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IDEALIZING SCIENCE AND DEMONIZING EXPERTS: AN INTELLECTUAL HISTORY OF EXPERT EVIDENCE

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I. INTRODUCTION

IN No Magic Wand: The Idealization of Science in Law, David Caudill and Lash LaRue analyze the way that many participants in the legal system—judges, lawyers and scholars alike—tend to misunderstand science and scientific processes.1 Loosely drawing on much recent work in the sociology of scientific knowledge, sometimes known as Science Studies, Caudill and LaRue's central thesis is that many, though by no means all, judges and scholars evince a disturbing tendency to idealize scientific knowledge. They fail to understand that science, even the best science, is an all-too-human enterprise, not separable from the myriad social, institutional, cultural and rhetorical practices in which it is embedded.

Caudill and LaRue, whose book serves as a jumping-off point for this symposium, advocate a "non-romantic view" of scientific knowledge, one that attempts to steer a careful and pragmatic course between the Scylla of strong social constructionism (an anti-realist view of scientific knowledge that understands science as socially constructed and lacking an inherent relationship to nature), and the Charybdis of idealized scientific naturalism (in which good science is understood not only as literally corresponding to actual reality, but also as unmarred by human interests or institutional limitations). To be sure, as one-sentence straw-men, each view might spur a puzzled shake of the head from the reader: Does anyone really believe either that the material world imposes no constraints whatever on scientific experiments and theories, or that scientists, when designing and conducting their research, can somehow stand wholly apart from all of the ordinary biases and motivations that affect us in all other domains? Both poles, the authors sensibly suggest, should be avoided. But in the legal setting, the more dangerous one—because more prevalent by far—is the latter, the tendency to idealize science, and hence misunderstand it.

* Professor of Law and Vice Dean for Faculty & Research, UCLA School of Law. Thanks to David Caudill, Simon Cole, Tal Golan, Ariela Gross and Michael Risinger, for conversations and useful comments relating to the material in this Article. Earlier versions of this article were presented at the USC Law and Humanities workshop and at the Yale Law School and I am grateful to participants in both for helpful suggestions and comments. For extremely helpful research assistance, I thank Jennie Katz.

A central focus of attention for Caudill and LaRue is the consequences of idealization on judges making admissibility determinations about the validity of scientific evidence. The 1993 United States Supreme Court case of Daubert v. Merrell Dow Pharmaceuticals, Inc. placed squarely on federal trial court judges the obligation to play a gatekeeping role with respect to scientific evidence, assessing its validity in order to determine if it is sufficiently reliable to present in court. Prior to Daubert, novel scientific evidence was often assessed under the Frye test, the name deriving from a 1923 D.C. Circuit Court opinion that suggested that novel forms of expert evidence ought to be permitted in court only after they had become “generally accepted” in the relevant community of experts. Daubert rejected the claim that the Frye test was implicitly imported into the Federal Rules of Evidence, and instead required judges to assess whether proffered evidence is indeed “scientific knowledge.” In place of Frye, judges were directed to use a variety of flexible and non-exclusive criteria for assessing validity, including whether the evidence can be and has been tested; whether it has been subject to peer review; whether the expert technique in question has a known (and sufficiently low) error rate and standards controlling its operation; and finally, the Frye criterion of general acceptance.

A critical difference between Daubert and Frye is the shift from proxy criteria for assessing scientific evidence to a direct judicial inquiry into scientific validity. Frye, on its face, does not ask the judge to decide whether the evidence is reliable, but rather, whether the expert community deems it reliable. While reliability is still the ultimate goal, the judge’s inquiry focuses on the beliefs of experts themselves, which are presumed to be an adequate proxy for reliability. By contrast, Daubert requires the judge to personally assess the reliability of the evidence. The admissibility question has thus shifted from “what does the relevant expert community think about the reliability of this evidence?” to “what does the judge, making a preliminary determination under Federal Rule of Evidence 104(a)”

3. Frye v. United States, 293 F. 1013 (D.C. Cir. 1923). In Frye’s oft-quoted language, 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, if it is really deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs. Id. at 1014 (emphasis added).
4. See Daubert, 509 U.S. at 590 (referring to Federal Rule of Evidence 702).
5. See id. at 593-94 (noting that “overarching subject is the scientific validity . . . of the principles that underlie a proposed submission”).
6. Federal Rule of Evidence 104 governs the judicial evaluation of preliminary questions of admissibility. Some evidentiary questions—those deemed conditioned on a preliminary fact—are governed by Rule 104(b)’s lower standard of
think about the reliability of this evidence?" In making a determination under this latter question, the judge may well consider proxy criteria like general acceptance and peer review but the turn to such proxies is now made in service of an independent judicial inquiry into reliability, rather than as an end in itself.7

Though Caudill and LaRue do not describe the issue in these terms, it is this shift from proxy criteria to a direct assessment of reliability that has made the judicial understanding of science into such an important matter for the admissibility assessment of scientific and other forms of expert evidence. If judges' understandings of the methods and practices of science are significantly mistaken, this decreases the chances that a judge's assessments of the validity of the expert evidence on offer in any particular case will be on the mark.

Caudill and LaRue argue that an unrealistically idealized understanding of science and how it is produced raises twin practical dangers, each the inverse of the other. They write:

[T]rial judges who have a romantic view of science tend, alternatively, to make two mistakes: sometimes they disallow good science because the scientific expert does not live up to their idealistic image of science; and paradoxically, sometimes they allow bad science on the basis of its social authority alone. In both cases, a failure to understand the practical goals and limitations of science leads to the phenomenon of a distinctively 'legal' science in the courtroom that does not match the reality in which scientists work.8

A judge may have an idealistic and unrealistic set of expectations about what science looks like when it is done right; she may expect methodological perfection and near-perfect attention to protocol. She may not understand that even a high-quality scientific study probably contains some flaws in research design or implementation, or that even careful laboratories do not always follow every protocol to a tee. She may, in other words, mistake the ordinary, routine imperfections that are part of any human process for disqualifying flaws.

By contrast, other judges may, because they idealize science, be too snowed by the category "science" to engage in serious substantive inquiry. These judges, Caudill and LaRue suggest, fall victim to a tautological fallacy: Because science gives us the truth, and because this witness is a scien-

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8. CAUDILL & LAARUE, supra note 1, at xv.
tist, this witness must be giving us the truth.9 While Caudill and LaRue are, I think, overstating here for effect, they are correct that in some instances, even post-Daubert (and ostensibly applying it), courts fail to delve beyond credentials and superficial plausibility.

Though Caudill and LaRue do not focus on this point, alongside law’s idealization of science runs an equally strong current of frustration with the use of expert evidence in court. In the closing decades of the twentieth century, expert evidence was routinely disparaged as “junk science” and the witnesses who purveyed it as hired guns, professional experts, partisans, even whores.10 Indeed, Daubert and the heightened focus on judicial scrutiny of expert claims emerged in significant part out of the anxiety that lax judicial gate-keeping was contributing to verdicts in which the fact-finder’s determination contradicted the substantial consensus of the expert community. While judges may have a romantic view of “science” writ large, when it comes to many of the actual experts that parties proffer in court, the bloom is off the rose.

I find both sympathetic and persuasive the argument that judges—and indeed “the legal system” if we dare personify such a thing—have a tendency to idealize science. And there can be no doubt that Daubert, along with the general increase in judicial scrutiny of expert evidence that it has provoked, underscores the question of how judges understand science: whether they have the competence to evaluate it rationally, and whether their methods, heuristics, instincts and abilities will permit them adequately to distinguish expert testimony that the fact-finder should hear from expert evidence that should be barred for lack of proof of validity.

However, while Daubert increased the legal consequences of the judicial idealization of science, this idealization itself is far from new. In fact, as I argue in this Article, the legal community has a long and substantial history of idealizing science within the legal sphere. It turns out that the idealization of science in court—and a concomitant on-the-ground frustration with the use of science in court—dates back just about as far as expert witnesses themselves. In fact, a close look at how expert evidence was understood in the late-nineteenth century sharply reveals a pair of beliefs that still feel remarkably familiar: confidence that scientific evidence ought to be capable of providing especially critical and reliable evidence within legal disputes, coupled with a great deal of frustration with the actual, practical use of expert evidence in court.

9. See id. at 31 (stating “[s]ome trial judges are overly deferential to scientific experts . . . ”).

10. 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 Samuel R. Gross, Expert Evidence, 1991 Wis. L. Rev. 1113 (1991). For a polemical but influential account of the problems with the use of expert evidence in civil cases, see Peter Huber, Galileo’s Revenge: Junk Science in the Courtroom (1991).
What follows, then, might be understood as offering an important pre-history to Caudill and LaRue’s useful and engaging book. In what follows, I describe in some detail how expert evidence was received roughly a hundred years ago, and how, the idealizing tendency that Caudill and LaRue identify goes back virtually as far as the modern expert witness himself. Apart from its inherent interest, historicizing this phenomenon does, I think, have some present-day consequences. Caudill and LaRue believe that only if we can achieve a clear-eyed, pragmatic understanding of scientific knowledge, its value and its limits, can we use it appropriately in court. They posit what I might call a “Goldilocks” approach to how we in the legal domain ought to understand science: We should expect from it not too much, and not too little, and then and only then will we get it just right. Truth be told, I do not even disagree with their assessment; but the long and substantial history of idealizing science makes me far less sanguine that we can actually manage such a feat. Our desire to idealize science runs, I fear, rather deep; we do not actually want science to be muddy, complex, pragmatic, methodologically imperfect and messy. When the science offered in court is all of these things, as it so often is, we therefore tend to blame the science itself, rather than our own unrealistic desires.

In what follows, I first survey the dominant criticisms of expert evidence in the closing decades of the nineteenth century, both to describe their content and to provide some illustrations of their rhetorical flavor and intensity. The following Section draws out some of the significant, and even counterintuitive, implications of how experts and scientific knowledge were understood within this period. Then, in the final Section, I briefly link this history back to Caudill and LaRue’s contemporary analysis, suggesting that the historical analysis, while enriching our understanding of our present dilemmas and our efforts to solve them, also cautions against a belief that easy answers are available.

II. Expertise in Court Before the Emergence of the Modern Expert Witness

Long before the invention of the modern expert witness, the common law legal system already had ways to harness the knowledge of people with special skills to aid in adjudication. Rather than the party-called expert witness with whom we are now familiar, the early modern British legal system made use of two methods of obtaining expert advice: (1) special juries, in which the decision-makers themselves had specialized knowledge that could help achieve a just resolution; and (2) advisors called by the court to assist either the judge or the jury in understanding the issues.

Sometimes “special juries,” made up of jurors with particular qualifications relevant to the subject matter were used as decision-makers.11 Ju-

ries made up of merchants or members of a particular guild or trade might make determinations relating to matters of trade. In a case dating back to 1351, in which a defendant was charged with selling rotten food, the jury consisted of cooks and fishmongers, well-positioned by virtue of their specialized experience to evaluate the merits of the claim.\(^\text{12}\) Foreign defendants could be tried by a “mixed jury,” partly foreigners, partly natives.\(^\text{13}\) Determinations about a woman’s pregnancy might be made by an all-female “jury of matrons.” These legal processes made use of decision-makers who themselves possessed the necessary background and skill to reach an informed judgment. Instead of having experts inform the jury, as is the modern practice, these were, in essence, juries made up of experts. As Learned Hand described the phenomenon in a well-known 1901 article on expert evidence, “the issue [was] actually decided by people especially qualified.”\(^\text{14}\)

The legal system also incorporated the knowledge of those with special skill as advisors to the court, a practice that has a substantial pedigree, dating back to at least the fourteenth century. In 1345, for example, the court summoned surgeons to help determine whether a particular wound was fresh.\(^\text{15}\) Initially, such experts were called to assist the court, rather than the jury, which typically did not hear from live witnesses. Rather, jurors had access to relevant knowledge themselves, as they were typically men of the community who may already have known the parties or may have even witnessed the incident in question themselves. To the extent they needed to supplement their knowledge, jurors sought out additional information on their own. There was thus no need for specially skilled witnesses to present facts to the jury in a formal process; indeed, there was no formal process for the presentation of witnesses at all.

Though the timeline and details of the transformation remain murky, this “self-informing” jury gradually gave way, by the sixteenth century, to a passive jury that generally lacked independent knowledge of the facts and heard from witnesses at trial.\(^\text{16}\) In some cases, the jury would hear from

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14. See Learned Hand, Historical and Practical Considerations Regarding Expert Testimony, 15 Harv. L. Rev. 40, 42 (1901) (explaining that practice of using expert witnesses was not entirely new).
15. See id. at 42-43 (noting that experts were used to determine if case should go to trial). For other early examples, see Thomas R. Forbes, Surgeons at the Bailey: English Forensic Medicine to 1878 (1985).
skilled witnesses. In a witchcraft trial in 1664, for example, the court asked Dr. Brown of Norwich—a respected man of the community and "a person of great knowledge,"—for his opinion about whether two children had been bewitched. Through the end of the eighteenth century, witnesses of special skill, including physicians and engineers, were called by the court to present their opinions and conclusions to the jury. In general, in this period, it seems to have been the judge who requested the opinion and assistance of the skilled witness, rather than one of the parties. Moreover, though such opinions were not considered binding on the jury, they usually had significant influence, particularly because they were not typically challenged through cross-examination or counter-testimony.

Over time, as legal procedures grew increasingly adversarial, lawyers began to exert more control over the process of proof. At some point, most likely in the latter half of the eighteenth century, parties began to call their own skilled witnesses. A 1782 civil case, Folkes v. Chadd, in which a well-respected engineer named John Smeaton testified on behalf of one party, is often cited as providing official judicial sanction of adversarial expert testimony, though historian of science Tal Golan convincingly argues that seeing this case as an origin story for the adversarial expert is somewhat misplaced. While calling non-percipient experts as witnesses might have been a novelty in the late nineteenth century, Golan's account establishes that Lord Mansfield, the judge in the case, did not see himself as giving his stamp of approval to a novel means of adding expert evidence, nor did he appear concerned about potential problems of partisanship.

In a similar vein, Stephan Landsman, in an

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18. See generally Landsman, supra note 17; Hand, supra note 14.
19. Landsman, supra note 17, at 137.
22. For the typical account, see J. Henry Wigmore, A Treatise on the Anglo-American System of Evidence in Trials at Common Law § 1917 (3d ed. 1940) (noting judge used word "facts" to legitimize expert's testimony).
24. See id. at 6-7.
empirical study of the use of skilled witnesses at the Old Bailey, has found that there was a resistance to partisanship on the part of experts even into the beginning of the nineteenth century:

What is most notable about the eighteenth- and early nineteenth-century materials is not dichotomous use of questioning techniques or nonobserver witnesses, which are both perfectly consistent with growing adversarial methodology, but the regular rejection, by judges and lawyers alike, of advocacy or partisanship on the part of medical experts. When an expert was perceived as an advocate, whether for conviction or acquittal, he or she was likely to be subjected to sharp attack. It was fine for barristers to be partisans—that was their assigned role. It was, however, perceived as dangerously provocative for experts to assume such an attitude.  

However, by the middle of the nineteenth century, the “reticent” expert who resisted making strong conclusions was vanishing. More and more often, both parties called skilled witnesses and these witnesses began to be seen as both partisan and partial, serving the interest of the party who called them. The battle of the experts had begun.

In the United States as well, the modern expert witness was the product of the early nineteenth century. Interestingly, the use of the word “expert” as a noun generally was not itself even typical until the nineteenth century. Witnesses with special knowledge, formerly referred to as “skilled witnesses,” became, over the course of the nineteenth century, “experts” or “expert witnesses.”

### III. The “Lowest Order of Proof”: Frustrations with Expert Testimony

The modern expert witness was, however, roundly criticized and condemned from just about the moment of its invention. Indeed, by the end of the nineteenth century, complaints about expert testimony and its abuses in the American courtroom were legion. Neither lawyers, nor judges, nor the public, nor even the experts themselves thought that the system for adducing expert testimony in the courtroom was functioning effectively. Condemnation of both experts themselves and the legal procedures involving their testimony dated back to the middle of the century, but grew ever sharper and more frequent in the 1880s and 1890s. As one

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26. For a general discussion of experts in the middle of the nineteenth century, see W. M. Best, A Treatise on the Principles of Evidence (Garland 1978) (facsimile of the 1849 ed.).

27. See, e.g., Oxford English Dictionary.

28. For a discussion of the nineteenth century complaints about expert testimony, see infra notes 29 to 35 and accompanying text.
lawyer wrote in 1899, the testimony of experts "is the subject of everybody's sneer, and the object of everybody's derision. It has become a newspaper jest. The public has no confidence in expert testimony." Explicit expert witnesses were denounced in legal journals and by the popular press. They were attacked for routinely contradicting one another, accused of confusing rather than aiding juries, and lambasted for being partisan "hired guns," paid by and thus partial to one party or the other. Meanwhile the experts themselves attacked lawyers and the legal process, arguing that the adversarial approach to evidence created disagreements out of gossamer, needlessly insulted professionals of high integrity and thwarted well-intentioned witnesses with skill and training in their attempts to help the jury reach just decisions.

Judges themselves were remarkably forthright about their frustration with expert evidence. Their opinions often reveal that they had quickly become perplexed by and dissatisfied with the too-frequent spectacle of contradictory and incomprehensible experts on the stand. As Judge Davis of the Supreme Court of Maine put it, "If there is any kind of testimony that is not only of no value, but even worse than that, it is, in my judgment, that of medical experts." Likewise, an 1892 Michigan Supreme Court case declared,

> [E]xpert evidence, while useful in many cases, is dangerous in all, and should be restricted, for the purpose of accuracy in determining the truth, which is the aim of all judicial investigation, to those cases where its use is well nigh indispensable because of questions of science or skill being involved, in which a special and peculiar knowledge is desired in order to arrive at the truth.

And an 1899 Wisconsin Supreme Court opinion wrote,

> [T]he ease with which experts can be arrayed on each side of a controversy, especially where the human anatomy and human afflictions, their cause and probable results, are the subject of judicial inquiry, and two theories be sustained by the evidence of reputable men skilled in their calling, each theory fitting with exactness the necessities of the side on which it is advanced, is an unexplainable mental phenomenon which all have experienced who have had much to do with the trial of cases. It leads to the adoption, as a rule of law, of the expression of Lord Campbell, often quoted by text writers, that skilled witnesses come with such a bias on their minds that hardly any weight should be given to

30. T. Gold Frost, Medical Expertism Considered from its Legal and Medical Standpoints, 7 Medico-Legal J. 188, 189 (1889) (citing 1 Red. Wills 101).
their evidence. It seems that if a person is called as a witness to support one side of a controversy by opinion evidence, he is quite likely to espouse such side with all the zeal of blind partisanship, to view the situation from the point of interest and necessity of that one side of the controversy with such a degree of mental concentration as to shut out of view everything not within that narrow focus, inducing a mental condition of entire incapability of giving an independent, impartial opinion, and capability only of acting in the line which the interest of the one side suggests, with as much certainty as the hypnotized follows the mental suggestion of the hypnotizer.32

Rather than being the exception, such disparaging remarks were entirely commonplace. As one commentator described, “It is amazing the number of hard things which the courts of last resort have said about expert testimony; a volume quite as large as the Illinois Statutes could be compiled of condemnatory phrases and language.”33 Even the U.S. Supreme Court called expert opinions “reveries,” stating that they were as “effective in producing obscurity and error as in the elucidation of truth.”34

The most vociferous and frequently made criticisms of expert testimony in court were, first, that partisan pressure corrupted expertise, and second, that seemingly qualified experts regularly disagreed and contradicted one another. There were a variety of other complaints as well: that the criteria judges used for qualifying experts were too lenient; that the hypothetical question was awkward, unwieldy and impractical; that opinion testimony was inherently unreliable and hard to evaluate; that experts often failed to prepare adequately or communicate effectively; and finally, that lawyers purposefully manipulated and humiliated well-intentioned experts. To be sure, these various criticisms were not always independent or distinct, and several of them are intrinsically connected. But what is most striking is both how familiar the criticisms remain to twenty-first century observers and just how universal the complaining appears to have been in the closing decades of the nineteenth century. Virtually everyone who came into close contact with the use of experts within legal processes and bothered to comment on it in a speech or in writing thought that something was deeply amiss. I am not the first to notice this array of loud complaining about experts in the last decades of the nineteenth century, nor, frankly, as a historical claim, does it require particularly careful digging or interpretive prowess to see it. Truly, anyone who spent time perusing

33. Arthur J. Eddy, What Reforms in the Nature of Expert Testimony are Advisable, 58 A.L.R. L. J. 251, 251 (1898); see also E.S. Wood, Medical Testimony, 7 Am. Law. 92, 94 (1898) (noting that “cases condemning the value of expert witnesses and cautioning the jury against paying much attention to their opinion, are so numerous that they form an entire literature”).
medical and legal journals of the period could hardly fail to notice the steady hum of annoyance with adversarial expertise.35

What is, however, far less obvious is this: At root, this deep-seated late-nineteenth century anxiety about the use of adversarial experts resulted from the belief that scientific expert testimony should have been able to be a more reliable form of evidence, a more authoritative method for adducing knowledge than the other means available in court. Instead, it was seen as an enormous disappointment, every bit as flawed as all other forms of human testimony, indeed often more so. In other words, the widespread anxiety, dissatisfaction and frustration stemmed precisely from a generally idealized understanding of science that colored the expectations of participants within the legal sphere (and to some extent scientists themselves as well). Science, it was believed, should lead to more certainty, not less. It should be able to resolve disputes authoritatively, but instead it fomented further disagreement and confusion. The nearly universal frustration with the use of expert evidence in court in this period stemmed not only from the structural foundations of adversarialism (which participants certainly recognized), but also from an idealized notion of science itself, an understanding of science as a positivist enterprise that ought to be able to provide incontestable certainties about the natural world. When scientists disagreed in court about basic claims of fact, something, it was thought, was wrong with at least one of the scientists themselves, and with the legal process that perpetually generated such disagreement.

A. Partisanship

One of the most common—and most vociferous—criticisms of expert witnesses was that they were improperly partisan. Too often an expert appeared to be a hired mouthpiece for a party’s point of view instead of an objective spokesman for scientific truth. As one commentator wrote in 1899,

The public believes that expert testimony is a hired, a purchased commodity, and that the number of experts on each side is measured by the size of the purse of the respective sides. That it is just as easy to obtain the same expert on one side as on the other, if you only “have the price.” That the expert has no conscientious scruples about the side he is on. That he doesn’t think about the side, only money.36

35. For an excellent account of the enormous frustrations surrounding the use of expert evidence in court in the nineteenth century, primarily focusing on the British experience, see Golan, supra note 23.

36. Wollman, supra note 29, at 28; see also Lucillus A. Emery, Medical Expert Evidence, 39 Am. L. Rev. 481, 488 (1905) (calling partisanship "the most prolific cause of the disrepute of medical evidence is held"); William L. Foster, Expert Testimony—Prevalent Complaints and Proposed Remedies, 11 Harv. L. Rev. 169, 171 (1897) (noting that "bias" is "probably the most frequent complaint of all against the expert witness").
Even experts themselves complained about undue partisanship as a frequent and lamentable occurrence. As one doctor wrote in an article about physicians as experts,

The physician who is not impartial has no excuse. Even allowing for the almost universal bias that causes a physician to look upon a trial as a game in which “our side” is to win, and for the bias that a large fee, unconsciously perhaps, gives him as an incentive to earn his money, it is still true that the standard in our profession, even among honest men, is not yet high enough.37

The obvious structural root of the problem was that experts were paid by the side for whom they testified, and therefore had a clear incentive to please that party. The softer version of the criticism was articulated as a risk that even experts of impeccable integrity might unconsciously be biased by a natural allegiance to their employer, especially as trials were, at root, competitive contests. The more cynical complaint was that some testifying experts were fundamentally corrupt, willing to prostitute themselves and their credentials for the sake of lucre. But whether the expert was perceived as basically honest but swayed by his zeal or as overtly willing to sell his science and his soul, the unfortunate result was the same: Experts who testified spoke not for science, but for one side or the other. The result was “an array of experts swearing for their respective clients with an unction and vehemence born of desperation.”38

Anxious pleas urging experts to steel themselves against the temptation of partisan zeal were both common and ineffective; the earnest calls to experts to imitate the impartiality of a judge, not the passion of an attorney, were no match for the adversarial structure or the hard cash that passed between party and expert.39 Jurists and experts alike insisted that experts ought to separate their participation into two distinct roles. As “expert counsel,” an expert might help the lawyer prepare and strategize about the scientific part of the case. In this role, a certain degree of partisan zeal was both expected and morally acceptable.40 However, commentators pleaded (quite ineffectually) for partisanship to give way on the

39. See, e.g., H.B. Hutchins, The Examination of the Medical Expert (Part II), 3 Mich. L. Rev. 520, 617 (1905) (noting that expert’s function is “quasi-judicial,” and that he should not be “imbued with the spirit of the advocate”); M.J. Wade, The Use and Abuse of Expert Evidence, 12 Am. Law. 118, 119 (1904); Wollman, supra note 29, at 27.
40. See, e.g., Willard Bartlett, Medical Expert Evidence: The Obstacles to Radical Change in the Present System, 34 Am. L. Rev. 1, 4-5 (1900) (making distinction between giving of testimony and aid rendered as “assistant counsel”); Emery, supra note 36, at 490 (stating that “the physician should not be both witness and adviser . . . [because] [h]is zeal as tutor is too likely to color his testimony as witness”).
witness stand to a more objective and scientific stance, in which the expert's duty was to reveal the whole truth, not only the portion that benefited the party that called him. Alas, it was nearly universally agreed that in practice, experts typically cast off their neutrality and testified as advocates instead of as analysts.

B. Contradictory Testimony

The second dominant criticism, inherently intertwined with the first, concerned the perpetual battle of the experts—warring witnesses who disagreed vehemently with one another, under oath, about matters on which it was thought that there ought to be only one right answer. Experts, critics complained, not only appeared for both sides, but routinely gave testimony that was fundamentally contradictory in every respect. Too often, courtroom attendees were "entertained with the sad spectacle of two sets of experts giving solemn testimony in direct contradiction to each other."41 As one legal journal groused in 1872, "The summoning of expert witnesses by plaintiff and defendant, like the collision of opposing rays of light, ends only in darkness."42 If one expert testified that a plaintiff's injuries would heal completely, another would testify that the same injuries would cause permanent harm. If one expert testified that a man suffered from a mental disease, another would testify that he was of sound mind.43 If one expert testified that a piece of writing was a forgery, another would testify that it was authentic. And in many instances, all of the experts would claim absolute confidence in their own opinions, avowing complete certainty that their point of view was the right one.44

Contemporaneous observers largely agreed that contradictory testimony was an enormous practical problem, but their diagnoses about its root causes differed. Some understood the cause as downright charlatanism or incompetence: "Quack experts are the bane of trials, and their testimony poisons justice."45 Others put the same critique more gently, describing how an expert could too easily become "a headstrong enthusiast, wrapped up in the narrow contemplation of his employer's cause."46 But whether they labeled it outright dishonesty or the product of excessive partisan enthusiasm, this group of commentators thought that the disagreements were due to experts testifying improperly. Experts were making

43. See, e.g., Foster, supra note 36, at 173 (describing doctors' testimony in Barker Will case).
44. See, e.g., Foster, supra note 36, at 169 (describing case in which "an equal number of doctors had testified exactly opposite to each other, and all with equal positiveness").
45. Wight, supra note 41, at 145. The author was both a physician and an attorney.
claims on the stand that were not justified by either their expertise or their science, offering partial, biased or unduly speculative conclusions instead of providing neutral and objective assessments. They believed that if only expert testimony could somehow be sheltered from partisanship and party allegiance, if only mercenary and incompetent experts could be excluded, then the perpetual disagreements could be checked. This view depended on a particular perspective about scientific knowledge or at least about those sorts of scientific knowledge used in legal cases. The underlying idea was that the scientific method, properly applied, would lead to answers about which reasonable experts ought not to disagree.

By contrast, another group of critics, though much less numerous, recognized that experts (in or out of the courtroom) might well disagree—even if they were all honest, well-intentioned, and basically unbiased. This group—whose view of science was concomitantly less idealized—understood that there could be serious and legitimate disagreements even between competent experts.47 In the words of a judge on New York’s highest court, in a paper read before the New York Medical Association in 1899, “Medicine is not an exact science. There are innumerable questions within its domain which cannot be answered with certainty, and as to which practitioners of equal ability and integrity may differ in opinion.”48 In a speech before New Hampshire’s Medical Society, another judge expressed similar views: “Yes, it is a visible truth that doctors, as well as lawyers and ministers of the Gospel, do disagree. It would be marvelous and deplorable if they did not. If there were no disagreement, investigation and experiment would cease.”49 These analysts believed that eliminating charlatans and reducing the incentives for partisanship would not, in itself, forestall disagreement. The disagreements, they thought, were produced not simply by bias, but through legitimately diverging perspectives on theoretical questions and differing evaluations within uncertain areas of knowledge. For these commentators, the problem was not simply due to partisanship, charlatanry or otherwise inappropriate testimony, but inherent to science itself, which could not, by its nature, necessarily generate consistent and definitive answers in all areas, regardless of the good faith of the experts.

Even recognizing the impossibility of achieving unanimity of opinion among party-controlled experts, this group of critics nonetheless viewed the perpetual conflict between the claims of experts as a significant obstacle to jury decision-making. Even if these divergent opinions sprung from

47. See, e.g., R. Sayre Harnden, Medical Witnesses, 4 Mich. L. J. 224, 225, 227 (1895) (noting that medicine is not “exact science” and consensus of opinion cannot be expected).

48. Bartlett, supra note 40, at 5. See, e.g., E.F.B. Johnston, Medical Expert Evidence, 37 Can. L. J. 444, 445 (1901) (claiming that “medicine is not an exact science—perhaps not so much as law.”); Emery, supra note 36, at 486 (stating that “medicine is not yet an exact science” and “its absolute truths are few”).

49. Foster, supra note 36, at 179.
good faith differences and not from greed, partisanship or charlatanism, disagreements posed a stark problem for legal fact-finders. After all, expert testimony was doctrinally permissible only on those occasions where matters fell outside of a jury's ordinary capacity and experience. Juries heard expert testimony precisely because they lacked relevant knowledge for themselves. How, then, could they possibly make sense of contradictory expert testimony when, by definition, they lacked sufficient knowledge about the topic of the testimony? This dilemma caused Learned Hand to label the use of party-controlled expert testimony "an anomaly" from which "serious practical difficulties arise."50 "The trouble," he wrote, 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 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.51

Learned Hand's proposed solution to the structural dilemma of expert testimony in a lay jury system was to create a system for neutral, court-appointed experts—an advisory tribunal that could deliver to the jury "those general truths, applicable to the issue, which they may treat as final and decisive."52 In fact, variations on this solution were favored by a great many commentators frustrated with the perpetual spectacle of expert testimony in fundamental conflict. Calls for mechanisms for selecting neutral experts, to be appointed by either the government or the court, to replace (or to supplement) party-controlled expert witnesses, were commonplace.53 While neutral experts could well have allayed many of the concerns about partisanship, there was, nonetheless, a tension in this proposed solution—especially for those whose conception of science was more nuanced and less idealized, those who did recognize that even scientists of integrity might well reach divergent conclusions. If such disagree-

50. Hand, supra note 14, at 50.
51. Id. at 54-55. For a more recent version of this criticism vis-à-vis present-day expert testimony, see Scott Brewer, Scientific Expert Testimony and Intellectual Due Process, 107 Yale L.J. 1535 (1988).
52. Hand, supra note 14, at 55.
53. See, e.g., Clemens Herschel, Services of Experts in the Conduct of Judicial Inquiries, 21 Am. L. Rev. 571, 577 (1887) (claiming that "the only remedy" is to begin to use judicially-called experts); Kinne, supra note 38; Henry Mott, Expert Testimony, 11 Medico-Legal J. 44, 45 (1893) (advocating that judges be permitted to elect board of experts for each area of science that would testify at trial); J.B. Ransom, M.D., Medical Expert Testimony, 16 Medico-Legal J. 30, 31-34 (1899) (advocating that experts be selected by court rather than by parties); Emory Washburn, Testimony of Experts, 1 Am. L. Rev. 45, 61-62 (1867) (same); Wood, supra note 33.
ments were legitimate, resulting from genuine uncertainty or differing theoretical perspectives, the use of "neutral" experts could not, in fact, eliminate them. In that case, one of two things would result. The "neutral" expert might give only one point of view to the fact-finder—that is what Learned Hand seems to have envisioned when he spoke of "general truths . . . final and decisive"—in which case, an alternative plausible scientific viewpoint would be kept from the ears of the jury. Disagreement would be masked and the science would appear certain, but only by muffling a legitimate dissenting perspective. Alternatively, the "neutral" expert might explain the conflicts that led experts to different conclusions and describe the varying points of view. But in this case, the jury would face the same dilemma: familiar contradictory claims and no legitimate epistemological mechanism for selecting between them.

Occasionally, turn-of-the-century commentators recognized this difficulty with the use of "neutral" experts. More often, however, even those who thought that disagreements could be the result of genuine uncertainty nonetheless reverted, to some degree, to an idealistic positivism and saw neutral, court-selected experts as a solution to the crisis of expert testimony. Though there were some faltering legislative efforts to implement systems for the use of court-appointed experts, especially in the first decade of the twentieth century, dramatic change in the methods for adding the testimony of experts never did come to pass. And in fact, concerns about the partisanship of experts and their perpetually contra-

54. An exclusion of this sort would, in fact, create constitutional difficulties in criminal cases, as it would arguably impinge on a defendant's right to mount his defense. Turn of the century commentators recognized this potential problem, albeit rarely. See, e.g., Anonymous, Physicians as Witnesses, CHI. LEGAL NEWS, Jun. 6, 1908, at 344.


56. A number of state bar associations seriously investigated the possibility of creating a system for neutral experts, several states introduced bills on the topic, and at least two states, Michigan and Rhode Island, actually passed limited versions of such bills. For discussions of the various bills proposed, see Report of the Committee on Laws, MD. ST. B. ASS'N 34, 37-49 (1909) (proposing bill that would require Maryland judges to appoint medical expert witnesses in each jurisdiction; Report of the Committee on the Regulation of the Introduction of Medical Expert Testimony, N.Y. B. ASS'N 367, 367-406 (1909) (proposing bill to regulate expert testimony); Report of Committee on Medical Expert Testimony, VA. B. ASS'N 62 (1910) (proposing bill that would allow judges to appoint medical expert witnesses); Emery, supra note 36, at 492-93 (urging legislation for court-appointed witnesses); Anonymous, Expert Testimony, 14 VA. L. REG. 888, 888-89 (1909) (describing New York's proposed bill and urging similar one for Virginia); Foster, supra note 36, at 182-83; Edward J. McDermott, Needed Reforms in the Law of Expert Testimony, 1 J. AM. INST. CRIMINOLOGY 698, 703-04 (1911) (describing legislative reforms proposed unsuccessfully by author in Kentucky). For criticisms of these proposed reforms, see William Schofield, Medical Expert Testimony: Methods of Improving the Practice, 1 J. AM. INST. CRIMINOLOGY, 41, 45-52 (1910). Though the reasons for the failures in the reform plans were many, three of the most significant were: (1) the resistance of most trial lawyers to procedures that would limit their control over the presentation of proof; (2) the lack of an obvious administrative entity for appointing and
dictory testimony remain prevalent today and indeed form a critical part of the intellectual foundation that led to the Supreme Court’s Daubert opinion and the increasing academic and practical focus on the use of experts in court. It and today, still, while there are mechanisms available by which a court may appoint an expert or a technical advisor, the fact of the matter is that the use of such procedures remains exceedingly rare.

C. Other Complaints

While the most dominant concerns were partisanship and the constant disagreements among experts, late-nineteenth century observers of and participants in the legal system had a host of other gripes about expert evidence as well. Many believed that courts were too lenient in qualifying experts, too often permitting the testimony of those who were not truly expert in the relevant area. Just how expert did an expert have to be in order to present his opinion in court? There was no clearly designated quantum of study required, nor even any guidelines describing a sufficient experience level. As the Pennsylvania Supreme Court wrote, “An expert, as the word imports, is one having had experience. No clearly defined rule is to be found in the books as to what constitutes an expert. Much depends upon the nature of the question in regard to which the opinion is asked.” The key inquiry for the judge was whether the person had sufficient knowledge and experience to plausibly be able to render an opinion on the matter in question. And the decision whether to admit a particular person as an expert was generally seen to be within the trial judge’s discretion, not subject to scrutiny or reversal on appellate review.

The result, naturally enough, was that parties’ experts did not always come from the ranks of the prestigious. As one commentator wrote in 1893, “adverse criticism” of expert testimony “lies largely in the loose way in which the trial court admits it.” He proposed that expert testimony should be permitted only when the matter for expert analysis was directly relevant, and, even more important, only when “the witness presented as an expert is really such.” Experts themselves—presumably those experts who believed themselves safely on the proper side of the line that divided the genuine experts from the soi-disants—sniffed that better regulations of the

57. For a taste of the voluminous literature that touches on these concerns, see Huber, supra note 10; Jasanoff, Science at the Bar: Law, Science, and Technology in America (1995); Brewer, supra note 51; Gross, supra note 10.
59. Wigmor, supra note 22, at § 555.
61. Id. at 307.
credentials of those appearing in court could prevent many of the worst excesses.\textsuperscript{62}

Hypothetical questions, the archetypal form of the in-court examination of experts, also came under significant criticism. Experts were special witnesses in the sense that certain of the ordinary rules of evidence did not apply. They were, for example, permitted to give opinions and conclusions to the jury, while lay witnesses were expected to limit testimony, as much as practicable, to matters of direct sensory perception. While experts' opinions and conclusions did have to be based upon facts introduced into evidence, the expert himself did not need to have personal knowledge of these underlying matters. The mechanism by which the expert could be informed about the relevant matters outside his personal knowledge was the hypothetical question. An expert could be asked a question that took the form, "If you assume A, B, C, and D, what would be your opinion?" and could provide a conditional response—a conclusion dependent on a preliminary finding that A, B, C, and D were, in fact, true. Admissible evidence needed to support that inference of truth, but the expert did not have to possess actual knowledge of any of the presuppositions.

Elegant in theory, hypothetical questions had become unwieldy and troublesome in practice and experts found them especially vexing. John Henry Wigmore accurately captured the view of many experts when he mused, "It is a strange irony that the hypothetical question, which is one of the few truly scientific features of the rules of Evidence, should have become that feature which does most to disgust men of science with the law of Evidence."\textsuperscript{63} One expert referred to them as "veritable curiosities, so peculiar are they in their monstrosity."\textsuperscript{64}

Why were such questions so despised by those subject to them in court? Hypothetical questions were often absurdly long and complex, so that asking the question itself would take up many minutes.\textsuperscript{65} In fact, they often seemed to the listener to provide testimony more from the attorney than from the testifying expert. The lawyer might ask an extraordinarily long-winded question, essentially summing up all the evidence supporting

\textsuperscript{62} See, e.g., Persifor Frazer, \textit{Experts and Their Testimony}, 46 Am. L. Reg. 735 (1898) (suggesting need for new definition of expert that would exclude charlatans).

\textsuperscript{63} Wigmore, supra note 22, at § 686. Learned Hand, too, admired the hypothetical question, calling them "by no means so bad a method of ascertaining the truth as physicians and other experts insist." Hand, supra note 14, at 53 n.2.


\textsuperscript{65} For examples of lengthy hypothetical questions, see Charles E. Rosenberg, \textit{The Trial of Assassin Gutteau} 144-45 (Univ. of Chi. Press 1968) (quoting lengthy and partisan verbatim hypothetical question asked of Dr. James Kiernan in 1881); Davis v. Traveler Ins. Co., 52 P. 67, 67 (Kan. 1898) (complaining in dicta of hypothetical question that would take four printed pages to reproduce and that was "burdened with such prolixity of detail, as to be confusing, rather than enlightening").
his side item by item (and most likely ignoring the evidence of the opposing party). After a monumentally detailed, fact-laden, complicated question, the expert was expected to respond with a simple “yes” or “no.”\textsuperscript{66} Much of the time, the poor expert was not even allowed to disagree with one or more of the hypothetically assumed facts, nor was he permitted to inform the court and jury of important queries that had been excluded from the hypothetical. Experts despised such questions as straitjackets. They hated having to take the hypothetical as given instead of being able to adjust some of the assumptions or add nuance to the matters that had been assumed.\textsuperscript{67} The facts as presented in the hypothetical risked being “true as far as they go; but so connected with others that by themselves they import[ed] an untruth.”\textsuperscript{68} They therefore came to be seen as a “menace to the fair ascertainment of truth,”\textsuperscript{69} rather than as a useful way to frame the key matters at issue.

A third source of exasperation derived from the fact that expert evidence was typically opinion testimony—statements of belief rather than eyewitness observations. First, as a practical matter, such opinion testimony was not subject to the laws against perjury.\textsuperscript{70} To be sure, there was no formal “expert” exemption from the laws against perjury, but even when an expert’s testimony exceeded the bounds of scientific reasonableness a perjury charge was not typically a viable possibility. No matter how preposterous the opinion expressed, how could it actually be proved that the expert did not in fact believe it? Moreover, some worried that opinion testimony threatened to usurp the function of the jury, for if the witness gave his view on the fundamental issue at stake in a case, he was essentially telling the jury how it ought to decide.\textsuperscript{71} Though testifying directly to the ultimate issue was prohibited under the common law rules of evidence, opinion testimony often veered extremely close to the ultimate question at issue in a case, in substance if not in form.

\textsuperscript{66} Mason, supra note 64.

\textsuperscript{67} See, e.g., Wigmore, supra note 22, at § 686 (describing how hypothetical question “has artificially clamped the mouth of the expert witness”); Harnden, supra note 47, at 228-29 (describing that author invariably refused to answer hypothetical questions because they were improperly formed).

\textsuperscript{68} C.H. Reeve, An Honest Expert, 1 IND. L. J. 100, 103 (1898).

\textsuperscript{69} Wade, supra note 39, at 121; see also Anthony, supra note 37, at 15; Emery, supra note 36, at 488 (condemning hypothetical questions); Hutchins, supra note 39, at 597-98 (noting that hypothetical questions are too often long, complicated and confusing); Kinne, supra note 38, at 205 (complaining about lengthy and incomprehensible hypothetical questions); Denis O’Brien, Opinion Evidence, 1 COLUM. L. REV. 180, 183 (1901).

\textsuperscript{70} See, e.g., Johnston, supra note 48, at 448 (noting that experts are “beyond the reach of the law as regards perjury”); McDermott, supra note 56, at 698 (noting that there is “practically no chance to punish [an expert] for swearing to an unsound theory or for misstating his real opinion”); Wood, supra note 33, at 93 (noting near “absolute immunity” of experts to charges of perjury).

\textsuperscript{71} For discussions of these issues, see H.B. Hutchins, The Examination of the Medical Expert (Part I), 3 MICH. L. REV. 520, 532-38 (1905).
Others complained that too often experts were inadequately prepared by counsel for their role. An insufficiently prepared expert risked failing to “keep quite as cool as he should,” which would lead to “self-contradictions and apparent absurdities.”72 Other critics grumbled that testimony was less effective than it might be because experts would frequently use jargon and technical terms that the jury could not understand.73 As one judge advised would-be experts, “Do not use mysterious terms and high-sounding language. There may arise a suspicion in the mind of the court that you are trying to cover up some weak spot in your own . . . equipment. Sacrifice elegance and even some consistency in the desire to be intelligible.”74 One expert advised his colleagues not only to avoid technicalities, but that “illustrations should be homely and apt: capable of easy grasp by the jury’s minds, and if possible taken from scenes familiar to the jury in their daily lives.”75

Finally, many experts as well as some legal commentators blamed the woes of experts upon the craftiness of lawyers. As one physician complained, lawyers too often went beyond what was justifiable to support their clients, and “attempt[ed] to distort truth . . . . Because of the methods, however, of many attorneys of reputation, it is difficult to express in court one’s real opinion, hence the medical witness is forced to tell half truths, answer in monosyllables and reply to hypothetical questions framed to mislead.”76 Experts thus saw themselves as victims of unscrupulous attorneys who wielded magical legal tools (like cross-examination) to make even honest witnesses look like charlatans.77 As one prominent Boston physician described it, “It is the duty of a witness on the stand to state the truth. It is the business of legal counsel to distort and suppress the truth, except so far as it suits their own purpose.”78 According to another, testifying was “an ordeal,” the witness

liable to be browbeaten by ingenious and unprincipled counsel or be entrapped into statements seemingly contradictory by artfully devised questionings . . . . In a word a doctor is apt to look

72. Noble, supra note 60, at 310.
73. See Eugene C. Foster, Weak Points in Expert Testimony, 63 ALB. L.J. 277, 277 (1901) (wondering if expert would be more effective if “he clothed his convictions in words that could be recognized by those to whom he speaks”); see also Wade, supra note 39, at 119-120; M.J. Wade, The Office of the Expert Witness, 1 Am. L. SCH. REV. 225, 227-29 (1904) (describing at length that expert will not be effective unless he develops “vocabulary for the witness chair” that is more comprehensible to jurors).
75. Mason, supra note 64, at 210-11.
76. Anthony, supra note 37, at 15.
77. See, e.g., Herschel, supra note 53, at 571. For British examples, see Golan, supra note 23.
78. James Mohr, Doctors and the Law 103 (Oxford Univ. Press 1993) (citing 24 Boston Medical and Surgical Journal 123 (1841)).
upon a lawyer as his natural enemy, against whom his only defense is that of a hare against the hound, viz., flight. 79

Even some lawyers agreed that part of the problem with expert testimony was the typical method for adducing opinions based on partial facts. Lawyers often "brow-beat, belittle, and humiliate" experts, one member of the legal profession sheepishly acknowledged. 80

In sum, nearly everyone who came into contact with the use of experts in the adversarial courtroom was dissatisfied, and nearly all thought there was plenty of blame to go around. Whether critics primarily blamed the experts for letting partisanship trump scientific rationality or placed central blame on the attorneys for conniving to thwart nuanced testimony or to embarrass honest experts, they all agreed that expert testimony in court was most unsatisfactory in practice. Few would have disagreed with E.S. Wood's conclusion, written in 1899, that the American system of dealing with expert testimony "is clumsy, crude and unphilosophical, and tends to the disgrace of justice." 81 Contemporary observers understood this crisis of expert testimony as resulting, fundamentally, from two insurmountable problems: (1) the seeming incompatibilities between the adversarial legal processes and the nature of scientific inquiry, and (2) the distorting power of Mammon on would-be expert witnesses.

This account of the poor reception of the methods for using expert testimony has been both abbreviated and conceptual, focusing on the concerns expressed by legal writers of the period. Other scholars have also examined the anxiety-ridden relations between experts and the legal system over the course of the nineteenth century, and though they have not generally laid out the concerns seriatim or conceptually, each has also recognized the vexatious frustration felt by would-be expert witnesses, legal commentators and judges alike. 82 Indeed, it would be well-nigh impossible to read the voluminous literature produced by experts and lawyers in medical, legal and scientific journals in the period without coming to realize that dissatisfaction was substantial and widespread. There was a profound and wide-ranging crisis of expertise in the late-nineteenth century courtroom.

80. Eddy, supra note 33, at 251.
81. Wood, supra note 33, at 95.
82. For an extremely helpful account of the strained relations between the medical and legal systems in the nineteenth century, focusing in particular on the perspective of the doctors themselves, see Mohr, supra note 78. For an excellent account of these issues in the British context, see Golan, supra note 23. For an article that explicitly draws some of the connections between Victorian attitudes toward experts and contemporary notions, see Christopher Hamlin, Scientific Method and Expert Witnessing: Victorian Perspectives on a Modern Problem, 16 Soc. Stud. Sci. 485, 488-89 (1986).
IV. Implications in the Crisis of Expertise

A. The Rise of Expert Testimony

In this Section, I draw out two important aspects of this crisis—aspects that are suggested by the contemporaneous writings, but that are rarely stated directly within them. First, I emphasize the increasing routinization and frequency of use of expert evidence over the course of the nineteenth century, even as the chorus of criticism of experts intensified. Second, I call attention to the divergence between the idealized vision of scientific objectivity and authority and the practical realities of its use in the courtroom. Even as lawyers, judges and experts complained vehemently about the abuses of expert testimony in the courtroom, expert testimony was simultaneously becoming a more significant mode of legal proof, both in terms of its frequency of use and in terms of its perceived epistemological potential. In fact, the idealization of science was a significant, if rarely recognized, source of the tremendous dissatisfaction with its use in actual practice. It was precisely because of what science was thought to be able to offer to the process of legal decision-making that the sad, confusing spectacle of warring experts provoked such frustration and anger.

The near-universal criticisms of expert evidence in the closing decades of the nineteenth century need to be understood in conjunction with a critical fact: even as complaints about expert testimony grew, so did its general use in court. Understanding the social meaning of the complaints requires the recognition that the apparent dissatisfaction with expert testimony among judges and experts alike did not diminish its use one whit. Rather, as the chorus of complaints grew louder, the use of expert evidence in court grew ever more common. While at the beginning of the nineteenth century, the testimony of experts was still not an everyday event, by the turn of next century, it had become quite ordinary. As just one sign of its growing importance, several treatises devoted entirely to expert evidence were published in the 1880s and 1890s. Although treatises on evidence in general had become commonplace by this point, these were the first volumes to devote themselves entirely to expert and opinion evidence.

Another enormously rough but nonetheless suggestive indicator can be found in the number of cases that mention experts or skilled witnesses in the Century and Decennial digests, a compendium of nearly all federal and state cases reported, as well as in the regional reporters, after they began recording cases in the late 1880s and early 1890s. From 1851 to

83. Landsman, supra note 25, at 450-53 (describing how in Old Bailey records, only small number of cases—on the order of a dozen or so of the several hundred heard per year—involved medical experts).

84. See, e.g., John D. Lawson, The Law of Expert and Opinion Evidence Reduced to Rules (Bancroft-Whitney 1886); Henry Wade Rogers, The Law of Expert Testimony (1883). Each was popular enough to warrant a second edition as well.
1860, there were 252 such cases, while in the final decade of the century there were 2160.85 In a 1910 article, a Massachusetts judge claimed that in 1909, 660 of the 1146 cases actually tried in the Massachusetts Superior Court were personal injury cases, and he noted that one or more experts testified in virtually every such personal injury case.86 If his numbers are accurate, they suggest that experts testified in at least 58 percent of all cases heard before the Massachusetts Superior Court that year! This count may, in fact, even underestimate the true frequency of use, for it fails to include any non-personal injury cases, in some of which experts also surely testified.

Moreover, contemporary observers sometimes recognized, though in an off-hand way, that expert evidence was increasing in both use and significance. As one attorney wrote in 1898, "in spite of everything, its uses are on the increase."87 An editorial in the widely-read journal, The Green Bag, noted, "We live in an age which is gradually awaking to the value of expert opinion in every department of life," speculating that it would "play a part of growing importance in the trial of every description."88 Another turn of the century writer noted that "notwithstanding the prejudices of the courts and the profession, and the unfavorable criticism of the public it may be said the practice of bringing to the aid of the Court or jury expert knowledge . . . concerning certain disputed questions of fact has grown rather than diminished."89 The increase, like most matters of common knowledge, was not much commented on, but there can be little doubt that expert testimony was being used ever more frequently, even amidst the outcry over its inadequacies.

Note, also, that despite the chest-beating and frustration about expert testimony in practice, no one seriously thought that eliminating expert testimony was even an option. Emory Washburn, a well-known Harvard law professor, asked,

85. These numbers provide an interesting glimpse of the increase, but they must be viewed as nothing more than vaguely suggestive. First, they mostly represent appellate cases, since few states report trial court decisions. Evaluating on-the-ground evidentiary trends from appellate records is a tricky and uncertain business, for of course, the appellate cases only reveal those matters deemed worthy of appeal by one party or another. Moreover, appellate jurisdiction, in general, increased over the second half of the nineteenth century, and reporting practices grew more consistent. In addition, some of the increase may represent overall increase in litigation, rather than an expert-specific increase. Despite these imprecisions, it seems reasonable to assume that the more than eight-fold increase in the number of appellate cases suggests at least some degree of increase of use of experts in trials as well.

86. See Schofield, supra note 56, at 44 (discussing expert testimony in personal injury cases in 1909).

87. Endlich, supra note 55, at 852.

88. Editor's Bag, Medical Expert Testimony, 21 Green Bag 83, 84 (1909).

89. O'Brien, supra note 69, at 181.
Are we to throw away the lights of science in the investigation of these subjects? In the multiplication of interests connected with the application of the laws of science, which are daily growing more numerous and refined, it is hardly possible to dispense with that kind of knowledge in determining the rights of parties.90

Another critic commented, “The search for truth, unaided by the knowledge and judgment of scientific and medical experts, would be utterly hopeless.”91 Thus, those who complained bitterly about expert testimony understood that it had become a permanent and quite necessary feature of the trial. The increasing concern corresponded with, and partly stemmed from, the increasing frequency of use. By the turn of the century, both expert testimony and criticisms of expert testimony were equally well entrenched.

This recognition of the increasing importance of expert evidence and its increasing frequency of use complicates some of the historical claims that other scholars have made. To take one example, historian of medicine James Mohr, in his generally impressive account of the relations between physicians and the legal system over the course of the nineteenth century, noted that in the first decades of the nineteenth century, many physicians “actively sought opportunities to participate in jurisprudential undertakings,”92 while from the 1850s onward, “physicians were consciously avoiding jurisprudential situations.”93 Certainly individual physicians may well have chosen not to consult as experts for fear of the battering they might receive while on the witness stand. But recognizing the general increase of expert testimony over this period shows that while experts may have been unhappy with their treatment at lawyers’ hands and while some of them may have begun to refuse consulting as experts after such unpleasant treatment, plenty were electing not to opt out of legal participation.94 Rather, the increasing frequency of expert testimony reveals, that in fact, even as prominent physicians gave speeches and made pronouncements about the sorry state of medico-legal relations, large numbers of physicians and other experts willingly continued to provide testimony.

90. Washburn supra note 53, at 59-60.
91. Foster, supra note 36, at 175.
92. Mohr, supra note 78, at 52.
93. Id. at 102.
94. I am ignoring here an issue that received a good deal of attention among physicians in the second half of the nineteenth century: compensation for their time and energy as witnesses. Suffice it to say that in many states, a physician could be subpoenaed and forced to testify for nothing more than ordinary witness fees. Thus, a physician could not necessarily have avoided testifying, even had he wanted to. However, forcing experts to testify by subpoena (unless they were percipient witnesses, people with direct knowledge of relevant matters, such as a treating physician in a case) was not typical. More often, lawyers hired experts as consultants at an agreed-upon (and often significant) level of compensation. See generally Id. at 197-212.
More broadly, Mohr’s account tells the story of a glorious vision for medicine and law that failed to materialize. He writes that physicians in the early republic believed that they could, in essence, serve the nation by serving justice. The early leaders in medical jurisprudence—men like Benjamin Rush and Theodoric Beck, author of the monumental *Elements of Medical Jurisprudence*95 shared a civic republican dream of “a society guided by the cooperative interaction of scientific physicians, broad-minded attorneys, and the people’s representatives working through the state.”96 They imagined that they could be messengers of scientific medicine in broader public arenas, from the courtroom to the legislature, and they imagined, further, that medical jurisprudence would be a key part of every well-trained physician’s education.

Over time, however, leaders of medicine grew disillusioned. They were made weary by the public’s lack of willingness to provide any state support or funding for medico-legal matters, were worn down by the increase in malpractice suits and were exasperated and angered by the vitriolic battles in the courtroom.97 In the early decades of the century, medical jurisprudence seemed to be a field of great intellectual excitement and practical potential, and in the 1820s and 1830s, it rapidly grew in importance both within the fledgling medical schools and in terms of professional practice. But starting from the 1850s, it became ever more marginalized. By 1900, Mohr reports, “public-spirited medical jurisprudence . . . cross-professional and broadly conceived, had all but disappeared.”98 The holistic, integrated vision and the civic-republican dream had been forsaken and replaced by a bleaker, consumerist model of the medical profession. Physicians “would henceforth train to serve the specific medical needs of individual paying patients and stay away from the law, except insofar as they needed to know how to defend themselves against its incursions.”99

Mohr’s account persuasively describes the growing disillusionment of physicians and the abandonment of their idealistic conception of medical jurisprudence. But his perspective is exclusively that of the physicians themselves. He fails to look at the transformations in law and medicine from the legal perspective. The result is that he only focuses on one half of the story, revealing the growing cynicism and disappointment of physicians, while failing to emphasize their ever-increasing role in both ordinary and extraordinary trials. He provides a compelling account of how medical jurisprudence—both as an intellectual ideal of medicine integrated with public service, and as an area for growth and prestige in the medical academy—first blossomed and then wilted. But he does not draw...

96. *Id.* at 89.
97. *See generally id.*
98. *Id.* at 237.
99. *Id.* at 249.
attention to the fact that the field wilted precisely as medical and other forms of expertise became increasingly common as a mode of evidence within the courtroom itself. Mohr provides an account of physicians' changing attitudes toward the law and the legal system, but not of their behavior within it.

Recognizing the increased frequency of expert testimony recasts the frustrations of the expert and legal communities. We can see that the level of frustration was mounting precisely as the role of experts in the courtroom was growing more prominent. It suggests that it may in fact have been the growing importance of expert testimony itself that caused so many medical and legal commentators to complain about its imperfections. The role of the expert witness had become significant enough to be worthy of attention and complaint. The myriad of commentators from both the legal and medical communities who penned their harsh critiques were bemoaning what had become an ordinary practice, indeed one important enough to deserve both analysis and reform.

B. Idealization of Expert Testimony

I turn, now, to a second implication that lies buried within the array of criticisms made by nineteenth century lawyers, experts and judges. As we have seen, lawyers and judges railed against expert testimony. They claimed that it was rightly the object of sneers and derision, that it was dangerous and inaccurate and that juries should listen to it with suspicion. On their face, these criticisms suggest that expert evidence was seen as a particularly low order of proof, an especially poor mode of adducing evidence. Judges, indeed, often said as much explicitly.

And yet, perhaps counter-intuitively, I want to make the opposite argument. I want to suggest that in the nineteenth century, expert testimony was actually seen to offer the potential for a particularly authoritative mode of evidence, a kind of knowledge that could have been and should have been far superior to that of mere eyewitnesses. The widespread frustrations directed at expert evidence stemmed precisely from the divergence between these grandiose and idealized expectations associated with scientific evidence and its typically limited capacity in actual practice. Critics' frustration stemmed from the failure of expert evidence to live up to its potential and from the enormous gap between the ideal and the real. The condemnatory attitudes of judges and lawyers were the products of acquired disappointment rather than epistemic disdain.

We can see this first by returning for a moment to the substance of the criticisms levied against expert testimony. As we have seen, one of the central and perhaps most important complaints was that experts perpetually disagreed. To be sure, some writers attributed this constant contradiction to the imperfect state of knowledge within medicine. Most, however, seemed to perceive that something was wrong when experts disagreed. To cite just one example of this commonly articulated viewpoint, Justice Gray
of New York wrote, "The frequent spectacle of scientific experts differing in their opinion upon a case according to the side upon which retained tends much to discredit such testimony." The fact of disagreement was a spectacle that discredited testimony. In other words, unlike ordinary testimony, expert evidence really ought to have been consistent, or so Justice Gray believed. And it ought to have been consistent precisely because science was thought to be capable of producing certain knowledge, consistent answers—in short, indubitable truth. The frustrated complaints about disagreeing scientists only make sense when we recognize that those who complained had an idealized conception of the objectivity and certainty that science ought to have been able to provide.

After all, ordinary witnesses, even eyewitnesses to an event, frequently disagreed, contradicting each other on points large and small; and yet, while causing irritation and even frustration, this provoked neither fury nor angry speeches nor calls for reform. In fact, some amount of contradictory evidence was practically presumed by the need for a trial itself. If there were no conflict over the proof, there would be no need for a fact-finder to make a determination. Whole books were written in the late-nineteenth century on the methods for determining facts. Charles C. Moore's Treatise on Facts, for example, included detailed descriptions of "incredibilities and improbabilities" that could easily not be believed by a jury even if no other witness testified directly to the contrary, as well as extensive discussions of the credibility of witnesses and the possibilities for perjury and mistakes. James Ram's Treatise on Facts, first published in the United States in the 1860s, devoted many pages to describing how to evaluate whether a witness's statements deserved credit and belief. The point here is simple: ordinary testimony was frequently conflicted, and, while such conflicts forced juries to assess credibility and decide who to believe, no one saw this disagreement as either a serious predicament or an institutional failure. On the other hand, when experts disagreed, it was cause for alarm, as if something about the testimony had gone fundamentally awry. There were, it seems, a distinct set of expectations for expert witnesses that those witnesses routinely violated.

Occasionally, commentators attempted to defend expert testimony on the ground that it was, in fact, no worse than ordinary testimony: Experts might disagree, but so might ordinary witnesses. As one author wrote:

[All opinion or expert testimony has been much discredited on account of the unseemly and loquacious wrangling which results from its introduction . . . . But, after all, the objections that have been so often and so forcibly urged to this kind of evidence apply in a great measure to the narration of facts and all human testi-

100. People v. Kemmler, 119 N.Y. 580, 583 (N.Y. 1890).
101. 1 CHARLES C. MOORE, TREATISE ON FACTS 179-230 (1909).
102. Id. at 1125-1223 (discussing possibilities of witness error).
103. See JAMES RAM, TREATISE ON FACTS 154-209 (3d Am. Ed. 1873).
mony. The witness who testifies to a fact may be ignorant, or interested, or willfully false or mistaken. It is entirely safe to assert that justice is quite as frequently perverted by a false, mistaken or colored statement of facts from witnesses as it is in consequence of all the objections that have been or can be urged against the opinions of experts . . . 104

Another judge commented in a similar vein:

And after a man has sat for years in a courtroom, and has heard in nearly every trial lay witnesses, whose integrity is unquestioned, directly contradict each other as to plain facts observed by them, he develops a feeling of charity for those who, in the field of inference and surmise, occasionally run counter to their brothers. 105

But most critics were not convinced by this defense of experts. They were not satisfied with the notion that experts were like ordinary witnesses, subject to "the same errors of judgment as befall the rest of professional humanity," 106 capable of differences of opinion, faulty memory, lapses of judgment and downright mistakes. As one physician wrote:

[T]he plane to which the medical deponent and expert has at last gravitated is at best but little above that of the ordinary if not partisan witness. The light of scientific truth he sheds is even sometimes suspected as coming with bent and refracted rays through the distorting lens of self-interest and a paid opinion. 107

To this commentator, for the expert to be reduced to the level of an ordinary witness was faint praise indeed. "The light of scientific truth" should have been able to shine directly into the courtroom without being distorted by human weakness. As Recorder John W. Goff, a judge in New York, put it:

Science is the knowledge and the demonstration of truth . . . . [T]here are at least certain elementary principles which govern, and which honest and enlightened men must agree upon. What a spectacle it is to see two sets of medical witnesses at absolute variance with each other upon the same state of facts. 108

And Judge Kinne of the Iowa Supreme Court called expert wrangling "a reproach to the profession which they represent" and "a libel on sci-

104. O'Brien, supra note 69, at 180-81.
105. Wade, supra note 39, at 226.
106. Mason, supra note 64, at 212.
107. Kinne, supra note 38, at 204.
ence."  That ordinary witnesses might disagree could not justify the shameful contradictions among scientists and medical experts.

Legal commentators did not often write directly about what they expected from experts and from science, but occasionally, commentators on the problems of expert evidence did provide some description of what they thought expert evidence ought to be like. For example, Charles G. Garrison, a New Jersey Supreme Court judge, penned the following rhetorical question in 1889:

Brought in contact as medical experts are with the judiciary and the bar professionally, with parties and with juries representing the laity and speaking as it were in the ear of the whole medical world, do we or do we not find that their deliverances are received by the courts as authoritative—that advocates deem them calm and unbaissed [sic] representatives of science—that juries rely with confidence upon their utterances and that the profession of medicine delights to point to them as the accredited spokesmen of its great truths?

The proper answer, obviously, was “no,” their deliverances were not seen as authoritative, nor were they considered the accredited spokesmen of truth incarnate. But from the very wording of Garrison’s question we can infer that he believed that experts should have been able to make authoritative pronouncements and to provide great truths upon which juries could confidently rely. John Patterson, a Michigan lawyer, wrote in 1899:

The genuine medical expert has honesty, sincerity and love of truth and justice mixed in with his learning in skill. He is diligent in his examinations, and exhaustive in his research. He bases his opinions upon scientific authority and experience; and for such opinions, formulated by an intellectual process and not by caprice or passion, he is prepared to give a sound reason. Such a witness is prepared for rigid cross-examination. The competent, truthful and self-possessed expert witness can always stand the test of a searching cross-examination. Truth is like pure gold; the more it is burnished the brighter it becomes.

Real scientific truths, the sort of evidence that ought to be provided by experts, should have been able to emerge unscathed from the rigors of cross-examination, or so it was believed.

Emory Washburn, a prominent Harvard law professor with a significant interest in medical jurisprudence, had a similar perception of the heights to which the testimony of experts ought to reach, if only neutral,

court-appointed experts could be substituted for the partisans who perpetually disagreed. He wrote:

The place of an expert, instead of being, as it sometimes seems to be, that of a prize-fighter in a ring, would be elevated to one of dignity and importance, as that of a minister of equal and impartial justice; and would command the respect with which true science, even in the common affairs of life, is always regarded. Science and learning, as the means and handmaids of knowledge, would hereby become the honored and inseparable auxiliaries to truth, in the development and application of law to the multiform rights and interests of civil society.  

Judges and legal analysts had an image of science as a method for adducing reliable truths, a method that should have been able to produce certain evidence and unconflicting proof of facts in the legal arena. Scientific evidence should have been "a substantive fact[,] ... impersonal," rather than varying and conflicting depending on the speaker. Expert witnesses should have been able to set themselves "apart from human sympathies and become only scientific mouthpieces." When occupied by such an expert, the witness box would become "an exalted and honorable throne in the realm of truth," for the expert's "recognized and enlightened conclusions are as much matter of fact as the law of gravitation and the motion of heavenly bodies." Science should have been able to provide proof that was compelling, unshakeable, even overwhelming. One writer described the extraordinary effectiveness of scientific evidence at its best: "The darkened court room; the awed silence of the assembly; the intense mental strain on those more deeply interested; the awful force of the blow to the guilty man when he first beholds the evidence of his crime illuminated by the light of scientific test."

We thus see that to take the criticisms of scientific evidence purely at face value, to presume that legal commentators and judges viewed expert testimony as a particularly untrustworthy and unreliable mode of proof, would be to understand only half the story. In fact, these complaints were born of the belief that expert testimony ought to have been better than ordinary testimony, a superior form of proof. The frustration with expert testimony resulted from the distance between theory and practice, the gulf separating the idealized vision of its potential from the messy imperfections of its actual use. Though expert evidence was sometimes referred to

112. Washburn, supra note 53, at 64.
113. Garrison, supra note 110, at 490.
114. Kinne, supra note 38, at 206.
as "the lowest order of proof," it was simultaneously believed that it ought to have been the highest form. The criticisms of expert testimony thus grew from unmet aspirations.

C. The Desire for Authoritative Methods for Generating Knowledge

There was a growing desire in the late-nineteenth century to discover ways to prove matters that could offer more certainty and security than could fallible lay eyewitnesses. This interest in authoritative mechanisms for generating knowledge had a variety of different causes and cultural resonances. First, evidence law had become more formalized and rule-driven over the course of the nineteenth century, forcing attorneys, judges and legal commentators to wrestle with the rationality of rules of proof and the logic of persuasion. There emerged a regular cottage industry of evidence treatises, and as more and more writers examined common law rules about proof, both descriptively and ascriptively, interest in ensuring that juries had access to the best possible proof grew high.

Additionally, faith in ordinary eyewitness testimony was, it seems, diminishing. Until the early part of the nineteenth century, a wide variety of witnesses were prohibited from taking the witness stand; people could be deemed incompetent and thus excluded from testifying for any one of a variety of reasons. Atheists or members of religious sects who did not believe in taking the oath could not testify because they could not be sworn. Defendants in criminal cases were not allowed to testify under oath, although they were permitted to make unsworn statements to the jury. Perhaps most significantly, parties to civil suits and any person with a financial interest in the outcome of the case were also forbidden from testifying. Interested parties in civil lawsuits and defendants in criminal suits were prevented from testifying precisely because they had too much of an incentive to perjure themselves. Wigmore, in his historical examination of the emergence of the rules that made interest a testimonial disqualification, explains the traditional justification for the restrictions as "reducible in its essence to a syllogism."\textsuperscript{118}

Total exclusion from the stand is the proper safeguard against a false decision, whenever the persons offered are of a class specially likely to speak falsely; Persons having a pecuniary interest in the event of the cause are specially likely to speak falsely; Therefore such persons should be totally excluded.\textsuperscript{119}

The rule was understood as a protection against the "known infirmities of human nature," as "more mischief would result from the general reception of interested witnesses than is occasioned by their general exclu-

\textsuperscript{117} See, e.g., Whittaker v. Parker, 42 Iowa 586 (Iowa 1876). For further discussion of the weight of expert evidence, see Rogers, supra note 84, at 443-92.

\textsuperscript{118} Wigmore, supra note 22, at § 576.

\textsuperscript{119} Id.
sion," explained Thomas Starkie, in the 1824 edition of his leading treatise on evidence.

Over time, however, a variety of circumstances persuaded many that the conventional wisdom prohibiting interested witnesses from testifying was, in fact, unsound. Jeremy Bentham, in his *Rationale of Judicial Evidence*, railed against the restrictions on competency as absurd. Bentham and others argued that these rules were a significant obstacle to finding out the truth, as those closest to the underlying events that prompted the litigation—the parties themselves and others with a pecuniary interest in the outcome—were kept off the stand. How could juries be expected to reach correct decisions if so much relevant information was kept from them? Moreover, Bentham argued that the exclusions were not even based on common sense. Just because someone had a small financial interest in the outcome of the case did not mean he would lie on the stand. Furthermore, men might be motivated by matters other than money. Their testimony might be influenced by friendship and affection for one of the parties, a concern for reputation, a fear of legal punishment or a host of other matters.

Over the course of the nineteenth century, lawyers, judges and legislators in both Britain and the United States grew less convinced that excluding relevant evidence for fear of perjury was appropriate. In Britain, the rule requiring disqualification of non-party interested witnesses was eliminated by statute in 1843 and in the United States, Michigan led the way by abolishing the disqualification in 1846. Most states abolished the disqualification of parties, non-party interested witnesses and defendants by 1885, and by 1900, only Georgia still maintained the traditional common law exclusion (and only for criminal defendants).

Thus, by the end of the nineteenth century, all of the major testimonial restrictions had been completely eliminated. In his seminal historical study of the law of evidence, published in 1898, James Bradley Thayer wrote, "As to rules for the exclusion of witnesses, they have nearly disap-

120. Thomas Starkie, *A Treatise on Evidence* 83 (1824).


122. Id.


124. Lord Denman’s Act, 1843, 6 & 7 Vict., c. 85 (Eng.).

125. See Wigmore, supra note 22, at § 577; Bodansky, supra note 123, at 93.

126. Bodansky, supra note 123, at 93.

127. One minor exception that still exists to some extent is Dead Man’s Statutes, a disqualification that prevents the testimony of someone who was engaged in a transaction with someone who dies, from testifying about the transaction against the decedent’s estate.
peared. Little remains except what reason requires, namely, the exclusion of persons too young to be trusted, or too deficient in intelligence."\(^{128}\)

These newly competent witnesses often had the most intimate knowledge of the facts of a case, but they also had clear incentives to lie. Although the push to change the rules was driven, in part, by a decreased fear of perjury (or an increased faith that it could be detected),\(^{129}\) one of the central arguments wielded by opponents of the change was that it would drastically increase the frequency of perjured statements in court. In Britain, for example, one parliamentary opponent of a bill that would have allowed defendants to testify under oath attacked the legislation as "a Bill for the manufacture of perjury."\(^{130}\) Clearly the new rules allowed witnesses onto the stand who would be strongly tempted to lie, but many thought that the trade-off was worth it.\(^{131}\)

Still, the new classes of interested witnesses, combined with a diminishing faith in the oath as an honesty-inducing mechanism, led to increased anxiety about perjury and its prevalence. As one judge put it in an 1866 case heard shortly after incompetency for interested non-party witnesses was eliminated in the federal courts:

Until the act of congress of 1864, forbidding the exclusion of interested witnesses in civil actions, I had resisted the adoption of the state practice, admitting such as competent, and clinging to the old common law rule as the safest and wisest. When such testimony is offered to a jury, the court has nothing to say, but, as the credibility of witnesses in admiralty is a question for the court, I frankly declare that I will give to such testimony very little confidence . . . . With honorable men—and I know nothing to the contrary but what this father and these brothers are such—interest will not lead to the manufacture of falsehood, or the suppression of truth; but, in ninety-nine cases out of one hundred, such a relation to the case obscures the judgment, and generates mistake.\(^{132}\)

A New York judge similarly complained that the elimination of testimonial incompetence had "greatly increased the giving of false testimony, especially by parties."\(^{133}\) Though Charles C. Moore, writing in 1909, was not himself convinced that perjury was on the rise, he acknowledged that many believed it to be so:

\(^{128}\) Thayer, supra note 12, at 526.
\(^{129}\) Allen, supra note 123, at 167-70; Bodansky, supra note 123, at 96.
\(^{130}\) Bodansky, supra note 123, at 108 (citing 60 Parl. Deb. 317 (4th ser.)) (1898).
\(^{131}\) See generally Bodansky, supra note 123.
\(^{132}\) The Armstrong, 1 F.Cas. 1135, 1136 (E.D. Mich. 1866).
\(^{133}\) Nicholson v. Conner, 8 Daly 212, 216 (N.Y. 1879).
In 1898 President Whittaker of the New York Bar Association expressed his opinion that perjury was increasing, and said that many lawyers and judges agreed with him. In 1901 President McCarthy of the Iowa Bar Association and Judge Horton of Chicago declared that perjury and subornation of perjury were two of the most prevalent crimes of the day. Arthur Train, Esq., Assistant District Attorney for New York County, says that “the amount of deliberately false swearing in our criminal courts would be inadequately described as shocking...” In 1907 Mr. Justice Gaynor said: “Perjury has grown rapidly during the last twenty years.”

Thus, while excluding the testimony of parties and all interested witnesses was a rule recognized to be drastically overbroad, the elimination of the rule generated fear of increased perjury and a decreased faith that a sworn witness could be counted on to tell the truth.

Moreover, it was widely recognized that even honest witnesses could be mistaken. In Anthony Trollope’s 1874 novel Phineas Redux, Lord Fawn wrongly swears under oath that he saw Phineas Finn walking on a certain street at a certain hour of night, thus strongly implicating Phineas as the perpetrator of a murder. He is misled by circumstances (in part because he knew that Phineas bore the murdered man a grudge and thus had a motive to kill) into believing that the figure he saw on a dark evening was indeed Phineas Finn. Lord Fawn is a weak man, but he is the ultimate gentleman—nothing in the world matters more than his word—and yet, as Trollope shows us, even gentlemen can end up swearing falsely because they are mistaken. And, in the United States, increasing democratization and urbanization led to decreasing confidence that trustworthy people—people of the “right sort” and members of “polite society”—could be accurately distinguished from tricksters, villains and confidence men. Not only might gentlemen be mistaken, but credible witnesses and deceitful ones might wear the same clothes, mouth the same words, and be practically impossible to tell apart.

Finally, at the end of the nineteenth century, there began to be substantial interest across Europe in the sciences of memory, the problems of testimony, and the cognitive limitations of both eyesight and memory. As historian Matt Matsuda writes:

“False witness” was a subject of considerable interest around the turn of the century... The new French “science of testimony” was not an isolated phenomenon... but part of a developing Pan-European interpretive framework centered on what Paul Ricoeur has called a “hermeneutics of suspicion”—the idea that

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134. Moore, supra note 101, at 1176.
135. Anthony Trollope, Phineas Redux (1874).
136. For a superb exposition of this dynamic in antebellum America, see Karen Haltunnen, Confidence Men and Painted Women (1982).
people do not say what they mean . . . . What the literature on scientific testimony demonstrated both deliberately and unwittingly was that juridical truth depended very much not only upon what was remembered, but upon who spoke and who was believed.\(^{137}\)

Though it is difficult to say the extent to which, or how quickly, this research crossed the Atlantic, other researchers, such as German criminologist Hans Gross, who examined the nature of memory and scientific methods and techniques for criminal investigation, became very influential within the United States. His book on criminal investigation was first translated into English in 1907 and went through several editions.\(^{138}\) In 1913, Wigmore dedicated his *Principles of Judicial Proof* to Gross, saying that Gross had "done more than any other man in modern times to encourage the application of science to judicial proof."\(^{139}\) Moreover, psychological research on memory and testimonial capacity was emerging in the United States as well.\(^{140}\) And in his *Treatise on Facts*, Charles Moore devoted a full 250 pages to the consideration of the problem of memory.\(^{141}\) While much of this research took place after the period on which I am focusing, the increasing research emphasis on the cognitive limits of memory and the problems of testimony may plausibly be said to reflect somewhat earlier conceptions that human memory was a problematic instrument indeed.

It seems, then, that all of these factors—the increased formalization of the rules of evidence and heightened attention to the processes of proof, the intensified concerns about perjury in the wake of the expansion of rules governing witness competency, the widespread recognition of the fallibility of memory and the limits of powers of observation—alongside broader social phenomenon like the increasing democratization of the social and economic landscape—led to a particular interest in forms of legal evidence that might avoid the pitfalls and limitations of lay eyewitness testimony. After all, even the rules eliminating testimonial disqualifications had been made in the name of providing the best evidence for rational and accurate fact-finding. There was a genuine interest in providing methods for adding proof that would lead to correct jury decision-making. Science, with its promise of disinterested observation and objectivity, seemed to offer a promising method for generating dispositive evidence. And if the natural world could not be made to speak directly to jurors, perhaps men of science and distinguished physicians could speak for na-


\(^{138}\) Hans Gross, *Criminal Investigation* (1907).


\(^{140}\) See, e.g., George F. Arnold, *Psychology Applied to Legal Evidence and Other Constructions of Law* (1906); F.W. Colegrove, *Memory: An Inductive Study* (1900).

\(^{141}\) Moore, *supra* note 101.
ture and could provide within the courtroom truths more secure than ordinary testimony with all its vagaries.

Thus, nineteenth century judges and legal commentators were in search of modes of evidence that were better than mere eyewitnesses who might be mistaken or even lying. They were in search of methods for making authoritative judgments, trustworthy and credible mechanisms with which the jury could determine facts. Expert evidence held the promise of offering such a superior method of introducing knowledge. The frequency with which judges and legal commentators called for neutral experts—experts who could provide what Learned Hand had described as, "general truths . . . final and decisive,"—further illustrates the extent to which prominent members of the legal community sought a way to provide juries with evidence that could be plausible and persuasive, definite and dispositive.

For a legal community eager to find methods for determining truth with more certainty and security, the evidence of scientists and experts, those who had privileged access to the natural world, had seemed to offer enormous security. But as the use of expert evidence grew, nearly everyone who came into close association with it was dissatisfied, for they found that in practice, scientific and medical experts failed to live up to the promise of a more authoritative, more secure form of evidence. But this profound frustration with expert testimony in practice should not blind us to the hope shared by many late-nineteenth century judges and legal commentators—the hope that scientific testimony, if properly harnessed, could offer a form of legal proof that might be beyond dispute, a brand of knowledge more compelling than that of ordinary witnesses.

The problem, however, was that science was unlikely, most of the time, to provide the certainty that observers of the legal system craved. Part of the reason for this was precisely the problem that contemporary observers recognized: Adversarialism, in which advocates had an interest not in selecting the most honest expert, but rather in choosing whichever expert might best persuade the jury of that party's point of view, is not a system likely to generate either consensus or secure knowledge.

Advocates in the courtroom were able to generate the appearance of disagreement where, in other authoritative settings (like a scientific conference or the pages of a journal), there would have been none. Even if virtually all of the significant, reputable scientists in the field agree on some proposition, it might nonetheless be possible (or, more honestly, for the right price, it would almost certainly have been possible) for an advocate to find somebody with plausible credentials who was willing to disagree with the general consensus and perhaps even to deny that any such consensus exists. Legal processes and incentives could produce the erroneous appearance of dissent, creating a "spectacle" of disagreement that was literally produced by and for the courtroom. Given the general lack of regulation of experts by the court, there can be little doubt that at times
the appearance of controversy truly was an illusion, produced by partisan zeal or charlatanism.

However, in a great many cases—from highly sensational poisoning trials in which chemists were using cutting-edge (and often controversial) tests for detecting the presence of poisons, to cases involving insanity that called on alienists to make sense of the inner state of a defendant's mind, to nuisance suits about effluvia—the scientific questions needed to inform a legal resolution did not permit easy or uncontroversial answers. To expect otherwise was to expect too much of science—in other words, to idealize it. In all of these cases, even if there were a magic wand with which to banish partisanship, and even if only highly-trained, credentialed experts were allowed to testify, and even if we eliminated any unfair degree of battering within cross-examination, and even if we gave control of the hypothetical question back to the expert—in other words, even if we eliminated all of the structural problems so often complained about—we would still, almost certainly, find ourselves within a battle of the experts. The experts would still contradict each other and disagree because even genuine experts do often have genuine disagreements. Despite what so many participants in the legal sphere may have hoped, science is not in the business of producing incontestable certainty. Some matters may be taken as provisionally true, even probably true, but much of what is fought about in court will be outside the parameters of consensus. Moreover, when the consensus runs too deep, it may no longer be science at all, but dogma.

V. CONCLUSION

This historical excursion has shown that both concerns about the use of expert testimony in court and the idealization of science have deep roots. Almost as soon as the party-called expert witness was invented, it became the subject of loud complaints from both the legal community and from experts themselves. Lawyers railed against both contradictory testimony and partisanship. Physicians, scientists, and other experts were disgruntled and dismayed by their treatment in court and by the perpetual griping about the low quality of expert evidence that pervaded legal journals. Experts felt that cross-examinations were often unfair, unduly magnifying trivial inconsistencies and disagreements and that the hypothetical question backed them into corners and denied them control over their own testimony. More generally, some experts complained that the incremental nature of science and the adversarial process of the common law system were a poor fit. But all of these complaints occurred alongside the increasing practical importance of expert testimony. It was used ever more often even as it was roundly disparaged as almost valueless. And although the expert testimony that was actually introduced in court was frequently deemed to be partisan, biased and worthless, expert scientific testimony as an epistemic ideal held significant sway. Many judges and legal analysts hoped that expert testimony might offer a superior form of
proof, a more dispositive method of knowing than lay eyewitnesses. In practice, expert evidence more often than not failed to meet its expectations—a failure that resulted both from the structural problems that were widely recognized and also from their often idealized and unrealistic expectations for science itself.

What is most striking, I suspect, in this history, is just how familiar so much of it seems. The purpose of history is often to reveal that "the past is a foreign country; they do things differently there." And, of course, I do not mean to suggest that nineteenth century criticisms and attitudes precisely mirror our current views about experts. But I would suggest that despite the passage of a century, certain fundamental dynamics concerning the use of expertise within our adversarial legal system remain remarkably unchanged. We, like our forebears, worry about partisanship and even charlatanism on the part of experts. We, like our forebears, seem disquieted by fundamentally contradictory expert testimony. We, like our forebears, recognize that many of the most talented experts are understandably wary of setting foot as an expert in court. And we, like our forebears, tend to have unrealistic expectations about what science is and what it looks like. We too want secure moorings underfoot and this is part of why we turn to science and are therefore disappointed when scientific evidence is filled with the contradictions and uncertainties that plague ordinary evidence. Instead of seeing our expectations as excessive or misplaced, we may prefer to see the science before us as failing to live up to its promise.

This idealized understanding of science is not, to be sure, wholly the creation of the legal sphere. It is, in significant part, the creation of scientists themselves, many of whom may hold two quite distinct visions of science in their heads at once. They may well see science, or at least the particular, local practices out of which it is made, as an enterprise that is inherently probabilistic, cannot produce certainties, and is inevitably subject to biases, misapprehension, methodological imperfections and a multitude of other human sins. But they may simultaneously hold fast to the idea that the scientific commitment to methodological precision, norms about open exchange and the possibility for status and career gains that may result from challenging the results of others, guarantees that in the long run the "truth will out," and secure knowledge will be available (but perhaps not within the timeline of a lawsuit). This doubled understanding is obviously not universal, but it is, I would suggest, relatively conventional. And scientists do want to claim a kind of epistemic privilege, a special set of practices and methodologies that make their conclusions more authoritative than those of any other realm (with the possible exception of law).

143. The phrase originally comes from William Shakespeare, The Merchant of Venice act 2, sc. 2 (Oxford Univ. Press 2006).
Where does this leave us? Quite simply, with a certain degree of skepticism that attitudes or understandings about science in the courtroom will be capable of any radical degree of rapid transformation. Caudill and LaRue argue that if only we can make our expectations of science both modest and realistic, we will be able to trade the failed romance between law and science in for a more satisfactory, and ultimately more satisfying, companionate marriage. But our long and august history of idealizing scientific evidence in theory and excoriating it in practice leaves me doubtful that we are capable of following Caudill and LaRue’s advice, no matter how sage it may be. Change may be possible, but it will, I suspect, be hard-won.