2007

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EXPERTISE IN ACTION: PRESENTING AND ATTACKING EXPERT EVIDENCE IN DNA "FINGERPRINTING" CASES

MICHAEL LYNCH*

I. INTRODUCTION

THIS study examines transcripts and video footage of expert testimony during criminal trials, pre-trial hearings and appeal cases in the United States and the United Kingdom. The aim of the study is to identify recurrent moves and countermoves through which interrogators and expert witnesses build up and break down credibility. The conditions under which expert knowledge is secured—or made insecure—are of interest both for Science & Technology Studies ("S&TS") and legal studies. Research on landmark decisions by the United States Supreme Court on the admissibility of expert evidence points to the importance of judicial (mis)conceptions of "science" and the exercise of discretion in pre-trial admissibility hearings. Less attention has been given to interactional exchanges through which interrogators and witnesses present and attack expert testimony. There is, of course, considerable informal lore on strategies for presenting and undermining expert evidence, but in the courtroom, such strategies encounter interactional contingencies such as adversarial objections, judicial reactions and interventions and witness compliance or recalcitrance. Drawing upon ethnomethodological and conversational analytic studies of courtroom interaction, this article demonstrates how the nature, relevance and limits of "expert" identity are highly malleable and reactive to moves and counter-moves by parties to a hearing.

The topic of expert evidence, especially expert evidence that claims scientific status, is one of the major points of convergence between S&TS and legal studies. As several scholars have elaborated, versions of science that are invoked and officially recognized in legal settings are out of step with current thinking in history, philosophy and social studies of science.¹

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Although there is no single agreed-upon version of science that would correct such legal versions, many S&TS scholars would agree that they are narrowly cast. One major focus of discussion is, of course, the famous list presented in the Supreme Court's Daubert v. Merrell Dow Pharmaceuticals\textsuperscript{2} ruling. The list is characterized in various ways in Justice Blackmun's opinion, as well as in later court rulings and commentaries. In some accounts it is a list of four—testability, peer review, error rate and general acceptance. In others, it is a list of five—testability, peer review, standards, error rate and general acceptance. It is a list of what is variously called "factors," "general observations," "rules," "considerations," "concerns," "flexible standards," "guidelines" and "criteria." What the list applies to—all expert evidence, or only evidence claiming grounding in novel scientific principles or techniques—was open to dispute, but was later resolved, not without further ambiguity, in the Kumho Tire v. Carmichael\textsuperscript{5} decision. Moreover, the list itself is presented in a way that denies its essential value for demarcating science from non-science; it is qualified by repeated warnings that it is not intended to be used as a checklist, and that the specific "factors" (or whatever they are) are not exclusive or binding on judicial discretion. And yet, the list is rehashed endlessly and indeed seems to be used in many admissibility hearings as a checklist for excluding evidence.\textsuperscript{4}

There are clear reasons why the Daubert list holds fascination for S&TS and legal scholars. For one, it is prominent in federal law, and is sometimes mentioned in judicial rulings in state courts that have not adopted it.\textsuperscript{5} Furthermore, it presents a puzzling picture of science that can be criticized for being incoherent and outmoded. Additionally, as noted above, Daubert is a relatively rare instance in which a high court has made general pronouncements about the nature of science. Such pronouncements may seem ill-informed by current research in philosophy and social studies of science,\textsuperscript{6} but they provide opportunities for academic criticism and corrective.

\textsuperscript{What Judges Should Know About the Sociology of Science, 32 Jurimetrics J. 345, 345-59 (1992).}
\textsuperscript{2} 509 U.S. 579 (1993).
\textsuperscript{3} 526 U.S. 137 (1999).
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Similar to the creation-evolution trials such as McLean v. Arkansas Board of Education\textsuperscript{7} and Kitzmiller v. Dover Area School District,\textsuperscript{8} Daubert provides a fine opportunity for science studies scholars to locate debates about the nature of science within a highly consequential practical domain. Since S&TS scholars thrive on formulating and criticising definitions of science and demarcation criteria, it becomes possible for philosophers, historians and sociologists of science to be expert witnesses. Such opportunity can be a mixed blessing, as we saw in McLean and especially in Kitzmiller. In McLean, philosopher of biology Michael Ruse appeared as an expert witness for the plaintiffs and furnished Judge Overton with a list of essential characteristics of science that the judge recited in his ruling against the defendants. Yet, Ruse was later taken to task by fellow philosophers of science for having promulgated an outmoded (largely Popperian) and arguably inapplicable philosophy of science.\textsuperscript{9} In Kitzmiller, philosopher Steve Fuller, who calls himself a social epistemologist, testified for the defendant (the Dover area school board), and attracted criticism from others in social studies of science for offering skeptical testimony about evolution. Like Ruse, Fuller (though apparently inadvertently) provided testimony that was of use for the judge when ruling in favor of the plaintiffs. Indeed, Judge Jones repeatedly quoted Fuller’s testimony in his ruling to support holding in favor of the plaintiffs.\textsuperscript{10}

Despite such setbacks, judicial metascience—general conceptions of science deployed by judges and expressed in judicial rulings such as Daubert—remains an appealing topic for S&TS research. In this article, however, rather than focusing on judicial reasoning, I will pursue another line of research on expert evidence. This line of research takes its point of departure from an often-repeated argument about the “interpretative flexibility” of rules and related formalisms, such as plans, instructions, algorithms and methodological protocols. Given that such formalisms have a “flexible” relation to actions produced in accord (or out of accord) with them, just how they are used in actual settings of conduct becomes a lively

\textsuperscript{7} 529 F. Supp. 1255 (E.D. Ark. 1982).
\textsuperscript{8} 400 F. Supp. 2d 707 (M.D. Pa. 2005).
research question. Given the Supreme Court’s explicit emphasis on the “flexible,” discretionary use of the Daubert list, it should seem likely that there is a great deal of slack between the high court’s pronouncements and a given trial court’s rulings and allowances. The existence of such “slack” does not mean that Daubert makes no difference. Instead, it means that the list of criteria (if that is what they are) does not clearly determine how the moment-to-moment production and assessment of expert evidence is guided and evaluated in actual courtroom conduct. It also means that, even when the list is explicitly invoked, just how it relates to a particular expert’s testimony remains to be established in situ. Consequently, much remains to be investigated about how expert evidence is presented and evaluated in admissibility hearings and trial courts. This is the topic I shall address.

In what follows, I present excerpts from transcripts of expert testimony in criminal trials involving forensic evidence and analyze how technical expertise is presented, attacked and circumscribed in dialogues among witnesses, lawyers and judges. Following some preliminary remarks about the organization of testimony and expert testimony in particular, I shall present excerpts of testimony that exhibit discursive structures that are relevant to displaying or undermining expertise. These particular excerpts are taken from transcripts of trials involving DNA profile evidence. I shall focus on excerpts from the 1995 O.J. Simpson trial in which defense attorney Peter Neufeld cross-examined prosecution witness Dr. Robin Cotton, Director of Research at Cellmark Diagnostics. Those excerpts were selected for analysis not because of the intrinsic importance of the Simpson “trial of the century” (which apparently was not nearly as significant for the law as it was for the popular media), but because of the abundance of transcript and videotaped testimony of expert witnesses produced through the broadcast of the trial.

Although Daubert did not have jurisdiction in California courts, and the dialogue between Neufeld and Cotton occurred in the trial court rather than in an admissibility hearing, the dialogue concerned procedural standards—one of the items on the Daubert list. As we shall see, Neufeld struggled to demonstrate what, if any, standards could be invoked to assess the scientific adequacy of the prosecution’s DNA evidence. This problem emerged at a level of detail beneath the resolution of the Daubert list. Following discussion of that problem, we shall examine an instance of testimony (in this case, testimony by a fingerprint examiner) in which the Daubert list is explicitly relevant, though in a rather dubious way. In this

11. This line of research (especially its most sceptical formulations, such as in H.M. Collins’s studies) exists in tension, if not outright contradiction, with general formulations, such as the so-called “periodic table of expertises” recently formulated by Harry Collins & Robert Evans. For Collins’s early studies, see H. M. COLLINS, CHANGING ORDER: REPLICATION AND INDUCTION IN SCIENTIFIC PRACTICE (Sage 1985). For the “periodic table,” see HARRY COLLINS & ROBERT EVANS, EXPERTISE: A NEW ANALYSIS (Univ. of Chi. Press, 2007).
case, the Daubert list provides a model for organizing testimony rather than a set of independent standards for assessing the reliability of a particular source of expert evidence. The paper concludes by raising questions about what difference Daubert makes for presenting and evaluating expert evidence.

II. Testimony

Expert testimony is a specialized instance of courtroom testimony, which is distinct in certain respects. As famously noted by Justice Learned Hand in 1901, expert evidence presents jurors with specific problems of understanding:

The whole object of the expert is to tell the jury, not the facts . . . but general truths derived from his general experience. But how can the jury judge between two statements each founded upon an experience confessedly foreign to their own? It is just because they are incompetent for such a task that the expert is necessary at all . . . when the conflict [between experts] is direct and open, the absurdity of our present system is apparent.\(^{12}\)

The learned Justice could have added that judges are not necessarily any better than jurors when it comes to fathoming expert testimony,\(^ {13}\) but on the assumption that judges are capable of protecting jurors from charlatans and other purveyors of unreliable but seemingly impressive evidence, expert witnesses are subjected to admissibility hearings and voir dire examinations prior to being allowed to testify in open court.

In the Anglo-American adversary system, with very few exceptions, experts are summoned by one or the other litigating party.\(^ {14}\) Forensic experts in criminal cases usually testify for the prosecution, consistent with the fact that forensic laboratories work closely with the investigation of crimes. Defendants can, and sometimes do, commission forensic analyses and call expert witnesses. In many cases, defendants wishing to commission such expert evidence must do so with their own resources, as many state and local courts do not furnish indigent defendants with funding for it. Expert witnesses are exempted from some of the restrictions on hearsay testimony that apply to "ordinary fact" witnesses, and are permitted to elaborate upon relevant knowledge conveyed by teachers and texts during their training in the specialty. Despite the special status of expert testimony, many of the same general formats of interrogation apply to expert and non-expert witnesses alike: they are called to the stand and then subjected to direct- and cross-examination. The testimony of an expert wit-

\(^{12}\) Learned Hand, Considerations Regarding Expert Testimony, 15 Harv. L. Rev. 40, 54 (1902).


\(^{14}\) Federal Rule of Evidence 706 permits a judge to summon expert witnesses, but judges rarely do so. See Fed. R. Evid. 706.
ness, like that of any other witness, is solicited through a dialogue with the interrogator, composed of question-answer sequences. Further, many of the same restrictions apply to asking questions, avoiding leading questions, responding in a relevant way to the question on the floor and so forth. In addition, many of the same interrogation strategies for building up or breaking down credibility apply to expert as well as non-expert witnesses.

Because an expert, by definition, possesses relevant knowledge that is not widely accessible, effective cross-examination can require at least some insight into the normal practices of the expert community. An illuminating account on this point is given by J.S. Oteri et al. in a series of brief, but very instructive, exhibits of the craft of cross-examining government pharmacologists in drug cases. In a typical case of this sort, the defendant is alleged to have possessed or attempted to sell a controlled substance such as marijuana or heroin, and an amount of such substance was seized from the defendant’s person or premises. To prove that the substance in question was the illegal drug featured in the criminal charge, a pharmacologist testifies about various laboratory observations and tests on samples of the seized substance. In certain respects, the situation is analogous to interrogations of forensic scientists who testify about DNA tests on blood or other bodily materials associated with suspects, victims and crime scenes—in both instances, laboratory tests are used to ascertain the probable identity of a substance, in the one case, and of a person, in the other.

Oteri et al. present a series of ideal-typical sequences of questions for attacking a state pharmacologist’s credentials and testimony. These strategic sequences are designed for deployment before a jury, but variants of them could very well be produced in an admissibility hearing or voir dire examination before a judge. They perform what S&TS scholars sometimes call “deconstruction”—the unraveling of factual testimony in an effort to expose the practical and judgmental production of the evidence. This is a rather mundane conception of the “deconstructionist” arts, which has little to do with the legacy of Derrida. Indeed, Sir Karl Popper, hardly a Derridean post-structuralist, can be quoted to nicely summarize what the clever defense attorney hopes to unravel. In his criticism of the idea that scientific knowledge can be traced back to discrete sensory observations, Popper argues that “you would in fact never arrive at all those observations by eyewitnesses in the existence of which the empiricist believes. You

16. See id.
would find, rather, that with every single step you take, the need for further steps increases in snowball-like fashion." For the attorney cross-examining a state-employed pharmacologist's report that the substance seized by the police during a search of the defendant's vehicle's glove compartment was heroin, the aim is to unravel a simple finding so that, in "snowball-like fashion," it devolves into a complex array of previously unmentioned but questionable material transfers, judgments of similarity and difference and decisions about when enough testing had been done. And, while the expert is not an "eyewitness," the alert attorney demands accounts of what the expert witness observed, first hand, about the substance and its origins, as opposed to what the expert took for granted or accepted from the word of others (including the police). Note, however, that the questioner must know something about the pharmacologist's craft. This is especially clear in the following sequence:

Q: Is it true that other materials have different wavelengths than heroin?
Q: Is it possible for a material containing several materials with dissimilar wavelengths to collectively have the same peaks as heroin?
Q: Is it true that other materials have the same wavelengths as heroin?
Q: Is it true that some materials interfere with the analysis of heroin?

Even without knowing anything about tests for heroin, we should be able to forecast the witness's "Yes" answers to each question. To ask such questions, and to anticipate such answers, the questioner must have some technical knowledge of the substance and tests. Moreover, as the parenthetical commentaries in the sequence below indicate, the "deconstruction" of the expert's testimony relies upon normative knowledge of what such an expert would do in a typical case like the one at hand, given the standard practices and constraints of the job:

Q: Did you do a quantitative test on the substance? (Few do.)
Q: So you don't know what percentage, if any, of the substance is heroin? (The exact percentage can be determined. It rarely exceeds twenty percent.)
Q: What other substances were present? (Chemists rarely test for other substances.)

19. See id.; see also Steven Shapin, Cordelia's Love: Credibility and the Social Studies of Science, 3 PERSP. ON SCI. 255, 255-75 (1995).
20. See Oteri et al., supra note 15, at 257.
21. See id. at 254-55.
In this choreographed sequence, the initial question anticipates the witness’s answer, and the next question builds off of that answer, and so on down the line. In effect, the sequence of questions is a template for building an argument. The witness is set up as a docile partner whose steps are predetermined by the interrogator’s moves. Further sequences presented by Oteri et al. illustrate how a cross-examiner can make effective use of knowledge of a pharmacologist’s typical training and practice, the educational and professional credentials that a state pharmacologist is likely to possess, the routine tests that are typically performed and the possible tests that are not performed, the limits of resolution for the tests that are done and who else besides laboratory staff is likely to have taken part in the “chain of possession” of the substance after it was seized from the defendant and before it reached the laboratory. In other words, the attorney relies upon a partisan and selective sociology of occupations in order to solicit acknowledgements from the practitioner that the tests performed were less than exhaustive, that other possible analyses cannot be ruled out and that the practitioner’s scientific credentials are limited. Such questioning strategies can be highly effective for “exposing” discrepancies between an initial, unqualified characterization of the test results and the elicited acknowledgments of uncertainty, equivocality and limited competence. The upshot of such interrogation can be misleading because it presumes that routine forensic tests can be perfectly complete, certain and exhaustive, but the questioning is effective to the extent that it solicits expressions of uncertainty and acknowledgments of methodological limitations that appear to weaken the credibility of the state’s evidence.

III. The Interrogator’s Regress

Unfortunately for interrogators, witnesses have resources of their own and are not necessarily docile partners who comply with efforts to undermine their evidence. Moreover, an interrogator’s knowledge of an expert witness’s technical routines is likely to be spotty at best. Though it is often said that interrogators should only ask questions for which they already know the answers, there is no avoiding the contingencies of dialogue. Asking a question, even a yes-no question, gives the floor to an interlocutor who can then produce variants of “Yes, but . . .” or “Yes, and . . .” answers, which can be difficult to cut off without seeming to badger the witness or stifle the ability of the expert to give an adequate explanation, especially when the witness comes across as a credible member of an


23. See A. W. McHoul, Why There are No Guarantees for Interrogators, 11 J. PRAGMATICS 455, 455-71 (1987); see also Lynch & Bogen, supra note 22.
honored profession. Moreover, given the interrogator’s incomplete knowledge of the expert witness’s practices, and of the specific circumstances under which those practices were exercised in that particular case, “explaining” an answer may allow the witness to head off the trajectory of a question sequence and to introduce unanticipated facts and arguments. The interrogator is then faced with maintaining argumentative authority in the dialogue, but without the comfort of a choreographed sequence of questions.

The following sequences from People v. Simpson illustrate some of the contingencies of courtroom dialogue. The sequences occurred during a several-day-long cross-examination of a key prosecution witness, Dr. Robin Cotton of Cellmark Diagnostics, who during direct testimony had instructed the jury on the DNA profile methods used to analyze many of the blood samples collected during the investigation.

Cotton also presented a series of DNA profile matches between Simpson’s blood and some stains found at the crime scene, and between the two murder victims’ blood samples and stains found in Simpson’s vehicle and on items of clothing he apparently wore on the day of the murder. The defense contested the evidence on many fronts, but one of its more consistent lines of attack was to suggest that the Los Angeles Police Department (LAPD) and Cellmark mishandled the crime scene evidence, allowing the original DNA to degrade. Then, according to the argument, amounts of blood from Simpson’s reference sample (samples collected directly from him for purposes of comparison with the crime scene evidence) got into the degraded criminal samples either through a deliberate effort to frame Simpson by corrupt and racist police officers, or through inadvertent errors by Cellmark staff. Accordingly, the apparent matches between Simpson’s profile and the profiles developed from criminal samples attributed to the perpetrator were actually matches between the portions of the same reference sample. To demonstrate incompe-


27. William Thompson asserts that this argument was not as outlandish as it may have seemed to some viewers and commentators. One key item of evidence was a sock found in Simpson’s bedroom during the police investigation. Thompson states that a bloodstain on the sock, which matched Simpson’s DNA profile,
tent handling of evidence, at least by the police, and possibly also by Cellmark, Neufeld deployed an interrogative strategy that, first, solicits the witness’s assent to relevant practical standards, and second, explores the extent to which specific practices deployed in the case at hand adhered to those standards. The transparent aim of the strategy is to expose discrepancies between authoritative standards and particular practices used in the case at hand. A schematic outline of the strategy is as follows:

1. Propose a technical rule or standard that should be followed.
2. Find an authoritative statement of the standard (in a manual, for example).
3. Elicit agreement from the witness that the standard should have been in force.
4. Elicit agreement from the witness that the practice in question departed from the standard.
5. Argue or insinuate that this departure amounts to an error or lapse.

Over the course of his cross-examination Neufeld struggled, and complained about having to struggle, to solicit the witness’s acknowledgement that there was a single authoritative standard in force. Even when a standard was acknowledged, the witness was non-committal about how much discretion various agents should be granted, and how much license a given agent could claim for bypassing particular rules or recommendations. Part of Neufeld’s difficulty had to do with the fact, acknowledged by Bruce Matheson, an LAPD laboratory administrator, that the police had not yet developed a manual for handling and analyzing DNA evidence. Specific standards were not fully codified, though Matheson asserted that the LAPD used informal standards:

Blasier (Defense): Is it your opinion that not having a manual for your field unit is an acceptable practice, scientifically acceptable?

Goldberg (Prosecutor): Vague, argumentative.

Ito (The Court): Overruled.

Matheson (LAPD laboratory administrator): I think it is preferable that we have a manual; however, I believe you can still do good work and provide training and have people do acceptable work out there without having one.

showed traces of a chemical used by forensic labs for preserving blood samples. Moreover, according to Thompson, the stain bled through the sock to the other side, indicating that it had been deposited on the sock while it was lying on a flat surface rather than when it was being worn by Simpson. See William C. Thompson, DNA Evidence in the O.J. Simpson Trial, 67 U. COLO. L. REV. 827, 829 (1996).


29. Id.
Note that the interrogator (Defense Counsel Robert Blasier) suggests that the very lack of a manual may itself be a violation of “scientifically acceptable” procedure. Matheson's reply suggests instead that a manual would be “preferable,” but by no means essential, for doing “acceptable work.”

Dr. Robin Cotton represented Cellmark, not the LAPD, and she was loath to comment on the LAPD's procedures. Yet, by Neufeld's lights she also was less than forthcoming about the general standards to which Cellmark adhered. During one line of questions, Neufeld attempted to, in his words, “impeach the witness with a learned treatise”— in this case, a report published in 1992 by the National Research Council of the National Academy of Science entitled DNA Technology and Forensic Science. Neufeld established the authority of this text by proffering a copy, and noting that Cotton carried her own copy:

Neufeld: I noticed yesterday, Doctor Cotton that you had your own copy of the National Academy of Sciences book DNA Technology and Forensic Science, is that right?
Cotton: Yes, I do.

Neufeld: Are you familiar with, ahm, some of the members who are on that committee that authored this book?
Cotton: Yes. He went on to ask Cotton if she was familiar with the chairman (Victor McKusick) and many of the other prominent members of the committee that authored the report, laboriously reciting their credentials and asking Cotton to acknowledge the authority of their opinions. Cotton often qualified her assent to such questions, such as in the following sequence in which Neufeld refers to McKusick:

Neufeld: And I take it that he is someone whose opinions you respect?
Cotton: I guess that would depend on his opinion about any particular issue. . . . Despite the fact that he is a very well-known scientist, he may have an opinion on a single issue that I might not agree with, and an opinion on another issue that I might, so I can’t make a blanket statement that I would agree with every opinion that Dr. McKusick would have.

Throughout the three days of his cross-examination of Cotton, Neufeld repeatedly tried to solicit Cotton's assent to the authority of the NRC Report, but she consistently qualified her assent. For example, on the first...

32. See id.
day of her cross-examination, Neufeld asked, referring to Chapter Two of the NRC Report (which is about "Technical Considerations"):

Neufeld: . . . are there some things in the chapter that you do agree with?

Cotton: That would apply to the whole book. There are things that I agree with and there are things that I don't agree with.\(^{33}\)

Neufeld also had difficulty soliciting unequivocal agreement to specific recommendations in the text, such as in the following sequence, where he cites chapter and verse:

Neufeld: Dr. Cotton, in arriving at your opinions on this particular matter, did you read the section of the NRC Report entitled 'Experimental (sic.) Foundation'?\(^{34}\)

[Pause, approx. two seconds.]

Cotton: Ahm, if I could just look quickly at that.


[Long pause.]

Neufeld: . . . In arriving at your opinions as to- what a laboratory should do as a precondition before using new DNA typing, did you at all rely on that section of the National Academy of Science’s book DNA Technology in Forensic Science?\(^{35}\)

Cotton: No.\(^{35}\)

In contrast to the ideal-typical examples presented by Oteri et al., these sequences reveal how a witness is able to resist the seemingly inexorable movement from question to question, requiring the interrogator to contend with equivocal answers or flat denials, in contrast to the clear confirmation that would allow him to proceed to the next question. Moreover, in this instance, the witness only partly complies with the effort to set up an authoritative normative standard.

At the start of the third day of his cross-examination of Cotton, and before the jury was admitted into the courtroom, Neufeld complained about the witness’s replies to his questions about the NRC report:

Neufeld: In particular, with regard to the National Academy of Science’s book report DNA Technology in Forensic Science. What happened on Thursday and Friday, your Honor, is that the


\(^{34}\)See NAT’L RESEARCH COUNCIL, supra note 30, at 55. Note that the section is titled "experiential foundation," not "experimental foundation." See id.

witness, who obviously is extremely familiar with this book, has read it very carefully, in fact carries her own copy in her briefcase, was not allowed to be impeached by saying that those portions of the book she doesn’t agree with, she doesn’t rely upon. I think if we allow that approach to continue?

The Court: Do you have any case authority that the court’s rulings on this were inappropriate?

Neufeld: I haven’t seen any case that stands for the proposition that a witness can selectively pick and choose which sections of a learned treatise solely to enable her to say that for every section that I disagree with, I don’t rely on it so you can’t bring it to my attention. It would stand the entire rule on its head. That’s what’s so remarkable and I don’t think that should be allowed to continue and I’ve never seen any case anywhere that allows a witness to draw those kinds of distinctions between page 365, I agree with but page 366 I don’t, and so forth and so on. Obviously she is only going to then rely on those sections she agrees with, so one could never ever use a learned treatise to impeach a witness.

The Court: Mr. Clarke, any comment?

Clarke: I think Mr. Neufeld mischaracterizes what the witness has done. She has relied on only portions of that material because those portions are scientifically appropriate and other portions are inappropriate, so I think to characterize it as selective reliance to make testimony sound better is absolutely absurd in the context of this witness’s testimony. The court asked Mr. Neufeld, do you have any authority to demonstrate why the court’s rulings are incorrect and Mr. Neufeld says I don’t know of any rulings to the contrary. This court has previously ruled on this matter a number of times and I think the court’s rulings are absolutely appropriate because otherwise the court would be allowing inadmissible hearsay to come into court.

Neufeld: Your Honor, the only point I have on that very briefly is it’s per her opinion that certain portions are inappropriate, but those portions she requires as inappropriate were written by the same people who she felt wrote other portions that were appropriate. The only point I’m trying to make is I can’t believe that it’s an appropriate attitude within the scientific community to simply reject out of hand which is what the rule requires so far, reject out of hand those statements, those recommendations written by people in a book, in a learned treatise in the same book in which you agree with other portions of it, so those statements can
come in. It’s setting up some kind of artificial construct which I think completely deludes (sic.) the entire principle.\textsuperscript{36}

The complaint points to what we can call “the interrogator’s regress.”\textsuperscript{37} Unless Neufeld can get Cotton’s unambiguous consent to the scientific authority of the NRC Report, he cannot use its technical recommendations as stable normative standards for assessing the “scientific adequacy” of Cellmark’s or the LAPD’s practices. This is because Cotton’s uneven subscription to the authority of that “learned treatise” allows her to argue that specific departures from its recommendations are not violations or lapses, but are instead alternative practices governed by local standards and/or tacit knowledge. Neufeld complains that Cotton’s testimony is inconsistent and evasive, but she can (and does) claim an alternative source of authority and rationality. Far from acknowledging lapses, she simply disavows the over-arching authority of the NRC recommendations, while implying that the local standards and experience-based judgments in her laboratory are adequate for the task at hand. Her credentials as a Ph.D. scientist and laboratory director enhance her ability to claim more discretion than, say, a low-level criminalist such as Dennis Fung or Andrea Mazzola (two witnesses in the Simpson case who came off comparatively poorly during cross-examination).

The failure to get unequivocal consent to the standards provided by the “learned treatise” does not stop Neufeld in his tracks, however. Although the NRC report was an especially prominent source of standards from which to leverage testimony, Neufeld also used the emergent testimony itself as a local resource for “bootstrapping” standards into place. The recursive sequencing of questions and answers enabled him to enlist the witness in a local build-up of agreements, so that earlier agreements furnished a basis for leveraging later testimony. For example, during the third day of the cross-examination, Neufeld solicits Cotton’s subscription to “the practices of other laboratories” as a standard for the mundane practice of collecting crime scene evidence and placing it in a “bindle”—a


\textsuperscript{37} This notion is parasitic on H.M. Collins’s notion of “experimenter’s regress” (discussing \textsc{Collins, Changing Order}, supra note 11, at 83-84) an idea that itself is parasitic on skeptical philosophical arguments about the role of observation in experimentation. The experimenter’s regress has to do with the relationship between experimental results and the competent performance of the procedures that produce the results. When an experiment is novel, and its results are uncertain and/or contested, an experimenter cannot use the expected result to assess the competence of the procedure and the adequacy of the instrumentation. Moreover, since many of the contingencies that can affect the result are evident only in retrospect, if at all, the experimenter cannot be sure that the experiment was done correctly, independent of the result, and so the investigation can be bound up in a vicious circle between a questionable result and the constancies of the experiment’s performance.
folded piece of paper used as a container. Once again, however, he gets a circumscribed answer:

Neufeld: In your laboratory, Doctor Cotton, is there a standard procedure that every employee who removes or puts something into a bindle puts his or her initials on the bindle.

Cotton: Yes.

Neufeld: And are you familiar with the practices in other laboratories, Doctor Cotton?

[Brief pause]

Cotton: Eh, not particularly.

Neufeld: Well, Doctor Cotton, to the extent that you have expertise in this area, would you agree that it is a standard procedure at every forensic science laboratory to have an individual who either removes or puts something into a bindle to initial that bindle?

Cotton: I can really only speak for what we do in our laboratory, and when we take something in or out. A bindle is taped and initials are put on-across the tape and the uh-adjacent paper.38

In this sequence, Neufeld evidently tries to develop a line of preliminary questions. Those of us who recall the Simpson trial, and even many who do not, can anticipate that Neufeld is beginning to frame a discrepancy between a normative standard and what investigators may have done in the particular case (viz., mislabelling or failing to label a bindle containing blood evidence collected at the crime scene). Cotton’s answers—or, rather, her replies—to Neufeld’s questions only partly comply with the choreography: while she agrees that the practice of initialling a bindle is standard for her laboratory, she withholding agreement to questions about what is standard for other laboratories.

The interrogator’s regress is not an endless and vicious cycle, because the interrogator can—as Neufeld does—call the court’s attention to the witness’s (non)responses, and suggest that they are instances of evasion. In addition, as we can see from the following excerpt, an alert interrogator can convert a circumscribed reply, in which an expert disavows responsibility for what other agents may have done, into testimony against those agents. The excerpt also contains a humorous interlude in which Judge Ito catches a malapropism in one of Neufeld’s questions, which Neufeld acknowledges was inscribed in the notes he was reading—thus indicating that he had been working through a pre-set sequence of questions.

Neufeld: Would you agree Doctor Cotton, that moisture promotes bacterial growth?

Cotton: Yes.

Neufeld: And would you agree Doctor Cotton that the bacteria starts eating up the DNA, and then the DNA deteriorates and degrades?

Cotton: Over time, yes.

Neufeld: And would you agree, Doctor Cotton, that degradation occurs more quickly under the combined effects of moisture and heat?

Cotton: Yes, I would.

Neufeld: In your laboratory, Doctor Cotton, where you are the laboratory director, would it be scientifically acceptable to let wet plastic stains remain in sealed plastic bags in-

Judge Ito: . . . You said ‘wet plastic stains.’

Neufeld: Sorry. [Pause.] Because that is what I have written here.

[Cotton and audience laugh.]

Neufeld: At least I can read correctly, your Honor. I just can’t write correctly, I’m sorry.

Judge Ito: Here. Let me do it.

Neufeld: Sir- ahm, Doctor Cotton. [Pause.] In your laboratory, would it be scientifically acceptable to let swatches of wet blood stains remain in sealed plastic bags in the rear of a parked truck un-refrigerated and un-air-conditioned in the middle of June for up to seven hours?

Clark: Objection, argumentative.

Judge Ito: Overruled.

[Pause.]

Cotton: I don’t think that would be my first choice, but please keep in mind that my laboratory doesn’t collect evidence and so, we don’t collect it, we don’t have a truck, we just receive it from someone else who has already collected it.

Neufeld: And as a result of that, Doctor Cotton, there is no way that you can control for the extent to which the- um, offering agency either degraded those samples or cross contaminated those samples; isn’t that right?

Cotton: Of course. 39

This sequence is notable for at least two reasons. First, the humorous interlude touched off by Neufeld’s malapropism exposes that he was reading

from a prepared text when he interrogated Cotton. In other words, he was working through steps in an argument prepared in advance, while contending with the contingencies of an actual dialogue. The repeated preface “would you agree that” for successive questions in the early part of the excerpt provides a way for the cross-examiner to comply with the institutional demand to ask questions, while at the same time they enable him to put forward statements for the witness to confirm. The assertions are designed for agreement—that is, they are formed as unproblematic statements of fact that a reasonable witness should confirm. They also link each assertion to the just prior assertion, thereby building up an argument with the witness’s complicity. Neufeld’s argument follows a line of an attack on the chain of evidence (sometimes called the “chain of custody”) similar to what Oteri et al. outline for drug cases. Second, toward the end of the excerpt, Neufeld follows a circumscribed reply with a question that enrolls the prosecution witness (Cotton) in a criticism that threatens to undermine the value of the DNA evidence that Cotton and other prosecution witnesses had presented to the court.

At the start of the excerpt, Neufeld sets out an argument for casting doubt upon biological samples handled in a particular way (namely, left in sealed plastic bags for seven hours in a very hot place). Instead of using a procedural rule from an authoritative text, Neufeld initially invites Cotton to agree with a biological proposition about moisture and bacterial growth. After she assents, he follows by inviting her to agree with further statements of how that fact may implicate the quality of DNA samples. After she assents, with some slight qualification, he then begins to formulate a question that is more specific to the circumstances of the case, clearly alluding to samples that were given to Cellmark by the LAPD and pursuing the defense’s junk-in, junk-out argument.

After the humorous interlude about the malapropism, Neufeld resumes with a rhetorical question that elaborately forecasts the answer and draws an objection for being “argumentative.” The objection is overruled, but Cotton does not give the straightforward answer anticipated by the question. Instead, she qualifies her agreement (“I don’t think that would be my first choice”), allowing for the possibility that the evidence would be salvageable, and she pointedly excuses her lab (Cellmark) from responsibility for collecting evidence. Neufeld follows her utterance with a collaborative completion that turns her lab’s lack of responsibility for bad practice into a lack of control over the evidentiary import of the laboratory’s analysis. Neufeld thus enlists Cotton’s confirmation of an argument that excuses her domain of expertise from responsibility, while casting doubt upon the expert evidence she presented. Neufeld then builds upon her response to appropriate it as testimony against the adequacy of the LAPD’s practice.

Rhetorically and interactionally, Neufeld attempts to cast doubt upon the credibility of the evidence that Cotton had presented for the prosecution. He does so by enlisting Cotton’s credibility as a scientist (the phrase “would it be scientifically acceptable” explicitly invites a “scientific” evaluation of the practice in question). The hypothetical instance that Neufeld presents—leaving wet stains in a hot vehicle—is a transparent reference to testimony presented earlier in the trial that describes how blood evidence collected from the crime scene had been left in a police van for several hours. It also happens to be a well-chosen example of a “technical” matter (bacterial contamination of DNA in a sample) that is transparently (if misleadingly) intelligible by analogy with everyday examples of organic materials that spoil quickly when left in a warm place.

Cotton is at the end of the chain of agents responsible for collecting, analyzing and presenting the evidence. As director of research in the firm hired by the prosecution, she is at the “high” end of the hierarchy of scientific authority and credentials. The “low” end is occupied by ground-level police employees (such as hapless criminalists Fung and Mazzola) who collected crime scene evidence with “swatches” (cotton-tipped swabs), placed them in containers and transported them to LAPD facilities, from which they were later moved to Cellmark’s laboratories. As Simpson’s lawyers made clear, the low-end employees lacked scientific credentials, and when cross-examined, they typically professed little understanding of the invisible constituents of the evidence they handled. The defense held that their actions unwittingly or unwittingly degraded, or otherwise ruined, the scientific (and legal) value of the evidence. Forensic laboratories also include many low-end agents with limited credentials. However, the stark difference between the grubby work of collecting samples and the high-end delivery of expert evidence in the form of graphic displays and statistical probabilities provides an especially ripe resource for adversary attack.

41. One of the more humorous episodes during the Simpson trial occurred when a police officer was interrogated about footprints left at the crime scene. He was asked if he had taken evidence of the footprints at the scene, and after he answered affirmatively, he was caught flatfooted (so to speak) by a question about whether he had collected evidence of “invisible” footprints. When the police officer professed not to comprehend the question, the interrogator informed him that it was possible to dust the scene to reveal footprints that were not otherwise visible. The display of a difference between surface visibility and visibility revealed through technical mediation is one of the prime ways of exposing the difference between experts and non-experts.

42. Although high-end scientists sometimes complain of the rough treatment they get in adversary hearings, they also are addressed in more deferential ways. See Leslie Roberts, Science in Court: A Culture Clash, 257 Sci. 732, 732-36 (1992) (addressing complaints of witnesses in an admissibility hearing). There is a possible echo in the contemporary courts of an early-modern theme that Steven Shapin describes: truthfulness was strongly identified with the culture of the seventeenth century gentleman (with Robert Boyle as the iconic example), and the credibility of the gentleman was associated with his elevated status as someone with little to gain from deception and much to lose from being caught in a lie. Women, servants and other low-born categories of folk were deemed untrustworthy because of
Following the jury's not-guilty verdict in the Simpson case, one common explanation of how the jury could have discounted the seemingly powerful DNA evidence (which, according to the prosecution's results, showed matches between both victims' DNA profiles and blood evidence collected from Simpson's Ford Bronco and from a bloody glove found outside his home, and between Simpson's profile and blood droplets extracted from the sidewalk at the crime scene and from the Bronco), was that the jurors agreed with the defense's "junk-in, junk-out" argument that the DNA matches had doubtful significance due to incompetent and possibly fraudulent police handling of evidential items prior to their analysis. 43 Without discounting the charge of incompetence, we should keep in mind that it was not simply a matter of fact, but was an attribution derived and dramatized through interrogative strategies and lawyerly arguments. The defense was able to take advantage of a conjunction of factors that we can liken to a perfect storm: the location of the courtroom, 44 the predominantly African-American makeup of the jury and the collective memory (especially among Los Angeles's African-Americans) of the Rodney King police trial. 45 Police employees are "low" in the chain of custody, and thus are more readily attacked than credentialed experts, because they lack the favors they could gain through deception and ingratiating. See Shapin, supra note 19, at 255-75; Steven Shapin, A Social History of Truth (Univ. of Chi. Press 1994). A related logic, though distributed across the biography of the individual rather than across social categories, is discussed in Goffman's account of the "mortification" and "demoralization" that occurs as an inmate is demoted in a carceral institution to the point of having nothing left to lose from disruptive behavior. See Erving Goffman, Asylums: Essays on the Social Situation of Mental Patients and Other Inmates (Anchor 1961).

43. Sheila Jasanoff, The Eye of Everyman: Witnessing DNA in the Simpson Trial, 28/5-6 SOC. STUD. OF SCI. 713, 718 (1998); see also Thompson, supra note 27, at 827-57.

44. Former District Attorney Vince Bugliosi observes that the trial was originally scheduled to take place in Santa Monica, a predominantly white, well-to-do community in West Los Angeles, but was moved to a court near the city-center (to the extent Los Angeles has a center) in order to accommodate the television crews and cameras. The local neighborhood from which the jurors were drawn was predominantly African-American. Vincent Bugliosi, Outrage: The Five Reasons O.J. Simpson Got Away with Murder (W.W. Norton 1996).

45. The 1991-92 criminal trial of several white police officers, who were shown on videotape delivering a series of blows with 'batons' (police clubs) to Rodney King (an African-American man arrested after a lengthy car chase), resulted in a not guilty verdict which triggered a massive riot in South-Central Los Angeles. The trial was held in Simi Valley, a predominantly white and conservative district. Charles Goodwin gives an interesting account of the use of "expert" evidence by the defense in the case that resulted in re-specifying the details on the video from being (apparent) excessive blows meted out to the prone suspect to becoming technically appropriate responses to incipient aggressive actions by a potentially dangerous suspect. Although the composition of the jury was often mentioned in popular accounts, Goodwin does not consider the contingent relation between the terms and credibility of the rival "analyses" of the video and the pre-judicial inclinations of the jury members. See Charles Goodwin, Professional Vision, 96 Am. Anthropologist 606, 606-33 (1994).
cientific training and make no claim to understanding relevant molecular biological principles. Yet, police employees are implicated in the technical results delivered by the laboratory.\textsuperscript{46} Moreover, in the Simpson case, they were vulnerable to suspicions of racist motivation. Although Neufeld and the other lawyers also attacked the objectivity of Cotton and others who represented the high scientific end of the chain, such efforts to undermine the probative value of the DNA evidence proved far more effective when leveled against the ground-level agents who collected and handled the evidence.

As noted earlier, California courts do not recognize the \textit{Daubert} list—admissibility of expert evidence is guided by a variant of the \textit{Frye} general acceptance standard—and there was no admissibility hearing on the expert evidence in \textit{California v. Simpson}.\textsuperscript{47} Nevertheless, the above excerpts from the Simpson trial point to the indeterminate salience of one of the key items in the \textit{Daubert} list: \textit{standards}. By indeterminate salience I mean that the topic of "standards" was relevant to the solicitation and evaluation of the expert testimony; just what, if any, version of standards would be dispositive remained to be seen. Neufeld's questions invoked authoritative scientific standards as a resource for leveraging testimony about the extent to which such standards were violated or adhered to, but the witness's replies refused to acknowledge that her laboratory's practices were uniformly governed by the particular standards Neufeld referenced. Consequently, much of the interrogation was preoccupied with a search for \textit{some} kind of standard (whether written in an authoritative text or available as a common practice in the relevant field) through which to hold the expert evidence accountable. In the following section, I shall examine testimony in an admissibility hearing in which the \textit{Daubert} list is explicitly relevant. Once again, we shall encounter an indeterminate relationship between formal standards and testimony about practices, only in this case there is no ambiguity about which standards apply. Instead, the contested issue is \textit{what counts} as compliance with specific items on the \textit{Daubert} list.

\textsuperscript{46} It is commonplace in the social sciences to impute "unconscious" knowledge to agents; that is, knowledge relevant to the agents' activities but about which the agent has nothing to say. Using a similar logic, interrogations of "low end" agents use contrasts with "high end" expert accounts to drive a wedge between the agent's account of the relevant actions and a "scientific" account of factors that bear upon the rationality and effectiveness of the action, but about which the agent seems unaware. In such cases, what is "unconscious" is not located in the hidden recesses of the mind or body (motives that are not acknowledged, knowledge that is tacit, and so forth); what might be called the \textit{biological unconscious} is a hidden rationality or source of agency (\textit{e.g.}, a tendency to spoil or become contaminated if handled in a particular way) about which the agent simply does not know.

\textsuperscript{47} After the trial had begun, the defense filed a motion for an admissibility hearing on the prosecution's DNA evidence, but it was never held. See Michael Lynch, \textit{The Discursive Production of Uncertainty: The O.J. Simpson "Dream Team" and the Sociology of Knowledge Machine}, 28/5-6 SOC. STUD. OF SCI. 829, 829-68 (1998) (analyzing defense motion).
IV. THE DAUBERT LIST AS DEMAND CHARACTERISTICS

"Demand characteristics" are a well-known hazard in experimental research with human (and sometimes animal) subjects: the subject picks up clues from the experimental setting and behaves in a way that complies with, or otherwise reacts to, the anticipated results of the experiment. In other words, rather than orienting to the experimental conditions naively, as a way of revealing naturally occurring behavioral tendencies, subjects treat the experiment as a test of their competence and try to meet the demand for a correct answer. Efforts to mask demand characteristics include misleading subjects about the aims of an experiment, a strategy that is problematic on ethical grounds.

Here, I use the term to point to a relationship between expert testimony and the Daubert list. For an expert or body of experts, the list articulates a set of instructions for how to appear reliable; it is not simply a list of independent factors that enable a judge to assess whether a practice is reliable. For an expert witness, the items on the list provide demands for what such a witness will need to say or demonstrate in order for their evidence to meet the test of admissibility. To explore this construal of the Daubert list, I will examine the testimony of a prosecution witness, Stephen Meagher, Chief of Latent Fingerprint Unit III, FBI Laboratory, in the case Colorado v. Hood. Meagher has testified in numerous other cases, and a set of his Powerpoint slides for meeting the Daubert challenge are available on a website. Starting in 1999, the admissibility of latent fingerprint evidence has undergone dozens of challenges in federal and state courts in the United States. Although fingerprinting was well-established as criminal evidence early in the twentieth century, and in fact was so well-established that DNA "fingerprinting" borrowed its name and credibility when first introduced in the mid-1980s, it underwent challenge for two principal reasons in the late 1990s. First, by then, DNA profiling had displaced it as a gold standard in criminal forensics. Second, the Daubert and Kumho Tire decisions put a premium on "scientific" characteristics such as probability estimates and quantitative reliability tests. Fingerprint examiners declare

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48. The idea that principles such as the items on the Daubert list can be read as instructions for situated actions derives from Harold Garfinkel's ethnomethodological writings. See, e.g., Harold Garfinkel, Ethnomethodology's Program: Working out Durkheim's Aphorism, 197-218 (Rowman & Littlefield Publishers 2002) (providing account of instructed actions).


51. An appeal of United States v. Mitchell was the first of these cases. 199 F. Supp.2d 262 (E.D. Pa. 2002), aff'd, United States v. Mitchell, 365 F.3d 215 (3d Cir. 2004). The most publicized was United States v. Llera-Plaza, which resulted in two separate decisions by Judge Lewis Pollak. See http://onin.com (presenting over forty such challenges).
matches in court without giving specific random match probability measures, and they rarely have advanced degrees in a science.\textsuperscript{52}

The FBI and other organizations of latent fingerprint experts reacted to the \textit{Daubert} challenges by proposing reliability studies, promoting standard practices, and upgrading examiners' credentials, but in the short term, Meagher and other experts endeavored to demonstrate that latent fingerprint examination already complied with the \textit{Daubert} standards. This was a low-cost strategy, compared with the massive effort it would take to develop random match probabilities (even if it were possible to do so), to implement systematic proficiency tests and uniform standards for all examiners and to upgrade existing automatic fingerprint examining systems.

Meagher's testimony in \textit{Hood} is especially interesting for how it re-specifies the items on the \textit{Daubert} list in a way that is compatible with what fingerprint examiners already do. He relies upon a particular model adopted by the FBI, which presents fingerprinting as a "scientific procedure" given the acronym ACE-V:

\begin{itemize}
  \item Analysis – the qualitative and quantitative assessment of \textit{Level 1, 2} and \textit{3} details to determine their proportion, interrelationship and value to individualize.\textsuperscript{53}
  \item Comparison – to examine the attributes observed during analysis in order to determine agreement or discrepancies between two friction ridge impressions.
  \item Evaluation – the cyclical procedure of comparison between two friction ridge impressions to effect a decision, i.e., made by the same friction skin, not made by the same friction skin, or insufficient detail to form a conclusive decision.
  \item Verification – an independent analysis, comparison and evaluation by a second qualified examiner of the friction ridge impressions.
\end{itemize}

This parsing of the routine procedure into nominal phases presents the practice in the form of a step-by-step protocol. Moreover, the terminology (especially "verification") is well-chosen for assuring courts about the reliability of the practice. Recalling that the \textit{Daubert} list (in at least one of its common versions) consists of: (1) testability; (2) known error rate; (3) peer review; and (4) general acceptance, we can begin to examine how


\textsuperscript{53} The three levels refer to: (1) overall holistic pattern of ridge characteristics; (2) detailed ridge characteristics such as whorls, bifurcations, and so forth; and (3) microscopic details such as the arrangement of skin pores along a particular ridge.
Meagher respecifies those items to be compatible with his model of fingerprint examination.

(1) Testability

The Daubert court associates testability with reliability and validity. The Supreme Court did not draw sharp conceptual distinctions on the matter, and Susan Haack points out that the Court’s references to the philosophy of science conflate different criteria of testability. Yet, there is little doubt that the Court was oriented to some conception of experimental testing. When Meagher is asked about reliability, he cites quite a different conception of testing: “100 years of observation”:

Q. So is it reliable?
A. Yes.

Q. Is there any test performed to test the reliability of this method?
A. Uh, well, as just basically definition to science its observation. I think first the most obvious answer that we have is 100-years of observation, bench work. In terms of the millions and millions of comparisons that have been affected, yeah, I will openly admit there has been practitioner error.

Meagher’s account of testing as cumulative experience in the community of examiners would be highly unlikely to ward off concerns about confirmation bias, but apparently it has frequently succeeded in court. Note that Meagher freely admits the existence of errors, but he then advances a definition of “known error rate” that enables a “zero” figure to be used as a probability measure.

(2) Known Error Rate

When asked to discuss “known error rate,” Meagher stated:

The methodology has an error rate of zero where practitioner error rate is whatever practitioner rates are for that individual or group of individuals. Because fingerprints are unique and they are permanent there can only be one source attributed to an impression that’s left so there have—there can only be one conclusion. It’s ident[ification] or non-ident. If error occurs, it’s a practitioner error failing to apply the methodology properly. Same as a mathematician to the field of math.

Meagher’s distinction between practitioner error and error-free methodology draws on an analogy with mathematics. A child’s mistaken calculation, “2+2=3,” does not reveal an error rate for elementary arithmetic (although one could use such a rate to measure how often children of a

54. See Haack, supra note 6.
certain age make such errors). However, the analogy confuses a tautological deduction, "2+2=4," with an empirical determination that two materially different traces (a latent print or mark, and inked or scanned exemplar taken under controlled conditions) contain sufficient matching detail to support a declaration of identity. Determining that a latent print matches a rolled print is more like determining that two footprints derive from the same shoe, or that a bite mark on a body comes from the set of teeth from which a dentist took an impression. The credibility of a reported match depends upon the reliability of the technique, in general, and the quality of the evidence, in particular.

(3&4) Peer Review and General Acceptance

In the following sequence, Meagher manages to re-specify the meaning of peer review to accord with the verification step of ACE-V, and he also defines general acceptance in a way that limits to relevant scientific community to the "profession of forensic fingerprint examiners."

Q. [I]s this methodology generally accepted within the world of [sic] scientific community?
A. Yes, it is. Absolutely.
Q. And is there a peer review process to this methodology?
A. Well, the peer review to the—to the methodology would be the verification step but the methodology has in principle been peer reviewed and been practiced—well, I know since the day I was trained because I was trained to use this methodology. So the answer to the question is yes in both general sense as well as technical sense.

Meagher's version of peer review applies those words in a meaningful but rather unconventional way. Instead of referring to the conventions for reviewing publication submissions or grant proposals, "peer review" becomes a matter of one fingerprint examiner checking the work of another. And, given the fact that the scientific standing of the community of practitioners is the very matter in question, to say that there is "general acceptance" among members of that community does little to settle the question.

Despite the dubious quality of Meagher's arguments, none of the Daubert challenges to date has convinced federal or state courts to deny the admissibility of fingerprint evidence. Thus far, there has only been one partial exception—the first ruling in Llera-Plaza. In his ruling, Judge Pollak questioned fingerprint examiners' standing as a "scientific community":

Even those who stand at the top of the fingerprint identification field—people like David Ashbaugh and Stephen Meagher—tend to be skilled professionals who have learned their craft on the job
and without any concomitant advanced academic training. It would thus be a misnomer to call fingerprint examiners a “scientific community” in the Daubert sense.\textsuperscript{55}

He also objected to the “zero error rate” argument and many of Meagher’s and other government witnesses’ arguments. Although he did not rule against the admissibility of fingerprint evidence, he used the ACE-V schema as a basis for determining that latent fingerprint examiners should be permitted to present their analyses of the evidence and their detailed comparisons (the “A” and “C” phases), but not to state their “evaluations” (“E”) by declaring whether the latent print “matches” the suspect evidence. His first ruling restricted fingerprint examiners to presenting the evidentiary basis of their opinions, but did not permit them to declare explicitly that the evidence “matched.” The FBI and other proponents of the examiner community strongly objected to the ruling and presented Judge Pollak with numerous documents and testimonies supporting their objections. Slightly more than two months later, in March 2003, Judge Pollak took the unusual step of reviewing and modifying his earlier ruling. The major change he made was to remove the restriction on match declarations. In his concluding statement, he explicitly mentioned Meagher:

Through the efforts of government counsel, Stephen Meagher, heretofore a name in a transcript, became a real person, and through his live testimony I was able to get a substantially more rounded picture of the procedure—the FBI’s ACE-V process of fingerprint identification—whose degree of reliability for expert evidentiary purposes it is my responsibility to determine.\textsuperscript{56}

He added that he also learned that Scotland Yard had recently abandoned its sixteen-point system in favor of one that was substantially similar to the FBI’s ACE-V procedure. Arguing that what is good enough for England should be good enough for the United States, Judge Pollak acknowledged, “I have changed my mind.”\textsuperscript{57}

Although a different case was the occasion for Judge Pollak’s two rulings, he based his judgments on a review of the admissibility hearing in \textit{Mitchell}. In 2004, \textit{Mitchell} again came up for appeal. While allowing for the possibility that expert witnesses who were not themselves fingerprint examiners could be allowed to testify about the general reliability of the practice, the court invoked the \textit{Kumho Tire} decision and ruled that the key consideration was the reliability of latent fingerprint examination regardless of whether it was deemed scientific. And, like Judge Pollak, the Mitch-

\begin{footnotesize}


\end{footnotesize}
ell court accepted Meagher’s elaboration of the ACE-V schema as assurance that the practice was reliable.

If we hold that the Daubert list was originally formulated with scientific evidence in mind, and that the Kumho Tire decision made clear that the list extends to all forms of expert evidence, then fingerprint examiners have benefited from a flexible interpretation of a set of standards that, on their face, present an inflexible picture of expert evidence. So, for example, acceptance of Meagher’s remarkably flexible conception of “peer review” completely removes it from the domain of academic publication, and it becomes a routine work practice. Similarly, acceptance of Meagher’s treatments of error rate and testability for the most part consecrates the traditional practice of fingerprint examination by association with quantitative evaluation and experimental methodology. Consider in this light a remark made by Christophe Champod and Ian Evett about the increased scrutiny that traditional comparison evidence was beginning to undergo in light of emergent scientific standards:

With the extensive use of DNA—probability based—evidence and the evolving requirements for the admissibility of scientific evidence, older identification fields like fingerprints are becoming subject to more rigorous scrutiny and under the pressure of a growing demand of scientific data to underpin the identification of fingerprints.58

The recent Daubert challenges to fingerprinting are clear examples of such scrutiny, and the model of DNA evidence together with the Daubert and Kumho Tire decisions clearly provide conditions for such scrutiny.59 Presumably, proponents of fingerprint evidence are now faced with the task of upgrading their craft to meet such exacting scientific standards, and such efforts are no doubt underway. The Mitchell and Llera-Plaza II rulings, however, indicate an alternative way to rhetorically upgrade fingerprint evidence by redefining the Daubert list to be more compatible with what fingerprint examiners already were doing. Recall that Judge Pollak remarked in his first ruling that it would be “a misnomer to call fingerprint examiners a ‘scientific community’ in the Daubert sense.” In light of his and the Mitchell court’s subsequent rulings, “the Daubert sense” now has been expanded to allow expert “communities” and their practices to be admissible regardless of whether they can claim to be scientific.

The flexible uses of the Daubert list by Meagher and other proponents of fingerprint evidence, and the acceptance of such uses by federal courts, may leave us wondering what difference Daubert and Kumho Tire make. Do

59. Champod and Evett worked for the British Forensic Science Service, but their apparent reference to United States Supreme Court decisions about the admissibility of expert evidence indicates that those decisions were notable for forensic scientists abroad.
they simply provide rationales for courts to make local judgments for or against admissibility? If so, trend data showing that federal courts have been less likely to admit plaintiffs’ evidence in toxic torts may be less a consequence of Daubert and more a consequence of the appointment of judges with pro-business tendencies.\(^6\) And, given the latitude for judicial discretion and the fact that pro-business judges also tend to express strong law-and-order commitments, one should not be surprised if the trend toward more restrictive gatekeeping against plaintiffs’ evidence in civil suits runs alongside a trend toward less restricted gatekeeping against prosecution evidence in criminal trials.

V. Conclusion

The Supreme Court in its Daubert ruling explicitly stated that trial judges should use testability, error rate, standards, peer review and general acceptance as “flexible guidelines” for assessing the admissibility of expert evidence. As we have seen, flexibility was indeed paramount in the excerpts from trials and admissibility hearings discussed in this paper—perhaps more so than the Supreme Court had in mind. In the first set of excerpts, Peter Neufeld attempted to set up particular “scientific standards” with which to expose discrepancies between those standards and specific practices for handling samples and analyzing evidence in the case at hand. The witness, Robin Cotton, frustrated Neufeld’s strategy by emphasizing the necessity to make judgments about which standards applied and how to apply them in particular practical situations. In the second set of excerpts, the witness, Stephen Meagher, explicitly referenced the Daubert list, but redefined its features in a way that enabled him to say that fingerprinting evidence complied with its standards of reliability.

On rare occasions, the courts turn to science studies in a search for demarcation criteria, such as when they review the constitutionality of legislation promoting “creation science” or “intelligent design” as alternative scientific theories. Similarly, when making admissibility decisions about expert evidence, courts have had good pragmatic and legal reasons for wanting a principled set of demarcation criteria. The problem with this quest for demarcation criteria is that there is limited support in contemporary science studies for any particular set of such criteria, or even for the demarcationist project as a whole. Currently, there is far more support, at least in the circles in which I travel, for conceptions of the disunity of science, the “interpretive flexibility” of methodological and epistemological standards and the indeterminate relationship between theory and observational evidence.\(^6\) Explicit pronouncements about science in judicial rulings and in much of the legal literature evince far more respect for a picture of science as an institution with distinctive epistemological criteria

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that produces unassailable evidence than one ever finds in contemporary history, philosophy and social studies of science. One could conclude from this discrepancy that science studies are dominated by "postmodern" relativism. However, a less obvious conclusion should at least be entertained: when courts engage in practical demarcation ("boundary work" as it is often called in science studies), witnesses, lawyers and judges also become practical relativists. This particular species of relativism is not a denial of the possibility of knowing anything at all. Instead, it is a matter of downgrading demarcation criteria and technical standards so that they become rhetorical themes with which to claim credibility. This is not necessarily a terrible thing.