referred to the Henrician Act of Appeals. Winthrop's petition stated that “the records” showed the wisdom of “our ancestors” who “acknowledged a supremacy in the bishops of Rome in all causes ecclesiastical, yet would not allow appeals to Rome.”<sup>245</sup> Borrowing language from the preface to the Henrician Act, the petition stated that appeals “would be destructive of all government” because the colony would have

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241. 1 WINTHROP, JOURNAL, *supra* note 149, at 241.

242. Winthrop, *A Short Story*, *supra* note 240, at 256-57.

243. *Id.* at 257.

244. The fear of the Gorton and Child appeals twice sent Edward Winslow to England. His effort to stop Gorton's *Hypocrisie Unmasked*, did not address the appeals issue. EDWARD WINSLOW, *HYPOCRISIE UNMASKED, A TRUE RELATION OF THE PROCEEDINGS OF THE GOVERNOR AND COMPANY OF THE MASSACHUSETTS AGAINST SAMUEL GORTON OF RHODE ISLAND* (The Club for Colonial Reprints 1916) (1646).

245. 2 WINTHROP, JOURNAL, *supra* note 149, at 312.

to follow the “delinquents” to England “where the evidence and circumstances of facts cannot be so clearly held forth as in their proper place” and the expenses would be great.<sup>246</sup> If the Puritan leaders of Massachusetts were Henry VIII, then England could only be Rome. Winthrop must not have thought much of the commissioners. The analogy betrayed the precariousness of the argument—when Henry VIII had barred appeals, he had ended the supremacy of Rome.

However, Massachusetts had acknowledged English authority and the commissioners returned the favor by writing a response which seemed to support Massachusetts’ practice. In 1647, the commissioners responded, “[W]e intended not . . . to encourage any appeals from your justice.”<sup>247</sup> The commissioners added that they did not intend to “restrain the bounds of your jurisdiction to a narrower compass than is held forth by your letters patent” and that they would “leave you with all that freedom and latitude that may in any respect, be duly claimed by you.”<sup>248</sup> Both comments left open whether the patent implicitly reserved appeals. Nonetheless, Massachusetts took the response as a sign that the denial of appeals was compatible with English supremacy. Into the 1660s, the colony would proclaim its ability to deny appeals to England even as it clung tight to the culture of appeal.<sup>249</sup>

In places as diverse as Rhode Island and Massachusetts, the appeal survived with the help of people as ideologically different from one another as Williams and Winthrop. As numerous other incidents during the 1640s in Massachusetts and Rhode Island demonstrate, the appeal signified the acceptance of authority to such a degree that discussions of the appeal provided a space to construct and recognize authority. American Indians such as Pumhom used the appeal to indicate which colony’s authority they would temporarily recognize.<sup>250</sup> John Winthrop and the

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246. *Id.*

247. *Id.* at 337.

248. *Id.* Hugh Peter mysteriously wrote Winthrop shortly before the answer of the commissioners that “[a]ppeals will hardly be overthrown” and that they should not be troubled by such appeals. Letter from Hugh Peter to John Winthrop (May 5, 1647), in 5 WINTHROP PAPERS, *supra* note 8, 157 at 159.

249. A 1661 General Court order stated that the governor and other officials in Massachusetts had “full power and authority” over “ecclesiastics and civils, without appeal.” 4 MASSACHUSETTS RECORDS, *supra* note 150, at 24-25 (documenting an Act of the General Court dated June 10, 1661).

250. Letter from William Arnold to the Governor or Deputy Governor of Massachusetts (Aug. 15, 1648), in 5 WINTHROP PAPERS, *supra* note 8, at 246. The entire passage is worth quoting:

nine, in applying an especially stringent standard, used the wrong standard of review. They argued that *Daubert* invests gatekeeping responsibilities only in the trial court. Under traditional principles of evidence law, they pointed out, appellate courts are deferential to evidentiary decisions by a trial court judge. Thus, rather than give scientific evidence a "hard-look," they argued, the appellate court should reverse only if the trial judge abused his or her discretion. Here, they insisted, the district court did not abuse its discretion and thus the Eleventh Circuit should be reversed.

Petitioners' *amici* offered a rather poor defense of good science. These integrity-of-science forces generally view *Daubert's* gatekeeping function as a stringent threshold requirement. But the appellate court here applied a stringent appellate standard to permit what these forces considered bad science. Hence, these nine generally argued that appellate courts should not apply a stringent standard, though district judges should continue to do so under *Daubert*. Their general chagrin with the Eleventh Circuit's lackadaisical reaction to bad science led them to condemn the decision in its entirety. This reaction, although understandable, overlooks the bigger picture. The Eleventh Circuit's hard-look approach, though it produced an incorrect ruling in the present case, is likely to lead to salutary results in future cases. The best rule for ensuring the integrity of science in the law should require active participation of appellate courts in the process of evaluating the validity of scientific research.

The integrity-of-science forces missed the bigger picture. The arguments they advanced will likely lead, in the long term, to more bad science and less scientific sophistication among lawyers and judges. I share the goal of creating a process by which good scientific research can be integrated into legal decision making. But by focusing on the somewhat idiosyncratic outcome in *Joiner*, these *amici* embraced a procedural rule that will likely undermine rather than promote their goal. The remainder of this Essay argues for active appellate review, which is necessary to promote the sophisticated use of scientific research by courts.

### III. Integrating Science into the Law

*Take care of the sense, and the sounds will take care of themselves.*<sup>21</sup>

Early in the oral argument in *Joiner*, Chief Justice Rehnquist asked whether adopting an abuse of discretion standard might not mean that appellate courts would inevitably leave standing inconsistent district court decisions on the same subject. Also at oral argument, several of the justices asked whether expert testimony was somehow different from ordi-

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21. CARROLL, ALICE'S ADVENTURES IN WONDERLAND, *supra* note 1, ch.9, at 68.

nary testimony or evidence. After all, if scientific evidence is no different than ordinary evidence, the traditional abuse of discretion standard should be applicable to both. It turns out that the concern implicit in the Chief Justice's question provides the answer to the repeated query regarding what is so special, in an evidentiary sense, about science. Specifically, it is because aspects of scientific evidence sometimes transcend individual disputes, and thus are likely to recur in different jurisdictions, that appellate courts must have the power to resolve inconsistencies in lower court decisions.

#### A. The Division of Responsibility Between Judge and Jury

*"I'll be judge. I'll be jury," said cunning old Fury; "I'll try the whole cause, and condemn you to death."*<sup>22</sup>

The law divides responsibility for deciding most fact questions between the judge and jury, with a strong presumption that jurors will assume most of that responsibility. However, the rules of evidence regulate which facts reach the jury and these rules very often require judges to determine certain preliminary facts in order to resolve evidentiary issues. For example, the Federal Rules of Evidence create an exception to the general prohibition against hearsay for so-called dying declarations. Under this exception, a statement may be admissible only if the judge first determines that the statement was "made under a belief of impending death."<sup>23</sup> The exception for dying declarations does not apply unless the judge first determines the existence of this "preliminary fact."<sup>24</sup> Examples abound of such preliminary facts embedded in the rules of evidence.<sup>25</sup> In *Daubert*, the Court effectively determined that the validity of proffered scientific testimony was a preliminary fact.<sup>26</sup> On this reasoning, the determination of validity is a necessary precondition to the admission of scientific expert testimony and within the discretion of the judge.

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22. *Id.*, ch.3, at 22.

23. FED. R. EVID. 804(b)(2). Under Rule 804, the judge must also find that the declarant is "unavailable" to testify. FED. R. EVID. 804(a).

24. FED. R. EVID. 104(a).

25. Other representative examples of preliminary facts that must be found by the judge include whether a statement was "made during and in furtherance of a conspiracy" for the hearsay exclusion for co-conspirator statements to apply, FED. R. EVID. 801(d)(2)(E), and whether a statement was made while "the declarant was under the stress of excitement caused by the event or condition [described]" in order for the excited utterance exception to apply. FED. R. EVID. 803(3).

26. *Daubert*, 509 U.S. at 592-93.



Ordinarily, appellate judges defer to trial judges' findings regarding preliminary facts. There is good reason for this traditional deference. Virtually all preliminary facts concern matters that depend on the testimony of witnesses that the trial court sees and the appellate court can only meet through the written record. For example, when the dying declaration exception is at issue, a nurse's testimony about the circumstances of the declarant's death is likely to be essential to the necessary finding. There is no reason to believe that appellate judges reading a transcript of the testimony are better able to assess the relevant preliminary fact than the trial judge who heard the nurse's testimony. Indeed, there is good reason to believe otherwise.

Scientific evidence, however, is quite different from the ordinary preliminary fact. These differences nullify the trial court's preferred position. As the *Daubert* Court explicitly recognized, science presents special problems for deciding responsibility between judge and jury. In an often-quoted passage describing this division, the Court stated as follows:

The inquiry envisioned by Rule 702 is, we emphasize, a flexible one. Its overarching subject is the scientific validity—and thus the evidentiary relevance and reliability—of the principles that underlie a proposed submission. *The focus, of course, must be solely on principles and methodology, not on the conclusions that they generate.*<sup>27</sup>

The problem, however, is that this statement is not very illuminating, especially from a scientific perspective, on where the judge's responsibility ends and the jury's begins. In science, methods and conclusions cannot be separated. For example, extrapolating from animal studies to humans is sometimes warranted and sometimes not. But few, if any, scientists would contend that the conclusion that humans are affected in a certain way can be divorced from the fact that animals were studied in the underlying research. Scientists' conclusions ultimately depend on the strength of the methods they used to reach them. Evaluation of methods and conclusions simply cannot be divided among different decision makers. Both judge and jury must consider the methods employed by the researchers in order to appreciate the conclusions they reached. Still, the decision must be divided in some fashion, and the only question is how it might be divided so as to contribute to the wise use of science while, at the same time, responding to the procedural requisites of the law.

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27. *Id.* at 594-95 (emphasis added).

## B. The Special Case of Scientific Evidence

*It's as large as life, and twice as natural.*<sup>28</sup>

Scientific evidence is applied science. Thus, the question of relevance and weight involves several layers of scientific work. In *Joiner*, for instance, the evidentiary issue concerns both the general question of whether PCBs are associated with lung cancer, as well as, assuming the general question is answered in the affirmative, whether the particular plaintiff's lung cancer is attributable to exposure to PCBs. Courts have increasingly referred to these different issues as "general causation" and "specific causation." These general and specific qualities will be found in virtually all science that enters the courtroom.<sup>29</sup> For example, the validity of DNA profiling can be considered generally, since it depends on tenets of molecular biology and population statistics, and specifically, since allegations that the police planted the defendant's blood at the scene of the crime obviously confound test results. This general and specific character of scientific evidence provides a possible solution to both the question of how the responsibility between judge and jury should be divided under *Daubert*, as well as the question of what standard of appellate review should be established for scientific expert testimony in *Joiner*.

A judge's gatekeeping responsibilities should extend to the general aspects of science or, in other words, those scientific questions that transcend the particular case. Hence, deciding whether epidemiological research sufficiently demonstrates an association between PCBs and lung cancer should be part of the gatekeeping responsibility. Whereas, determining whether the treating physician's judgment is biased because of expert witness fees, or whether the plaintiff's history of smoking is longer than he testified, are questions largely for the jury. Similarly, the question of the validity and reliability of PCR tests in DNA profiling would be decided by the judge preliminarily, but the question of whether the laboratory's relationship with the prosecutor's office tainted their findings would be primarily for the jury to determine.

This insight should also guide establishment of the standard of appellate review. When the scientific evidence transcends the particular case, the appellate court should apply a "hard-look" or *de novo* review to the basis for the expert opinion. When the scientific evidence involves facts specific to the particular case, the appellate court should defer to the trier of fact below. Although ordinarily appellate courts should (and do)

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28. CARROLL, THROUGH THE LOOKING GLASS, *supra* note 1, ch.7, at 182.

29. See generally David L. Faigman, Elise Porter & Michael J. Saks, *Check Your Crystal Ball at the Courthouse Door, Please: Exploring the Past, Understanding the Present and Worrying About the Future of Scientific Evidence*, 15 CARDOZO L. REV. 1799 (1994).

apply a deferential standard to evidentiary matters, there are compelling reasons for applying heightened appellate review for scientific evidence that transcends individual cases.

Scientific findings that transcend individual cases involve mixed questions of fact and law. They contain substantial policy considerations that appellate courts should be obligated to decide. The law's need for scientific evidence often precedes science's ability to provide definitive answers. Mistakes, therefore, are inevitable. Where the risks and costs should lie for these mistakes is ultimately a policy determination. In this way, answers to questions about whether an area of scientific evidence has sufficient indicia of reliability to be admissible is more akin to a policy judgment than whether a preliminary fact specifically articulated in an evidentiary rule (e.g., "belief of impending death") has been met. In the silicone implant litigation, for instance, current research is not conclusive one way or the other about whether silicone implants cause connective tissue disorders. The issue of what costs will be accepted for an error is a legal policy judgment. Appellate courts do not traditionally defer to lower courts' legal findings.

The general nature of some scientific findings makes them more like "legislative facts" than "adjudicative facts."<sup>30</sup> Legislative facts, like the general aspects of scientific evidence, are factual questions that pose the complication of the possibility of inconsistent findings in the trial courts that can only be reconciled on appeal. Also, just like legislative facts, scientific questions that transcend particular cases have a strong legal or policy component. Hence, for both legislative facts and general science facts, a strong deferential standard on appeal inevitably will create inconsistencies and complications. Although the Supreme Court has yet to specifically adopt a non-deferential appellate standard for legislative facts, Chief Justice Rehnquist indicated that any other rule would pose serious difficulty. He explained why:

[Respondent] argues that the "factual" findings of the District Court and the Eighth Circuit . . . may be reviewed by this Court only under the "clearly erroneous" standard of Federal Rule of Civil Procedure 52(a). Because we do not ultimately base our decision today on the invalidity of the lower court's "factual" findings, we need not decide the "standard of review" issue. We are far from persuaded, however, that the "clearly erroneous" standard of Rule 52(a) applies to the kind of "legislative" facts at issue here. The difficulty with applying such a standard to "legislative" facts is evidenced here by the fact that at least one

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30. In a couple of articles, Professors John Monahan and Laurens Walker first identified the "legal" nature of factual questions that transcend particular disputes. See John Monahan & Laurens Walker, *Social Authority: Obtaining, Evaluating and Establishing Social Science in the Law*, 134 U. PA. L. REV. 477 (1986); Laurens Walker & John Monahan, *Social Frameworks: A New Use of Social Science in Law*, 73 VA. L. REV. 559 (1987).

other Court of Appeals, reviewing the same social science studies as introduced by [Respondent], has reached a conclusion contrary to that of the Eighth Circuit.<sup>31</sup>

If scientific-factual disputes are removed from appellate scrutiny, contradictory results are sure to follow, but with no mechanism to cure them. For instance, in the silicone implant litigation, among the nearly 100,000 cases nationwide, many of these cases are being litigated in Portland, Oregon, while others are being tried in Montgomery, Alabama. Judge Jones in Portland has already concluded that the scientific evidence does not support expert testimony that the implants cause autoimmune disorders.<sup>32</sup> Judge Pointer in Montgomery now has a panel of experts studying the same issue and will decide the matter sometime early next year. Suppose Judge Pointer permits the science to go to trial. A plaintiff's ability to bring suit and possibly recover millions of dollars will thus turn on whether she happened to live in Alabama rather than Oregon. Justice should not depend on such fortuity. Only appellate courts are in a position to impose order on trial courts that decide similar cases differently.

Simply put, the scientific fact of the matter is the same wherever it occurs for questions that transcend particular disputes. Hence, the association between silicone implants and connective tissue disorder is the same in Montgomery, Alabama as it is in Portland, Oregon. Similarly, the general validity of polygraph tests does not change whether they are employed in New York or in San Francisco. Appellate courts are the only arenas available for settling scientific disputes that transcend individual cases. Fairness requires that, where possible, like cases be treated alike. Where general scientific issues such as whether bendeclin causes birth defects or electromagnetic fields cause leukemia are involved, a litigant's success should not depend on the vagaries of where the lawsuit was brought. Appellate courts must take a hard-look at scientific evidence in order to ensure consistency across the lower courts.

An additional argument responds to the institutional competence issue that is at the core of the position that appellate courts should be deferential regarding scientific evidence. The reasons for deferring to a lower court's preliminary fact finding, however, are not present when the scientific question transcends the particular dispute. Good scientific research simply does not depend on the credibility of individual witnesses.

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31. *Lockhart v. McCree*, 476 U.S. 162, 168-69 n.3 (1986)(internal citation omitted); see also *Dunagin v. City of Oxford, Miss.*, 718 F.2d 738, 748 n.8 (5th Cir. 1983) (*en banc*) (plurality opinion of Reavley, J.).

32. *Hall v. Baxter Health Care Corp.*, 947 F. Supp. 1387, 1414-15 (D. Or. 1996). The court concluded that there was insufficient scientific support and granted the defendants' motion in limine to exclude the plaintiffs' expert testimony, and provisionally granted summary judgment pending the findings of the Rule 706 panel in Judge Pointer's court in Alabama. *Id.*

If the question is whether the declarant made a statement under a belief of impending death, the nurse's credibility might be critical, and this presumably can best be assessed in person. In contrast, whether a series of six epidemiological studies support the conclusion that the relative risk associated with silicone implants exceeds 2.0 for connective tissue disorders does not entail the same sort of credibility assessment. The science must be evaluated on the merits and as reported, in most cases, in the literature.

Contrary to the arguments against appellate courts' competency, arguably appellate judges are better positioned than trial judges (and trial judges better than juries) to decide scientific disputes that transcend particular cases. In areas that recur often, such as DNA profiling, or that involve a large number of claims, such as silicone implants, appellate courts have the luxury of time and distance to become familiar with the complex science. Very often the same or similar issues will arise in multiple cases, so expertise gained once will be available when the issue returns. Once a judge understands multiple regression analysis he or she need not learn it again when it arises in another context. In addition, appellate judges sit on panels and thus have the benefit of shared experience and expertise. The more academic character of appellate judging, therefore, is particularly well-suited to understanding and deciding general scientific issues.

### Conclusion

*"The question is," said Humpty Dumpty, "which is to be master—that's all."<sup>33</sup>*

Active appellate review of scientific research that transcends particular cases is mandated by both legal and scientific reasons. By necessity, appellate courts must have the wherewithal, the gatekeeping power, to settle scientific disagreements among lower courts. This will be true for all scientific questions that transcend particular litigation, from the validity of DNA profiling to the toxicity of PCBs. Case specific issues, however—such as allegations that evidence was planted at the scene of the crime, or that the expert is puffing for a fee—would remain matters on which appellate courts would defer to the fact-finder at trial. But only appellate courts are situated to ascertain and balance the policy implications raised by the science, to ensure consistency across jurisdictions, and to evaluate the methods, principles and reasoning of multiple research studies.

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33. CARROLL, THROUGH THE LOOKING GLASS, *supra* note 1, ch.6, at 169.

