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Debunked, Discredited, but Still Defended: Why Prosecutors Resist Challenges to Bad Science and Some Suggestions for Crafting Remedies for Wrongful Conviction Based on Changed Science

Aviva A. Orenstein

Indiana University Maurer School of Law, aorenste@indiana.edu

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Debunked, Discredited, but Still Defended: Why Prosecutors Resist Challenges to Bad Science and Some Suggestions for Crafting Remedies for Wrongful Conviction Based on Changed Science

Aviva Orenstein*

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I. INTRODUCTION

In his forthcoming article, *Revising State Post-Conviction Relief Statutes to Cover Convictions Resting on Subsequently Invalidated Expert Testimony*,¹ Professor Edward Imwinkelried persuasively demonstrates how testimony based on flawed science has significantly contributed to wrongful convictions.² In this thoughtful and methodical piece, Imwinkelried

* Associate Dean of Students and Academic Affairs, Professor of Law and Val Nolan Faculty Fellow, Indiana University School of Law-Bloomington.

¹ Edward J. Imwinkelried, *Revising State Post-Conviction Relief Statutes to Cover Convictions Resting on Subsequently Invalidated Expert Testimony*, 48 SETON HALL L. REV. 1095 (2018).

² See generally M. Chris Fabricant & Tucker Carrington, *The Shifted Paradigm: Forensic Science's Overdue Evolution from Magic to Law*, 4 VA. J. CRIM. L. 1, 1–2 (2016)

provides a taxonomy outlining which type of requests for post-conviction relief based on discredited expert testimony should receive a new trial. Imwinkelried's analysis is nuanced, acknowledging that scientific knowledge is not static and that "[a]bsolute certainty is beyond reach."³ The reassessment of expert testimony and the development of new scientific techniques do not automatically exonerate the accused (as does, for instance, certain DNA evidence). Instead, new science undermining old theories and techniques merely calls into question the basis of the conviction.⁴ Imwinkelried suggests that a new trial should be granted when the validation of a new analytic technique results in a different conclusion from the expert technique presented at trial and the change is "so extensive that it *either* discredits the prior expert testimony *or* seriously undermines confidence in its correctness."⁵ Noting that Texas and California have enacted statutes granting new trials in some circumstances where the conviction relied on flawed scientific testimony,⁶ Imwinkelried analyzes the wording and utility of the new statutes.

Imwinkelried specifically and appropriately limits his inquiry to flawed science, the deficiencies of which were unknown at the time of trial. If problems with the proposed expert testimony were known or knowable at

("The empirical evidence and data gathered here demonstrates that traditional forensic identification techniques, as well as the doctrines supporting them, are ultimately no more than a house of cards built on unvalidated hypotheses and unsubstantiated or non-existent data."); Brandon L. Garrett & Peter J. Neufeld, *Invalid Forensic Science Testimony and Wrongful Convictions*, 95 VA. L. REV. 1, 1 (2009) (analyzing the widespread effect of invalid science, finding that sixty percent of convictions of those later exonerated involved flawed forensic testimony, misstating or totally devoid of empirical data).

³ Imwinkelried, *supra* note 1, at 1110.

⁴ See Imwinkelried, *supra* note 1, at 1137 (stating the hardest cases are where new scientific evidence raises serious concerns about the accuracy of the prior conviction but does not prove the accused's undeniable innocence). In such cases, "the courts and legislatures have a far more difficult policy choice; they must weigh the competing interests in accuracy and finality." Imwinkelried, *supra* note 1, at 1137.

⁵ Imwinkelried, *supra* note 1, at 1116.

⁶ A California statute grants new trial motions when a prior conviction rests on "false evidence." As amended, CAL. PENAL CODE § 1473(e)(1) now reads:

For purposes of this section, "false evidence" includes opinions of experts that have either been repudiated by the expert who originally provided the opinion at a hearing or trial or that have been undermined by later scientific research or technological advances.

See Imwinkelried, *supra* note 1, at 1098 n.15 (citing 1 DONALD E. WILKES, JR., STATE POSTCONVICTION REMEDIES AND RELIEF HANDBOOK § 7:61 (2016)). Texas's Code of Criminal Procedure provides that a new trial is warranted if the accused presents testimony about expert research that "was not available . . . at the convicted person's trial" or that "contradicts scientific evidence relied on by the state at trial." TEX. CRIM. PROC. CODE ANN. art. § 11.073(a) (West 2015).

trial, reliance on such expert evidence might qualify for post-conviction relief based on ineffective assistance of counsel;⁷ however, such flawed testimony is not the subject of Imwinkelried's discussion. Similarly, exaggerated expert testimony where the expert overstated reasonable conclusions or baselessly inflated the probability of guilt does not warrant a new trial based on changed science if the accused's diligent inquiry could have exposed the overstatement via cross-examination or the introduction of a contradicting expert.⁸

Although, doctrinally, Imwinkelried is undoubtedly correct in limiting his analysis to newly discovered scientific flaws in evidence, several interrelated issues arise from this limitation. First, as I discuss in Part I, the line between changed science—to which the accused had no access—and inappropriate use of science that should have been detected and objected to at trial, is sometimes tricky to draw. The understanding and evaluation of “changed” science is often filtered through judicial tradition, and sometimes the change occurs not in scientific innovation but in judicial attitude. Second, Part II considers how ineffective assistance of counsel caused by a defendant's failure to object to known bad science indicates a systemic problem in the adversary system of which ineffective assistance is only one part. Admission of science so objectionable that defense counsel is deemed constitutionally ineffective raises an important question about what the other two major players in the courtroom—the prosecutor and judge—were doing. Prosecutors, in particular, may face various institutional pressures, professional incentives, and psychological phenomena that prompt them to introduce and rely on bogus science or to unfairly overstate the expert testimony in closing. Part II applies these institutional factors, especially pressures on prosecutors, to the challenges presented by changed science, and speculates about prosecutors' resistance to new trials based on changed science. Part III considers recent cultural trends towards new science and the politicization of science in general, which bode ill for challenging unproven “science” in the courtroom. Finally, Part IV speculates on how to create structures and incentives that encourage the acceptance of new science and promote motions for new trials for those convicted under faulty science.

⁷ Imwinkelried, *supra* note 1, at 1105 (citing *Hinton v. Alabama*, 134 S. Ct. 1081 (2014) (“Simply stated, when the defense counsel could feasibly have accessed the scientific research at the time of the accused's original trial, there is no need to resort to special legislation such as the new California and Texas statutes.”)).

⁸ Imwinkelried, *supra* note 1, at 1105.

II. DISTINGUISHING BETWEEN KNOWN BOGUS SCIENCE THAT SHOULD HAVE DRAWN OBJECTION AND CHANGES IN SCIENCE THAT SHOULD TRIGGER REEXAMINATION OF CONVICTIONS

The line between known problems with expert scientific testimony and changed science can be hard to draw. Among the cases for which Imwinkelried advocates new trials are those that relied on expert evidence concerning bite marks and hair analysis, matching the accused to the victim and crime scene respectively. In cases evoking such so-called expertise, questionable science arguably contributed to the accused's conviction.⁹

New science has conclusively refuted key pieces of forensic evidence and discredited the experts who offered it. However, that does not obviate the fact that many of these experts made assertions that should have been challenged by the defense even without the new science.¹⁰ The new science offers more conclusive refutation, but the testimony was demonstrably flawed even without it. Often, no foundation was laid for the reliability of the forensic testimony; experts relied on anecdotal experience or appealed to juror intuition without explaining or justifying their assumptions.

Experts in bitemark and microscopic hair analysis often offered overblown conclusions and failed to provide proper foundations, thereby violating then-existing scientific norms. For instance, experts conducting microscopic hair analysis overstated the probative value of finding two hair samples microscopically indistinguishable in identifying a perpetrator. They regularly testified that in their experience it was very rare for them not to be able to tell hairs apart, a meaningless anecdotal boast.¹¹ Additionally, such

⁹ Pema Levy, *Jeff Sessions Wants Courts to Rely Less on Science and More on "Science,"* MOTHER JONES (Apr. 24, 2017), <http://www.motherjones.com/politics/2017/04/sessions-forensic-science/> ("Analyses regularly presented in courtrooms—using such evidence as bite marks, hair, and bullets—that for decades have been employed by prosecutors to convict and even execute defendants are actually incapable of definitively linking an individual to a crime.").

¹⁰ Brandon L. Garrett, *Judging Innocence*, 108 COLUM. L. REV. 55, 82 (2008) ("To a surprising extent, the forensic testimony at trial was improper based on science at the time."). Certainly, cases exist where the science improved and the expert at the original trial did nothing wrong. For instance, imagine a case from the 1980s where an expert identified the accused's blood type as being the same as type the perpetrator left at the crime scene. If the expert did not inflate the probabilities, then the statement itself was based on the best science then available, and the defense was in no way ineffective.

¹¹ See Garrett & Neufeld, *supra* note 2, at 60 (discussing experts' claims that among their thousands of cases they never encountered hairs which they could not microscopically distinguish); Jennifer L. Mnookin et. al., *The Need for a Research Culture in the Forensic Sciences*, 58 UCLA L. REV. 725, 731 (2011). Because no individual examiner can ever examine every possible specimen in the universe, experience alone cannot justify a claim of individualization, assuming that the potential population of the source is substantial. Cf. *Bos. Police Dep't v. Civil Serv. Comm'n*, No. SUCV2013-1250-A, 2014 Mass. Super. LEXIS 2427, at *8-9 (Oct. 6, 2014) (upholding civil commission's ruling that police department lacked just cause to terminate six of ten officers because, standing alone, positive hair test for

experts never offered any empirical evidence that scientific testing had been done to establish an error rate for microscopic hair analysis.¹² New science has enabled much more sophisticated matching of hairs to an individual based on mtDNA (mitochondrial DNA), whereby hairs from crime scenes that were originally matched to the accused were actually determined to come from other sources.¹³ Although experts can now conclusively rule out hair as not being from the accused, this does not address the fact that prosecution experts regularly made unsupported and unsupportable claims contravening *Daubert*.¹⁴

Similarly, supposed expert forensic odontologists—members of a by-and-large self-policing club that publishes a journal not subject to peer review—use the “trappings of science”¹⁵ to testify from photographs that certain marks on the victims matched the unique tooth configuration of the accused. New developments in computer software that provide better imaging have revealed that many of the marks in question were not bite marks at all and certainly did not match the accused’s dentition.¹⁶ Although

cocaine was insufficiently reliable to outweigh officers’ credible denial of drug use; commission noted that “[h]air testing for drugs . . . has not achieved general acceptance within the scientific or law enforcement communities,” and that “no uniform, nationally approved standards for hair testing exist, so that positive or negative test reports depend on different standards used by different laboratories at different times”).

¹² Additionally, no foundation was offered that human hairs are unique to each person. Further complicating matters, hairs belonging to the same person differ significantly. Garrett & Neufeld, *supra* note 2, at 61–63.

¹³ For example, Imwinkelried cites an FBI study, where of 80 hair comparisons in which microscopic analysts reported matches or associations, mtDNA analysis demonstrated that nine samples (12.5%) came from different persons. Imwinkelried, *supra* note 1, at 1113–14 nn.76–80 and accompanying text; see also Garrett & Neufeld, *supra* note 2, at 14–15 (“Of the 65 cases involving microscopic hair comparison in which transcripts were located, 25 cases, or 38%, had invalid forensic science testimony.”).

¹⁴ *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579 (1993).

¹⁵ Erica Beecher-Monas, *Reality Bites: The Illusion of Science in Bite-Mark Evidence*, 30 CARDOZO L. REV. 1369, 1372 (2009) (“The testifying experts have advanced degrees, and often board certification. They have two professional associations, with impressive names. They publish in their own professional journals. They use the statistical product rule to come up with remote-sounding probability statements. But those trappings do not make it science.”).

¹⁶ In 2009, the National Association of Sciences published a congressionally-commissioned report on the state of forensic science in the courtroom entitled “Strengthening Forensic Science in the United States: A Path Forward.” NAT’L RES. COUNCIL, STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD (2009), <https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf> (NAS Report). Noting the high rate of false-positives, the report found that “the scientific basis is insufficient to conclude that bite mark comparisons can result in a conclusive match.” *Id.* at 174–75; see Garrett & Neufeld, *supra* note 2, at 67 (noting that marks considered by experts to be human bite marks are often merely post-mortem artifacts); see also Beecher-Monas, *supra* note 15, at 1371–77, 1392 (arguing the forensic odontology has no empirical basis, no objective standard, no population data establishing the frequency of dental patterns, no proof that human dentition is unique, no

we are more sophisticated in evaluating match ups, the rookie mistake of assuming, with no proof, that everyone's bite mark is unique, the phony probabilities asserted by experts, and reliance on the untested personal observations of experts, who provided no testing for error rate, were knowable problems that went unchecked before the scientific innovation.¹⁷ For both microscopic hair analysis and bitemark matching, an honest assessment of what the science could tell us at the time of trial indicates that the defense was often ineffective. An effective challenge to the baseless assertions and the lack of empirical evidence of testing for falsifiability would have excluded or diminished the expert testimony and made conviction less likely.

Relatedly, it can be hard to pinpoint the moment the science changes. In *Commonwealth v. Kunco*,¹⁸ the court rejected post-conviction relief because, to the extent that the bitemark testimony was flawed, the defense should have known about the problems with such testimony years before the National Academy of Sciences report.¹⁹ Because the criticisms were not "previously unknown" at the time of the trial, defense could not attack the judgment collaterally on the basis of that testimony.²⁰

III. AN INEFFECTIVE SYSTEM—FOCUSING ON THE PROSECUTOR

To establish ineffective assistance of counsel, a criminal defendant must first prove that counsel's performance was deficient: that counsel made errors so serious that he or she was not functioning as the "counsel" guaranteed the defendant by the Sixth Amendment.²¹ If the failure to

known error rates and therefore cannot even meet the low level of basic relevance under FED. R. EVID. 401 (2009); Radley Balko, *How the Flawed "Science" of Bite Mark Analysis Has Sent Innocent People to Prison*, WASH. POST (Feb. 13, 2015), <https://www.washingtonpost.com/news/the-watch/wp/2015/02/13/how-the-flawed-science-of-bite-mark-analysis-has-sent-innocent-people-to-jail/> (citing the Innocence Project and reporting that 24 people have been exonerated after they were either convicted or arrested based on the wrongful assertions of a bite mark analyst).

¹⁷ See, e.g., *Otero v. Warnick*, 614 N.W.2d 177, 178 (2000), in *Reality Bites: The Illusion of Science in Bite-Mark Evidence*, 30 CARDOZO L. REV. 1369 (2009) (expert testified that only one person in the world could have inflicted the bite marks).

¹⁸ No. 482-C-1991, 2010 Pa. Dist. & Cnty. Dec. Unpub. LEXIS 488 (Pa. D. & C. Oct. 28, 2010), *aff'd*, 34 A.3d 233 (Pa. Super. Ct. 2011).

¹⁹ *Id.* at 32–33 ("Based upon the public information available and the contents of the NAS Report itself, this court determines that the information regarding studies indicating the lack of reliability of bitemark comparisons insofar as they purport to identify a particular perpetrator to the exclusion of any other individuals was information that was available to the defendant long before the filing of the Writ of Habeas Corpus/PCRA. . . .").

²⁰ *Id.*

²¹ *Strickland v. Washington*, 466 U.S. 668, 687 (1984). The defendant must also show that the deficient performance prejudiced the defense so as to deprive the defendant of a fair trial, that is, a trial whose result is reliable. *Id.*

challenge expert testimony rises to the level of ineffective assistance of counsel, the error must be obvious. Logically, as competent practitioners, the prosecutor and the judge should have also been aware of the glaring deficiency. When a defense counsel is ineffective, what does this say about the other actors in the courtroom?

One might excuse the trial judge by claiming that judges do not understand science, and some evidence supports that assertion.²² But the notion of judicial scientific illiteracy or even reluctance to engage with complex science is at least somewhat belied by very sophisticated civil opinions, in which courts discuss complex scientific theories and claims.²³ The very different treatment that experts receive in civil tort cases versus criminal cases indicates that something deeper and more systemic is going on in criminal cases, and the treatment of experts may be closely tied to a culture of certitude and a pro-conviction bias.²⁴

Alternatively, perhaps trial judges understand the flaws in the expert testimony but choose to act as neutral arbiters, waiting to adjudicate disputes that criminal defense attorneys do not raise. When no one objects, judges normally do not insinuate themselves into the presentation of evidence. But defenders, who have the incentive to challenge the science, have significantly fewer resources to draw upon than those representing the state.

²² See Adam B. Shneiderman, *Prosecutors Respond to Calls for Forensic Science Reform: More Sharks in Dirty Water*, 126 YALE L.J. FORUM 348 (2017) (noting a consensus that most state court judges do not understand basic *Daubert* concepts such as falsifiability and error rates).

²³ See, e.g., *Worrell v. Elliot & Frantz*, 799 F. Supp. 2d 343 (D.N.J. 2011) (improper installation of wet kit in excavator); *Graves v. Mazda Motor Corp.*, 675 F. Supp. 2d 1082 (W.D. Okla. 2009) (auto design defect); *Blackwell v. Wyeth*, 971 A.2d 235 (Md. 2008) (whether thimerosal-laden vaccines cause autism); *In re Asbestos Litig.*, 900 A.2d 120 (Del. 2006) (risk of contracting asbestos related disease from chrysotile asbestos). Many scholars have noted the irony that scientific testimony in civil cases is treated much more skeptically than scientific testimony in criminal cases. See Margaret A. Berger, *Expert Testimony in Criminal Proceedings: Questions Daubert Does Not Answer*, 33 SETON HALL L. REV. 1125 (2003); Fabricant & Carrington, *supra* note 2, at 40 n.161 (comparing Mississippi's rigorous attitude toward civil experts in med-mal and products cases to the lack of scrutiny in bitemark cases); Mnookin et. al., *supra* note 11, at 761 (observing that if courts applied *Daubert* to criminal cases with the same intensity and skepticism applied to toxic torts "there is little doubt that the forensic science community would have become forceful advocates for whatever research seemed necessary to justify admissibility"); D. Michael Risinger, *Navigating Expert Reliability: Are Criminal Standards of Certainty Being Left on the Dock?*, 64 ALB. L. REV. 99 (2000).

²⁴ See *infra* Part III (discussing the culture of forensic evidence in the courtroom and the adherence to traditional forms of scientific testimony even when they do not comport with *Daubert*). See also Elizabeth L. DeCoux, *The Admission of Unreliable Expert Testimony Offered by the Prosecution: What's Wrong with Daubert and How to Make It Right*, 2007 UTAH L. REV. 131, 132 (2007) ("[P]rosecutors fending off challenges to the reliability of their expert witnesses enjoy a success rate of ninety-two percent in trial courts and ninety-eight percent in appellate courts.").

Aside from exceptional cases involving wealthy defendants,²⁵ the prosecutor can regularly outspend and outmatch the accused. A public defender's ability to challenge scientific evidence is limited by crushing caseloads, insufficient training, and lack of funds for forensic experts, who could testify as well as help prepare cross-examination of government expert witnesses.²⁶

By far the most interesting actor in the courtroom when it comes to faulty expert testimony is the one who most often actively promotes it: the prosecutor. As Professor Bennett Gershman has observed, "the prosecutor, for good or ill, is the most powerful figure in the criminal justice system."²⁷ A prosecutor "has the responsibility of a minister of justice and not simply that of an advocate."²⁸ Both substantive law and ethical duties require prosecutors to disclose exculpatory evidence to the defense,²⁹ but the issue

²⁵ Examples include the O.J. Simpson murder trial, and Bill Cosby's first rape trial, but there are also some less well known examples where million dollar defenses led to acquittals. See e.g., Elizabeth Nix, *5 Infamous "Not Guilty" Verdicts*, HISTORY.COM (Mar. 25, 2015), <http://www.history.com/news/history-lists/5-infamous-not-guilty-verdicts>; Gary Cartwright, *How Cullen Davis Beat the Rap*, TEX. MONTHLY (May 1979), <http://www.texasmonthly.com/articles/how-cullen-davis-beat-the-rap-2/> (discussing the enormous fees and defense tactics of Racehorse Hyanes).

²⁶ Defenders do not have the investigative power of the police, as do prosecutors. Most importantly, they do not have access to vital discovery of scientific evidence—the type that is regularly available in civil cases. See Paul C. Giannelli *Pretrial Discovery of Expert Testimony* 44 No. 6 CRIM. LAW BULLETIN. The right to confrontation is hollow if the defenders have no meaningful basis on which to cross-examine the expert witness. See generally Jennifer N. Mellon, *Manufacturing Convictions: Why Defendants Are Entitled to the Data Underlying Forensic DNA Kits*, 51 DUKE L.J. 1097 (2001) (arguing that trial courts should exclude the results of forensic DNA testing if the defendant lacks access to the scientific data supporting the testing method." Thanks to Professor Keith A. Findley for first raising this point at the conference in honor of Professor Michael Risinger. Anecdotally, defenders also have other fewer resources. See Garrett & Neufeld, *supra* note 2, at 33–34 (outlining the disabilities faced by indigent defendants in securing forensic experts and in facing police libraries). My mother, Sylvia Orenstein, a retired Appellate Defender in New Jersey received access to Lexis, an online search engine, a full year after the district attorneys and attorney generals did. Letter from Sylvia Orenstein to author (undated) (on file with author).

²⁷ BENNETT L. GERSHMAN, *PROSECUTORIAL MISCONDUCT* vi (2d ed. 2018). Interestingly, Professor Gershman's comprehensive treatise on prosecutorial misconduct has almost no treatment of expert scientific testimony.

²⁸ MODEL RULES OF PROF'L CONDUCT r. 3.8 cmt. 1 (AM. BAR ASS'N 2017) ("This responsibility carries with it specific obligations to see that the defendant is accorded procedural justice, that guilt is decided upon the basis of sufficient evidence, and that special precautions are taken to prevent and to rectify the conviction of innocent persons."); see *Berger v. United States*, 295 U.S. 78, 88 (1935) (the role of a prosecutor is to see that justice is done; "It is as much [a prosecutor's] duty to refrain from improper methods calculated to produce a wrongful conviction as it is to use every legitimate means to bring about a just one."). Gershman also notes that prosecutors have "a special duty not to mislead." GERSHMAN, *supra* note 27, at 10:27 (quoting *United States v. Myerson*, 18 F.3d 153 (2d Cir 1994)); ABA CRIM. JUST. STANDARDS § 3-5.6(a) ("[P]rosecutor should not knowingly offer false evidence.").

²⁹ *Brady v. Maryland*, 373 U.S. 83 (1963) (holding that prosecution must turn over exculpatory evidence to the defense); MODEL RULES OF PROF'L CONDUCT r. 3.8(d) (AM. BAR

is considerably murkier when such evidence only becomes available post-conviction and calls the conviction into question rather than undermining it entirely.³⁰ On the issue of post-conviction obligations, the A.B.A. Model Code of Professional Conduct provides that prosecutors who secure a conviction have an ethical duty to come forward if “new, credible and material evidence” creates “a reasonable likelihood that a convicted defendant did not commit an offense of which the defendant was convicted.”³¹ The prosecutor must “undertake further investigation, or make reasonable efforts to cause an investigation, to determine whether the defendant was convicted of an offense that the defendant did not commit.”³² But that duty has not always been enforced,³³ and some jurisdictions apply the obligation differently in different circumstances.³⁴

One reason for bad science may be that prosecutors are as unsophisticated about science as everyone else in the courtroom, blindly accepting the pronouncements of experts. It is clear, however, from the cases where prosecutors behave illegally and outrageously, that innocent misunderstanding of the science cannot provide a full explanation; sometimes prosecutors knowingly suppress exculpatory forensic evidence.³⁵

ASS’N 2017) (requiring prosecutors to “make timely disclosure to the defense of all evidence or information known to the prosecutor that tends to negate the guilt of the accused or mitigates the offense, and, in connection with sentencing, disclose to the defense and to the tribunal all unprivileged mitigating information known to the prosecutor”).

³⁰ Daniel S. Medwed, *The Prosecutor As Minister of Justice: Preaching to the Unconverted from the Post-Conviction Pulpit*, 84 WASH. L. REV. 35, 35 (2009) (exploring the “minister of justice” theory and noting that “in the post-conviction sphere . . . few concrete principles exist to govern prosecutorial behavior after the conviction of a criminal defendant”); Fred C. Zacharias, *The Role of Prosecutors in Serving Justice After Convictions*, 58 VAND. L. REV. 171, 174 (2005) (noting that there was little law defining prosecutors’ duties post-conviction).

³¹ MODEL RULES OF PROF’L CONDUCT r. 3.8(g) (AM. BAR ASS’N 2017).

³² *Id.* The Rule also provides that “[w]hen a prosecutor knows of clear and convincing evidence establishing that a defendant in the prosecutor’s jurisdiction was convicted of an offense that the defendant did not commit, the prosecutor shall seek to remedy the conviction.” *Id.* at 3.8(h).

³³ See *Comm’n for Lawyer Discipline v. Hanna*, 513 S.W. 3d 175 (Tex. Ct. App. 2016) (affirming the dismissal of disciplinary actions against a district attorney and assistant district attorney for not disclosing potentially exculpatory information to defendant post-conviction because of TEX. DISC. R. PROF. CONDUCT 3.09(d), requiring prosecutors to timely disclose information known to the prosecutor tending to negate defendant’s guilt or mitigate offense did not impose a post-conviction duty of disclosure at the time of the conduct at issue).

³⁴ Under California law, prosecutors must disclose *Brady* evidence in post-conviction death penalty and life without the possibility of parole cases. CAL. PENAL CODE § 1054.9 (West, Westlaw through 2003 legislation). However, in other cases, where a defendant has received a life sentence with the possibility of parole, statutory law does not require such disclosures. *In re Scott*, 61 P.3d 402, 417–18 (Cal. 2003) (reiterating that the nature and scope of discovery is generally resolved on a case by case basis).

³⁵ See *Brady v. Maryland*, 373 U.S. 83 (1963); Ellen Yaroshefsky, *Wrongful Convictions: It is Time to Take Prosecution Discipline Seriously*, 8 U. D.C. L. REV. 275 (2004)

Regarding our focus on bad science in the courtroom, some prosecutors intentionally mischaracterize the evidence, violating their ethical duty to be candid to the tribunal and to avoid knowing misstatements of fact.³⁶

The behavior of prosecutors who knowingly act unethically and the behavior of prosecutors who resist admitting to and correcting mistakes that led to obvious unfairness at trial illuminate a systemic problem of denial. Such behavior suggests how some prosecutors will respond to motions for new trials based on changed science. I explored the subject of prosecutors' refusal to acknowledge mistakes in *Facing the Unfaceable: Dealing with Prosecutorial Denial in Postconviction Cases of Actual Innocence*,³⁷ examining cases in which prosecutors engaged in stunning levels of denial and seemingly irrational attachment to the notion of the accused's guilt despite stark DNA evidence excluding the convicted person as the perpetrator.³⁸ Although significant differences exist between the effect of changed science and the conclusive exoneration offered by some DNA cases, there is every reason to believe such prosecutorial behavior in the DNA exonerations will carry over to new trial motions based on changed evidence.

A. Institutional Pressures & Personal Needs

Institutional and political pressures affect prosecutors' willingness to admit error, encouraging them to resist acknowledging or even perceiving a conviction as wrongful. Given the many frivolous claims of innocence that prosecutors encounter, they are understandably skeptical of such post-conviction claims. Prosecutors can be cynical to the point of hostility toward convicts, whom, as a class, many perceive as liars and whiners.³⁹ They

(documenting such failures to turn over exculpatory forensic and other evidence); Emily Bazelon, *She Was Convicted of Killing Her Mother. Prosecutors Withheld the Evidence That Would Have Freed Her*, N.Y. TIMES MAG. (Aug. 1, 2017), <https://www.nytimes.com/2017/08/01/magazine/she-was-convicted-of-killing-her-mother-prosecutors-withheld-the-evidence-that-would-have-freed-her.html> (discussing *State v. Jackson*, 444 S.W.3d 554 (Tenn. 2014), which overturned a conviction because of prosecutorial comment on the accused's failure to take the stand, as well as the suppression of vital exculpatory evidence contradicting the testimony and questioning the credibility of the only witness against the accused).

³⁶ MODEL RULES OF PROF'L CONDUCT r. 3.3(a)(1) (AM. BAR ASS'N 2017) (prohibiting an attorney from making "a false statement of fact or law to a tribunal"); *id.* at 3.3 (a)(3) (forbidding an attorney from offering "evidence that the lawyer knows to be false").

³⁷ Aviva Orenstein, *Facing the Unfaceable: Dealing with Prosecutorial Denial in Postconviction Cases of Actual Innocence*, 48 SAN DIEGO L. REV. 401 (2011).

³⁸ *Id.*

³⁹ Orenstein, *supra* note 37, at 423; CAROL TAVRIS & ELLIOT ARONSON, MISTAKES WERE MADE (BUT NOT BY ME): WHY WE JUSTIFY FOOLISH BELIEFS, BAD DECISIONS, AND HURTFUL ACTS 132 (2007) (discussing prosecutors' cynicism because people lie to prosecutors all the time); Alafair Burke, *Neutralizing Cognitive Bias: An Invitation to Prosecutors*, 2 N.Y.U. J.L. & LIBERTY 512, 519 (2007) ("[P]rosecutors live in a world that constantly reinforces their perceptions that the defendants charged in their cases are all guilty.").

express “the needle in a haystack disincentive,”⁴⁰ believing that time spent on examining old convictions would pointlessly detract from protecting the public by securing new convictions. Issues of finality and concern for victims and their families also play a vital role in prosecutors’ disinclination to reopen old cases.⁴¹ Even when prosecutors are caught not playing by the rules, they sometimes argue that the result was fair, and that the invalid inculpatory evidence or suppressed exculpatory evidence was just extra insurance to prevent an obviously guilty person from going free.⁴²

Pressures on prosecutors also arise from the desire to maintain allegiance to their office culture,⁴³ remain team players, uphold their personal credibility, protect the image of the office, advance professionally,⁴⁴ and, in the case of elected officials, stay in power.⁴⁵ Arguably, people who are attracted to prosecution possess personality traits that make it harder to confess error, such as high levels of confidence and competitiveness.⁴⁶ Furthermore, prosecutors’ tremendous power and discretion might shape their attitudes and worldviews over time, in some cases leading to a sense of

⁴⁰ Daniel S. Medwed, *The Zeal Deal: Prosecutorial Resistance to Post-Conviction Claims of Innocence*, 84 B.U. L. REV. 125, 148–50 (2004).

⁴¹ See Orenstein, *supra* note 37, at 405–06; Zacharias, *supra* note 30, at 219.

⁴² See *id.* at 432 n.169 (quoting TAVRIS & ARONSON, *supra* note 39, at 156) (“Apologize to them? Give them money? Don’t be absurd. They got off on a technicality. Oh, the technicality was DNA? Well, they were guilty of something else.”); see Baker, *supra* note 23, at 47 (“At one point I didn’t care who went to jail, because everybody was guilty of something.”).

⁴³ See Jonathan A. Rapping, *Who’s Guarding the Henhouse? How the American Prosecutor Came to Devour Those He Is Sworn to Protect*, 51 WASHBURN L.J. 513, 557, 559 (2012) (footnotes omitted) (describing prosecutor offices as “competitive environments” in which “prosecutors vie with one another to see who can obtain the most convictions or the fastest jury verdicts” and those where “prosecutors competed to secure convictions, and a chart tallying wins and losses”); DAVID HEILBRONER, *ROUGH JUSTICE: DAYS AND NIGHTS OF A YOUNG D.A.* 239 (1990) (describing the culture of his prosecutor’s office as rewarding bravado and frowning upon admitting ignorance or mistake).

⁴⁴ See Stephanos Bibas, *Plea Bargaining Outside the Shadow of Trial*, 117 HARV. L. REV. 2463, 2471 (2004) (“Favorable win-loss statistics boost prosecutors’ egos, their esteem, their praise by colleagues, and their prospects for promotion and career advancement.”); Medwed, *supra* note 40, at 136 (“Simply put, prosecutors may perceive (or fear the public will perceive) the post-conviction exoneration of an innocent prisoner as undermining the credibility of the office—and the person—that prosecuted that defendant.”); Barbara O’Brien, *A Recipe for Bias: An Empirical Look at the Interplay Between Institutional Incentives and Bounded Rationality in Prosecutorial Decision Making*, 74 MO. L. REV. 999, 1010 (2009) (noting that high conviction rates assist advancement; “winning is considered such a reliable indicator of work quality that some offices require a prosecutor to file a report explaining why a trial ended in acquittal, imposing no such requirement for convictions.”).

⁴⁵ O’Brien, *supra* note 44, at 1010 (“High conviction rates bolster re-election campaigns and funding requests.”).

⁴⁶ See Medwed, *supra* note 40, at 139–40 (discussing self-righteous and “gung-ho” attitude of prosecutors) (quoted in Orenstein, *supra* note 37 at n.118); Orenstein, *supra* note 37, at 405 n.19.

self-righteousness, or in extreme cases, delusions of infallibility.

B. *Unconscious Bias & Denial*

Although prosecutors face considerable reputational consequence, personal angst, and peer pressure to win cases and hold onto convictions, it would be a mistake to see their subsequent denial of wrongful convictions as solely aimed at professional advancement, response to external pressures, or cynical manipulation of the justice system. The problem is not as clear or as crass as Upton Sinclair's famous dictum, "It is difficult to get a man to understand something when his salary depends upon his not understanding it"⁴⁷—though that bon mot might explain the behavior of some forensic odontologists.⁴⁸

Prosecutors often do not understand or cannot admit to themselves that they are overreaching or inappropriately ignoring evidence of innocence. The vast majority of prosecutors are not self-conscious rule-breakers, scheming to convict at all costs; rather, they confront serious psychological roadblocks that affect their judgment and cognition. Prosecutors can fall victim to their own hype, experiencing confirmation bias⁴⁹ and other psychological mechanisms that skew their judgment and ability to confront the evidence dispassionately.⁵⁰

⁴⁷ UPTON SINCLAIR, I, CANDIDATE FOR GOVERNOR: AND HOW I GOT LICKED 109 (1944).

⁴⁸ See *infra* notes 15–17 and accompanying text (discussing the unreliable and unmonitored "expertise" of forensic odontologists). One district court makes this very point about them, quoting Sinclair. See *Starks v. City of Waukegan*, 123 F. Supp. 3d 1036, 1052 (N.D. Ill. 2015).

⁴⁹ Confirmation bias is a "tendency to search for and interpret information in line with one's preconceptions." Orenstein, *supra* note 37, at 425 (citing O'Brien, *A Recipe for Bias*, *supra* note 44, at 1011) (defining confirmation bias as a "tendency to seek and interpret evidence in ways that support existing or favored beliefs," and noting that "[c]onfirmation bias connotes something more subtle and less conscious than the deliberate case building that any attorney must do to prepare for trial"); Barry C. Scheck, *Conviction Integrity Units Revisited*, 14 OHIO ST. J. CRIM. L. 705, 715–17 (2017) (discussing how prosecutors "spurned the Commission [on Future of DNA Evidence] recommendations, reflexively opposed testing, and unreasonably refused to vacate convictions even after court ordered post-conviction DNA testing produced powerful, exculpatory results" and discussing "this striking phenomenon and the cognitive psychology that underlies cases where prosecutors "irrationally refuse to admit error").

⁵⁰ Other relevant psychological mechanisms include "tunnel vision," which describes how once a suspect is identified, contradictory evidence is more likely to be dismissed or minimized. See Susan Bandes, *Loyalty to One's Convictions: The Prosecutor and Tunnel Vision*, 49 HOW. L.J. 475, 492–94 (2006); Keith A. Findley & Michael S. Scott, *The Multiple Dimensions of Tunnel Vision in Criminal Cases*, 2006 WIS. L. REV. 291, 354 (2006); see generally Alafair S. Burke, *Improving Prosecutorial Decision Making: Some Lessons of Cognitive Science*, 47 WM. & MARY L. REV. 1587, 1593 (2006) (exploring confirmation bias, selective information processing, belief perseverance, and the avoidance of cognitive dissonance, all types of cognitive bias that affect prosecutorial decision making and exercise of discretion).

Most poignantly, it is prosecutors' best impulses that may lead them astray. Their view of themselves as champions of justice makes prosecutors especially psychologically defended against charges of wrongful conviction. Their self-perception as those who fight on the side of the angels makes them particularly resistant to admitting error.⁵¹ The mistake of a false conviction challenges prosecutors' self-concept; the error of a false conviction is simply too painful to admit.⁵² As Carol Tavis and Elliot Aronson explain in their book, *Mistakes Were Made (But Not by Me)*, prosecutors often deny obvious evidence of post-conviction innocence or minimize the harm of a false conviction, believing that the accused probably committed some other crime.⁵³ The only other option would be to acknowledge that the prosecutor sent an innocent person to prison, something so antithetical to a prosecutor's self-concept. Therefore, the prosecutor engages in tortured reasoning to argue that no mistake was made.

Many of the same factors that lead prosecutors to resist DNA exonerations will influence the reaction to new trial motions based on changed science. In rare cases, prosecutors will agree and support a motion for a new trial. In other cases, however, they may perceive the presentation of advancements in science that question old verdicts as simply one more defense trick for allowing the guilty to re-litigate and go unpunished. Specifically, I think we can expect to see prosecutors responding to new trial motions based on unsupportable expert science in one of the following ways: they will (1) overvalue or mischaracterize the questionable evidence, arguing that it comports with current science; (2) minimize the role of expert testimony in gaining the conviction, assuring the court and themselves that the jury would have convicted without the expert testimony;⁵⁴ or (3) question the new science itself. This last option is discussed in Part III.

⁵¹ Although, to be fair, no one enjoys being wrong. KATHRYN SCHULZ, *BEING WRONG: ADVENTURES IN THE MARGIN OF ERROR* 233–35 (2010) (discussing prosecutors' reactions to exonerating DNA).

⁵² See Orenstein, *Facing the Unfaceable*, *supra* note 37 at 402–03 (“Ironically, a prosecutor’s desire to do justice and the prosecutor’s self-image as a champion of justice render the fact of wrongful conviction particularly painful. As a result, some prosecutors go to incredible lengths to deny the obvious rather than face the fact that the justice system failed and they may have contributed to that failure.”); see also Rachel Pecker, Note, *Quasi-Judicial Prosecutors and Post-Conviction Claims of Innocence: Granting Recusals to Make Impartiality a Reality*, 34 *CARDOZO L. REV.* 1609, 1620–21 (2013) (explaining that prosecutors often have difficulties with their dual responsibilities of freeing the innocent and convicting the guilty, especially when a prosecutor is “confronted with the heightened risk that her own, or her office’s, actions contributed to an innocent person being imprisoned”).

⁵³ CAROL TAVIS & ELLIOT ARONSON, *MISTAKES WERE MADE (BUT NOT BY ME): WHY WE JUSTIFY FOOLISH BELIEFS, BAD DECISIONS, AND HURTFUL ACTS* 131–33 (2007).

⁵⁴ They will acknowledge what they characterize as minor or trivial inaccuracies but discount the effect of the flawed science on the overall verdict, arguing that justice was done.

One might imagine that it would be psychologically easier for prosecutors if the new trial motion is based on scientific knowledge to which no one had access at the time of the trial. How could there be explicit or even implicit criticism of the prosecutor for not knowing the unknowable? Yet, a motion for new trial based on changed science challenges the entire case and, to a large extent, the prosecutor's credibility and effectiveness. Because the conviction relied on many factors, it calls into question the performance of the prosecutor regarding the rest of the evidence, not just the scientific testimony. Furthermore, the prosecutor in changed science cases, unlike DNA exoneration cases, can still credibly believe and argue that the result was just (even if some bad science arguments were credited to convict). Prosecutors will also have institutional and administrative concerns beyond those involving DNA exonerations. The use of a flawed science technique might have affected many cases and a tidal wave of new trial motions would overwhelm the system, particularly because old cases would be difficult to retry years later, given stale evidence and long-gone witnesses. Finally, in some cases the bad science, while wrong and unfair, does not necessarily shake the court's belief in actual guilt.⁵⁵ This is especially so because the standard for post-conviction relief can be very high.⁵⁶

IV. POTENTIAL SOURCES OF RESISTANCE TOWARD NEW SCIENCE: ANTI-CRIME ORIENTATION AND TRADITIONALIST VALUES

The notion of "changed science" means something different from mere new discoveries, understanding or techniques; it also implicates the culture of expert evidence in the criminal courtroom. Bitemark analysis and microscopic hair analysis went routinely unchallenged not because they relied on solid foundations but because of their traditional and unexamined court acceptance by everyone—judiciary, prosecution and defense. Despite *Daubert*, the "science" of the courtroom was intensively influenced by stare decisis and courtroom cultural norms. The entrenchment of certain

⁵⁵ Consider, for instance, *State v. Prade*, 9 N.E.3d 1072 (Ohio Ct. App. 2014), in which one expert opined that he did not believe more than one person could make the same bite mark and definitively attributed that bite mark to the accused. *Id.* at 1090. Later, DNA analysis based on improved scientific techniques excluded the accused's saliva from the locus of the bite mark. *Id.* at 1110. Nevertheless, based on eyewitness testimony and the accused's history of violence against and stalking of the victim, the Court of Appeals reversed the trial court's exoneration remanding for an inquiry whether the petitioner established actual innocence by clear and convincing evidence on post-conviction relief.

⁵⁶ Imwinkelried acknowledges the importance of the standard of review in determining how many cases will receive new trials based on changed science, but consciously saves that question for another day. See Imwinkelried, *supra* note 1 at 1103. See also Scheck, *supra* note 49, at 733 (discussing various standards of review ranging from preponderance to clear and convincing).

questionable science reflects three interrelated phenomena. First, it is an outgrowth of a pro-prosecution bias. Second, it represents institutional inertia and an inclination toward the status quo and arguably, authoritarian tendencies, demanding certainty and allegiance to tradition, even in the face of hard scientific evidence to the contrary. Finally, resistance to new science highlights a suspicion of the scientific method itself.

Significantly, mistakes in admitting unreliable expert testimony in criminal cases appear to be unidirectional—they serve the prosecution.⁵⁷ Therefore, any challenges based on changed science would exclusively benefit the accused.⁵⁸ New science may not only undermine confidence in past convictions, it may also make it harder for prosecutors to convict future defendants. As then-Senator and now Attorney General Jeff Sessions stated concerning handwriting analysis, “I don’t think we should suggest that those proven scientific principles that we’ve been using for decades are somehow uncertain and leaving prosecutors having to fend off challenges on the most basic issues in a trial.”⁵⁹ This statement has nothing to do with science and everything to do with easing the path of prosecutors towards conviction.⁶⁰

The reluctance to acknowledge scientific innovation, however, reflects more than the zero sum calculation that changed science is good for defenders and bad for prosecutors. Rather, the hostility to new science in the courtroom, particularly science that challenges traditional practices, comes from a deep and deeply defended place. In part, it reflects a fondness for the status quo as reflected in the ease of determining precedent and following *stare decisis* as opposed to the challenge of figuring out new (and often complicated and less accessible) science. The resistance also arises from the fear that changed science disrupts traditional courtroom norms and questions

⁵⁷ See Garrett & Neufeld, *supra* note 2, at 34 (“[T]he presentation of forensic science during criminal trials is usually one-sided, provided only by analysts testifying for the prosecution.”). I am unaware of mistaken expert testimony that exonerates. Because of double jeopardy, any scientific mistake that exonerates an accused cannot be revisited on appeal.

⁵⁸ Because of double jeopardy, the government cannot re-prosecute even if new science irrefutably pointed to the guilt of someone who was acquitted for the crime. See U.S. CONST. amend. V.

⁵⁹ Radley Balko, *Jeff Sessions Wants to Keep Forensics in the Dark Ages*, WASH. POST (Apr. 11, 2017), <https://www.washingtonpost.com/news/the-watch/wp/2017/04/11/jeff-sessions-wants-to-keep-forensics-in-the-dark-ages/>. Sessions also expressed concern that “this is being thrown up to create the impression with a jury that there’s no basis for these kind of reports” which he had “always understood to be proven scientific techniques.” *Id.*

⁶⁰ See D. Michael Risinger, *Goodbye to All That, or, A Fool’s Errand, By One of the Fools: How I Stopped Worrying About Court Responses to Handwriting Identification (and ‘Forensic Science’ in General) and Learned to Love Misinterpretations of Kumho Tire v. Carmichael*, 43 TULSA L. REV. 447 (2007) (eviscerating the value of handwriting evidence, noting that trial courts crave certainty and have turned a blind eye to commands of screening science when it comes to the bogus science of handwriting analysis).

established authority.⁶¹ The “truth” of mythical unchangeable science and the cult of experts who perform tests that lead inexorably to conviction have become enshrined in case law. To challenge established courtroom science is to subvert authority, question long-accepted traditions, and impugn the quality of the justice that sent people to jail.⁶² The process of constant questioning, rethinking, and debunking threatens a rigid worldview that prizes certitude, distrusts challenges to authority, venerates tradition, and seeks to perpetuate the status quo.⁶³ Courts tend to cite established legal authority and thereby ossify courtroom “science.” At the extreme, such resistance is reflected in decisions to continue to accept questionable science via judicial notice.⁶⁴

The reluctance to credit changed science also arouses suspicion and skepticism about the scientific enterprise generally. Such resistance may express itself not merely as an objection to the disruptive nature of new trial motions and their practical effect on prosecution, but as resistance to modern science itself. Imwinkelried quotes Margaret Farrell for the proposition that: “Science came to be seen not as a gradual, relentless accumulation of knowledge . . . but as a succession of superseded theories.”⁶⁵ This view of science comports with *Daubert*, which understands science as dynamic and

⁶¹ Cf. D. Michael Risinger, *The Irrelevance, and Central Relevance, of the Boundary Between Science and Non-Science in the Evaluation of Expert Witness Reliability*, 52 VILL. L. REV. 679, 689 (2007) (disparaging the support of fingerprint evidence because of its longevity in the courts or the expert’s “professional judgment based on training and experience” as “junk science” and observing that such evidence “is not thoughtful, it is not rigorous, and it is not—whatever the term may ultimately mean—scientific”).

⁶² This is particularly true in the current approach of the Justice Department’s pro-conviction, lock-’em-up-and-throw-away-the-key approach to criminal justice. See Sari Horwitz & Matt Zapotsky, *Sessions Issues Sweeping New Criminal Charging Policy*, WASH. POST (May 12, 2017), https://www.washingtonpost.com/world/national-security/sessions-issues-sweeping-new-criminal-charging-policy/2017/05/11/4752bd42-3697-11e7-b373-418f6849a004_story.html?utm_term=.436c8f963712.

⁶³ See Imwinkelried, *supra* note 1; see M. Chris Fabricant & Tucker Carrington, *The Shifted Paradigm: Forensic Science’s Overdue Evolution from Magic to Law*, 4 VA. J. CRIM. L. 1, 85 (2016) (discussing “the lethal dissonance between scientific reality and legal precedent”); Mnookin et. al., *supra* note 11, at 731, 747 (“Forensic science needs to focus more on science than on law, to shift from a quasi-adversarial perspective to a research orientation.”; “Many forensic scientists, as well as many judges, are too willing to infer scientific validity from the fact of longstanding use.”).

⁶⁴ See e.g., *Johnson v. Commonwealth*, 12 S.W.3d 258, 262–63 (Ky. 1999) (“Based upon the overwhelming acceptance of this evidence [microscopic hair analysis] by other jurisdictions, as well as our own history of routine admission of this evidence at trial, trial courts in Kentucky can take judicial notice that this particular method or technique is deemed scientifically reliable.”); Fabricant & Carrington, *supra* note 63, at 115 (noting the intersection of science and law—where science becomes ossified and judicial notice is taken).

⁶⁵ Imwinkelried, *supra* note 1 at 1095 (quoting Margaret G. Farrell, *Daubert v. Merrell Dow Pharmaceuticals, Inc.: Epistemology and Legal Process*, 15 CARDOZO L. REV. 2183, 2194 (1994)).

self-correcting.⁶⁶ Not every jurisdiction follows *Daubert*, however; instead some jurisdictions adopt the *Frye* standard, which is inherently conservative and prefers deferring to expert guilds rather than exploring knowledge or assuring accuracy.⁶⁷ For instance, one Pennsylvania court opined that as a “Frye State” it looked for “‘general acceptance’ in the particular community from which it derives” and “*the scientific reliability of bitemark evidence and bitemark identification is irrelevant, so long as the methodology, techniques, and analysis have gained ‘general acceptance’ in the community of forensic odontologists.*”⁶⁸

Furthermore, even in jurisdictions where *Daubert* theoretically applies, many courts cling to orthodoxy and certitude, failing to examine experts’ conclusions as long as the discipline has been acknowledged by past courts.⁶⁹ *Starks v. City of Waukegan*,⁷⁰ citing Michael Risinger, noted the lack of scientific support for bitemark evidence and its failure to comply with *Daubert*.⁷¹ The court observed that nevertheless state “courts have regularly accepted bite mark evidence—including in all three States in the Seventh Circuit.”⁷² Illinois is a *Frye* State, but Indiana and Wisconsin theoretically follow *Daubert*.⁷³ Even under *Daubert*, it takes time for the legal doctrine to catch up.⁷⁴

The debate over changed science also reflects larger current intellectual and cultural scientific debates. Those resisting scientific challenges to previously accepted forensics conceive of science as providing absolute truth

⁶⁶ Mnookin et. al., *supra* note 11, at 743 (“Claims of knowledge should be taken as provisional and subject to revision in the face of new information. Dogma should be resisted.”).

⁶⁷ *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).

⁶⁸ *Commonwealth v. Kunco*, 2010 Pa. Dist. & Cnty. Dec. Unpub. LEXIS 488, at *25 n.11 (Pa. D & C. Oct. 28, 2010), *aff’d*, 34 A.3d 233 (Pa. Super. Ct. 2011) (emphasis added).

⁶⁹ See *Garrett & Neufeld*, *supra* note 2, at 33 (“At least in criminal cases, having found that the underlying discipline is satisfactory and the evidence admissible following the *Frye*—or now the *Daubert*—standard, courts do not typically examine conclusions experts reach on the stand regarding whether statistical claims or others inferences drawn from the data are supported by the evidence.”).

⁷⁰ 123 F. Supp. 3d 1036 (N.D. Ill. 2015).

⁷¹ *Id.* at 1052.

⁷² *Id.*

⁷³ Recent Indiana cases seem to credit bite mark analysis. See *Jacobs v. State*, 2 N.E.3d 116 (Ind. Ct. App. 2014), *aff’d*, 22 N.E.3d 1286 (Ind. 2015) (finding substantial independent evidence of the defendant’s guilt, including that “the bite marks on [the minor’s] penis matched Jacob’s pattern of missing teeth.”); *Davis v. State*, 2014 Ind. App. Unpub. LEXIS 1142 (Ind. Ct. App. Aug. 29, 2014) (finding “independent evidence” of guilt, including testimony of a forensic odontologist who testified that the injury on the victim’s cheek was a bite mark).

⁷⁴ See Sarah Lucy Cooper, *The Collision of Law and Science: American Court Responses to Developments in Forensic Science*, 33 PACE L. REV. 234, 300 (2013) (noting that despite significant criticism forensic odontology continues to be admitted in court).

akin to religious belief. Such true believers are the opposite of the skeptical testers who engage in the scientific method. In resisting challenges to handwriting, fingerprints, microscopic hair analysis and bite marks, opponents display almost a religious, creationist fervor committed to the notion that each individual is identifiably and unmistakably unique. They accept, unproven as an unshakable axiom, that God has made no set of fingerprints or set of teeth alike.

Those certain about the value of forensics used to convict will brook no challenge. Attorney General Jeff Sessions' Justice Department has disbanded panels formed by the Obama administration to examine forensic science.⁷⁵ Attorney General Sessions did not renew the charter of the National Commission on Forensic Science.⁷⁶ Similarly, the Trump administration also terminated pilot studies to test bitemark and firearm analysis as well as a Justice Department project to craft guidelines for forensic testimony.⁷⁷ The skepticism of science encouraged and exacerbated by Trump's administration and Sessions's Justice Department reflects deep cultural rifts in epistemology, worldview, and the point of a trial.⁷⁸ To be fair, Attorney General Loretta Lynch, though striking a more temperate tone, also declined to adopt the recommendation from the Presidents' Council of Advisors on Science and Technology.⁷⁹ However, the criticism of Professor Paul Giannelli has taken on even greater force in the current Trump administration:

⁷⁵ To be fair, this may not be about science alone; any innovation of the Obama administration is considered an abomination. One good predictor of President Trump's policy is that he is always inclined to do the opposite of his predecessor. See Peter Baker, *Can Trump Destroy Obama's Legacy?*, N.Y. TIMES (June 23, 2017), <https://www.nytimes.com/2017/06/23/sunday-review/donald-trump-barack-obama.html>. Nevertheless, there is something beyond the glee of undoing Obama's legacy that animates the disbandment of the scientific panels.

⁷⁶ Levy, *supra* note 9 (concluding of the Trump administration: "The message was clear: The era of independent scientific review of forensics is over."). During its four years, the Commission—which included lawyers, judges, academics, law enforcement, and forensic experts—issued "dozens of recommendations on forensic standards, testing, and accreditation," including new accreditation policies for Justice Department labs. Levy, *supra* note 9.

⁷⁷ *Id.*

⁷⁸ See Paul C. Giannelli, *Daubert and Forensic Science: The Pitfalls of Law Enforcement Control of Scientific Research*, 2001 U. ILL. L. REV. 53, 57 (2001) (Scientific values are often antithetical to law enforcement values—or at least frequently perceived to be so by prosecutors and police. In particular, the notion of transparency has repeatedly been trumped by an adversarial process that favors trial by ambush. . . . The DOJ, the FBI Crime Laboratory, and some prosecutors have attempted to shape science by controlling the research agenda, hiding unwelcomed test results, attacking legitimate studies that were considered unfavorable, harassing scientists who disagreed with them, and "spinning" these issues in the press.").

⁷⁹ See Shnideman, *supra* note 22. The Trump Administration has removed the page containing the Presidents' Council from the White House's website.

The government has not only failed to conduct the needed research, it has thwarted efforts to do so. Indeed, the conduct described in this Article rivals that of some private corporations such as the tobacco industry²⁵⁴—shaping the research agenda, limiting access to data, attacking experts who disagree with its positions, and “spinning” negative reports. Currently, we have the worst of two possible worlds. Basic research in the forensic sciences is weak, and the only agency currently capable of funding research, the DOJ, is sabotaging efforts to conduct rigorous independent studies.⁸⁰

V. WHAT WILL MAKE THE CRIMINAL TRIAL MORE RECEPTIVE TO CHANGED SCIENCE?

A. *Sanctions on Prosecutors Will Not Work*

Although some scholars call for sanctions on prosecutors as a means of enforcing ethical courtroom behavior, many despair of the state disciplinary authorities as the correct vehicles for imposing discipline or effectuating change.⁸¹ As a practical matter, prosecutors rarely face any negative consequence for outrageous behavior regarding obvious misuse of science or even suppression of evidence.⁸² The lack of any consequence is particularly true in post-conviction phase where prosecutors’ obligations are less clear. If the possibility of sanctions is ineffective in deterring nakedly unethical behavior, it will certainly have no effect on a prosecutor’s

⁸⁰ Paul C. Giannelli, *Daubert and Forensic Science: The Pitfalls of Law Enforcement Control of Scientific Research*, 2011 U. ILL. L. REV. 53, 90 (2011).

⁸¹ See *supra* note 33 (citing an example where a prosecutor who ignored ethical requirements suffered no consequence); see also Natasha Minsker, *Prosecutorial Misconduct in Death Penalty Cases*, 45 CAL. W. L. REV. 373, 398, 403 (2009) (citing Bennett L. Gershman, *The New Prosecutors*, 55 U. PITT. L. REV. 393, 444–54 (1992) for the suggestion that an independent prosecutorial conduct commission be formed); Yaroshefsky, *Wrongful Convictions*, *supra* note 21, at 297; Gershman *supra* note 27, at vi (“Restraints on prosecutorial misconduct are either meaningless or nonexistent”; “the available sanctions are sparingly used and even when used have not proved effective.” Misconduct is commonly met with judicial passivity and bar association hypocrisy.”).

⁸² See Minsker, *supra* note 81, at 398 (documenting that in California “out of eight death penalty cases reversed for prosecutorial misconduct, five prosecutors have ‘no public record of discipline,’ and one prosecutor is a sitting judge”); Yaroshefsky, *Wrongful Convictions*, *supra* note 35, at 276–77 (footnote omitted) (discussing the case of Ron Williamson whose wrongful conviction was obtained by prosecutorial suppression of evidence, for which no prosecutor was disciplined; “Scholars and other commentators agree that discipline for prosecutors is rare and that there are few, if any, consequences for the prosecutorial misconduct”). *But cf.* Fred C. Zacharias, *The Professional Discipline of Prosecutors*, 79 N.C. L. REV. 721, 778 (2001) (concluding that “the traditional lamentations regarding the absence of bar discipline are somewhat overblown, but also contain a large measure of truth”; also expressing skepticism of the utility of exhortations to be good or do justice).

willingness to consider the effect of new science.

Sanctions and even education will not deter prosecutors who have convinced themselves they are right and that the accused is guilty. In the case of truly new science (something that I argue in Part II may be hard to define), there is, theoretically, nothing and no one to sanction. The scientific knowledge was simply inadequate at the time of trial. Nevertheless, a wrongful conviction based on flawed science may still impugn the prosecutor, indicating that multiple mistakes or misdeeds occurred at trial all leading to a wrongful conviction. In attempting to uncover those mistakes and argue that they mattered, those who adopt a censorious attitude toward the prosecution will find it counterproductive.

B. *Best Practices for an Effective System of Motions for New Trials Based on Changed Science*

The institutional resistance exhibited by some prosecutors and judges in the DNA exonerations, where even clear-cut evidence of wrongful conviction was denied or explained away, predicts how many of these actors will respond to challenges based on changed science in the fields of bite marks, microscopic hair analysis, and other areas where the science has developed to discredit previous expert testimony. To assure that motions for new trials based on the use of superseded science receive a fair hearing, we must reconfigure the institutional rewards⁸³ and appeal to prosecutors' self-image as champions of justice. Ideally, all prosecutors should react this way: "The citizens of this community need to know that the District Attorney's Office considers exonerating an innocent person as important as [convicting] a guilty one."⁸⁴ But experience indicates that we should not count on it.

Strategically, we should avoid attacking the prosecution and instead petitioners should credit scientific progress for the need to revisit the convictions.⁸⁵ Those representing the convicts seeking new trials should emphasize the newness of the science and highlight that it was unknown at the time of prosecution.⁸⁶ This way, prosecutors do not have to apologize or

⁸³ See Medwed, *supra* note 40, at 135–36, 171–72 (citing Erwin Cherminsky's work about prosecutors' incentives and his suggestion that the decision to grant promotions consider and reward the prosecutor's attempts to rectify errors).

⁸⁴ Gene Warner & Matt Gryta, *Man Jailed Nearly 7 Years for '84 Rape Is Exonerated*, BUFFALO NEWS, June 22, 2010, at A1.

⁸⁵ Cf. Alafair S. Burke, *Talking About Prosecutors*, 31 CARDOZO L. REV. 2119, 2121 (2010) (discussing the "rhetoric [of] the wrongful conviction literature" and arguing that it "alienates the very parties who hold the power to initiate many of the most promising reforms of the movement: prosecutors").

⁸⁶ I advocate this strategic approach even though realistically the line between known bad scientific testimony and changed science is hard to draw. See Part I; see also Imwinkelried, *supra* note 5 (presenting the Texas and California statutes).

confess error (which as noted above will be resisted to an astounding extent)⁸⁷ but instead can be praised for pursuing justice.⁸⁸

Prosecutors' desire to avoid wasting time and money and the institutional drive to insulate convictions are important factors in their resistance to revisiting convictions. Obviously, sound moral arguments indicate that cost alone cannot be used to justify keeping an innocent person in prison. However, to address the issue, given the cost of incarceration, the state may actually save money by participating in post-conviction review.⁸⁹ Similarly, issues of finality which sometimes dictate that a case cannot be re-litigated ad nauseum, are not convincing where an unknowable change in science questions the justice of the verdict. Such arguments about finality work best when the accused could have raised objections and did not.

The new California and Texas statutes allow for new trials, presumably by motion by the person convicted with faulty science. This raises practical questions concerning who will identify cases, present them to the court, and pay for the whole process. It is essential that some institutional actor has the time to review cases, decide which ones deserve new trials based on changed science, and actually bring the cases forward. To accomplish these goals the petitioner must (1) fully understand the science, and (2) have some incentive to pursue the question.

As noted in Part II, individual public defenders often seem ill-equipped in knowledge, funding, support, and time to challenge convictions based on changed science. It is doubtful that individual defense attorneys could realistically screen and handle all their previous bite mark and microscopic hair cases, let alone the many other types of dubious science used to convict their former clients. Furthermore, given the stressful and crushing caseloads of current cases, putting the burden on the original defender seems unfair and impractical.

Tasking individual prosecutors with moving for new trials also seems highly problematic. As Professor Zacharias persuasively argued, prosecutors are "ill-equipped to analyze post-trial obligations on their own"

⁸⁷ See *supra* Parts III A & B (describing prosecutors' reactions to DNA exonerations). For instance, when Alan G. Northrop and Larry W. Davis were released after seventeen years of incarceration based on DNA exoneration, the prosecutor stated: "The reason we don't feel an apology is appropriate is that we feel the cases were prosecuted professionally." Laura McVicker, *Officially Free After 17 Years: Men Finally Shed Rape Charges*, COLUMBIAN (Vancouver, Wash.), July 15, 2010, at A1.

⁸⁸ See Medwed, *supra* note 40, at 156–70 (discussing cases where prosecutors turned their willingness to exonerate into a political win, something that is admittedly easier to do if another suspect emerges).

⁸⁹ See Andrew Chongseh Kim, *Beyond Finality: How Making Criminal Judgments Less Final Can Further the "Interests of Finality,"* 2013 UTAH L. REV. 561 (2013) (analyzing costs of post-trial review and arguing that expanding defendants' rights on post-trial review can often conserve state resources and improves vital perception of fairness in the legal system).

so that prosecutors cannot be relied on to resolve difficult ethical problems without guidance or supervision.⁹⁰ He and many others have argued for the creation of independent bodies or divisions within the prosecutor's office.⁹¹ Under this approach, the best practice would establish an independent unit that would respond to all post-conviction claims, rather than assign the matter to general appeals, or worse yet, plop it back on the desk of the prosecutor who tried the case.⁹² Prosecutors who were not involved in the original case will be more dispassionate in reviewing the merits of the case and less likely to engage in confirmation bias and to see the faulty science as harmless. Furthermore, independent prosecutors will not have to personally face the daunting prospect of retrying the case, which would be a strong disincentive to recommending a new trial based on changed evidence.

Professor Barry Scheck advocates for "Conviction Integrity Units, "independent, well-funded government entities," such as the Criminal Court Review Commission in the United Kingdom and the North Carolina Innocence Inquiry.⁹³ Ideally, he would like to see such units housed outside prosecution offices with a heavy presence of defenders.⁹⁴ Given the current climate against criminal defendants, federal law enforcement's reluctance to examine traditional courtroom forensic science, and hostility to questioning the righteousness of prosecutors or police, the chance of a truly independent unit, especially on the federal level, seems close to zero. Attorney General Sessions has disbanded the academic inquiry into various forensic sciences, so it seems even less likely that he would support efforts to challenge individual convictions based on new science he does not want to know about. The gold standard of independent review, independent laboratories, independent experts, and a scientifically literate bench and bar seems more elusive than ever. At the very least, however, the California and Texas provisions for new trial offer a mechanism for reconsideration of convictions based on flawed science.

⁹⁰ Zacharias, *supra* note 30, at 174–75; see also Keith Swisher, *Prosecutorial Conflicts of Interest in Post-Conviction Practice*, 41 HOFSTRA L. REV. 181 (2012) (arguing that prosecutors suffer from a conflict between their duty to justice and their duty to themselves—their duty to seek the release of the innocent person and their interest in avoiding embarrassment and liability for themselves and their offices).

⁹¹ See Medwed, *supra* note 40, at 175–77.

⁹² Zacharias, *supra* note 30, at 174–75 (citing the absence of clear legal standards, lack of incentives, and complexity of the notion of justice in the postconviction context).

⁹³ Scheck, *supra* note 49, at 710.

⁹⁴ Scheck, *supra* note 49, at 710.