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CHANGED SCIENCE WRITS AND STATE HABEAS RELIEF

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ABSTRACT

For decades now, the 1996 federal Antiterrorism and Effective Death Penalty Act (AEDPA) has limited the scope and influence of federal courts in post-conviction case review, forcing convicted individuals to rely instead on state habeas proceedings for conviction relief. Due in large part to the 2009 National Academy of Sciences Report, petitions for conviction relief increasingly include challenges to the government's scientific evidence at trial. These petitions analyze that evidence by comparing the trial evidence to the advancement of scientific findings and scientific knowledge in the years since the trial. State habeas petitions thus provide an avenue for relief from misused and misrepresented scientific evidence.

State courts, however, can only reexamine faulty scientific evidence, and reverse unconstitutional convictions, if the legislature provides the tools to do so. One such tool is the ability to review post-conviction relief petitions based specifically on faulty science, a tool known as changed science writs.

This Article reviews the growth of state-level changed science writs and examines how other states can adopt this tool to review habeas petitions based on scientific evidence. This Article posits that changed science writs both incentivize greater reliability of

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evidence at trial by creating a process of review, and help to identify wrongful convictions based on inaccurate, misrepresented, or faulty scientific evidence.

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"[A]s our understanding of scientific truth grows and changes, the law must follow the truth in order to secure justice."[1]

I. INTRODUCTION

Since 2009, advances in forensic science have transformed state habeas proceedings into crucial arenas for regulating false or misleading forensic evidence in the criminal legal system. The publication of *Strengthening Forensic Science in the United States: A Path Forward*[2] in 2009 prompted scientists and legislators to critique, challenge, and ultimately strengthen forensic science disciplines. Concomitantly, litigants explored how to require accurate forensic science evidence in the courtroom. Post-conviction state court proceedings emerged as an arena to thoughtfully and robustly challenge the flaws in forensic disciplines.

For decades now, the 1996 federal Antiterrorism and Effective Death Penalty Act (AEDPA) has limited the scope and influence of

1. Lee v. Tennis, No. 4:08-CV-1972, 2014 WL 3894306, at *19 (M.D. Pa. June 13, 2014).

2. NAT'L RESEARCH COUNCIL, STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD (2009) [hereinafter NAS REPORT], https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf [https://perma.cc/59PP-X864].

federal courts in post-conviction case review,[3] forcing convicted individuals to rely instead on state habeas proceedings for conviction relief. In state habeas proceedings, the plaintiff frequently files under a more generous time limit,[4] the applicable court rules are civil rather than criminal,[5] and for good or ill those rules are only loosely understood and applied in the habeas context.[6] Due in large part to the 2009 National Academy of Sciences (NAS) Report, petitions for conviction relief increasingly include challenges to the government's scientific evidence at trial.[7] These petitions analyze that evidence by comparing the trial evidence to the advancement of scientific findings and scientific knowledge in the years since the trial. The lack of time restraints and the availability of civil discovery mean, practically speaking, that developments in science—and forensic science in particular—can be raised years after the conviction and the original reliance on unreliable evidence at trial. State habeas petitions thus provide an avenue for relief from misused and misrepresented scientific evidence.

State courts, however, can only reexamine faulty scientific evidence, and reverse unconstitutional convictions, if the legislature provides the tools to do so. One such tool is the ability to review post-conviction relief petitions based specifically on faulty science.

Using changed science writs of habeas corpus, sometimes referred to as "junk science writs," plaintiffs can challenge their convictions if the science in their case has changed significantly.[8] Given the fluctuation and rapid development in various forensic fields, these petitions are particularly applicable for criminal convictions reliant on forensic evidence. Rather than returning to

3. *Impact of Federal Habeas Corpus Limitations on Death Penalty Appeals: Hearing Before the Subcomm. on the Constitution, Civil Rights, & Civil Liberties of the H. Comm. on the Judiciary*, 111th Cong. 4, 7–8 (2009).

4. *See, e.g.*, CONN. GEN. STAT. § 52-582(a) (2019) (establishing an exception to the rule that petitions for a new trial may not be entertained until three years after judgment where the petitioner can produce previously unavailable evidence); Prison Law Office, *California State Court Petitions for Writ of Habeas Corpus*, https://prisonlaw.com/wp-content/uploads/2019/06/HCM-June-2019.pdf [https://perma.cc/B5N7-57PZ] (last updated June 2019) (noting that "[t]here is no specific deadline for filing a state petition for writ of habeas corpus" in California).

5. *See* Justin F. Marceau, *Challenging the Habeas Process Rather than the Result*, 69 WASH. & LEE L. REV. 85, 189 (2012).

6. *See* Eve Brensike Primus, *Federal Review of State Criminal Convictions: A Structural Approach to Adequacy Doctrine*, 116 MICH. L. REV. 75, 84–87 (2017).

7. Valena Elizabeth Beety, *Identifying the Culprit in Wrongful Convictions*, 82 TENN. L. REV. 975, 987–88 (2015).

8. *Id.* at 988.

the stringent baseline that our criminal legal system protects due process rights but does not safeguard against wrongful convictions,[9] changed science writs provide an avenue for courts to examine the evidence today and make a substantive decision on the evidence itself. As the Ninth Circuit has opined, "recognizing [a due process claim] is essential in an age where forensics that were once considered unassailable are subject to serious doubt."[10]

Lacking this tool, some state courts deny petitions when they find that *any* discrediting evidence existed at the time of trial to disprove the science behind the conviction. Their reasoning is that if any scientific evidence existed, even if it was not widely known or adopted, then the scientific evidence cannot be raised in the present because it is not so-called "new evidence," or was not newly discovered.[11] This situation creates the anomaly where courts cannot, or do not, consider conviction relief for someone who is wrongfully convicted even when the fully-developed science conclusively shows their innocence. Some petitioners then creatively argue—often compellingly but with mixed results—that the *change in science itself* is newly discovered evidence to be reviewed.[12]

This Article reviews the growth of state-level changed science writs and examines how other states can adopt this tool to review habeas petitions based on scientific evidence. This Article posits that changed science writs both incentivize greater reliability of evidence at trial by creating a process of review, and help to identify wrongful convictions based on inaccurate, misrepresented, or faulty scientific evidence.

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9. *See generally* Valena Beety, *Justice Antonin Scalia's Rebuke of Innocence*, OXFORD HUM. RTS. HUB BLOG (Mar. 8, 2016), https://ohrh.law.ox.ac.uk/justice-antonin-scalias-rebuke-of-innocence [https://perma.cc/U5NB-6LDJ] ("This Court has *never* held that the Constitution forbids the execution of a convicted defendant who has had a full and fair trial but is later able to convince a habeas court that he is 'actually' innocent." (quoting *In re* Davis, 557 U.S. 952, 955 (2009) (Scalia, J., dissenting)).

10. Gimenez v. Ochoa, 821 F.3d 1136, 1143–44 (9th Cir. 2016).

11. Caitlin M. Plummer & Imran J. Syed, *Criminal Procedure v. Scientific Process: The Challenging Path to Post-Conviction Relief in Cases that Arise During Periods of Shifts in Science*, 41 VT. L. REV. 279, 286, 300 (2016); *see also infra* Section VI.D (describing two wrongful convictions cases in two states without changed science writs).

12. *Compare* Shelby v. State, No. 24C12:16-cv-0114, at 2 (Cir. Ct. of Harrison Cty. Miss. 2d Jud. Dist. Dec. 7, 2018) (upholding the conviction because the petitioner failed to prove that shaken baby syndrome with impact is "either debunked or unreliable particularly as applied to the facts"), https://courts.ms.gov/appellatecourts/docket/sendPDF.php?f=1416575-0-24CI2.pdf&c=89528&a=N&s=2 [https://perma.cc/GSE6-MBQQ], *with Ex parte* Henderson, 384 S.W.3d 833 (Tex. Crim. App. 2012) (granting a new trial to a woman convicted of capital murder where petitioner presented evidence that developments in biomechanics could show that the instant death was the result of an accident).

In the context of changed science writs, the question arises whether these writs should include relief for scientific evidence in other realms, such as eyewitness identification and false confessions. Notably, the Supreme Court has been reluctant to recognize and acknowledge scientific studies over the past forty years that demonstrate the unreliability of traditional eyewitness protocols; the Court has likewise abstained from requiring updated procedures for police and for courts in admitting the evidence.[13] Some states have independently established greater requirements for reliability by creating state rules of evidence, state legislation enshrining best practices for police protocols, and state case precedent for ensuring more accurate eyewitness identifications with police and in courtrooms.[14] However, for states that have to date failed to recognize the changed science of eyewitness identifications and false confessions,[15] a changed science writ may free state courts to genuinely and substantively reevaluate scientific evidence. This Article acknowledges, but does not answer, that question.

To lay the foundation for the importance of these changed science writs, this Article will initially review the fundamental necessity for state habeas proceedings in Part II. This necessity is partially due to the proven wrongful convictions discussed in Part III, particularly those caused by faulty forensic evidence. In Part IV, by evaluating the faults and improvements of forensic disciplines over the past ten years, this Article lays the basis to encourage states to adopt changed science writs. Issues like the lack of accountability for state actors who knowingly admit faulty or false evidence against a defendant, national reforms proposed and occasionally adopted, and FBI investigations alongside more stringent standards for accreditation, illuminate a path for reform. Likewise, Part V documents state reform—particularly in Texas—to provide a strategic guide for other states to either respond to crises or proactively demand a structure of accountability and relief for faulty forensic evidence. This Article concludes with

13. *See, e.g.*, Perry v. New Hampshire, 565 U.S. 228, 232–33, 235–36, 248 (2012) (holding that "the Due Process Clause does not require a preliminary judicial inquiry into the reliability of an eyewitness identification when the identification was not procured under unnecessarily suggestive circumstances arranged by law enforcement"). For a more detailed discussion on eyewitness identification, see generally Beety, *supra* note 7, at 990–98.

14. *See* Beety, *supra* note 7, at 996–99.

15. *See, e.g.*, Dassey v. Dittmann, 877 F.3d 297, 300–01, 318 (7th Cir. 2017) (en banc) (reversing the district court's grant of habeas relief based on Wisconsin state court finding that the defendant's confession was "voluntary").

Part VI, highlighting the specific individual states that have implemented post-conviction review for changed science, and hypothetical applications of changed science writs in other states.

II. THE CURRENT IMPORTANCE OF STATE HABEAS PROCEEDINGS

A. State Habeas Overview

State habeas review is a defendant's first opportunity to reexamine all of the evidence in a case—both inside and outside of the record—and raise a claim that was not previously litigated.[16] While the standard of review is incredibly demanding, state habeas provides the opportunity to challenge faulty or false evidence, or alternatively, implement new Supreme Court precedent that retroactively applies to the case.[17] Decades ago, state habeas review was seen simply as a necessary step of exhaustion along the way to federal court habeas review.[18] However, under the Antiterrorism and Effective Death Penalty Act of 1996,[19] federal habeas review became inordinately restrictive, with limited means of review and relief.[20] As to just one factor, federal habeas has time limitations that state habeas may not, and federal courts are obligated to act deferentially to state habeas decisions.[21] State habeas is now recognized as the most important venue for collateral relief.[22] In the words of Professor Lee Kovarsky, "[D]emand for collateral process is rising at the same time that federal supply is falling."[23]

State habeas is an area of prime opportunity, and sometimes of penultimate disfunction.[24] Generally, state habeas receives

16. *See* Lee Kovarsky, *Structural Change in State Postconviction Review*, 93 NOTRE DAME L. REV. 443, 447–48 (2017).

17. *See id.* at 454–58.

18. *See* CHARLES DOYLE, CONG. RESEARCH SERV., RL33391, FEDERAL HABEAS CORPUS: A BRIEF LEGAL OVERVIEW 7–10 (2006).

19. Antiterrorism and Effective Death Penalty Act of 1996, Pub. L. No. 104-132, 110 Stat. 1214 (1996).

20. Eve Brensike Primus, *Equitable Gateways: Toward Expanded Federal Habeas Corpus Review of State-Court Criminal Convictions*, 61 ARIZ. L. REV. 291, 292–93, 297–303 (2019) ("[O]ne empirical study revealed that fewer than 0.3% of noncapital state petitioners get any form of federal habeas relief, and more than half of the prisoners who file habeas petitions have their petitions dismissed on procedural grounds without a federal court ever considering the merits of the underlying constitutional claims.").

21. *See id.* at 299.

22. Kovarsky, *supra* note 16, at 497.

23. *Id.* at 445.

24. *See id.* at 446 & n.17.

minimal attention or awareness.[25] Courts, prosecutors, and defense attorneys tend to the pressing crush of active cases and the cycle of arraignments and plea deals, with the occasional trial. Thus, habeas petitions—a collateral proceeding after the conviction is finalized—remain on the backburner, so much so that habeas petitions can occasionally wait for years simply to be reviewed.[26] States generally provide insufficient resources for thorough review and handling of state habeas petitions.[27] Professor Kovarsky notes instances of how habeas review at the state level can sometimes even ignore Supreme Court precedent.[28]

Critiques of state habeas abound because of the lack of attention or care for such proceedings, and the confusing procedural requirements.[29] State habeas uniquely applies rules of civil procedure, rather than rules of criminal procedure.[30] While courts and attorneys may struggle with the appropriate rules to apply, an informed litigant can obtain far more discovery in this civil proceeding than in their[31] prior criminal case. As but one example of how state habeas provides fact-gathering and robust discovery in ways that the criminal trial does not, habeas petitioners—mirroring federal civil procedure—often may send interrogatories and conduct depositions.[32] At trial, criminal

25. *Id.* ("State PCR largely operates below the broader legal community's awareness threshold.").

26. *See, e.g.*, Gardner v. Ballard, 172 F. Supp. 3d 925, 927 (S.D. W. Va. 2016) ("The issue before the court is the constitutionality of holding a man in prison for more than twenty-five years after the state convicted him using false testimony and the state circuit court inexplicably allowed his habeas petition to languish for over two decades.").

27. *See* Kovarsky, *supra* note 16, at 448.

28. *See id.* at 451–52.

29. *See, e.g.*, Nancy J. King, *Enforcing Effective Assistance After* Martinez, 122 YALE L.J. 2428, 2442–46 (2013) (noting the dearth of legal representation in State PCR); Primus, *supra* note 6, at 77 ("At the state level, modern postconviction review schemes are often so complicated and confusing that indigent criminal defendants have no realistic prospect of complying with the procedural rules.").

30. Marceau, *supra* note 5, at 189 (noting that "post-conviction proceedings are nominally civil rather than criminal proceedings").

31. Please note that I use the singular they when referring to someone whose gender is unknown or irrelevant. *See Chicago Style for the Singular They*, CMOS SHOP TALK (Apr. 3, 2017), http://cmosshoptalk.com/2017/04/03/chicago-style-for-the-singular-they/?_ga=2.28840895.2050086297.1567209194-157249459.1567209194 [https://perma.cc/F9NT-5WM8]; *Position Statement on Gender and Pronouns*, NAT'L COUNCIL TCHRS. ENG. (Oct. 25, 2018), http://www2.ncte.org/statement/genderfairuseoflang/ [https://perma.cc/8DSF-74EF].

32. *See* Marc D. Falkoff, *Back to Basics: Habeas Corpus Procedures and Long-Term Executive Detention*, 86 DENV. L. REV. 961, 994 (2009) ("Noting that the Court had jurisdiction to hear Hamdi's claims pursuant to the federal habeas statute, Justice O'Connor stated that 'all agree that [28 U.S.C.] § 2241 and its companion provisions provide at least a skeletal outline of the procedures to be afforded a petitioner in federal habeas review,' and that, '[m]ost notably, § 2243 provides that "the person detained may, under

depositions are virtually nonexistent, permitted exclusively to preserve testimony by a witness who may be unavailable for trial.[33]

Civil discovery mechanisms for habeas petitions also provide an avenue for examining the quality of forensic evidence.[34] Before trial, prosecutors may fail—without consequences—to disclose forensic discovery, even though the American Bar Association advises full documentation from forensic labs to be disclosed, including the complete files and methods of analysis rather than the basic results.[35] It should be noted that when only one party has access to complete files and methods, cognitive bias and tunnel vision can influence decisions that are detrimental to the defendant and to the integrity of the criminal legal system.[36] Indeed, although forensic evidence is routinely admitted in criminal cases without explanation, civil proceedings anticipate a robust *Daubert* challenge to causation evidence and both parties

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oath, deny any of the facts set forth in the return or allege any other material facts," and § 2246 allows the taking of evidence in habeas proceedings by deposition, affidavit, or interrogatories.'" (alterations in original) (quoting Hamdi v. Rumsfeld, 542 U.S. 507, 525 (2004))).

33. FED. R. CRIM. P. 15(a)(1); Jennifer D. Oliva & Valena E. Beety, *Discovering Forensic Fraud*, 112 NW. U. L. REV. 121, 130 (2017) ("Moreover, discovery depositions are nonexistent in the criminal justice system. Indeed, criminal depositions are permitted exclusively to preserve the testimony of a party's own witness who may be unavailable for trial.") (citing Ion Meyn, *Discovery and Darkness: The Information Deficit in Criminal Disputes*, 79 BROOK. L. REV. 1091, 1120 (2014)).

34. *See* Oliva & Beety, *supra* note 33, at 130–31 (comparing pretrial discovery in criminal and civil proceedings).

35. Brandon Garrett, *The Constitutional Regulation of Forensic Evidence*, 73 WASH. & LEE L. REV. 1147, 1179–82 (2016). Notably, Rule 16 of the Federal Rules of Criminal Procedure only requires discovery of scientific reports and examinations if such evidence "is material to preparing the defense or the government intends to use the item in its case-in-chief at trial." FED. R. CRIM. P. 16(a)(1)(F)(iii).

36. *See* Jennifer E. Laurin, *Remapping the Path Forward: Toward a Systemic View of Forensic Science Reform and Oversight*, 91 TEX. L. REV. 1051, 1096–98 (2013) ("Cognitive bias of this sort is likely to have particularly perverse effects with respect to precisely the types of forensic evidence that, from a reliability-enhancing perspective, we should be most concerned about: exculpatory science, and science that is *less* than the 'gold standard.' On the former count, confirmation bias and tunnel vision have been widely accepted as causes of erroneous disregard, rejection, or recharacterization of exculpatory evidence by both police and prosecutors, and the anecdotal evidence is that the force of science does not render forensic evidence immune to this pressure." (footnotes omitted)); Keith A. Findley & Michael S. Scott, *The Multiple Dimensions of Tunnel Vision in Criminal Cases*, 2006 WIS. L. REV. 291, 308–09 ("The foundational tendency is probably best understood as an expectancy bias, which is a form of confirmation bias. When people are led by circumstances to expect some fact or condition (as people commonly are), they tend to perceive that fact or condition in informationally ambiguous situations. This can lead to error biased in the direction of the expectation." (footnotes omitted)). *See generally* Valena Beety, *Changing the Culture of Disclosure and Forensics*, 73 WASH. & LEE L. REV. ONLINE 580 (2017).

usually proffer high quality scientific evidence before it is admitted.[37]

B. Due Process Rights of Defendants

At this point, it is important to remember the lack of due process rights for defendants regarding access to forensic evidence.[38] Defendants do not have due process rights to protect against the destruction of forensic evidence and they possess neither a free-standing nonprocedural due process right to DNA evidence nor a due process right to access an expert.[39] The lack of transparency in discovery for criminal defendants has led to wrongful convictions, including individuals taking guilty pleas to crimes they did not commit.[40] While legal formalists may argue that the Due Process Clause protects against flawed procedures, not flawed outcomes,[41] the criminal procedure is likely flawed if an innocent person is convicted. Due to these wrongful conviction outcomes, some states have proactively created statutes to preserve evidence, require disclosure of DNA testing results, and provide avenues for defense experts.[42]

Separate from these commendable state statutes, defendants do independently maintain due process protections from the intentional use of inaccurate information at trial. The U.S. Supreme Court's decision *Napue v. Illinois* requires relief for a defendant who can prove knowing use of false evidence by a prosecutor.[43] The State's knowing use of false evidence violates the

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37. Oliva & Beety, *supra* note 33, at 126–31 (comparing pretrial discovery in criminal and civil proceedings).

38. Garrett, *supra* note 35, at 1186.

39. *See id.* at 1148 nn.1–3 (describing shortcomings in the due process rights of the criminally accused).

40. *See* Adam Wisnieski, *A 'Draconian' System Where the Innocent Plead Guilty*, CRIME REP. (Feb. 29, 2016), https://thecrimereport.org/2016/02/29/2016-guggenheim-3/ [https://perma.cc/AJY6-BUJV] (describing Judge Jed Rakoff's keynote address at the 11th Annual Harry Frank Guggenheim Symposium on Crime in America at John Jay College of Criminal Justice). *See generally* NAT'L REGISTRY OF EXONERATIONS, EXONERATIONS IN 2018 (2018), https://www.law.umich.edu/special/exoneration/Documents/Exonerations%20in%202018.pdf [https://perma.cc/JKB2-SUXT] (reporting on exonerations from 1989 through the end of 2018).

41. *See, e.g.*, Perry v. New Hampshire, 565 U.S. 228, 249 (2012) (Thomas, J., concurring) ("[T]he Fourteenth Amendment's Due Process Clause is not a 'secret repository of substantive guarantees against "unfairness."'" (quoting BMW of N. Am., Inc., v. Gore, 517 U.S. 559, 598–99 (1996) (Scalia, J., dissenting))).

42. For a detailed list of state-level adopted reforms by state, see *Policy Reform*, INNOCENCE PROJECT, https://www.innocenceproject.org/policy/ [https://perma.cc/8RD9-UGYU] (last visited Oct. 26, 2019).

43. Napue v. Illinois, 360 U.S. 264, 269 (1959).

defendant's due process rights, whether false evidence is solicited or presented uncorrected to the court and jury.[44]

The Second and Ninth Circuits, and the State of Texas, however, establish accountability for prosecutors using false evidence, whether or not they knew the evidence was false. The Texas Court of Criminal Appeals in *Ex parte Henderson* granted a new trial, stating that regardless of whether the prosecutor was aware of the reliability of the evidence, use of now-discredited evidence by the State is a due process violation.[45] Although it was a per curiam opinion, eight justices issued or joined differing concurrences and dissents.[46] The Second and Ninth Circuits have held the same,[47] with the Ninth Circuit correlating "a conviction based in part on false evidence" as incompatible with "fundamental fairness," and entitling the defendant to a new trial "if there is a reasonable probability that [without the evidence] the result of the proceeding would have been different."[48] Importantly, in *Lee v. Glunt*, the Third Circuit opinion discussed how a conviction based on now-invalidated scientific evidence violates the defendant's due process rights, regardless of whether one could have known at trial that the science was imperfect.[49]

Habeas thus can provide an opportunity to uncover whether scientific evidence used at trial was accurate, inaccurate, or false. However, even when discovering false evidence—presented to a jury for their deliberation—petitioners must overcome another hurdle to gaining relief: transforming that false evidence into a viable claim.

Habeas law stresses that claims must be litigated at the earliest possible stage of litigation, or the claimant faces procedural default for delaying until post-conviction.[50] For cases

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44. *See id*.

45. *Ex parte* Henderson, 384 S.W.3d 833, 834 (Tex. Crim. App. 2012) (per curiam).

46. *Id.* at 834.

47. *See* United States v. Young, 17 F.3d 1201, 1203–04 (9th Cir. 1994); Sanders v. Sullivan, 863 F.2d 218, 224 (2d Cir. 1988).

48. *Young*, 17 F.3d at 1203–04 (citing United States v. Endicott, 869 F.2d 452, 455 (9th Cir. 1989)).

49. Lee v. Glunt, 667 F.3d 397, 407 (3d Cir. 2012); *see also* Plummer & Syed, *supra* note 11, at 308.

50. *See* Plummer & Syed, *supra* note 11, at 286 n.41 (citing cases from the District of Columbia, Michigan, Oregon, and Vermont, which all discuss how the evidence must be brought early, and new evidence can only be brought after a showing of reasonable diligence at the trial stage); *see also, e.g.*, Bouknight v. United States, 867 A.2d 245, 252, 256 (D.C. 2005) (holding that a witness's proffered statement did not constitute "new evidence" because the defendant failed to exercise reasonable diligence with respect to obtaining that testimony at trial); People v. Rao, 815 N.W.2d 105, 111 (Mich. 2012) ("It is the obligation of the parties to undertake all reasonable efforts to marshal *all* the relevant evidence for that

where the State allegedly used faulty or false evidence at trial, the petitioner may make two claims: ineffective assistance of counsel and/or newly discovered evidence. A petitioner may claim that counsel failed to challenge the State's evidence by using discrediting scientific literature that was available at the time of trial. Necessarily, petitioner would argue that counsel's behavior was ineffective, and that the failure to appropriately challenge the State's evidence prejudiced the petitioner.[51]

The Constitution provides each defendant with the right to effective assistance of counsel under the Sixth Amendment.[52] However, the defendant must establish that counsel's performance fell below objective reasonableness and prejudiced the defendant, such that there is a "reasonable probability" that the defendant would have been acquitted but for the representation.[53] In changed science cases, defense counsel is only required to perform with reasonable diligence, which does not mean following every lead.[54] A determination of whether counsel is effective is tied to "reasonableness under prevailing professional norms,"[55] and currently, defense culture does not include a norm of challenging forensic evidence and filing *Daubert* motions.[56]

Alternatively, the petitioner may claim that the scientific research undermining the State's evidence at trial is newly

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trial. Evidence will not ordinarily be allowed in installments."); State v. Arnold, 879 P.2d 1272, 1277 (Or. 1994) (en banc) (explaining that to obtain relief on newly discovered evidence claims, defendant must show that they exercised reasonable diligence in attempting to obtain the evidence previously); State v. Tester, 923 A.2d 622, 627 (Vt. 2007) ("For purposes of a new trial motion based on newly discovered evidence, the evidence must 'be truly new and not undiscovered merely through a lack of diligence.'" (quoting State v. Sheppard, 582 A.2d 116, 118 (Vt. 1990))).

51. *See* Strickland v. Washington, 466 U.S. 668, 687 (1984).

52. U.S. CONST. amend. VI; *Strickland*, 466 U.S. at 684.

53. *See Strickland*, 466 U.S. at 694.

54. *See* Plummer & Syed, *supra* note 11, at 286 n.43 (discussing the United States Supreme Court case *Harrington v. Richter*, which discussed what a defense attorney can and cannot be responsible for in tracking down evidence); *see also, e.g.*, Harrington v. Richter, 562 U.S. 86, 106–07 (2011). The Court in *Harrington* held that the defendant's attorney did not render deficient service because: "From the perspective of Richter's defense counsel when he was preparing Richter's defense, there were any number of hypothetical experts—specialists in psychiatry, psychology, ballistics, fingerprints, tire treads, physiology, or numerous other disciplines and subdisciplines—whose insight might possibly have been useful. . . . Counsel was entitled to formulate a strategy that was reasonable at the time and to balance limited resources in accord with effective trial tactics and strategies." *Harrington*, 562 U.S. at 106–07.

55. *Strickland*, 466 U.S. at 688.

56. That culture may be changing due to the growing responsibilities and accountability courts are placing on defense attorneys in faulty forensic evidence cases. *See* Beety, *supra* note 36, at 584 (citing Garrett, *supra* note 35, at 1167–71, 76).

discovered evidence, not available at the time of trial.[57] A petitioner may be in a particularly difficult scenario where trial counsel did not know of the scientific shift and lack of reliability for the State's expert evidence, but theoretically *could have* found out.[58] In this situation, the new evidence confirming that the State presented false or faulty scientific findings and testimony at trial is not "new evidence" because counsel could have found out about these false or faulty findings at the time of trial, and thus failed to exercise reasonable diligence to present all relevant defenses at that time.[59] Accordingly, the petitioner does not strictly have "newly discovered evidence" to reverse their conviction.

Thus, even with proof that the State presented false evidence and false testimony at trial, a habeas petitioner may be without a remedy because the proof does not align with the court's precedential decisions on what is newly discovered evidence, and what is ineffective assistance of counsel.[60] This predicament highlights the value and importance of changed science writs in order to provide an avenue of relief when the State has presented false evidence at trial. Otherwise, the failure to litigate the reliability of the evidence at trial may foreclose any avenues of relief—regardless of the discovery of changed science.

III. STATE HABEAS RELIEF AND FAULTY FORENSIC EVIDENCE: WRONGFUL CONVICTIONS

Known wrongful convictions can motivate judges, defense attorneys, and prosecutors—the key players in a courtroom—to reexamine evidence in light of scientific advancements since a conviction. Ideally, known causes of wrongful conviction also impact how judges, prosecutors, and defense attorneys evaluate evidence and admit evidence before trial and at trial. The Supreme Court has recognized that "[s]erious deficiencies have been found in the forensic evidence used in criminal trials."[61] According to the

57. *See* Plummer & Syed, *supra* note 11, at 286.

58. *Id.*

59. *Id.*; *see also, e.g.*, Skakel v. State, 991 A.2d 414, 449 (Conn. 2010) ("Whether trial counsel has fulfilled his or her duty to conduct a reasonable investigation forms the linchpin issue in a petition for a new trial made on the basis of newly discovered evidence.").

60. For a detailed discussion of this predicament, see Plummer & Syed, *supra* note 11, at 286–87.

61. Melendez-Diaz v. Massachusetts, 557 U.S. 305, 319 (2009). The Supreme Court also mentioned how "[o]ne commentator asserts that '[t]he legal community now concedes, with varying degrees of urgency, that our system produces erroneous convictions based on discredited forensics.'" *Id.* at 319 (second alteration in original) (quoting Pamela R. Metzger, *Cheating the Constitution*, 59 VAND. L. REV. 475, 491 (2006)).

National Registry of Exonerations, over the past thirty years our criminal legal system convicted and incarcerated at least 612 innocent individuals due in part to faulty forensic evidence.[62]

With changed science writs, more innocent individuals can challenge their wrongful convictions and the faulty forensic evidence that led to their incarceration. Claims of newly discovered forensic evidence come in two types: either there is new scientific evidence that discredits the old evidence, or there are new scientific conclusions that can be drawn about the same physical evidence. In the words of the U.S. Court of Appeals for the Sixth Circuit, "[I]t is [the expert's] opinion itself, rather than the underlying basis for it, which is the evidence presented. Therefore, if [the expert's opinion has changed], the evidence itself has changed, and can most certainly be characterized as new."[63] This Section elucidates the importance of court-recognized changed science claims by acknowledging the lax introduction of faulty forensic evidence in the courtroom, and the State's frequent lack of full disclosure of forensic findings. These concerns are highlighted by their causal connection to wrongful convictions nationally.

A. Notably Low Evidence Admissibility Standards for Forensic Evidence in Criminal Trials

The 2016 President's Council of Advisors on Science and Technology (PCAST) Report, *Forensic Science in Criminal Courts*, identified at length how feature-comparison techniques need more validation studies to demonstrate their reliability.[64] As the authors of the PCAST Report stated, "There is no justification for accepting that a method is valid and reliable in the absence of

62. *Browse the National Registry of Exonerations*, NAT'L REGISTRY EXONERATIONS, http://www.law.umich.edu/special/exoneration/Pages/browse.aspx?View={B8342AE7-6520-4A32-8A06-4B326208BAF8}&FilterField1=Contributing%5Fx0020%5FFactors%5Fx0020&FilterValue1=False%20or%20Misleading%20Forensic%20Evidence [https://perma.cc/B2F3-NFKJ] (last visited Feb. 12, 2020) (filtered "Contributing Factors Display" column for "False or Misleading Forensic Evidence").

63. Souter v. Jones, 395 F.3d 577, 592 (6th Cir. 2005) (citation omitted).

64. PRESIDENT'S COUNCIL OF ADVISORS ON SCI. & TECH., EXEC. OFFICE OF THE PRESIDENT, FORENSIC SCIENCE IN CRIMINAL COURTS: ENSURING SCIENTIFIC VALIDITY OF FEATURE-COMPARISON METHODS 5–14 (2016) [hereinafter PCAST REPORT], https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensic_science_report_final.pdf [https://perma.cc/YCY4-3T7Z].

appropriate empirical evidence";[65] and further, "Forensic science is at a crossroads."[66]

And yet this evidence is regularly admitted in criminal trials, in part due to a lack of robust pretrial discovery.[67] The PCAST Report, like the NAS Report,[68] implored the criminal justice system to reexamine thoughtless admission of forensic evidence at trial and issued recommendations to ensure that criminal courts only admitted scientifically valid and reliable evidence.[69] Notably, the Department of Justice refused to adopt the PCAST Report recommendations, and the Federal Bureau of Investigation objected to many PCAST Report findings.[70]

This lack of support for reliable standards of admissibility reinforces the back-end need for habeas petitions that recognize changed science as a cognizable stand-alone claim, particularly when the new science shows innocence. As noted by Professor Jessica Cino, "Evidence admissibility is largely dependent on implementing and enforcing comparable standards, which should be achieved for the entire forensic process, from crime scene to courtroom. Yet, consistency and predictability across the forensic nervous system are few and far between."[71]

As one example of disconnect, the accuracy of fingerprint analysis depends on the number of points of comparison between prints;[72] however, prosecutors encourage testifying analysts to say the simple magic—and incorrect—words: it's a match.[73] Lab analysts repeatedly try to educate prosecutors and defense

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65. PRESIDENT'S COUNCIL OF ADVISORS ON SCI. & TECH., EXEC. OFFICE OF THE PRESIDENT, AN ADDENDUM TO THE PCAST REPORT ON FORENSIC SCIENCE IN CRIMINAL COURTS 4 (2017), https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensics_addendum_finalv2.pdf [https://perma.cc/C36Z-7PWB].

66. *Id.* at 9.

67. *See* PCAST REPORT, *supra* note 64, at 22 ("[R]eviews by competent bodies of the scientific underpinnings of forensic disciplines and the use in courtrooms of evidence based on those disciplines have revealed a dismaying frequency of instances of use of forensic evidence that do not pass an objective test of scientific validity.").

68. *See infra* Part IV.

69. PCAST REPORT, *supra* note 64, at 124–45.

70. Gary Fields, *White House Advisory Council Report is Critical of Forensics Used in Criminal Trials; U.S. Attorney General Says Justice Department Won't Adopt Recommendations*, WALL ST. J. (Sept. 20, 2016, 4:25 PM), http://www.wsj.com/articles/white-house-advisory-council-releases-report-critical-of-forensics-used-in-criminal-trials-1474394743.

71. Jessica D. Gabel, *Realizing Reliability in Forensic Science from the Ground Up*, 104 J. CRIM. L. & CRIMINOLOGY 283, 351 (2014).

72. *Id.* at 298–99.

73. *See* Valena E. Beety, *Forensic Ignorance on Trial*, *in* Lucien E. Dervan et al., *Voices on Innocence*, 68 FLA. L. REV. 1569, 1586–87 (2016).

attorneys on the language in lab reports and their meaning—even when only discussing said reports with counsel minutes or hours before a trial.[74] Even more concerning is when lab analysts are in police-controlled labs, which may influence and bias their own findings.[75] One well-known example of such influence occurred when forensic analyst Joyce Gilchrist, then a scientist at the Oklahoma City Police Laboratory, not only made false findings with DNA evidence, but appeared to have actively colluded with the prosecutor to hide exculpatory evidence from defense counsel, sending a potentially innocent man to death row.[76] Even Justice Scalia remarked, when penning the opinion of *Melendez-Diaz v. Massachusetts* in 2009, that "[f]orensic evidence is not uniquely immune from the risk of manipulation . . . . A forensic analyst responding to a request from a law enforcement official may feel pressure—or have an incentive—to alter the evidence in a manner favorable to the prosecution."[77]

Ultimately, courts are vastly slower to adopt scientific reforms than the fields directly impacted by new scientific discoveries, experiments, and challenged hypotheses.[78] As medical examiner, lawyer, dentist, and forensic dental consultant Michael Bowers has stated: "Science does move on. So should the criminal justice system . . . ."[79] Judges in criminal cases may be reluctant to exclude questionable evidence, leaving jurors to discern between reliable scientific findings and junk science. Indeed, even when jurors are apprised of the problems with forensic evidence through cross-examination, studies indicate that cross-examination or instructions from a judge have little impact on the decision-making of the jurors.[80] Fire science investigators now police

74. *See id.*

75. Sherry Nakhaeizadeh et al., *The Emergence of Cognitive Bias in Forensic Science and Criminal Investigations*, 4 BRIT. J. AM. LEGAL STUD. 527, 537, 549 (2015) ("Selective information search within legal perspectives occurs when an individual examines information or evidence to incriminate a suspect based on a personal hypothesis, and ignores the search for evidence that could exonerate or lead to an alternative hypothesis."); *see also* Alafair S. Burke, *Improving Prosecutorial Decision Making: Some Lessons of Cognitive Science*, 47 WM. & MARY L. REV. 1587, 1588–1613 (2006) (illustrating how prosecutorial decisions are influenced by cognitive biases).

76. Mitchell v. Gibson, 262 F.3d 1036, 1063–64 (10th Cir. 2001).

77. Melendez-Diaz v. Massachusetts, 557 U.S. 305, 318 (2009).

78. *See* Jennifer E. Laurin, *Criminal Law's Science Lag: How Criminal Justice Meets Changed Scientific Understanding*, 93 TEX. L. REV. 1751, 1753–54 (2015).

79. FORENSIC SCIENCE REFORM: PROTECTING THE INNOCENT 149–50 (Wendy J. Koen & C. Michael Bowers eds., 2017) [hereinafter FORENSIC SCIENCE REFORM] (quoting Letter from C. Michael Bowers, Fellow, Am. Acad. Forensic Scis.).

80. *See* Dawn McQuiston-Surrett & Michael J. Saks, *Communicating Opinion Evidence in the Forensic Identification Sciences: Accuracy and Impact*, 59 HASTINGS L.J.

themselves often more than courts do, holding themselves to standards under their own National Fire Protection Association Guide 921,[81] even when courts may not recognize the standards or request compliance.[82]

Professor Laurin characterizes this phenomenon as the "science lag," explaining that "even as scientific understanding evolves, criminal justice outcomes whose epistemic bona fides depend on the reliability of that science remain rooted in discredited knowledge."[83] Therefore, "relief from a conviction premised on expert evidence that was, but is no longer, viewed as valid by the scientific community is exceedingly rare."[84]

B. Low Accountability for State Actors' Use of False or Faulty Evidence and Failure to Disclose Exonerative Evidence

Even when the evidence and testimony are proven to be false, little accountability is found through the court system.[85] Prosecutors who present false evidence are shielded by absolute immunity and qualified immunity; police who ignore or suppress exonerative evidence are equally shielded.[86] Section 1983 and civil rights cases brought against fraudulent "experts" and their bogus testimony, such as forensic odontologists,[87] have been thrown out, with experts shielded as state actors.[88] As we have seen, with the

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1159, 1167–69 (2008) ("Whether or not jurors were informed about the limitations of microscopic hair examination on cross-examination or by the judge had little measurable or meaningful impact on their judgments about the likelihood that the defendant was the source of the crime-scene hair or their perceived understanding of the expert's testimony.").

81. NAT'L FIRE PROT. ASS'N, NFPA 921: GUIDE FOR FIRE AND EXPLOSION INVESTIGATIONS 921-1 (2017).

82. *See generally* Valena Beety & Jennifer Oliva, *Evidence on Fire*, 97 N.C. L. REV. 483 (2019).

83. Laurin, *supra* note 78, at 1753–54.

84. *Id*.

85. *See generally* Paul C. Giannelli, *Scientific Fraud*, 46 CRIM. L. BULL. 1313 (2010) (examples of systemic forensic fraud).

86. *See* Barry Scheck, *Professional and Conviction Integrity Programs: Why We Need Them, Why They Will Work, and Models for Creating Them*, 31 CARDOZO L. REV. 2215, 2219–21 (2010) ("The absolute immunity doctrine is not the only reason federal civil rights claims against prosecutors are, as a practical matter, rare and difficult to pursue. The qualified immunity good faith defense is a very substantial hurdle for a civil rights plaintiff as well. Though not a complete bar to liability, the Supreme Court has recognized that qualified immunity shields all but the plainly incompetent or those who knowingly violate the law.").

87. *See, e.g.*, Burke v. Town of Walpole, 405 F.3d 66, 70–71 (1st Cir. 2005); Stinson v. City of Milwaukee, No. 09-C-1033, 2013 WL 5447916, at *1 (E.D. Wis. Sept. 30, 2013).

88. *See, e.g.*, Brewer v. Hayne, 860 F.3d 819, 821, 823–24, 826 (5th Cir. 2017) ("But Defendants here, though calling on their medical training, were performing a role that more closely parallels criminal investigation—'a core government activity' traditionally protected

lack of board discipline for prosecutors who withheld exculpatory *Brady* evidence, there are few ramifications for using false evidence against a defendant, not even financial ones.[89] In areas such as forensic odontology, prosecutors continue to propose bite mark evidence, and courts continue to admit it, despite the purported restrictions of *Napue* and *Daubert.*

IV. NATIONAL FORENSICS REFORM SINCE THE 2009 NAS REPORT

Given the causal connection between court admissibility of flawed forensic evidence and resulting wrongful convictions, this next Part imperatively addresses key advancements in forensic science disciplines and accountability. As these disciplines gain reliability and accuracy, courts will see fewer wrongful convictions. Since the National Academy of Sciences report in 2009,[90] avenues for ensuring greater reliability have been pursued, dropped, rejected, and stalled. This Part details advancements and encourages further work and effort down these avenues.

A. National Commission on Forensic Science—Created and Disbanded

Perhaps the most important legislative action to increase the reliability and accuracy of forensic sciences was the creation of the National Commission on Forensic Science. The National Commission on Forensic Science was created in 2013 as a joint enterprise of the Department of Justice and the National Institute of Standards and Technology.[91] The Commission was housed in the Department of Justice and was a Federal Advisory Committee, in partnership with the National Institute of Standards and

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at common law by immunity. . . . We are persuaded that Defendants, as consulting forensic experts, were engaged in the criminal investigative functions of the state protected at common law and are here entitled to assert qualified immunity."); *see also* Radley Balko, *Federal Court: Despite 'Grossly Negligent' Testimony That Put Two Innocent Men in Prison, Forensic Experts Can't Be Sued*, WASH. POST (June 29, 2017, 7:57 PM) https://www.washingtonpost.com/news/the-watch/wp/2017/06/29/federal-court-despite-grossly-negligent-testimony-that-put-two-innocent-men-in-prison-forensic-experts-cant-be-sued/ [https://perma.cc/WDH9-ZPJW].

89. *See, e.g.*, KATHLEEN M. RIDOLFI & MAURICE POSSLEY, N. CAL. INNOCENCE PROJECT, PREVENTABLE ERROR: A REPORT ON PROSECUTORIAL MISCONDUCT IN CALIFORNIA 1997–2009, at 36–37 (2010), https://digitalcommons.law.scu.edu/cgi/viewcontent.cgi?article=1001&context=ncippubs [https://perma.cc/XBQ9-AW5E].

90. *See generally* NAS REPORT, *supra* note 2.

91. *National Commission on Forensic Science*, U.S. DEP'T JUST., https://www.justice.gov/archives/ncfs [https://perma.cc/FWS6-RUEV] (last visited Feb. 12, 2020).

Technology, to enhance the reliability of forensic disciplines.[92] The membership of the Commission included "federal, state and local forensic science service providers; research scientists and academics; law enforcement officials; prosecutors, defense attorneys and judges; and other stakeholders from across the country."[93] The mandate of the Commission was to "improve the practice of forensic science by developing guidance concerning the intersections between forensic science and the criminal justice system" and to "work to develop policy recommendations for the U.S. Attorney General . . . ."[94] Unfortunately for forward advancements, Attorney General Jefferson Beauregard Sessions III allowed the Commission's charter to expire on April 23, 2017, without renewal.[95]

B. National Code of Ethics—Drafted but Not Adopted

In response to the 2009 NAS Report, the Education, Ethics, and Terminology Inter-Agency Working Group of the National Science and Technology Council's Subcommittee on Forensic Science took action on ethics. In 2010, they developed and released a National Code of Ethics and Professional Responsibility for Forensic Science and Forensic Medicine Service Providers.[96] All forensic science practitioners were encouraged to adopt the National Code, particularly those "who provide reports and expert opinion testimony with respect to forensic evidence in United States courts of law . . . ."[97]

The Code was not adopted.[98] As one of its parting statements before being disbanded by Attorney General Sessions, the National Forensic Science Commission advised the Attorney General to direct the forensic science service providers in the

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92. *See id.*

93. *Id.*

94. *U.S. Departments of Justice and Commerce Name Experts to First-Ever National Commission on Forensic Science*, U.S. DEP'T JUST. (Jan. 10, 2014), https://www.justice.gov/opa/pr/us-departments-justice-and-commerce-name-experts-first-ever-national-commission-forensic [https://perma.cc/Z3WQ-KT4W].

95. *National Commission on Forensic Science*, *supra* note 91; Erin E. Murphy, *Sessions Is Wrong to Take Science out of Forensic Science*, N.Y. TIMES (Apr. 11, 2017), https://www.nytimes.com/2017/04/11/opinion/sessions-is-wrong-to-take-science-out-of-forensic-science.html [https://perma.cc/SYT2-P6E2].

96. Nat'l Comm'n on Forensic Sci., *National Code of Ethics and Professional Responsibility for the Forensic Sciences*, U.S. DEP'T JUST., https://www.justice.gov/archives/ncfs/page/file/788576/download [https://perma.cc/DEG2-XGN7] (last visited Oct. 23, 2019) [hereinafter *National Code*].

97. *Id.*

98. *Id.*

Department of Justice to adopt the National Code, to sign it, to review the Code annually, and to enforce violations.[99] None of these actions were taken.

The National Code was an attempt to build on the codes of ethics already adopted by most professional forensics organizations.[100] Some, indeed, also have ethics boards to evaluate the complaints, even though the administration of the boards may remain opaque, and questionably self-serving.[101] Questions about identifying behavior and recourse for ethical violations remain unanswered. Even when forensic science organizations have adopted codes of ethics, "there are no consistent mechanisms for enforcing any of the existing codes of ethics."[102]

C. Prosecutorial Duty to Disclose Exculpatory Evidence Post-Conviction—22 States Adopting Rule 3.8(g) and (h)

In addition to ethical obligations, there are also professional obligations for regulatory boards—particularly for those forensic disciplines that have been challenged for accuracy and reliability. A few legal boards have responded more stringently in cases of prosecutorial review, and states have enacted expanded Rules of Professional Conduct, notably 3.8(g) and 3.8(h) underneath *Special Responsibilities of a Prosecutor*. The comment to Rule 3.8 identifies as prosecutorial obligations the duties 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*."[103]

The American Bar Association (ABA) created Rule 3.8(g) and (h) in order to recognize and define a prosecutor's ethical duties after a conviction. Rule 3.8(g) requires prosecutors to disclose "new, credible, and material" evidence of innocence to "an appropriate court or authority," and if the case is in the prosecutor's jurisdiction, to disclose that evidence to the defendant *and* to investigate whether the defendant was wrongfully convicted.[104] Rule 3.8(h) requires that, if there is clear and

99. *Id.*

100. *Id.*

101. *See, e.g.*, Jennifer D. Oliva & Valena E. Beety, *Regulating Bite Mark Evidence: Lesbian Vampires and Other Myths of Forensic Odontology*, 94 WASH. L. REV. 1769, 1811 (2019).

102. Gabel, *supra* note 71, at 335 (quoting NAS REPORT, *supra* note 2, at 26).

103. MODEL RULES OF PROF'L CONDUCT r. 3.8 cmt. 1 (AM. BAR ASS'N 2019) (emphasis added).

104. *Id.* r. 3.8(g) ("When a prosecutor knows of new, credible and material evidence creating a reasonable likelihood that a convicted defendant did not commit an offense of

convincing evidence of innocence, "the prosecutor *shall* seek to remedy the conviction."[105] Violations of these rules can be acknowledged and reprimanded by state law licensing boards. Rule 3.8(g) and (h) were proposed by the American Bar Association and have been adopted or are presently being considered by twenty-two states.[106]

Similar to the lenient treatment of questionable testimony by forensic experts, courts frequently give prosecutors wide leeway in determining whether they have violated applicable rules of professional conduct.[107] As noted scholar Bruce Green opines, "For every case in which a prosecutor is publicly sanctioned for egregious misconduct, there are many more in which prosecutors' questionable conduct goes unpunished."[108] The Veritas Initiative examined more than 4,000 state and federal California cases from 1997 to 2009 with claims of prosecutorial misconduct. In 707 of these cases, California courts explicitly found misconduct, and yet the prosecutors almost never faced discipline.[109]

Former prosecutor Michael Nifong in North Carolina is the rare case of a prosecutor who was disbarred for not disclosing exculpatory evidence; however, the state law licensing board disbarred Nifong largely because a previous scandal led to greater board commitment to accountability.[110] The Office of Disciplinary

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which the defendant was convicted, the prosecutor shall: (1) promptly disclose that evidence to an appropriate court or authority, and (2) if the conviction was obtained in the prosecutor's jurisdiction, (i) promptly disclose that evidence to the defendant unless a court authorizes delay, and (ii) 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.").

105. *Id.* r. 3.8(h) (emphasis added) ("When 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." (emphasis added)).

106. *Variations of the ABA Model Rules of Professional Conduct*, AM. B. ASS'N, https://www.americanbar.org/content/dam/aba/administrative/professional_responsibility/mrpc_3_8_g_h.pdf [https://perma.cc/DEG2-XGN7] (last updated Sept. 29, 2017) ("Of the states that have adopted the Model Rule: Three (3) states have adopted the Model Rule as is: ID, IL, and WV. Fourteen (14) states have adopted modified Model Rule: AK, AZ, CO, DE, HI, MA, NC, NM, NY, ND, TN, WA, WI, and WY. In five (5) jurisdictions, Rules Committees are studying the Model Rule: CA, DC, NE, PA, and VT.").

107. *See* Bruce A. Green, *Prosecutors and Professional Regulation*, 25 GEO. J. LEGAL ETHICS 873, 874 (2012) ("Courts often interpret the generally applicable rules of professional conduct as less restrictively applied to prosecutors than to other lawyers. When prosecutors engage in questionable conduct that does implicate professional conduct rules, professional discipline rarely follows." (footnote omitted)).

108. *Id.* at 874.

109. *See* RIDOLFI & POSSLEY, *supra* note 89, at 2, 10–13.

110. Robert P. Mosteller, *Exculpatory Evidence, Ethics, and the Road to the Disbarment of Mike Nifong: The Critical Importance of Full Open-File Discovery*, 15 GEO.

Council in North Carolina disbarred Nifong for his misconduct in the Duke Lacrosse players case, however accountability was primed because of the corruption of evidence in the prior death penalty case of Alan Gell.[111] Alan Gell was freed from death row in North Carolina when significant exculpatory and impeachment evidence came to light—evidence that the prosecutors had suppressed.[112] This evidence included statements by seventeen separate witnesses who saw the victim alive after Gell was already incarcerated.[113] The prosecutors in Gell's case received light discipline from the Disciplinary Hearing Committee, and the Committee was the brunt of severe backlash.[114] This backlash set the stage for Nifong's disbarment, and ultimately changed the State's discovery process to open-file access for defense attorneys.[115]

As a model of accountability, the Texas State Bar independently investigated former prosecutor and then-sitting judge Ken Anderson, after learning that he had suppressed exculpatory evidence in the case of Michael Morton, who was wrongfully convicted and freed by DNA evidence.[116] Ken Anderson suppressed statements from Morton's three-year-old son, Eric, who was present during the murder of his mother and said his father was not there while describing the crime scene in detail.[117] Police records also showed a man repeatedly parked a green van behind the Morton's house, and that when Christine Morton's Visa card was recovered in a San Antonio jewelry store, the jeweler said he could identify the person who had attempted to use the card.[118] This evidence was not disclosed.

MASON L. REV. 257, 272–76, 302–06 (2008) (explaining the relationship between the *Gell* case and the subsequent criminal discovery reforms enacted by the North Carolina legislature).

111. *Id.* at 272–76.

112. *Alan Gell*, NAT'L REGISTRY EXONERATIONS, http://www.law.umich.edu/special/exoneration/Pages/casedetail.aspx?caseid=3236 [https://perma.cc/FL83-RC29] (last updated July 8, 2019).

113. *Id.*

114. 2004 N.C. Sess. Laws 515, 519–20; *see also* Mosteller, *supra* note 110, at 269–76.

115. *See* Mosteller, *supra* note 110, at 269–76, 302–06.

116. *Michael Morton*, NAT'L REGISTRY EXONERATIONS, https://www.law.umich.edu/special/exoneration/Pages/casedetail.aspx?caseid=3834 [https://perma.cc/E7RB-EGTW] (last updated June 2012).

117. *Id.*; *see also* Tom Dart, *Texas Prosecutor Accused of Misconduct for Role in Famous Execution Case*, GUARDIAN (Mar. 19, 2015), https://www.theguardian.com/us-news/2015/mar/19/texas-prosecutor-accused-misconduct-execution-case [https://perma.cc/XTA2-MDDZ].

118. *Michael Morton*, *supra* note 116.

Ken Anderson ultimately received ten days on the charge of criminal contempt of court—the first prosecutor nationally to face criminal charges for misconduct.[119] The Texas State Bar investigated Anderson and required that he forfeit his license, which ultimately meant he had to step down from the bench.[120] The Texas State Bar also investigated prosecutor Charles Sebesta and revoked his law license for withholding evidence and using false testimony to win a capital murder conviction against an inmate who was later exonerated.[121]

This accountability by boards, including the Texas Bar charges against prosecutors for hiding exculpatory evidence and presenting false testimony, is of particular importance given the lackluster accountability for prosecutorial misconduct by the courts.[122] Indeed, the Supreme Court has expanded the protections for prosecutors through the doctrine of prosecutorial immunity.[123] The expanded protections occur concomitantly with findings by the National Registry of Exonerations that 1,348 exoneree cases involve "official misconduct."[124]

D. The Organization of Scientific Area Committees for Forensic Science and Established Standards—Rules but What Implementation?

Several so-called Scientific Working Groups (SWGs) in the forensic sciences, and now the Organization of Scientific Area Committees for Forensic Science (OSAC), were established to

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119. Mark Godsey, *For the First Time Ever, a Prosecutor Will Go to Jail for Wrongfully Convicting an Innocent Man*, HUFFPOST, https://www.huffpost.com/entry/for-the-first-time-ever-a_b_4221000 [https://perma.cc/C8ZY-E8S2] (last updated Oct. 16, 2015).

120. *See Michael Morton*, *supra* note 116; Alexa Ura, *Anderson to Serve 9 Days in Jail, Give Up Law License as Part of Deal*, TEX. TRIB. (Nov. 8, 2013, 3:00 PM), https://www.texastribune.org/2013/11/08/ken-anderson-serve-jail-time-give-law-license/ [https://perma.cc/5VSL-3VFD].

121. Pamela Colloff, *Ex-DA Who Sent Exoneree Anthony Graves to Death Row Is Disbarred*, DAILY POST (June 12, 2015), https://www.texasmonthly.com/the-daily-post/ex-da-who-sent-exoneree-anthony-graves-to-death-row-is-disbarred/ [https://perma.cc/KF2K-LDTU].

122. *But see* Scheck, *supra* note 86, at 2225 (advocating for internal reform in the prosecutor's office in order to identify, correct, and prevent ethical violations).

123. *See, e.g.*, Connick v. Thompson, 563 U.S. 51, 59 (2011) (holding that defendant prosecutor was entitled to judgment as a matter of law because plaintiff did not prove that he was on actual or constructive notice of a need for adequate training); Van de Kamp v. Goldstein, 555 U.S. 335, 344 (2009) (holding that a prosecutor can enjoy absolute immunity against claims concerning a prosecutor's administrative and supervisory duties).

124. *% Exonerations by Contributing Factor*, NAT'L REGISTRY EXONERATIONS, http://www.law.umich.edu/special/exoneration/Pages/ExonerationsContribFactorsByCrime.aspx [https://perma.cc/E4J2-6PYH] (last updated Oct. 27, 2019).

create rules to be followed by forensic disciplines.[125] These forensic science standards "define minimum requirements, best practices, scientific protocols, and other guidance to help ensure that the results of forensic analysis are reliable and reproducible."[126] While the OSACs did not anticipate who would enforce the rules, and perhaps were willing to allow analysts to self-police, their point was that regulations *should* exist, and that best practices should be created and adopted.[127] However, due to unstaffed committees, progress on creating these standards has been slow.

E. 2013 FBI Hair Microscopy Investigation

One conclusion by the 2009 NAS Report was that hair microscopy—the discipline of uniquely identifying an individual as the source of a particular hair—was similar to other "matching" sciences: stretched and applied beyond its scientific boundaries.[128] Thereafter, lab analysts who had testified to exact matches between hairs came under scrutiny.[129] The NAS Report damningly stated that "testimony linking microscopic hair analysis with particular defendants is highly unreliable,"[130] putting lab analysts in a defensive position as to the accuracy of their testimony. This scrutiny was heightened as DNA evidence concluded definitively that false testimony had been provided and innocent people

125. *The Organization of Scientific Area Committees for Forensic Science*, NAT'L INST. STANDARDS & TECH., https://www.nist.gov/topics/organization-scientific-area-committees-forensic-science [https://perma.cc/EGD4-SXQE] (last visited Oct. 26, 2019); *Scientific Working Groups in the Forensic Sciences*, NAT'L INST. JUST. (July 24, 2012), https://nij.ojp.gov/topics/articles/scientific-working-groups-forensic-sciences [https://perma.cc/7ARN-PY76].

126. *Houston Forensic Science Center to Voluntarily Adopt OSAC Standards*, NAT'L INST. STANDARDS & TECH., (Dec. 18, 2018), https://www.nist.gov/news-events/news/2018/12/houston-forensic-science-center-voluntarily-adopt-osac-standards [https://perma.cc/5P4D-8RBF].

127. *See The Organization of Scientific Area Committees for Forensic Science*, *supra* note 125.

128. NAS REPORT, *supra* note 2, at 158, 160–61.

129. Part of the difficulty with hair microscopy was not simply accurately determining whether characteristics between the target hair and the defendant's hair were similar, but what the pool size was for the number of humans with hairs matching those characteristics. With no sample size, testimony such as "hairs only match to this extent 1 in a 1000 times," or "I've only seen hairs match like this once in my career" was meaningless, yet persuasive for juries. No statistics existed for the presence of particular hair characteristics across different populations. *See* NAS REPORT, *supra* note 2, at 158, 160–61; *see also* FBI, MICROSCOPIC HAIR COMPARISON ANALYSIS 1 (2012), https://www.mtacdl.org/attachments/CPE/Nelson/FBI_Limits_of_Science__%20Microscopic_Hair_Comparison.pdf [https://perma.cc/HZ32-NAS5] ("[T]he size of the pool of people who could be included as a possible source of a specific hair is unknown.").

130. NAS REPORT, *supra* note 2, at 161.

wrongfully convicted based on "matching" hair testimony.[131] In 2013, the FBI ultimately reexamined cases between 1985 and 2000 where agents had testified to a match beyond the scope of what hair microscopy could determine. They released their results to the defendants and the Innocence Project, with an agreement that the FBI would provide free DNA testing in those cases and the DOJ would not oppose federal petitions for DNA testing. A number of incarcerated individuals were ultimately exonerated.[132]

F. Increased Accreditation, and Still More to Do

The NAS Report specifically questioned the lack of certification required for forensic science practitioners in states. Certification was not generally revoked for ethical violations, and forensic disciplines had varying standards and codes of ethics while lacking consistent mechanisms for enforcement.[133] Ten years after the NAS Report, certification of forensic science practitioners remains a voluntary process. As of 2014, only 70% of state crime labs employed one or more externally certified forensic science practitioners in their labs.[134]

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131. Spencer S. Hsu, *FBI Admits Flaws in Hair Analysis Over Decades*, WASH. POST (Apr. 18, 2015), https://www.washingtonpost.com/local/crime/fbi-overstated-forensic-hair-matches-in-nearly-all-criminal-trials-for-decades/2015/04/18/39c8d8c6-e515-11e4-b510-962fcfabc310_story.html [https://perma.cc/DJ89-DHA5]; *FBI/DOJ Microscopic Hair Comparison Analysis Review*, FBI, https://www.fbi.gov/services/laboratory/scientific-analysis/fbidoj-microscopic-hair-comparison-analysis-review [https://perma.cc/5CXM-X6RV] (last visited Oct. 17, 2019).

132. *Innocence Project and NACDL Announce Historic Partnership with the FBI and Department of Justice on Microscopic Hair Analysis Cases*, INNOCENCE PROJECT (July 18, 2013), https://www.innocenceproject.org/innocence-project-and-nacdl-announce-historic-partnership-with-the-fbi-and-department-of-justice-on-microscopic-hair-analysis-cases/ [https://perma.cc/X3BK-24EB] (last visited Dec. 22, 2019); *see also, e.g.*, *Timothy Bridges*, INNOCENCE PROJECT, https://www.innocenceproject.org/cases/timothy-bridges/ [https://perma.cc/MG45-NHD7] (last visited Dec. 22, 2019).

133. NAS REPORT, *supra* note 2, at 6, 26.

134. *Id.* at 23, 25 (noting accreditation should be mandatory for all forensic science professionals); *see also* Haley Melbourn et al., *Mandatory Certification of Forensic Science Practitioners in the United States: A Supportive Perspective*, *in* 1 FORENSIC SCI. INT'L 161, 161–63 (2019) ("Historically, forensic science has been highly unregulated. More recently, however, forensic science has made strides at becoming more regulated as 88% of public sector crime laboratories are accredited (as of 2014) and 98% of crime laboratories conduct proficiency testing. This is in part due to the 2009 National Academy of Sciences report on strengthening forensic science which recommended mandatory laboratory accreditation. As of 2013, ten states and the District of Columbia statutorily require accreditation for some or all scientific disciplines conducted in their forensic laboratories. Although progress is being made towards the accreditation of crime laboratories, certification has not followed the same trend."); ANDREA M. BURCH ET AL., BUREAU OF JUSTICE STATISTICS, NCJ 250152, PUBLICLY FUNDED FORENSIC CRIME LABORATORIES: QUALITY ASSURANCE PRACTICES 5, 10 (2016), https://www.bjs.gov/content/pub/pdf/pffclqap14.pdf [https://perma.cc/G2WZ-P9C8] (detailing how many forensic labs employed one or more externally certified analysis in

Just as an individual can be certified, a lab or medical examiner office can be accredited. Some accreditations have improved since the NAS Report.[135] The International Organization for Standardization (ISO) provides an international standard specifically for lab quality. ISO 17025 applies to lab testing and calibration of instruments, and ISO recommends its standards be adopted by accreditation organizations.[136] ISO standards on managerial requirements include suggested policies, standards, and procedures to ensure greater quality.[137] ISO standards on technical requirements focus on individual analyst competence, reporting requirements, managing equipment, and methodology.[138] A more recent ISO 17025 standard section, 7.7.7.1.i, also requires technical review of reported results, although no time frame is provided.[139] The ANSI National Accreditation Board (ANAB) has accreditation that mirrors the ISO guidelines, but accreditation is voluntary.[140]

Beginning in 2018, the Department of Justice issued Uniform Language for Testimony and Reports guidance to forensic experts.[141] The guidance applies to all DOJ forensic experts, including experts at the ATF, DEA, and FBI.[142] While the DOJ does have a Scientific Research and Integrity Policy and a Code of Professional Responsibility for the Practice of Forensic Science,

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2014).

135. *See* BURCH, *supra* note 134, at 3. ("Since [the publication of the NAS Report in] 2009, the proportion of crime labs with an ISO-based accreditation standard increased from 27% to 83%.").

136. Gabel, *supra* note 71, at 343.

137. *Id.*

138. *Id.*

139. INT'L ORG. FOR STANDARDIZATION, ISO/IEC 17025: GENERAL REQUIREMENTS FOR THE COMPETENCE OF TESTING AND CALIBRATION OF LABORATORIES 13–14 (3d ed. 2017).

140. *See About ANAB*, ANAB, https://www.anab.org/about-anab [https://perma.cc/8FEK-YEKJ] (last visited Oct. 22, 2019).

141. *See Uniform Language for Testimony and Reports*, U.S. DEP'T JUST., https://www.justice.gov/olp/uniform-language-testimony-and-reports [https://perma.cc/G93R-6N6J] (last updated Mar. 19, 2019). As of this update, the DOJ has created fourteen guidance documents. The date of adoption for each document can be found in the footer of each report.

142. *See Forensic Science: Quality Management System Documents*, U.S. DEP'T JUST., https://www.justice.gov/olp/forensic-science [https://perma.cc/N98F-K6KQ] (last updated Dec. 20, 2019) ("The Department posts quality management system documents online to promote the scientific value of transparency and enhance knowledge of Department forensic policies and practices by the stakeholders. These documents include quality assurance measures, laboratory policies, and standard operating procedures for testing and analysis, and summaries of internal validation studies for forensic methods and techniques that are currently used by Department labs.").

the DOJ does not lay out a mechanism for responding to false testimony by an agent.[143]

The NAS Report specifically challenged the reliability of one discipline in particular: forensic odontology, or bite mark evidence. Bite mark evidence fails in many of its basic assertions, notably: that the marking is a human bite mark; that the bite mark is associated with the suspect's dentition; and that an expert can estimate the frequency of such an association.[144] Proficiency studies now fundamentally undermine the reliability and accuracy of bite mark evidence.[145] These studies prove that one can no longer assume that dentition is unique or that human skin can accurately record features of dentition. The 2009 NAS Report itself found that "[t]he uniqueness of the human dentition has not been scientifically established."[146] With only eight teeth evaluated in a bite mark, it may actually prove impossible to decipher unique features, and thus far, accurate associations between dentition and marks have only been possible within limited populations.[147] Likewise, the NAS Report found that: "[B]ite marks on the skin will change over time and can be distorted by the elasticity of the skin, the unevenness of the surface bite, and swelling and healing.

143. *See Forensic Science: Scientific and Research Integrity Policy and Code of Professional Responsibility*, U.S. DEP'T JUST., https://www.justice.gov/olp/forensic-science [https://perma.cc/WS2W-DCY8] (last updated Dec. 20, 2019) ("Department personnel – including officials, attorneys, law enforcement agents and employees engaged in scientific disciplines rely upon and present evidence founded in fact and veracity. This is particularly critical in the forensic science arena, where the credibility of the evidence often depends upon the integrity of the handlers, examiners, experts, and presenters of that evidence. These documents outline the Department's policy on scientific research and integrity and its code of professional responsibility for the practice of forensic science.").

144. NAS REPORT, *supra* note 2, at 175–76.

145. *See* C. Michael Bowers, *Problem-Based Analysis of Bitemark Misidentifications: The Role of DNA,* 159 FORENSIC SCI. INT'L SUPP. S104, S106–S107 (2006) (noting a 1999 ABFO bite mark workshop where "ABFO diplomats attempted to match four bitemarks to seven dental models [and] found 63.5% false positives").

146. NAS REPORT, *supra* note 2, at 175.

147. Oliva & Beety, *supra* note 101, at 11; *see also* Mary A. Bush et al., *Similarity and Match Rates of the Human Dentition in Three Dimensions: Relevance to Bitemark Analysis*, 125 INT'L. J. LEGAL MED. 779, 782–83 (2011) (finding that there may not be a scientific basis for bite mark analysis generally, but finding significant match rates when specifically considering the incisal edges of the six anterior teeth); Mary A. Bush et al., *Statistical Evidence for the Similarity of the Human Dentition*, 56 J. FORENSIC SCI. 118, 118–21 (2010) (observing correlations and nonuniform distributions of tooth positions and matches between dentitions); H. David Sheets et al., *Dental Shape Match Rates in Selected and Orthodontically Treated Populations in New York State: A Two-Dimensional Study*, 56 J. FORENSIC SCI. 621, 621–26 (2011) (finding that although there are dental matches within populations, bite mark analysis does not match the individuality of fingerprints and the likelihood of matching a specific individual's alignment pattern is still to be determined).

These features may severely limit the validity of forensic odontology."[148]

Even the American Board of Forensic Odontologists (ABFO) recognizes that bite mark evidence is prone to considerable error. Within its own ranks, the ABFO conducted a confidential study in 2015 entitled *Construct Validity Bitemark Assessments Using the ABFO Bitemark Decision Tree*. The study presented 100 injuries to 103 ABFO board-certified Diplomates. The Diplomates were asked to determine whether the injury was a human bite mark and, if human, whether it had distinct identifiable arches and individual toothmarks. Thirty-nine Diplomates completed the survey. Of the one hundred case studies presented to the Diplomates, 100% of the analysts agreed on a mere four case studies. When the rate of agreement was lowered to 90%, eight analysts remained in agreement.[149]

Despite the apparent lack of reliability and accuracy of bite mark evidence, the American Academy of Forensic Science renews its recognition of the ABFO every five years and did so yet again in 2018.[150] Forensic odontology will continue to be a recognized and validated field within the forensics world and the Academy for at least another five years, until their recognition is up for renewal and reconsideration in 2023. The Forensic Science Accreditation Board, which puts the stamp of approval on forensic specialties, continues to approve of forensic odontology.[151] Within the ABFO, certification is optional, rather than mandatory.[152] The ABFO does

148. NAS REPORT, *supra* note 2, at 174.

149. FORENSIC SCIENCE REFORM, *supra* note 79, at 156–57; *see also* Radley Balko, *A Bite Mark Matching Advocacy Group Just Conducted a Study That Discredits Bite Mark Evidence*, WASH. POST: THE WATCH (Apr. 8, 2015, 2:36 PM), https://www.washingtonpost.com/news/the-watch/wp/2015/04/08/a-bite-mark-matching-advocacy-group-just-conducted-a-study-that-discredits-bite-mark-evidence/ [https://perma.cc/CG4R-G9VU] (reporting on the AFBO session at the 2015 American Academy of Forensic Sciences convention that presented results of the confidential AFBO bite mark study).

150. Mike Bowers, *If Bitemark Identifiers Are Flawed, Why Did the AAFS Just Recertify Them?*, FORENSICS & L. FOCUS @ CSIDDS (Mar. 27, 2018), https://csidds.com/2018/03/27/if-bitemark-identifiers-are-flawed-why-did-the-aafs-just-recertify-them/ [https://perma.cc/P3NJ-DTQ8]; *see also About the ABFO*, AM. BOARD FORENSIC ODONTOLOGY, https://abfo.org [https://perma.cc/89SP-DMPR] (last visited Oct. 22, 2019) ("The ABFO is comprised of individuals who are nationally and internationally recognized experts. The ABFO is accredited by the Forensic Specialties Accreditation Board (FSAB) as a forensic specialty offering board certification to qualified dentists.")

151. Bowers, *supra* note 150.

152. *See About the AFBO*, *supra* note 150 ("The objective of the Board is to establish, enhance, and revise as necessary, standards of qualifications for those who practice forensic odontology, and to certify as qualified specialists those voluntary applicants who comply with the requirements of the Board."); *Certification and Examining Committee Guidelines*, AM. BOARD FORENSIC ODONTOLOGY, http://abfo.org/wp-content/uploads/2012/11/6Certifi

not regulate forensic odontologists, which means both the ABFO and the Forensic Science Accreditation Board continue to permit false testimony by forensic odontologists.

V. STATE REFORM SINCE THE 2009 NAS REPORT: TEXAS LEADS THE WAY

Texas has led the nation in criminal justice reforms over the past twenty years, particularly in the field of forensic science. Texas established the first Forensic Science Commission, a nationally regarded accountability and reliability mechanism for forensic evidence in criminal courts.[153] The deep scientific investigatory work of the commission is detailed below, along with the commission's current goal of state certification requirements for forensic analysts. As a comparator, this Part also discusses the new Massachusetts Forensic Oversight Board, modeled after Texas, and created in response to forensic scandals in Massachusetts. This Part highlights the importance of these commissions in court recognition of changed science claims and refuting flawed or faulty forensic evidence.

A. Texas Forensic Science Commission

1. Challenging Faulty Forensic Evidence. The Texas legislature established the Texas Forensic Science Commission (TFSC) in 2005.[154] The Commission is composed of nine members appointed by the Governor to serve two-year terms. The nine members include seven scientists (two of whom must have expertise in the field of forensic science), one criminal defense attorney, and one district attorney.[155] As detailed by Professors Thompson and Cásarez, the TFSC was born from forensic scandal and challenged forensic fraud from its conception.[156] The Texas legislature created the TFSC in the wake of a vast public embarrassment and questions regarding the validity of scientific testimony from the Houston Police Department Crime

cation-and-Examining-Committee-Guidelines-v.-March-2019.pdf [https://perma.cc/DBQ6-VZ2R] (last visited Feb. 12, 2020) (detailing the application process for individuals wishing to "be awarded the ABFO Certificate of Proficiency in Forensic Odontology").

153. *See* Michael Hall, *False Impressions*, TEX. MONTHLY (Dec. 23, 2015), https://www.texasmonthly.com/articles/false-impressions [https://perma.cc/9R5P-X624].

154. TEX. CODE CRIM. PROC. ANN. art. 38.01, § 1.

155. *Id.* § 3.

156. Sandra Guerra Thompson & Nicole Bremner Cásarez, *Building the Infrastructure for "Justice Through Science": The Texas Model*, 119 W. VA. L. REV. 711, 716–17 (2016).

Laboratory.[157] In 2004, "George Rodriguez was exonerated, bringing calls from two successive HPD Police Chiefs, the city's mayor, and other public officials for *a moratorium on executions* in cases involving evidence produced by the HPD Crime Laboratory."[158] At the same time, in February 2004, the state executed Cameron Todd Willingham, a man convicted of arson despite new research questioning the evidence used to support his conviction.[159]

The importance of Cameron Todd Willingham's case cannot be overstated: his case revolutionized fire science investigations and laid the groundwork to exonerate innocent men and women nationally.[160] Fire investigators were previously taught that understanding a fire was about "intuition," and "rules of thumb."[161] The fire investigator in Willingham's case testified: "The fire tells the story. I am just the interpreter. I am looking at the fire, and I am interpreting the fire. That is what I know. That is what I do best. And the fire does not lie. It tells me the truth."[162]

These presumptions were not subjected to scientific studies to verify their reliability or validity. The state's fire investigator's testimony against Willingham was based on now-debunked arson myths.[163]

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157. *See id*. at 717.

158. *Id.* (emphasis added).

159. *See id*. at 716 (summarizing the facts of Cameron Todd Willingham's case). For a discussion regarding the validity of the evidence used to convict Willingham, see Rachel Dioso-Villa, *Scientific and Legal Developments in Fire and Arson Investigation Expertise in* Texas v. Willingham, 14 MINN. J.L. SCI. & TECH. 817, 820, 829–33 (2013) (using evidence presented in Willingham's case to illustrate how the lack of scientific testing and reporting can lead fire investigators to draw conclusions rooted in opinion rather than chemical testing); and also David Grann, *Trial by Fire: Did Texas Execute an Innocent Man?*, NEW YORKER (Aug. 31, 2009), http://www.newyorker.com/magazine/2009/09/07/trial-by-fire [https://perma.cc/9R5P-X624] (examining new evidence that raises questions about the validity of Willingham's conviction and execution).

160. *See* Grann, *supra* note 159.

161. Paul C. Giannelli, *Forensic Science:* Daubert*'s Failure*, 68 CASE W. RES. L. REV. 869, 889 (2018) ("For decades arson investigators came from the 'old school' of investigators—those who used intuition and a number of rules of thumb to determine whether a fire was incendiary. Critics complained that instead of being rooted in science, the approach was based on folklore that had been passed down from generation to generation—without any empirical testing. A government report noted, as early as 1977, that common arson indicators had 'received little or no scientific testing' and that '[t]here appears to be no published material in the scientific literature to substantiate [the burn indicators'] validity.'" (quoting JOHN F. BOUDREAU ET AL., NAT'L INST. OF LAW ENF'T & CRIMINAL JUSTICE, U.S. DEP'T OF JUSTICE, ARSON AND ARSON INVESTIGATION: SURVEY AND ASSESSMENT 88, at xvi–xvii (1977))).

162. Statement of Facts Volume XI at 244, Texas v. Willingham, No. 24–467 (13th Dist. Ct., Navarro County, Tex. Aug. 18, 1992).

163. *See* Dioso-Villa, *supra* note 159, at 823–24, 830, 833.

Soon after Willingham's execution, the newly established TFSC investigated his case, fulfilling the Commission's motto of "Justice through Science."[164] The TFSC's resulting report, *The Willingham / Willis Investigation* (TFSC Report), was published on April 15, 2011.[165]

In researching the TFSC Report, the TFSC contracted for the professional opinion of Dr. Craig L. Beyler. The TFSC asked Dr. Beyler to review expert testimony in Willingham's case and another arson case, that of Ernest Ray Willis.[166] Dr. Craig Beyler's expert review, released in 2009, found that:

> The investigations of the Willis and Willingham fires did not comport with either the modern standard of care expressed by NFPA 921, or the standard of care expressed by fire investigation texts and papers in the period 1980–1992. The investigators had poor understandings of fire science and failed to acknowledge or apply the contemporaneous understanding of the limitations of fire indicators. Their methodologies did not comport with the scientific method or the process of elimination. A finding of arson could not be sustained based upon the standard of care expressed by

164. Cameron Willingham was executed on February 17, 2004. *Death Row Information*, TEX. DEP'T. CRIM. JUST., https://www.tdcj.texas.gov/death_row/dr_executed_offenders.html [https://perma.cc/TQ72-AF3G] (last updated Jan. 16, 2020). The TFSC was established by House Bill 1068 which amended the Texas Code of Criminal Procedure to add Article 38.01. *See* Act of May 30, 2005, 79th Leg., R.S., ch. 1224, § 1, 2005 Tex. Gen. Laws 3952, 3952–53 (codified at TEX. CODE CRIM. PROC. ANN. art. 38.01). The Act took effect on September 1, 2005. *Id.* § 23; *see also* TEX. FORENSIC SCI. COMM'N, ANNUAL REPORT FY2011, at 5 (2011), https://www.txcourts.gov/media/1440349/fsc-annual-report-fy2012.pdf [https://perma.cc/E5VH-YX3W] ("The Texas Legislature created the Texas Forensic Science Commission in 2005 to address concerns about the integrity and reliability of forensic science in Texas courts. The concerns emanated in part from problems at the Houston Police Department's ('HPD') crime lab in the early 2000's. Serious deficiencies were found in many areas of forensic analysis at the HPD lab, including the handling, labeling, storing and examination of evidence."). The TFSC's motto, "Justice Through Science," is published on the cover of its annual report. *Id.* at 1.

165. *See generally* TEX. FORENSIC SCI. COMM'N, WILLINGHAM/WILLIS INVESTIGATION (2011) [hereinafter TFSC REPORT], https://www.txcourts.gov/media/1440974/09-01-final-report-willingham-willis-investigation-20110415-with-addendum-20111028.pdf [https://perma.cc/6JT5-FKW3].

166. *Id.* at 8–9; *see also id.* at Ex. 7 (Dr. Craig L. Beyler's report, "Analysis of the Fire Investigation Methods and Procedures Used in the Criminal Arson Cases Against Ernest Ray Willis and Cameron Todd Willingham"); *id.* at Ex. 8 (listing of documents sent to Dr. Beyler to use in the creation of his report). For a procedural history of Ernest Ray Willis' convictions and appeals, see generally *id.* at 12–13. Willis filed a writ of habeas corpus petition with the United States District Court for the Western District of Texas. He was exonerated and granted relief on August 9, 2004. Willis v. Cockrell, No. P-01-CA-20, 2004 WL 1812698, at *1, *34–35 (W.D. Tex. Aug. 9, 2004).

> NFPA 921, or the standard of care expressed by fire investigation texts and papers in the period 1980–1992.[167]

Just as the TFSC was set to hear Dr. Beyler's testimony in late September 2009, Governor Rick Perry—who had refused Willingham's stay of execution in 2004—repopulated the TFSC.[168] Thereafter in April 2011, the TFSC issued seventeen recommendations for improving fire investigations.[169] On July 9, 2011, the TFSC was directed by the Texas Attorney General that it lacked the authority to opine on the evidence admitted in cases before the creation of the TFSC in 2005.[170] Then, on October 11, 2011, the TFSC included an addendum to its April 2011 report "declin[ing] to issue any finding regarding allegations of negligence or misconduct by the . . . Texas State Fire Marshal " on either of the cases, but maintained its seventeen recommendations for reforming arson investigations.[171] This important exposure of Willingham's case introduced laypeople to the flaws in fire science and how faulty arson evidence can lead to wrongful convictions.

After issuing the recommendations, the TFSC partnered with the Texas State Fire Marshall to implement the recommendations and "committed to ensuring the best possible forensics are used in fire investigations in Texas."[172] Then, the Texas State Fire Marshall undertook a project in collaboration with the Innocence Project of Texas to review arson convictions and testimony in light of these recommendations.[173]

The TFSC was also the first commission in the United States to review state testimony on microscopic hair analysis, after the forensic discipline was chastised by the NAS Report.[174] The TFSC began the review in light of the joint hair microscopy case audit between the FBI, DOJ, the Innocence Project, and the National

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167. TFSC REPORT, *supra* note 165, Ex. 7 at 51.

168. *See* Rick Perry, Governor, Tex., Press Conference (Oct. 13, 2009) (transcript available at https://tsl.access.preservica.com/uncategorized/digitalFile_79e0bb2a-9c86-4da8-a36d-83e05094db0a/ [https://perma.cc/3DQZ-EQPD]); John Burnett, *2004 Execution Haunts Texas Governor's Race*, NPR (Oct. 21, 2009, 1:48 PM), https://www.npr.org/templates/story/story.php?storyId=114005470 [https://perma.cc/WNK6-PTF9].

169. TFSC REPORT, *supra* note 165, at 39–52.

170. Tex. Att'y Gen., Op. No. GA-0866 (2011) (Re: Investigative Authority of the Texas Forensic Science Commission).

171. TFSC REPORT, *supra* note 165, add. at 2.

172. *Id.* add. at 5; Plummer & Syed, *supra* note 11, at 336.

173. *See* Plummer & Syed, *supra* note 11, at 336.

174. NAS REPORT, *supra* note 2, at 160–61; Jordan Smith, *Hair Analysis: The Root of the Evidence Problem*, AUSTIN CHRON.: DAILY NEWS (Jan. 13, 2014, 3:10 PM), https://www.austinchronicle.com/daily/news/2014-01-13/hair-analysis-the-root-of-the-evidence-problem/ [https://perma.cc/CF3X-FDK7].

Association of Criminal Defense Lawyers.[175] The FBI audited cases where FBI analysts testified falsely or were beyond the scope of the scientific evidence, finding errors in at least 90% of the cases reviewed, and informing both prosecutors and defendants of the results.[176] The FBI analysts testified falsely in cases in forty-one states.[177] In response to the audit, the American Society of Crime Lab Directors Laboratory Accreditation Board issued the following statement: "We have an ethical obligation to 'take appropriate action if there is potential for, or there has been, a miscarriage of justice due to circumstances that have come to light, incompetent practice or malpractice.'"[178]

Despite the FBI review of cases where federal agents testified beyond the scope of scientific evidence in cases involving microscopic hair analysis, few states pursued a similar review of state analysts. This lack of state review is particularly troubling given the training provided to state analysts by FBI agents—the same agents who consistently and throughout their careers testified beyond the scope of the evidence in their own cases.[179] These practices were passed on from FBI agents to state lab analysts, and potentially false testimony was provided in these state cases. And yet, most of these cases remain unexamined.[180]

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175. Smith, *supra* note 174.

176. Press Release, Fed. Bureau of Investigation, FBI Testimony on Microscopic Hair Analysis Contained Errors in at Least 90 Percent of Cases in Ongoing Review (Apr. 20, 2015), https://www.fbi.gov/news/pressrel/press-releases/fbi-testimony-on-microscopic-hair-analysis-contained-errors-in-at-least-90-percent-of-cases-in-ongoing-review [https://perma.cc/QVC9-6F9Z].

177. *Id.*

178. The statement continued: "It is not ASCLD/LAB's intent to direct that such reviews be conducted by any laboratory or judicial system but it is our recommendation that each laboratory, in consultation with the appropriate legal authorities, consider whether there may be past cases, specifically involving convictions, in which it would be appropriate to evaluate the potential impact of the reported conclusions and/or related testimony on the conviction." Press Release, Am. Soc'y of Crime Lab. Dirs. Lab. Accreditation Bd., Notification from the ASCLD/LAB Board of Directors to Interested Parties Concerning Potential Issues with Hair Comparison Testimony (Apr. 11, 2013) (quoting *ASCLD/Lab Guiding Principles of Professional Responsibility for Crime Laboratories and Forensic Scientists*, AM. SOC'Y CRIME LABORATORY DIRECTORS LABORATORY ACCREDITATION BOARD, http://www.ascld-lab.org/about_us/guidingprinciples.html [https://web.archive.org/web/20130515072158/http://www.ascld-lab.org/about_us/guidingprinciples.html] (last visited Feb. 2, 2020)), http://www.ascld-lab.org/annmts/hair_comparison.html [https://web.archive.org/web/20130515070941/http://www.ascld-lab.org/annmts/hair_comparison.html].

179. Press Release, Fed. Bureau of Investigation, *supra* note 176.

180. *See* Spencer S. Hsu, *Convicted Defendants Left Uninformed of Forensic Flaws Found by Justice Dept.*, WASH. POST (Apr. 16, 2012), https://www.washingtonpost.com/local/crime/convicted-defendants-left-uninformed-of-forensic-flaws-found-by-justice-dept/2012/04/16/gIQAWTcgMT_story.html [https://perma.cc/89WH-V3BB] (finding erroneous

Finally, the TFSC has explicitly advised against the use of bite mark evidence in Texas, recommending that bite mark evidence not be admitted in criminal cases in 2016 at its current stage of unreliability.[181] The TFSC conducted a systemic review of bite mark cases in Texas to determine if there were wrongful convictions and unreliable testimony.[182] The TFSC created a Bite Mark Investigation Panel that reviewed scientific literature and research studies evaluating the reliability of forensic odontology and held hearings where experts in the field of forensic odontology testified.[183] The Panel presented its results to the Commission, and on April 12, 2016, the Commission released a report finding:

> First, there is no scientific basis for stating that a particular patterned injury can be associated to an individual's dentition. Any testimony describing human dentition as "like a fingerprint" or incorporating similar analogies lacks scientific support. Second, there is no scientific basis for assigning probability or statistical weight to an association, regardless of whether such probability or weight is expressed numerically (e.g., 1 in a million) or using some form of verbal scale (e.g., highly likely/unlikely). Though these types of claims were once thought to be acceptable and have been admitted into evidence in criminal cases in and outside of Texas, it is now clear *they have no place in our criminal justice system* because they lack any credible supporting data.[184]

These three examples of deep scientific investigatory work by the TFSC, in fire science, hair microscopy analysis, and forensic odontology, have set a standard for national reform in forensic evidence. Even as national initiatives have made unsteady progress, and many state courts continue to admit faulty forensic

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testimony by FBI hair examiners was "widespread and could affect potentially thousands of cases in federal, state and local courts"); *see also* M. Chris Fabricant & Tucker Carrington, *The Shifted Paradigm: Forensic Science's Overdue Evolution from Magic to Law*, 4 VA. J. CRIM. L. 1, 107–08 (2016) ("[B]eginning in the late 1970's, the FBI lab implemented a two-week training program in hair and fiber analysis for state and local lab employees, and there is ample evidence state practitioners were taught to proffer misleading testimony to triers of fact. . . . [T]he Bureau's two-week program trained in excess of 500 examiners over a period of twenty-five years.").

181. Thompson & Cásarez, *supra* note 156, at 721.

182. *Id.*

183. TEX. FORENSIC SCI. COMM'N, FORENSIC BITEMARK COMPARISON COMPLAINT FILED BY NATIONAL INNOCENCE PROJECT ON BEHALF OF STEVEN MARK CHANEY – FINAL REPORT 8–9 (Apr. 12, 2016), https://txcourts.gov/media/1440871/finalbitemarkreport.pdf [https://perma.cc/A2E2-KNPR].

184. *Id.* at 11–12 (emphasis added).

evidence, the TFSC is leading the country with its example of demanding accuracy and reliability in forensic evidence.

2. Creating State Certification Requirements for Forensic Analysts. Presently, the TFSC is creating a licensing program to establish consistent and ongoing oversight of forensic analysts in Texas.[185] This Article is written in the midst of Texas' experiment with certification; the legislature mandated that all forensic analysts be licensed by the TFSC by January 1, 2019.[186] The TFSC qualifications for licensing include:

> (A) successful completion of education requirements; (B) specific coursework and experience, *including instruction in courtroom testimony and ethics in a crime laboratory*; (C) successful completion of an examination required or recognized by the commission; and (D) successful completion of proficiency testing to the extent required for crime laboratory accreditation.[187]

In line with requiring these qualifications, the TFSC holds conferences and training programs, and participates nationally in forensic science reform as well.[188]

Although the Texas legislature created the State's Forensic Science Commission in 2005, in 2013 the legislature expanded TFSC's investigative and reporting responsibilities by amending the statute.[189] Two years later, the legislature amended the 2005 statute again when it removed the Director of the Department of Public Safety from the accreditation process for forensic laboratories.[190] In other words, the legislature removed the crime labs from under police authority and control, just as the NAS Report had recommended.[191] Up until that point, the Director of the Department of Public Safety had accredited—and exempted—

185. *See* TEX. CODE CRIM. PROC. ANN. art. 38.01, § 4-a(b).

186. *Texas Forensic Science Commission Forensic Analyst Licensing Program: Overview*, TEX. FORENSIC SCI. COMMISSION, https://www.txcourts.gov/fsc/licensing/ [https://perma.cc/D84Q-7RNV] (last visited Feb. 12, 2020).

187. CRIM. PROC. art. 38.01, § 4-a(d) (emphasis added).

188. Thompson & Cásarez, *supra* note 156, at 720–21.

189. Patrick S. Metze, *Dissecting the ABA Texas Capital Punishment Assessment Report of 2013: Death and Texas, A Surprising Improvement*, 51 AKRON L. REV. 219, 231 (2017).

190. *Id.* at 232.

191. CRIM. PROC. art. 38.01, § 5, *amended by* Act effective Sept. 1, 2015, 84th Leg., R.S., ch. 1276, § 1, 2015 Tex. Gen. Laws 4315, 4316.

Texas crime labs.[192] Now, the TFSC accredits all the state laboratories.[193]

The legislature charged the TFSC with "establish[ing] procedures, policies, and practices to improve the quality of forensic analyses."[194] In response, the TFSC established a licensing program for forensic analysts, and has the authority to establish licensing programs for other forensic disciplines.[195] The TFSC also accredits and licenses medical examiners and forensic pathologists in Texas, for forensic pathology in criminal cases.[196]

Finally, the TFSC, also in response to their increased statutory duties, requires state crime laboratories to "report professional negligence or professional misconduct."[197] The TFSC is still limited from making a finding of negligence or misconduct, leaving the issue of deterrence and reprimand undetermined.[198] However, the legislature now requires the TFSC to issue reports that include observations of the reliability and integrity of lab analysts, as well as recommendations for resolutions.[199]

Texas now leads the country by having a state-level forensics oversight agency, the TFSC, and statewide accreditation through that agency. Houston, after the Houston Police Department Crime Laboratory scandals in the early 2000s, is likewise leading the country in forensic reform. Houston established an independent forensics laboratory, the Houston Forensic Science Center, which is a nationally respected and independent center.[200] The Center named a death row exoneree, Anthony Graves, to its board.[201]

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192. *See* Metze, *supra* note 189, at 255.

193. Thompson & Cásarez, *supra* note 156, at 720 ("The TFSC's most important role is to regulate forensic laboratories by overseeing the state requirement that all forensic laboratories be accredited.").

194. CRIM. PROC. art. 38.01, § 4-d(b-1).

195. Metze, *supra* note 189, at 232.

196. Tex. Att'y Gen., Op. No. KP-0188 (2018) (Re: Whether Postmortem Toxicological Analysis Conducted Pursuant to the Request of a Medical Examiner or Forensic Pathologist is Subject to Accreditation Requirements of the Forensic Science Commission).

197. Metze, *supra* note 189, at 231. This includes reporting on issues of professional negligence or misconduct in both accredited forensic fields and unaccredited fields. Tex. Att'y Gen., Op. No. KP-0127 (2017) (Re: The Admissibility of Certain Forensic Analysis in Texas Courts, Statutory Authority of the Texas Forensic Science Commission, and Reporting Requirements for Certain Crime Laboratories).

198. CRIM. PROC. art. 38.01, § 4(f).

199. Metze, *supra* note 189, at 231–32.

200. Jon Schuppe, *How Anthony Graves Went from Death Row to Overseeing the Houston Crime Lab*, NBC NEWS (June 27, 2015, 2:02 PM), http://www.nbcnews.com/news/us-news/how-anthony-graves-went-death-row-overseeing-his-local-crime-n381891 [https://perma.cc/CQ4R-36V9].

201. *Id.*

B. Massachusetts Follows: The Creation of the Massachusetts Forensic Science Oversight Board

1. Massachusetts Department of Public Health Lab Scandals. Another state legislature similarly established a forensic science oversight board in response to forensic evidence scandals: Massachusetts. Massachusetts dismissed 47,000 convictions because of fraudulent forensic evidence from two lab technicians, Annie Dookhan and Sonja Farak.[202] The same prosecutor's office that encouraged Annie Dookhan's behavior through rewarding quick turnaround and "good" results then criminally prosecuted her.[203] Dookhan explicitly stated in work e-mails her desire to please prosecutors, and their responses indicated how helpful she had been in their cases.[204] During Dookhan's career at the Hinton Drug Lab outside of Boston, she converted negative drug findings to positive, forged evidence logbooks and machine use documents, fabricated reports, and testified falsely.[205] Dookhan "dry-labbed," claiming to have tested substances when she hadn't; if she did test a substance and it returned negative, she changed the results on her report.[206] Dookhan turned around quick results at double the rate of an average lab technician, and her lab and the prosecutor's office praised her for her productivity.[207]

Either the prosecution or the defense could have realized Dookhan's false testimony. Perhaps most glaring and ostensibly discoverable was her false testimony that she had a Master of

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202. Shawn Musgrave, *The Chemists and the Cover-Up*, REASON, Mar. 2019, at 18, 19, 21–22.

203. *Id.*; *see also* MASS. OFFICE INSPECTOR GEN., INVESTIGATION OF THE DRUG LABORATORY AT THE WILLIAM A. HINTON STATE LABORARTORY INSTITUTE 2002–2012, at 113–14 (2014) [hereinafter OIG REPORT] ("[T]he OIG finds that Dookhan's motive was not based on a zealous desire to convict criminal defendants given that her percentage of negative findings was consistent with the percentage of negative findings of all other chemists."). Dookhan pled guilty to "conduct including tampering with Drug Lab documents, tampering with aliquots (by making negative findings into positives), and falsely testifying to having a Master of Science degree." *Id.* at 113.

204. OIG REPORT, *supra* note 203, at 114 n.215. One of the recommendations by the OIG was that "managers of forensic labs should be experts in their respective fields; they should have both subject-matter expertise and an understanding of how to address changes in the law." *Id.* at 117.

205. *Id.* at 113; Tom Jackman, *Mass. Supreme Court Ordered Prosecutors to Review 24,000 Cases Tainted by 'Rogue' Chemist*, WASH. POST (Jan. 20, 2017, 5:10 AM), https://www.washingtonpost.com/news/true-crime/wp/2017/01/20/mass-supreme-court-orders-prosecutors-to-review-24000-cases-tainted-by-rogue-chemist/ [https://perma.cc/RR28-9ZGV].

206. OIG REPORT, *supra* note 203, at 113.

207. *See* Musgrave, *supra* note 202, at 20.

Science degree.[208] In one of her most notorious cases, Dookhan testified under oath that a cashew piece was actually crack cocaine.[209] Her false testimony in that case led a jury to convict Leonardo Johnson of selling a controlled substance; he was sentenced and served two years in prison.[210]

The Massachusetts Office of the Inspector General found that Annie Dookhan's ongoing behavior for eight years at the Hinton Drug Lab was due to a "failure of management."[211] The Hinton Drug Lab was run by the Massachusetts Department of Public Health.[212] Yet both the Director of the Bureau of Laboratory Sciences *and* the Director of Analytical Chemistry "had no forensic experience or training," and "[n]either ensured that background checks (including confirmation of academic credentials) were performed for new Drug Lab employees or that annual employee performance evaluations were conducted."[213] The Directors failed to investigate the allegations and ultimately buried them. The Directors promoted Dookhan to another position that did not include drug testing duties and never reported any of Dookhan's failures to any outside agency.[214]

The Hinton Drug Lab is an example of the concerns voiced in the NAS Report.[215] The lab did not have "uniform written protocols for many aspects of its operations, including training, chain of custody [or] testing methods," and the lab was not accredited.[216] The lab did not provide training for analysts, did not require continuing education inside or outside of the lab, and did not provide any funding for continuing education for lab analysts. Most chemists in the lab did not belong to any professional organizations.[217] Thus, the lab provided minimal oversight and accountability for its analysts, who were likewise not accountable to any external organizations, nor to greater accountability within the Department of Public Health. The OIG Report found that the

208. OIG REPORT, *supra* note 203, at 113.

209. Musgrave, *supra* note 202, at 20.

210. Dookhan has been ordered by a federal court to compensate Mr. Johnson for his time wrongfully spent incarcerated. Scott J. Croteau, *Federal Judge Orders Former State Chemist Annie Dookhan to Pay $2 Million to Wrongfully Convicted Man*, MASS LIVE (June 22, 2017), https://www.masslive.com/news/index.ssf/2017/06/federal_judge_orders_former_st.html [https://perma.cc/SAB6-WAMD].

211. OIG REPORT, *supra* note 203, at 114.

212. *See id.*

213. *Id.* (footnotes omitted).

214. *Id.*

215. *See* NAS REPORT, *supra* note 2, at 4.

216. OIG REPORT, *supra* note 203, at 115.

217. *Id.* at 115–16.

lab was "isolated from the rest of the forensic community and behind the times in terms of trends in forensic drug chemistry and practices."[218]

Not surprisingly, the Hinton Drug Lab did not train lab analysts to testify in criminal court proceedings and did not review expert testimony, even though chemists were regularly testifying in court.[219] "As a result, chemists testified in such a way that they misrepresented the two-chemist system and testified inaccurately about the statistical basis for weight extrapolations in trafficking cases."[220]

While the lab covered up Dookhan's behavior, the Department of Public Health failed to thoroughly investigate the allegations when it was notified, and refused to disclose the breach to prosecutor's offices.[221] On its own, the Hinton Drug Lab decided to provide prosecutors with only the final results when they received discovery requests, not the previous runs or the control sheets, which could have been exculpatory.[222]

For the forensics world, Annie Dookhan's behavior was nothing new. Twenty years prior, lab analyst (or, as he preferred, Trooper) Fred Zain dry-labbed results in the West Virginia State Police Forensic Laboratory. His intentional and expedient dishonesty only led to promotions in the lab, until there was no one left above Zain to reprimand him or review his actions.[223] Zain's false testimony and findings led to multiple wrongful convictions in West Virginia and a nearly complete overhaul of the crime lab.[224] One aspect did not change: the lab remains under the agency and authority of the state police.[225] As the West Virginia Supreme Court of Appeals opined, Zain overstated the strength of his results, overstated the frequency of matches on individual pieces of evidence, misreported genetic matches, said he tested

218. *Id.* at 116.

219. *Id.*

220. *Id.*

221. *Id.* at 80, 115.

222. *Id.* at 116.

223. *See* Kathleen Keough Griebel, *Fred Zain, the CSI Effect, and a Philosophical Idea of Justice: Using West Virginia as a Model for Change*, 114 W. VA. L. REV. 1155, 1182, 1188 (2012); Francis X. Clines, *Work by Expert Witness is Now on Trial*, N.Y. TIMES (Sept. 5, 2001), https://nytimes.com/2001/09/05/us/work-by-expert-witness-is-now-on-trial.html [https://perma.cc/W9SD-NYRU].

224. Paul C. Gianelli, *Wrongful Convictions and Forensic Science: The Need to Regulate Crime Labs*, 86 N.C. L. REV. 163, 172–73 (2007).

225. *Cf. West Virginia State Police Forensic Laboratory*, W. VA. ST. POLICE, https://www.wvsp.gov/about/Pages/CrimeLab.aspx [https://perma.cc/N8GU-YHUX] (last visited Feb. 12, 2020).

many items instead of only one, reported inconclusive results as conclusive, altered lab reports, implied a match with a suspect with no evidence, and reported "scientifically impossible or improbable results."[226] Zain reported findings that literally other analysts could not, and prosecutors readily accepted his pseudo-science.[227]

2. Creation of Massachusetts Forensic Science Oversight Board. In response to the Annie Dookhan scandal, the Massachusetts state legislature created a statewide Forensic Science Oversight Board in 2018 modeled after the TFSC.[228] As a compromise, the Massachusetts Forensic Science Oversight Board (MFSOB) is housed in the Executive Office of Public Safety and Security, however, the MFSOB is tasked with "provid[ing] enhanced, objective and independent auditing and oversight of forensic evidence used in criminal matters, and of the analysis, including the integrity of such forensic analysis performed in state and municipal laboratories."[229] The extensive Board has thirteen members to be appointed by the governor, including scientists with varying expertise (including an expert in cognitive bias), two prosecutors, two criminal defense attorneys, and one person nominated by the New England Innocence Project.[230] Members serving on the board may not be employed by or affiliated with any state or municipal forensic laboratory, with the exception of the undersecretary for forensic sciences and those employed by or

226. *In re* Investigation of the W. Va. State Police Crime Lab., Serology Div., 438 S.E.2d 501, 516 (1993).

227. Ira P. Robbins, *A Deadly Pair: Conflicts of Interest Between Death Investigators and Prosecutors*, 79 OHIO ST. L.J. 901, 927 (2018).

228. MASS. GEN. LAWS ch. 6, § 184A(a) (2018); *see also* Radha Natarajan, *Forensic Science Commission Is Needed*, COMMONWEALTH (Sept. 28, 2017), https://commonwealthmagazine.org/criminal-justice/forensic-science-commission-needed/ [https://perma.cc/L4LA-3Y7Z].

229. MASS. GEN. LAWS ch. 6, § 184A(a).

230. *Id.* ("The board shall consist of: the undersecretary for forensic sciences or a designee, who shall serve as chair but shall not be a voting member; and 13 members who shall be appointed by the governor, 1 of whom shall have expertise in forensic science, 1 of whom shall have expertise in forensic laboratory management, 1 of whom shall have expertise in cognitive bias, 1 of whom shall have expertise in statistics, 1 of whom shall be in academia in a research field involving forensic science, 1 of whom shall have expertise in statistics, 1 of whom shall have expertise in forensic laboratory management, 1 of whom shall have expertise in clinical quality management, 1 of whom shall be nominated by the Massachusetts District Attorneys Association, 1 of whom shall be nominated by the attorney general, 1 of whom shall be nominated by the committee for public counsel services, 1 of whom shall be nominated by the Massachusetts Association of Criminal Defense Lawyers, Inc. and 1 of whom shall be nominated by the New England Innocence Project, Inc.").

affiliated with "the Massachusetts District Attorneys Association, the attorney general, the committee for public counsel services or the New England Innocence Project Inc."[231] One of the Board's first tasks, within six months of completing appointments, is "a comprehensive audit of the facilities and practices being utilized for criminal forensic analysis in the Commonwealth and the operation and management of the Massachusetts state police crime laboratories" including "establishing professional qualifications necessary to serve as the head of the state police crime laboratory; . . . the licensure and oversight of laboratory personnel;" and reexamining whether the director of the state police crime lab should be an "independent executive director."[232]

The MFSOB is further tasked by the Massachusetts legislature with initiating "an investigation into any forensic science, technique or analysis used in criminal matter" when alleged to be commonly used but not scientifically valid by at least five members of the MFSOB, or when five members agree that "a forensic analysis would advance the integrity and reliability of forensic science in the [C]ommonwealth."[233] The board shall report its findings and recommendations to a number of stakeholders.[234] In line with the example of the TFSC, one of MFSOB's recommendations may be statewide uniform licensing and accreditation by the MFSOB. Indeed, the board is tasked to "develop, implement and periodically review a system to evaluate laboratory accreditation *and professional licensing processes*," although that task is currently limited to ensuring facilities are accredited and in compliance with the International Organization of Standardization standards (ISO).[235] Finally, the board is expected to "recommend ways to improve education and training in forensic science and the law, and identify measures to improve the quality of forensic analysis performed in laboratories."[236]

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231. *Id.*

232. *Id.* § 184A(c).

233. *Id.* § 184A(d).

234. *Id.* ("The board shall report the results of an investigation by the board, with any resulting recommendations, to the executive office of public safety and security, the joint committee on public safety and homeland security, the supreme judicial court, the Massachusetts District Attorneys Association, the attorney general, the committee for public counsel services, the Massachusetts Association of Criminal Defense Lawyers, Inc. and the New England Innocence Project, Inc.").

235. *Id.* § 184A(g) (emphasis added) (noting that the board shall also evaluate laboratory accreditation and professional licensing processes, "including securing and maintaining such accreditation, and shall ensure that every facility is actively accredited and in compliance with standards promulgated by the International Organization of Standardization").

236. *Id.* § 184A(f).

VI. NEXT STEPS OF REFORM: CHANGED SCIENCE WRITS

Having examined the contributory role of flawed forensic evidence to wrongful convictions, this Part examines a post-conviction solution: changed science writs. The Texas legislature created the first changed science writ, recognizing the vital importance of this safety valve for convictions based on faulty evidence. This Part discusses the Texas writ, the California changed science writ that followed soon after, and the additional state legislatures that have created changed science writs. It concludes with the hypothetical role a changed science writ could play in states that have yet to adopt them, notably West Virginia and Mississippi.

A. The First "Junk Science Writ": Texas

Texas has already taken the next step in forensics reform: the creation of a changed science writ. In 2013, the Texas legislature became the first in the country to enact a "junk science writ,"[237] providing an avenue for individuals to challenge their convictions that were based on now-discredited scientific evidence.[238] In 2015, the legislature expanded the grounds for relief under the writ from "new scientific evidence" to include changes in scientific conclusions by a testifying expert, to address cases where state experts had changed their expert opinions.[239] Under the Texas statute, a habeas corpus petition may be considered if "relevant [and admissible] scientific evidence is currently available and was not available at the time of the convicted person's trial because [it] was not ascertainable through the exercise of reasonable diligence . . . before the date of or during the convicted person's trial."[240]

To support the enactment of this new writ, the Texas legislature likewise expanded the mission of the Office of Capital

237. Thompson & Cásarez, *supra* note 156, at 727; *see also* Laurin, *supra* note 78, at 1776 (positing that "changed-science writs like Texas's present an opportunity to override aspects of generally applicable postconviction doctrines that uniquely impinge on new science claims").

238. TEX. CODE CRIM. PROC. ANN. art. 11.073.

239. Thompson & Cásarez, *supra* note 156, at 727 (citing Tex. S.B. 344, 83rd Leg., R.S. (2013)). Senate Bill 344 amended Texas Code of Criminal Procedure Article 11.073(d). CRIM. PROC. art. 11.073(d).

240. CRIM. PROC. art. 11.073(b)(1)(A); *see also* Laurin, *supra* note 78, at 1775 (noting that the Texas statute's "critical significance was to remove the requirement in Texas that constitutional violations or actual innocence be proved to obtain postconviction relief; it thus created a science-specific claim").

Writs, renaming it the Office of Capital and Forensic Writs.[241] The Office of Capital and Forensic Writs may now provide counsel for criminal defendants who have changed science claims and are referred by the TFSC.[242] Currently, the Office of Capital and Forensic Writs does not receive additional funding to cover the representation of defendants on changed science writs of habeas corpus.[243]

B. California's Junk Science Writ

California became the second state to enact a changed science writ, allowing individuals to challenge their convictions in state habeas beginning in 2014.[244] The California statute allows for consideration of a petition that challenges material and probative false evidence that was introduced at trial. [245] False evidence is defined as including "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."[246]

241. *See* Thompson & Cásarez, *supra* note 156, at 728 n.127 (citing Tex. S.B. 1743, 84th Leg., R.S. (2015)) ("The idea was the brain child of Governor Perry's criminal justice policy director who suggested that the legislature expand the OCW to include attorneys who specialized in both forensic science and habeas proceedings.").

242. CRIM. PROC. art. 38.01, § 4(h) ("The commission may review and refer cases that are the subject of an investigation . . . to the office of capital and forensic writs . . . .").

243. *See* NAT'L ASS'N FOR PUB. DEFS., ASSESSMENT OF THE TEXAS OFFICE OF CAPITAL AND FORENSIC WRITS 38–39 (2018), https://www.publicdefenders.us/files/2018%20Assessment%20of%20the%20Texas%20Office%20of%20Capital%20and%20Forensic%20Writs%20Final.pdf [https://perma.cc/5UZB-BARJ] (finding "[f]inancial resources are necessary for the Texas Office of Capital and Forensic Writs to competently and timely meet its statutory and constitutional forensic writ representation responsibilities").

244. CAL. PENAL CODE § 1473 (West 2017); *see also* Simon A. Cole, *Changed Science Statutes: Can Courts Accommodate Accelerating Forensic Scientific and Technological Change?*, 57 JURIMETRICS J. 443, 443, 446 (2017) (explaining that "[i]n the past several years, the nation's two most populous states have passed new statutes specifically intended to address the issue of rapidly changing scientific and technological knowledge, perhaps signaling a national trend" and adopting Professor Laurin's "changed science" terminology to refer to these legal and judicial developments).

245. PENAL § 1473(b)(1) (permitting a convicted individual to petition for a writ of habeas corpus if, among other things, "[f]alse evidence that is substantially material or probative on the issue of guilt or punishment was introduced against a person at a hearing or trial relating to his or her incarceration").

246. *Id*. § 1473(e)(1). For more information on this statute, see Oliva & Beety, *supra* note 101, at 27–33.

C. Connecticut, Wyoming, Michigan, and Nevada Reforms

Four other states have now adopted changed science as an avenue for challenging a conviction, including two states—Michigan and Nevada—in 2019.

In Connecticut, the state legislature passed a law in 2018 that removed the three-year time limit for a defendant to file a habeas petition based on new non-DNA evidence;[247] this evidence can include scientific advancements, new guidelines, and expert recantations on forensic evidence.[248] The statute went into effect in October 2018.[249]

In Wyoming, the legislature passed the Post-Conviction Determination of Factual Innocence Act in 2018 to allow a person convicted of a felony offense to petition the court for exoneration if the person can establish that he is factually innocent of the convicted crime(s).[250] Under the Act, the district court must review the petition and find whether it has satisfied all of the requirements of § 7-12-403(b) of the Wyoming Annotated Statutes.[251] "The scope of the Factual Innocence Act is plainly limited to claims of factual innocence based on newly discovered evidence."[252] The statute went into effect in 2018.[253] The statute also requires the government to preserve the evidence once a petition for post-conviction relief based on the evidence is filed.[254]

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247. CONN. GEN. STAT. § 52-582(a) (2019).

248. *Id.* § 52-582(d).

249. *See id.*

250. *See generally* WYO. STAT. ANN. §§ 7-12-401 to -407 (2019).

251. *Id.* § 7-12-403(c).

252. Parkhurst v. State, 443 P.3d 834, 837 (Wyo. 2019) (citing § 7-12-403(b)) (stating that the law "requir[es] every petition filed pursuant to the Factual Innocence Act to 'contain an assertion of factual innocence' supported by 'newly discovered evidence'"). Specifically, the definition of "newly discovered evidence" includes "[r]elevant forensic evidence that was not available at the time of trial . . . or that undermines forensic evidence at trial." § 7-12-402(a)(iv). The petition also must contain a statement that "[n]either the petitioner nor the petitioner's counsel knew of the evidence at the time" of trial, sentencing, or timely post-conviction action, and that the evidence was not discoverable; otherwise, the petitioner may proceed under the Act only if "[a] court has found ineffective assistance of counsel for failing to exercise reasonable diligence in uncovering the evidence" and the evidence "[w]as not discovered by the petitioner or the petitioner's counsel; [i]s material upon the issue of factual innocence, and [h]as never been presented to a court." *Id.* § 7-12-403(d)–(e).

253. *Id.* § 7-12-401.

254. *Id.* § 7-12-403(j) ("Once a petition is filed under this section, attorneys for the state, law enforcement officers and crime laboratory personnel shall preserve the evidence that is the subject of the petition and shall preserve information to determine the sufficiency of the chain of custody of the evidence.").

In Michigan, petitioners may file a successive petition for relief based on scientific evidence and changed science.[255] Otherwise, successive petitions are barred.[256]

In 2019, Nevada passed a law creating an avenue for people to present new, non-DNA evidence of factual innocence beyond two years after a conviction.[257] The law clarifies that new evidence may include relevant forensic evidence that was not available at trial or that materially undermines forensic evidence presented at trial.

D. Hypothetical Applications of the Changed Science Writs

If there is an individual who would have benefited from a changed science writ, it is Cameron Todd Willingham. Willingham hired a world-renowned fire expert, Dr. Gerald Hurst, to reexamine his case a decade after Willingham was convicted. Dr. Hurst's scathing report was the first domino exposing the false evidence used against Willingham. Dr. Hurst concluded, "[T]here was no evidence of arson, and that a man had already lost his three children and spent twelve years in jail was about to be executed based on 'junk science.'"[258] Counsel sent Hurst's report to the Texas Board of Paroles, seeking clemency.[259] The board denied the application for clemency, and Governor Rick Perry denied any stay of execution.[260] A changed science writ could have spared Willingham's life.

I have had the honor of representing two individuals on post-conviction habeas claims, who have failed to meet the courts' standards for newly discovered evidence. One client was convicted based on faulty shaken baby syndrome testimony, the other was convicted based on faulty arson testimony. In two separate states, courts have refused post-conviction relief to both of these clients, finding that their evidence of innocence is not "newly discovered."

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255. MICH. CT. R. 6.502(G)(2)–(3). "[N]ew evidence" that may form the basis for a subsequent motion includes changes in science, such as shifts "in a field of scientific knowledge, including shifts in scientific consensus; in a testifying expert's own scientific knowledge and opinions; or in a scientific method on which the relevant scientific evidence at trial was based." *Id.* at 6.502(G)(3)(a)–(c).

256. *Id.* at 6.502(G)(1) (stating that except for new evidence motions, "one and only one motion for relief from judgment may be filed with regard to a conviction").

257. Assemb. B. 356, 2019 Assemb., 80th Sess. § 6(1) (Nev. 2019), https://www.innocenceproject.org/wp-content/uploads/2019/06/AB356-NV-Change-in-Science-eff.-2019.pdf [https://perma.cc/5BBE-GFRM].

258. Grann, *supra* note 159.

259. *Id.*

260. *Id.*

Tasha Mercedez Shelby was convicted in 2000 in Biloxi, Mississippi for the 1997 death of her stepson, Bryan.[261] At Shelby's trial in June 2000, the prosecutor told the jury it was "undisputed" that Bryan died from violent shaking.[262] Indeed, both the State's primary expert at trial, forensic pathologist Dr. LeRoy Riddick, and the defense expert agreed that the child died from shaking and impact.[263]

In 2018, the testimony and evidence presented by the State at trial were heavily disputed in a post-conviction hearing, most notably by the State's expert witness Dr. Riddick.[264] Dr. Riddick now disputes his trial testimony that the cause of death was shaken baby syndrome.[265] Since the time of trial, advancements in pediatric medicine, traumatic medicine, and biomechanical engineering have undermined the State's evidence at trial. These advancements in science likewise led Dr. Riddick to change his opinion on the cause and manner of death and testify on behalf of Ms. Shelby at the post-conviction hearing. On December 7, 2018, the Circuit Court Judge for Harrison County found Dr. Riddick's testimony at the hearing was not newly discovered evidence, nor was the advancement in science.[266] Ms. Shelby remains incarcerated with a life sentence for a death she did not cause.

Samuel Anstey was convicted in 1994 in Fayette County, West Virginia, of arson resulting in the death of his grandmother.[267] The State's expert in electrical and forensic engineering determined that Sam had maliciously rigged a toaster to start the fire; no photos were taken of the original location of the toaster, and the head of the volunteer fire department manipulated electrical breakers and the toaster before photographing them.[268] Fire science has changed dramatically

261. Shelby v. State, No. 24C12:16-cv-0114, at 1, 3 (Cir. Ct. of Harrison Cty., Miss. 2d Jud. Dist. Dec. 7, 2018), https://courts.ms.gov/appellatecourts/docket/sendPDF.php?f=1416575-0-24CI2.pdf&c=89528&a=N&s=2 [https://perma.cc/PZ6H-KXX5].

262. Opening Brief for Petitioner-Appellant at 12, Shelby v. State, No. 2019-CA-00034-COA (Cir. Ct. of Harrison Cty., Miss. 2d Jud. Dist. June 21, 2019).

263. *Shelby*, No. 24C12:16-cv-0114 at 4–5.

264. *Id.* at 10–12.

265. *Id.* at 10–11.

266. *Id.* at 27.

267. *See* Anstey v. Ballard, 787 S.E.2d 864, 866 (W. Va. 2016).

268. *See id.* at 869–71; *see also id.* at 884–85 (Ketchum, J., dissenting) ("Without doubt, the fire investigation conducted by the volunteer firefighters at the trailer is questionable. . . . [I]t is undisputed that the toaster and the trailer's breaker switches were manipulated during the first stages of the investigation. One of the State's witnesses in charge of the Oak Hill Volunteer Fire Department's investigation unit moved the toaster's plunger up and down before photographing the toaster. Moreover, although volunteer firefighters had flipped the trailer's main electrical breaker to the off position, that same witness flipped

since 1994, most notably with the creation of NFPA 921 as an internal standard—a standard not met by any of the investigators in Sam Anstey's case. Along with NFPA 921, Sam submitted a post-conviction relief petition with affidavits from fire experts, including one from Dr. Gerald Hurst, the same expert who first identified the false fire testimony in Cameron Todd Willingham's case.[269] In 2014 the state trial court found no newly discovered evidence;[270] in 2019, the federal district court for the Southern District of West Virginia likewise found that NFPA Guide 921 was available at the time of trial, even if not widely used, and the new affidavits did not suffice as newly discovered evidence.[271] Mr. Anstey remains in prison serving a life sentence.

Neither Tasha Shelby nor Sam Anstey had the opportunity to apply for relief with a changed science writ. Their scientific evidence fell outside the narrow confines of "newly discovered," leaving them with no remedy for their wrongful convictions.

And yet, it was cases just like theirs that prompted the state legislatures in California and Texas to establish changed science writs.[272] In both of those states, legislators were infuriated when an expert's changed opinion was rejected by the court as not newly discovered evidence.[273] In California, William Richards was convicted based on faulty bite mark evidence, and even when the State's expert changed his opinion, the California Supreme Court determined that this did not prove the expert's own trial opinion was "false evidence."[274] In Texas, Neal Robbins was convicted in a child death case and ten years later, the same medical examiner's office reviewed the case and two medical examiners found the autopsy did not support the conclusions, amending the manner of death from homicide to undetermined.[275] Similar to California, the Texas Court of Criminal Appeals denied Robbins relief, finding that he had not established "false evidence" to reverse his

three other breaker switches back and forth to the off and on positions to determine whether those switches had tripped during the course of the fire.").

269. *See id.* at 873–74, 877.

270. *Id.* at 874.

271. Anstey v. Terry, No. 2:17-cv-03462, 2019 WL 3713715, at *1–2 (S.D. W. Va. Aug. 6, 2019).

272. Cole, *supra* note 244, at 446–47 (citing *Ex parte* Robbins, 360 S.W.3d 446 (Tex. Crim. App. 2011), and *In re* Richards, 289 P.3d 860 (Cal. 2012)).

273. *See generally* Naina Soni, *New Science, Old Convictions—Texas Senate Bill 344: Identifying Further Necessary Reform in Forensic Science*, 2 J.L. & BIOSCIENCES 149 (2015) (discussing the legislative history of Senate Bill 344).

274. *Richards*, 289 P.3d at 871–72.

275. *Robbins*, 360 S.W.3d at 448, 453–54.

conviction.[276] The dissent in *Robbins* criticized the majority for clinging to verdicts that "look inaccurate, if not downright ludicrous."[277] The backdrop to *Robbins* was Cameron Todd Willingham's execution based on arson myths. In both California and Texas, patently false forensic evidence—bite marks and arson myths—led to wrongful convictions that outraged legislators.[278] To the extent that change may be prompted by scandal,[279] these scandals continue to occur, and remedying them must become a priority.

E. Will Junk Science Writs Prevent Faulty Evidence from Being Admitted at Trial?

Ideally, junk science writs will prevent faulty forensic evidence from being admitted at trial. Some courts now place higher requirements on eyewitness identifications because of wrongful convictions based on mistaken identifications.[280] Similarly, perhaps as courts grant post-conviction relief and acknowledge faulty forensic evidence from the past, they will bring a more critical eye to present admissibility of forensic evidence.

This is one of the strengths of state habeas: the same court reviewing habeas petitions is a current state trial court presiding over current cases. While this can be problematic when the same judge who presided over the trial is now reviewing whether to reverse the conviction in habeas, more generally there may be a greater awareness of faulty forensics through these well-litigated, lengthy, and expert-supported state habeas petitions. In one notable pretrial bite mark evidence case in Pennsylvania, the Pennsylvania Supreme Court has directed the intermediate appellate court to review the validity of bite mark evidence in a pending murder re-trial of Paul Ross.[281] Defense counsel for Mr. Ross challenged the admissibility of bite mark evidence, while the prosecution argued for admission; the Blair County judge ruled that prosecutors be allowed to present the bite mark evidence

276. *Id.* at 463.

277. *Id.* at 470 (Cochran, J., dissenting).

278. Cole, *supra* note 244, at 453–54; Natasha Machado, *Chapter 623: Giving the Wrongfully Convicted a Better Chance at Review*, 46 MCGEORGE L. REV. 387, 388–89, 392 (2014).

279. Simon Cole, *Scandal, Fraud, and the Reform of Forensic Science: The Case of Fingerprint Analysis*, 119 W. VA. L. REV. 523, 542 (2016).

280. Beety, *supra* note 7, at 996.

281. Kay Stephens, *Top Court Orders Bite Mark Review: Ross Homicide Retrial on Hold*, ALTOONA MIRROR (Nov. 21, 2018), http://www.altoonamirror.com/news/local-news/2018/11/top-court-orders-bite-mark-review/ [https://perma.cc/EE5L-3T9D].

during the retrial to the jury.[282] On interlocutory appeal, the Pennsylvania Supreme Court ordered the Superior Court to review the validity of bite mark evidence.[283]

Should the state trial court deny the habeas petition and not find fault with the scientific evidence, then high state court decisions reversing convictions based on faulty forensic evidence may also impact how lower courts evaluate and admit forensic evidence at trials. The Texas Court of Criminal Appeals recently reversed Steven Chaney's conviction on bite mark evidence using the state's junk science writ, similarly to the California Supreme Court reversing William Richards' conviction based on bite mark evidence using that state's junk science writ. Both decisions reversed the convictions using the state's changed science writs, and both decisions reversed the convictions based on faulty bite mark evidence.[284] Perhaps this will trickle down and trial courts may begin excluding bite mark evidence from trial. Indeed, at a minimum, the TFSC's robust review of all bite mark cases and issued recommendations are having a notable impact. In Harris County, due to these recommendations, counsel has been appointed to prisoners so changed science writs can be filed.[285]

VII. CONCLUSION

State legislatures have the examples of six other states for how to craft their own statutes for allowing habeas petitions based on changed science. The adoption of these changed science writs empowers courts in state habeas proceedings to reverse wrongful convictions, rather than be hindered by procedure. Texas has created the path for remedying wrongful convictions and establishing greater reliability, accuracy, and accountability for forensic evidence in the courtroom; its exemplary changed science writ is just one example, but one to be followed. In light of the changes in forensic evidence since the NAS Report, and the advancements still needed, these writs keep in step with identifying problems in forensic evidence and continuing to move forward.

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282. *Id.*

283. *Id.*

284. *Compare Ex parte* Chaney, 563 S.W.3d 239, 244, 255 (Tex. Crim. App. 2018), *with In re* Richards, 371 P.3d 195, 196 (Cal. 2016).

285. TEX. FORENSIC SCI. COMM'N, TEXAS DEPARTMENT OF PUBLIC SAFETY HOUSTON REGIONAL CRIME LABORATORY SELF-DISCLOSURE 7, 11–12 (Apr. 5, 2013).