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ESSAY

FRED SCHAUER: A TRULY ORIGINAL THINKER

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It is a great privilege to be part of this program honoring the late, wonderful Fred Schauer. I first met Fred after he had relocated to the University of Virginia, but we quickly became friends. Even before that, however, he had already become friendly with my brother Todd when they were both at Harvard, my brother as a law professor and the multi-talented Fred as a member of the faculties of both the Law School and the Kennedy School of Government. Fred and my brother first met when Todd became Dean of the J.D. Program at the Law School in the year 2000. Todd, wanting to get a better idea of the job of being an academic dean, went to see Fred, who was then Academic Dean of the Kennedy School. As Todd recalls it, it was a rainy day, and after a few pleasantries, he asked Fred to describe the essence of being a dean. Fred responded by walking to a window, pointing to the pouring rain, and saying to Todd, "See that rain? It's your fault!"

Although in later years, I was privileged to become good friends with both Fred and his fantastic wife Bobbie, I want to focus my remarks not so much on Fred's lively personality or his unquestionable brilliance, but on the originality of his thinking. To be frank, originality is not a long suit in the legal profession. We judges—perhaps because our common-law-derived legal system focuses on precedents and our analysis of laws and regulations is ever more textualist—tend to have

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trouble "looking outside the box," so to speak. For everyday practitioners, concerned with solving their clients' problems, "originality" largely consists of finding loopholes that can be logically supported. And as to members of the legal academy, even the so-called "theories" that increasingly occupy their attention are often more focused on public policy implications than on new perceptions. So, Fred's gift for thinking about familiar legal issues in highly original ways was itself highly unusual.

But in the limited time I have here today, let me focus on just one example involving one of his lesser-known articles, "Can Bad Science Be Good Evidence? Neuroscience, Lie Detection, and Beyond," which was published in the *Cornell Law Review* in 2010.[1] The article grew out of Fred's participation in the MacArthur Foundation's Law and Neuroscience Project, in which both he and I were deeply involved. That Project, which continues to this day under the able leadership of Professor Owen Jones at Vanderbilt Law School, was and is concerned with the implications of discoveries in the rapidly advancing field of neuroscience for the Anglo-American system of law, with its heavy emphasis on mental states.[2] Put simply, our legal system tends to assign moral fault to injurious actions taken with conscious intent, so the question of how to determine an actor's intent becomes critical. And, much more generally, central not just to our system but to virtually every judicial system is determining whether a witness is lying or telling the truth.

Beginning in the early 2000s, some neuroscientists began to claim that a careful analysis of brain scans could show whether a witness was consciously lying or not.[3] To give a simple example from one of the earliest experiments, the subjects were given playing cards, placed in fMRI brain-scanning machines, and then shown photos of playing

[1] Frederick Schauer, Can Bad Science Be Good Evidence? Neuroscience, Lie Detection, and Beyond, 95 Corn. L. Rev. 1191 (2010).

[2] Mission of the Research Network, Vanderbilt Univ. L. Sch.: MacArthur Found. Rsch. Network on L. & Neuroscience, https://www.lawneuro.org/mission.php [https://perma.cc/43W6-XSG6] (last visited Jan. 10, 2026); Network Administration, Vanderbilt Univ. L. Sch.: MacArthur Found. Rsch. Network on L. & Neuroscience, https://www.lawneuro.org/people.php#admin [https://perma.cc/S58J-9NRY] (last visited Jan. 10, 2026).

[3] See Eric Jaffe, Detecting Lies, Smithsonian Mag. (Feb. 1, 2007), https://www.smithsonianmag.com/science-nature/detecting-lies-147115783/ [https://perma.cc/A7SW-W3GE].

cards.[4] Subjects were then instructed that they would be rewarded with cash if they successfully concealed possession of a particular card.[5] For example, if they were asked if they had the ace of spades, and the ace of spades was not in their possession, they would respond truthfully.[6] But if they were shown the ten of hearts, and they had the ten of hearts, they would deny possession.[7] When they did this, it turns out, the amount of activity in the parts of the brain associated with cognition and emotion both increased, and the experimenters hypothesized that such increases were associated with the act of lying.[8] One might intuit from these results that, while a witness could not realistically be hooked up to a brain-scanning machine while testifying in court, he could be asked beforehand to give the same testimony while his brain waves were being simultaneously recorded, and a qualified neuroscientist could then determine whether or not he was being truthful. Several companies were then incorporated to market such brain-scan lie detection to the legal profession and other potential consumers.[9]

But under the auspices of the MacArthur Project, many reputable neuroscientists and others concluded that the experiments on which brain-scan lie detection was based—even though they were mostly much more sophisticated than the experiment I have described—were either unreliable or subject to conflicting interpretations.[10] For example, the increase in cognitive brain activity when a subject lied could simply be the result of his having to take greater cognitive efforts to decide when to lie and what lie to tell.[11] In other words, the subjects, just in order to follow the directions of the experimenter, had to engage in greater cognitive activity when they chose the moments to lie, and this might have independently led to the increase in the measured brain activity. As a result of these and other concerns, the work of the MacArthur Project and its leaders, in some of the pioneer cases in which

[4] D.D. Langleben et al., Brain Activity During Simulated Deception: An Event-Related Functional Magnetic Resonance Study, 15 NeuroImage 727, 729 (2002).

[5] Id.

[6] See id.

[7] See id.

[8] Id. at 727.

[9] See Schauer, supra note 1, at 1198–99.

[10] MacArthur Found. Rsch. Network on L. & Neuroscience, fMRI and Lie Detection 2–4 (2016), https://www.lawneuro.org/fMRI%20and%20Lie%20Detection-%20Knowledge%20Brief.pdf [https://perma.cc/UR9J-VBD3].

[11] Id. at 2–3.

brain-scan lie detection was sought to be introduced, provided the relevant courts with cautionary critiques of brain-scan lie detection—critiques so strong that they led to the proffered evidence being excluded.[12]

But it was only Fred Schauer who had the imagination to question whether brain-scan lie detection, even if subject to conflicting interpretations, was still good enough to warrant its admissibility in court, where credibility was often determined by such "soft" and definitely nonscientific factors as a witness's demeanor. Indeed, a great many studies have shown that judges' and jurors' assessments of witnesses' credibility on the basis of "demeanor" are both inconsistent and highly unreliable.[13] So Fred suggested that experimental approaches that the scientific community regarded as less than definitive science might still be an improvement over the status quo.[14] And implicit in this question, as Fred recognized, was the broader question of when, if ever, science that was less than perfect but still not "junk" could be received in evidence in the courtroom.[15] As Fred put it in his article, "Bad science is worse than good science, but may not be worse than the nonscience that lurks in the heads of judges and jurors."[16]

To appreciate how original this thought was, consider the legal background. Back in 1923, the U.S. Court of Appeals for the D.C. Circuit, in the case of *Frye v. United States*, addressed the question of whether the results of a test of credibility involving the first quasi-scientific lie detector, which we now call the polygraph, could be admitted in evidence.[17] The court concluded that science-based evidence

[12] For example, in *United States v. Semrau*, the Government relied on the work of Dr. Marcus Raichle, a founding member of the MacArthur Project, to successfully exclude fMRI lie detection evidence that purported to show defendant's truthfulness. United States' Motion in Limine and Memorandum in Support to Exclude Defendant's Expert Witness Testimony of Dr. Steven Laken and Request by the United States for a *Daubert* Hearing at 6–7, United States v. Semrau, No. 07-cr-10074, 2010 WL 6845092 (W.D. Tenn. June 1, 2010); *Semrau*, 2010 WL 6845092, at *1, *aff'd*, 693 F.3d 510, 516 & n.2 (6th Cir. 2012); New $10 Million MacArthur Project Integrates Law and Neuroscience, MacArthur Found. (Oct. 9, 2007), https://www.macfound.org/press/press-releases/new-10-million-macarthur-project-integrates-law-and-neuroscience [https://perma.cc/A4PL-HCTA].

[13] See, e.g., Jeremy A. Blumenthal, A Wipe of the Hands, A Lick of the Lips: The Validity of Demeanor Evidence in Assessing Witness Credibility, 72 Neb. L. Rev. 1157, 1159 & n.14 (1993).

[14] Schauer, supra note 1, at 1213–16.

[15] Id. at 1216–17.

[16] Id. at 1216.

[17] 293 F. 1013 (D.C. Cir. 1923).

was not admissible unless the scientific principle or discovery on which it was based was "sufficiently established to have gained general acceptance in the particular field in which it belongs."[18] This so-called "*Frye* standard" (which, incidentally, led to the exclusion of polygraph evidence, as remains the case—with few exceptions—in the majority of jurisdictions) was then adopted as the prevailing standard across the United States.[19] While it proved difficult to apply in many cases, there was never any question thereafter that, at least in principle, only evidence well accepted in the scientific community as good science should be admitted in court.

Then, in 1993, in the famous case of *Daubert v. Merrell Dow Pharmaceuticals*, *Inc.*, the Supreme Court of the United States changed the standard to a rather more complicated inquiry into whether the scientific evidence in question had complied with prevailing scientific methodology, that is, had been tested, peer reviewed, applied consistently, and much else.[20] This so-called "*Daubert* standard" was eventually adopted by a majority of the states as well, though a significant minority of states stuck with the *Frye* standard.[21] But both standards were alike in insisting that the only scientific evidence that could even be admitted in court had to be based on what the scientific community regarded as sound practices and principles.[22] Put another way, those who favored *Frye* and those who favored *Daubert* all agreed that scientific evidence that did not in some sense meet what the scientific community regarded as rigorous scientific standards and methodology should be excluded from admissibility in court.

It took Fred to recognize that this was fundamentally different from the much more relaxed standards of admittance imposed by state and federal courts alike with respect to virtually all other kinds of evidence.[23] Consider the following example, which is not itself discussed in Fred's article but which I think nicely illustrates his point. Suppose that one cold evening, the water pipes burst in your basement,

[18] Id. at 1014.

[19] Schauer, supra note 1, at 1196; 5 David L. Faigman et al., Modern Scientific Evidence: The Law and Science of Expert Testimony § 38:1–7 (2025) (collecting cases).

[20] 509 U.S. 579, 592–95 (1993).

[21] Nat'l Civ. Just. Inst., State-by-State Compendium Standards of Evidence (2023), https://ncji.org/wp-content/uploads/2024/01/Evidence-Standards-by-State-7.12.23.pdf [https://perma.cc/39QL-GE75].

[22] Schauer, supra note 1, at 1196–97.

[23] Id. at 1207–1209.

causing flooding and a great deal of damage. And you, the homeowner, bring a lawsuit against the manufacturer of the pipes, saying they were negligently manufactured. As part of your case, you call your plumber, who is prepared to testify that in his experience, there are three reasons for pipes bursting. The first is that they were improperly installed, but in this case he himself did the installation and is prepared to testify they were properly installed in every respect. The second is that they were insufficiently insulated, but he was also the person who did the insulation, and he is prepared to testify that these pipes were fully insulated. And that, he is prepared to testify, just leaves the third alternative: that the pipes were improperly manufactured, which, in his "expert opinion," must have been the case here. Notice that while some of his testimony is based on his personal knowledge as to how he installed and insulated the pipes, much of his testimony, such as that there are only three reasons for a pipe to burst and that he has deductively concluded that negligent manufacturing was the cause here, is a form of expert testimony about technology and perhaps even about the physics of pipes. Should his testimony that, "in his experience," there are only three reasons that a pipe would burst be excluded as disguised scientific testimony that does not pass either *Frye* or *Daubert*? Even though it does not strictly comply with *Daubert*, and maybe not even with *Frye*, I think most judges would allow the testimony. But in doing so, they are effectively applying Fred's approach that if it is not totally junk, it should come in—subject, of course, to cross-examination.

Well, you might say, even the technical aspects of the plumber's testimony are sufficiently close to everyday experience that most judges and jurors can fairly evaluate them. But let me give another example, again not discussed in Fred's article, but drawn from a real-life event. Some of you may possibly recall that right after 9/11, letters containing deadly anthrax spores were mailed to various U.S. Senators, as well as prominent news organizations, resulting in five deaths.[24] The FBI then launched an intensive investigation to try to determine who had sent the poisoned letters.[25] Initially they focused on a scientist named Stephen Hatfill, but after they determined he was innocent and had no other immediate suspects, they recruited some of the nation's most highly

[24] U.S. Dep't of Just., Amerithrax Investigative Summary 1 (2010), https://www.justice.gov/archive/amerithrax/docs/amx-investigative-summary.pdf [https://perma.cc/6VTY-CCXM].

[25] Id.

regarded scientific experts on anthrax to help.[26] Working in secret (because it was a criminal investigation), those scientists developed a new technique for observing and recording how an individual anthrax spore morphs over time, and based on that new technique, they were eventually able to determine that the remaining anthrax spores from the mailed envelopes had morphed in a particular way.[27] Using this morphological fingerprint, so to speak, they then found that of the many anthrax spores the FBI had collected from laboratories throughout the world, only one had morphed in the same way as the crime samples, and it was from a sample taken from the refrigerator of a U.S. government scientist who worked on anthrax research named Bruce Ivins.[28] After some further investigation, the Department of Justice announced that Ivins would be charged as the culprit—at which point Ivins committed suicide.[29]

But suppose Ivins had not committed suicide and the case had gone to trial? The evidence against Ivins mostly would have consisted of the testimony of the scientists, based on their new methodology. Would it have been admissible under either *Daubert* or *Frye*? Probably not, as the science in question, having been developed in secret as part of the criminal investigation, had not been subject to any outside testing, peer review, or the like, let alone become generally accepted in the overall scientific community. But under Fred's approach, it likely would have been admissible—which seems to me to be the right result.

Lest it be thought that I am endorsing Fred's approach across the board, let me offer three clarifications. First, what Fred somewhat satirically referred to as "bad" science was really experimental science that had not yet made its way to full acceptance in the scientific community or to full adherence to the rigors of the scientific method but, by any objective standard, was very far from sheer hypothesis or "junk."[30] Second, Fred was by no means suggesting that such experimental science should not be confronted rigorously in court, both by cross-examination and by competing expert testimony; his point was only that whether it should make it to the point of initial admissibility should be determined by a less exacting standard than scientists require

[26] Id. at 6–7.
[27] Id. at 24–25.
[28] Id. at 24–26.
[29] Id. at 1.
[30] Schauer, supra note 1, at 1214–15.

for full acceptance or for rigorous compliance with the scientific method.[31] And third, I don't want to be understood as suggesting that Fred's approach is not without its own significant problems. For example, as Fred pointed out in his article, his approach implicitly suggested that *Daubert* should be overruled.[32] In my own view, *Daubert*, for all its arguable shortcomings, has succeeded in keeping a lot of truly junk science out of the reach of juries, and I am not sure that Fred's approach would so readily have that salutary effect.

But my point for today's purposes is to show how Fred could so completely think "outside the box" and bring wholly new and broader perspectives to bear on what were otherwise narrow debates. He was, like his thinking, a true original—and he is sorely missed.

[31] See id. at 1214.
[32] See id. at 1216–17.