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BAD SCIENCE BEGETS BAD CONVICTIONS: THE NEED FOR POSTCONVICTION RELIEF IN THE WAKE OF DISCREDITED FORENSICS

JESSICA GABEL CINO*

I. INTRODUCTION

The headlines trumpet delayed justice: “Innocent Man Freed after 35 Years has an Incredible Outlook on Life,”¹ “North Carolina Frees Innocent Man Who Spent Half His Life in Jail,”² and “DNA Helps Free Inmate after 27 Years.”³ In the limelight is modern science’s ability to rectify decades-old wrongs. There is no question that scientific developments, particularly in the area of DNA, have advanced how criminal cases are investigated, prosecuted, and presented in court. Overlooked in the wake of such acclaim, however, is the fact that forensic science is far from infallible.

While progress in DNA testing has provided a more exacting tool with which to explore guilt and innocence, scientific developments that call previously accepted forensic techniques into question often escape attention. Headlines such as “FBI Admits Flaws in Hair Analysis over Decades,”⁴ “How the Flawed ‘Science’ of Bite Mark Analysis has Sent Innocent People to Prison,”⁵ and “Fuzzy Math: Advances in DNA Mixture Interpretation Uncover Errors in Old Cases”⁶

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1. Christina Sterbenz, *Innocent Man Freed after 35 Years Has an Incredible Outlook on Life*, BUS. INSIDER (Oct. 18, 2013, 9:04 AM), <http://www.businessinsider.com/james-bain-exonerated-after-35-years-in-prison-2013-10>.

2. Ed Pilkington, *North Carolina Frees Innocent Man Who Spent Half His Life in Jail*, THE GUARDIAN (Jan. 23, 2015, 3:33 PM), <http://www.theguardian.com/us-news/2015/jan/23/north-carolina-frees-innocent-man-joseph-sledge-half-life-jail>.

3. *DNA Helps Free Inmate after 27 Years*, CBS NEWS 60 MINUTES (May 2, 2008), <http://www.cbsnews.com/news/dna-helps-free-inmate-after-27-years/>.

4. 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-b510-962fcfab310_story.html.

5. Radley Balko, *How the Flawed ‘Science’ of Bite Mark Analysis Has Sent Innocent People to Prison*, WASH. POST (Feb. 13, 2015), <https://www.washingtonpost.com/news/the-watch/wp/2015/02/13/how-the-flawed-science-of-bite-mark-analysis-has-sent-innocent-people-to-jail/>.

6. Jessica Gabel Cino, *Fuzzy Math: Advances in DNA Mixture Interpretation Uncover Errors in Old Cases*, MIMESIS LAW (Oct. 8, 2015), <http://mimesislaw.com/fault-lines/fuzzy-math-advances-in-dna-mixture-interpretation-uncover-errors-in-old-cases/3669>.

underscore problems with forensic science that have largely escaped accountability and remain unchecked.

Undoubtedly, forensic science is a vital component of the criminal justice system. Thousands of guilty defendants have been convicted with the help of forensic techniques. At the same time, the Innocence Project estimates that forensic evidence with little to no probative value caused or contributed to a wrongful conviction in nearly half of the DNA exoneration cases the Project has evaluated.⁷ Many forensic techniques, such as hair and fiber analysis, toolmark comparisons, and fingerprint analysis, rely upon little more than a matching of patterns where a forensic analyst compares a known sample to a questioned sample and makes the highly subjective determination that the two samples originated from the same source. Although lacking a true scientific foundation, what passes as “science” plays a prominent role in many cases because of the availability of trace evidence, which is easy to leave and easy to find at a crime scene. Other forensic fields, including forensic pathology, arson investigation, and firearms identifications, rely on assumptions that are “under-researched and oversold.”⁸

In theory, scientific expert testimony must meet certain standards of reliability before being admitted in court. In federal court and some state courts, the *Daubert* standard governs the admissibility of such testimony.⁹ Under *Daubert*, a judge acts as a “gatekeeper” and may admit scientific evidence as long as it is both “relevant” and “reliable.”¹⁰ Other state courts have continued to follow the earlier *Frye* standard, under which scientific evidence “must be sufficiently established to have gained general acceptance in the particular field in which it belongs” to be admissible.¹¹ Despite these roadblocks to admissibility, courts have routinely accepted much of the so-called science underlying forensic testing with little, if any, inquiry.¹²

Forensic science’s armor has some cracks in it, however. In 2005, the Federal Bureau of Investigation (“FBI”) discontinued its Comparative Bullet Lead Analysis (“CBLA”) program, finding that “neither scientists nor bullet manufacturers are able to definitively attest to the significance of an association made between bullets in the course of a bullet lead examination.”¹³ The FBI Laboratory performed CBLA examinations for decades, and the resulting evidence was used to

7. Innocence Project, *DNA Exonerations in the United States*, <http://www.innocenceproject.org/dna-exonerations-in-the-united-states/> (last visited Dec. 21, 2016) (stating that 46% of the 347 DNA exonerations “[i]nvolved misapplication of forensic science”).

8. Jessica D. Gabel & Margaret D. Wilkinson, *Good Science Gone Bad: How the Criminal Justice System Can Redress the Impact of Flawed Forensics*, 59 HASTINGS L.J. 1001, 1002 (2008).

9. See *Daubert v. Merrill Dow Pharms.*, 509 U.S. 579 (1993).

10. *Id.* at 597.

11. *Frye v. United States*, 293 F. 1013, 1014 (D.C. Cir. 1923); *People v. Geier*, 161 P.3d 104, 142 (Cal. 2007).

12. See, e.g., *Johnson v. Commonwealth*, 12 S.W.3d 258, 263-64 (Ky. 1999).

13. FEDERAL BUREAU OF INVESTIGATION, FBI LABORATORY ANNOUNCES DISCONTINUATION OF BULLET LEAD EXAMINATIONS (Sept. 1, 2005), http://www.fbi.gov/pressrel/pressrel05/bullet_lead_analysis.htm.

convict many defendants.¹⁴ In 2015, the U.S. Department of Justice (“DOJ”) and FBI formally admitted that almost every examiner in the FBI’s microscopic hair unit gave misleading, exaggerated, or otherwise flawed testimony in criminal cases between 1972 and 1999.¹⁵ A cloud of doubt now hangs over cases involving hair evidence, but they are not alone. A committee at the National Academy of Science (“NAS”) concluded in 2009 that “no forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source.”¹⁶ Simply put, the criminal justice system is “sending *people to jail based on bogus science*.”¹⁷

The President’s Council of Advisors on Science and Technology (“PCAST”), released a report on forensic science in September 2016.¹⁸ While the Council acknowledged the ongoing efforts to improve forensic sciences after the 2009 NAS Report, its report also emphasized the significant problems in multiple disciplines of forensic sciences.¹⁹ The PCAST Report focused on “pattern identification evidence” – the evidence that requires interpretation by an examiner.²⁰ The main question asked by PCAST is whether these types of evidence are supported by reproducible research.²¹

PCAST suggested that there are two types of validity a discipline of forensic science must pass.²² The first is foundational validity, which means that the discipline is based on research and studies that are accurate and reproducible.²³ The

14. *Id.*; see also John Solomon, *FBI’s Forensic Test Full of Holes*, WASH. POST (Nov. 18, 2007), <http://www.washingtonpost.com/wp-dyn/content/article/2007/11/17/AR2007111701681.html>.

15. Spencer S. Hsu, *supra* note 4.

16. COMM. ON IDENTIFYING THE NEEDS OF THE FORENSIC SCIENCE CMTY. ET AL., NAT’L RESEARCH COUNCIL OF THE NAT’L ACADS., STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD 7 (2009) [hereinafter NAS REPORT]. In recent years, studies of certain forensic fields have demonstrated a lack of scientific foundation in the testing methods, identified serious flaws, and questioned the continued use of such techniques. See INNOCENCE PROJECT ARSON REVIEW COMM., REPORT ON THE PEER REVIEW OF THE EXPERT TESTIMONY IN THE CASES OF STATE OF TEXAS V. CAMERON TODD WILLINGHAM AND STATE OF TEXAS V. EARNEST RAY WILLIS 40 (2006) (“The significant lack of understanding of the behavior of fire . . . can and does result in significant misinterpretations of fire evidence, unreliable determinations, and serious miscarriages of justice with respect to the crime of arson.”); NAT’L RESEARCH COUNCIL OF THE NAT’L ACADEMIES, BALLISTIC IMAGING 3 (2008) (“The validity of the fundamental assumptions of uniqueness and reproducibility of firearms-related toolmarks has not yet been fully demonstrated.”).

17. Kelly Servick, *Reversing the Legacy of Junk Science in the Courtroom*, SCI. MAG. (Mar. 7, 2016, 4:30 PM), <http://www.sciencemag.org/news/2016/03/reversing-legacy-junk-science-courtroom>.

18. EXECUTIVE OFFICE OF THE PRESIDENT, PRESIDENT’S COUNCIL OF ADVISORS ON SCIENCE AND TECHNOLOGY, FORENSIC SCIENCE IN CRIMINAL COURTS: ENSURING SCIENTIFIC VALIDITY OF FEATURE-COMPARISON METHODS, (Sept. 2016), https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensic_science_report_final.pdf [hereinafter PCAST REPORT].

19. *Id.* at 1-20.

20. *Id.*

21. See *id.*

22. *Id.* at 4-5.

23. *Id.*

second type of validity is applied validity, which means that the method is reliably applied in practice.²⁴ Among the disciplines of forensic science PCAST examined, including DNA analysis, bite marks, latent fingerprints, firearms identification, and footwear analysis, the only valid discipline (using both foundational and applied validity) was single-sourced DNA analysis.²⁵

What can the criminal justice system do about bad science? This article provides an answer to that question in three parts. First, this article looks at the inability of certain fields of forensic science to produce reliable results. Second, it discusses problems with the current methods of challenging convictions based on unreliable science. Finally, it proposes a new framework to better enable prisoners to seek review of such convictions. What this article does not do is propose ways to prevent wrongful convictions in the future. Many issues, including the need for more research, accurate testing, judicial acceptance, and shifts in forensic laboratory culture will need to be addressed in order to protect innocent individuals from being convicted in the first instance. This article proposes a way to confront faulty forensics retrospectively, by providing an avenue of relief for the numerous current prisoners who were convicted based on misleading scientific evidence.

II. FAULTY FORENSICS: SHROUDING GUESSWORK IN THE CLOAK OF SCIENCE

The cases are many, but the differences are few. Whether it was a bullet from a smoking gun or a fingerprint left on a glass, the evidence (and the alleged science behind it) produced wrongful convictions. Critics have attempted to shed light on the weaknesses in forensic science, but a policy of willful blindness prevails. The examples below are only a fraction of the larger problem, but should serve as a reminder that innocence cannot be ignored.

A. THE ERROR IN HAIR: MICROSCOPIC HAIR EXAMINATION

Hair analysis, also referred to as microscopic hair examination or hair microscopy, was used in criminal investigations from the 1970s through 2000, when DNA testing supplanted it. Even in 2000, the FBI stated that hair recovered from a crime scene was beneficial because it transferred during physical contact among and between the suspect, the victim, and the crime scene. The logic followed that

24. *Id.*

25. *Id.* at 7-14. The PCAST Report received criticism for its findings, most notably from those on the prosecutorial side of the aisle. *See, e.g.*, National District Attorneys Association, *National District Attorneys Association Slams President's Council of Advisors on Science and Technology Report* (Sept. 2, 2016), <http://www.ndaa.org/pdf/NDAA%20Press%20Release%20on%20PCAST%20Report.pdf>. PCAST responded in detail, noting: "Forensic science is at a crossroads. There is growing recognition that the law requires that a forensic feature-comparison method be established as scientifically valid and reliable before it may be used in court and that this requirement can only be satisfied by actual empirical testing." It also encouraged forensic science to be the author of its own destiny. EXECUTIVE OFFICE OF THE PRESIDENT, PRESIDENT'S COUNCIL OF ADVISORS ON SCIENCE AND TECHNOLOGY, AN ADDENDUM TO THE PCAST REPORT ON FORENSIC SCIENCE IN CRIMINAL COURTS 9 (2017), https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensics_addendum_finalv2.pdf.

hair evidence could be used to associate a suspect with a crime scene or a victim.²⁶ Hairs recovered from a scene and hairs from a sample were analyzed and compared against each other to determine whether a transfer occurred.²⁷ Generally, this evaluation was done by an examiner who placed both the sample and the evidence under a comparison microscope for simultaneous viewing.²⁸ That enabled the examiner to determine whether the hairs came from the same source.²⁹

Although hair microscopy evidence received some criticism, it remained relatively unscathed for decades.³⁰ It appears, however, that the past-tense is finally an appropriate fit for hair comparison. In April of 2015, the FBI admitted major flaws in the analysis procedure.³¹ The DOJ and FBI “formally acknowledged” that almost all examiners in a forensic unit gave flawed testimony in trials for over two decades.³² The unsound testimony favored prosecutors in more than 95 percent of the initial 268 trials that had been reviewed by April of 2015.³³ Most often, this flawed testimony was in relation to the level of certainty the experts claimed.³⁴ “The review confirmed that FBI experts systematically testified to the near-certainty of ‘matches’ of crime-scene hairs to defendants, backing their claims by citing incomplete or misleading statistics drawn from their case work.”³⁵

This review began in July 2012, when the DOJ and the FBI began an evaluation of more than 10,000 cases in which hair analysis was used at trial.³⁶ Before that, although hair analysis was considered to be “highly unreliable” by the 2009 NAS Report on Forensic Science,³⁷ it still remained a feature in some cases. Of the 268 trials reviewed by April 2015, at least thirty-five cases involved defendants who received death sentences.³⁸

26. Douglas W. Deedrick, *Hair Evidence*, 2 FORENSIC SCI. COMM. 3 (July 2000), <https://www.fbi.gov/about-us/lab/forensic-science-communications/fsc/july2000/deedric1.htm>.

27. *Id.*

28. *Id.*

29. *Id.*

30. See, e.g., Clive A. Stafford Smith & Patrick D. Goodman, *Forensic Hair Comparison Analysis: Nineteenth Century Science or Twentieth Century Snake Oil?*, 27 COLUM. HUM. RTS. L. REV. 227, 229-31 (1996) (“[F]orensic hair analysis has been generally accepted by our courts for many years, with little fuss or skepticism.”).

31. Hsu, *supra* note 4.

32. *Id.*

33. *Id.*

34. *Id.*

35. *Id.*

36. Spencer S. Hsu, *Justice Dept., FBI to Review Use of Forensic Evidence in Thousands of Cases*, WASH. POST (July 10, 2012), https://www.washingtonpost.com/local/crime/justice-dept-fbi-to-review-use-of-forensic-evidence-in-thousands-of-cases/2012/07/10/gJQAT6DlbW_story.html.

37. FEDERAL BUREAU OF INVESTIGATION, FBI TESTIMONY ON MICROSCOPIC HAIR ANALYSIS CONTAINED ERRORS IN AT LEAST 90 PERCENT OF CASES IN ONGOING REVIEW (April 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>.

38. *Id.*

Since these results became public, many other cases have come under review.³⁹ For example, in 1991 a man in Virginia was convicted of rape based on a single hair found on the victim.⁴⁰ After testing the hair, the Innocence Project concluded it could not belong to Darnell Phillips, who was sentenced to 100 years in prison.⁴¹ He has been granted the right to test the new evidence.⁴² Additionally, the DOJ proposed in March of 2016 to expand its review from hair analysis to include fingerprint examinations and bullet-tracing.⁴³

B. TAKING THE BITE OUT OF BAD SCIENCE: BITE MARK ANALYSIS

Bite mark evidence gained national attention in the Ted Bundy trial in 1979.⁴⁴ Since then, American courts have time and again improperly legitimized this allegedly “scientific” evidence.⁴⁵ The common—yet untested—assumption is that each person produces a unique bite mark, unlike any other in the world.⁴⁶ Unlike DNA analysis, however, there is no scientific basis for the testimonial that an expert can identify a single individual based on bite mark analysis.⁴⁷ As a result the NAS Report recommended that the only probative value of such analysis in criminal prosecutions be in *excluding* an individual from suspicion rather than identifying a suspect.⁴⁸

In 2014, the American Academy of Forensic Sciences further evaluated forensic odontologists and determined that they lacked the ability to simply conclude which marks were actually bite marks.⁴⁹ What may initially appear to be bite marks can actually be just another injury; a cut or scrape that looks strikingly similar to a tooth pattern.⁵⁰ Moreover, bite marks, unlike a dental mold taken of a sus-

39. Seth Augenstein, *Four States Auditing Cases Involving Flawed FBI Hair Analysis*, FORENSIC MAG. (April 27, 2015), <http://www.forensicmag.com/articles/2015/04/four-states-auditing-cases-involving-flawed-fbi-hair-analysis>.

40. Seth Augenstein, *Virginia Inmate, Serving 100 Years for Rape Based on Hair, to Get New DNA Testing*, FORENSIC MAG. (Feb. 25, 2016), <http://www.forensicmag.com/news/2016/02/virginia-inmate-serving-100-years-rape-based-hair-get-new-dna-testing>.

41. *Id.*

42. *Id.*

43. Spencer S. Hsu, *Justice Department Frames Expanded Review of FBI Forensic Testimony*, WASH. POST (March 21, 2016), https://www.washingtonpost.com/local/public-safety/justice-department-frames-expanded-review-of-fbi-forensic-testimony/2016/03/20/ed536702-eed9-11e5-85a6-2132cf446d0a_story.html.

44. Radley Balko, *It Literally Started with a Witch Hunt: A History of Bite Mark Evidence*, WASH. POST (Feb. 17, 2015), <https://www.washingtonpost.com/news/the-watch/wp/2015/02/17/it-literally-started-with-a-witch-hunt-a-history-of-bite-mark-evidence/>.

45. *Id.*

46. NAS REPORT, *supra* note 16, at 173-75.

47. *Id.*

48. *Id.* at 176.

49. Souviron, R. R. *The NAS Report, Forensic Odontology, and a Path Forward*. Presented at the American Academy of Forensic Sciences, Seattle, Washington, 2014.

50. *Id.*

pect's teeth, are left in malleable material: human skin, making it difficult to truly define the boundaries of an impression.⁵¹

As part of a larger examination of forensic science for which the validity has been called into question, in 2014 the Texas Forensic Science Commission began a sweeping review of cases where bite mark analysis played a role in the conviction.⁵² The Commission is now considering the validity of the entire field of bite marks.⁵³ Furthermore, the White House Science Advisor has also thrown doubt on the reliability of bite mark analysis.⁵⁴

The assumed reliability of “forensic odontology” is particularly dangerous due to the esoteric nature of the discipline and the simple fact that most jurors and attorneys are unfamiliar with either its terminology or methodology, and are more likely to uncritically accept the conclusions of a bite mark expert.⁵⁵ The cases of faulty bite mark evidence are numerous and appalling.⁵⁶ In March 2016, Keith Allen Harward was released from prison based on DNA evidence due to a rape conviction based entirely on the testimony of two forensic odontologists, who told the jury that the bite-mark found on the surviving woman's legs conclusively came from Harward.⁵⁷ Harward spent 33 years in prison.⁵⁸

Similarly, Bennie Starks was convicted of a brutal rape in 1986 and sentenced to sixty years in prison as a result of faulty forensic testimony.⁵⁹ The prosecution's forensic serologist testified that, based on her analysis of a semen sample taken from the victim's underpants and a sample obtained from Starks, she could not exclude Starks as the source.⁶⁰ The prosecution also hired two dentists who self-identified as “experts” in forensic odontology to testify that bite marks on the

51. *Id.*

52. Brandi Grissom, *Forensic Science Commission will Investigate Convictions Based on Bite Marks*, DALLAS MORNING NEWS: TRAIL BLAZERS BLOG (Aug. 14, 2015), <http://trailblazersblog.dallasnews.com/2015/08/forensic-science-commission-will-investigate-convictions-based-on-bite-marks.html>; see also Texas Forensic Science Commission, *Texas Bite Mark Case Review* (last visited Dec. 20, 2016), <http://www.fsc.texas.gov/texas-bite-mark-case-review>.

53. See Texas Forensic Science Commission, *Texas Bite Mark Case Review* (last visited Dec. 20, 2016), <http://www.fsc.texas.gov/texas-bite-mark-case-review>.

54. Radley Balko, *A High-Ranking Obama Official Just Called for the 'Eradication' of Bite Mark Evidence*, WASH. POST (July 22, 2015), <https://www.washingtonpost.com/news/the-watch/wp/2015/07/22/a-high-ranking-obama-official-just-called-for-the-eradication-of-bite-mark-evidence/>.

55. Letter Brief of Amici Curiae in Support of Petition for Rehearing at 4, *In re Richards*, 289 P.3d 860 (Cal. 2012) (No. S189275), 2012 WL 7160188, at *5.

56. See, e.g., *In re Richards*, 289 P.3d 860, 863 (Cal. 2012); *People v. Starks*, 850 N.E.2d 206, 209 (Ill. App. Ct. 2006).

57. Seth Augenstein, *DNA Exonerates Man Convicted on Bite-Mark Evidence, 33 Years Later*, FORENSIC MAG. (Apr. 11, 2016), <http://www.forensicmag.com/article/2016/04/dna-exonerates-man-convicted-bite-mark-evidence-33-years-later>.

58. *Id.*

59. *People v. Starks*, 850 N.E.2d 206, 209-10 (Ill. App. Ct. 2006).

60. *Id.*

victim's shoulder had been made by Starks.⁶¹ The dentists testified that after comparing the evidence, photos, X-rays, and a model of Starks's teeth, the bite marks shared sixty-two characteristics with Starks's teeth.⁶² Hearing the forensic "experts" testimony tying the defendant to the crime, the jury convicted Starks of two counts of aggravated criminal sexual assault, attempted aggravated sexual assault, and aggravated battery.⁶³

In 2006, after spending nearly twenty years behind bars, a DNA test categorically excluded Starks as the source of the semen.⁶⁴ Additionally, two other odontologists' independent examinations of the bite mark evidence completely discredited the conclusions and testimonies presented at trial.⁶⁵ Their reports pointed out that the examination method used by the State's odontologists had since been rejected by its own creators and concluded that the dentists "misapplied the methodology and used flawed preservation and photography techniques."⁶⁶

The appeals court ordered Starks released on bond pending a new trial.⁶⁷ His convictions were vacated and the last charges dismissed in January 2013, which led to his full exoneration.⁶⁸ During the twenty years Starks spent behind bars, advancements in technology progressed exponentially (see the DNA that helped set him free), and it left bite marks behind. Even though bite mark evidence continues to suffer from fatal flaws and a low threshold of reliability, somehow it still perseveres.

Bite mark evidence's absurd perseverance is equally obvious in the case of William Richards.⁶⁹ In 1997, a California jury convicted Richards in the murder of his wife, Pamela.⁷⁰ Bite mark evidence provided the proverbial smoking gun.⁷¹ The analyst testified that he compared an autopsy photo of Pamela's body to the unusual gap in William's dentition and found a match.⁷² More than a decade later, the analyst recanted his testimony and called the once-matching gap a defect in the photo.⁷³ To add insult to injury, the analyst further stated that he no longer even believed the bite was made by a human.⁷⁴ Finally, four other forensic odontologists

61. *People v. Starks*, 975 N.E.2d 71, 73 (Ill. App. Ct. 2012).

62. *Id.*

63. *Id.* at 72.

64. *Id.* at 73.

65. *Id.* at 77.

66. *Id.* at 77.

67. *Id.* at 74.

68. Innocence Project, *Bennie Starks* (last visited Dec. 20, 2016), <http://www.innocenceproject.org/cases/bennie-starks/>.

69. *In re Richards*, 289 P.3d 860.

70. *Id.*

71. *Id.*

72. *Id.* at 865.

73. *Id.* at 948.

74. *See id.* at 956 (quoting Dr. Norman Sperber, the forensic dentist who testified as an expert at trial, as later saying "I cannot now say with certainty that the injury on the victim's hand is a human bite mark injury.").

said that the photo did not offer enough detail to provide a match to William Richards.⁷⁵

Roundly criticized as the “worst opinion of [2012],”⁷⁶ the California Supreme Court upheld Richards’s conviction.⁷⁷ The court concluded that Richards would have to prove that the evidence used against him went beyond the bounds of exaggeration: he would have to prove that it was false.⁷⁸ Thus, even though the bite mark analyst retracted his prior testimony, Richards cannot fight the conviction because *at the time of trial*, the analyst thought he was giving accurate testimony.⁷⁹ In light of the decision, the California legislature has begun a series of amendments to its false evidence statute, discussed *infra*,⁸⁰ and Richards has, yet again, found himself in front of the California Supreme Court.⁸¹

C. LATENT RELIABILITY: FINGERPRINT EXAMINATION

Fingerprint identification involves a comparison of questioned friction skin ridge impressions from fingers (or palms) left at a crime scene to known fingerprints. Once an examiner determines that there are enough areas of agreement between the two prints, the conclusion is that the questioned print is attributed to the suspect.⁸² Over the years, the terminology associated with this connection ranges from “match” to “identification” to “individualization.” These absolute terms rest on a premise ingrained in our minds since childhood and prevalent for more than a century: no two fingerprints are alike. In fact, there are three basic assumptions on which fingerprint identification depends:

1. [N]o two fingers have ever been found to possess identical ridge characteristics.
2. A fingerprint will remain unchanged during a person’s lifetime.
3. Fingerprints will have general ridge characteristics that permit them to be systematically classified and examined with great efficiency and efficacy.⁸³

75. *Id.* at 975 (Liu, J. dissenting).

76. Radley Balko, *The Path Forward on Bite Mark Matching - and the Rearview Mirror*, WASH. POST, (Feb. 20, 2015), <https://www.washingtonpost.com/news/the-watch/wp/2015/02/20/the-path-forward-on-bite-mark-matching-and-the-rearview-mirror/>.

77. *Richards*, 289 P.3d at 970.

78. *Id.*

79. *See id.* at 964-66 (determining that even though the analyst had changed his opinion following the trial, new technology or advancements in the field had not rendered his initial testimony objectively untrue; therefore, because of the “subjective component of expert opinion testimony,” his testimony at trial was not false under California law).

80. *See infra* Part IV.B.

81. Balko, *supra* note 76.

82. *See* DAVID R. ASHBAUGH, *RIDGEOLOGY: MODERN EVALUATION FRICTION RIDGE IDENTIFICATION* 34-35 (1991), <http://onin.com/fp/ridgeology.pdf>.

83. TERRENCE F. KIELY, *FORENSIC EVIDENCE: SCIENCE AND THE CRIMINAL LAW* 349 (2d ed. 2006).

Since fingerprint evidence has been venerated for so long, its admissibility rarely receives challenges. There is no actual evidence, however, that an individual's fingerprints are unique to all others in the world.⁸⁴ Instead, like hair analysis, fingerprint analysis is another exercise in an examiner's subjective attempt at visual comparisons. Fingerprint evidence cannot fall short of admissibility, and for obvious reasons: it would upend more than a century of convictions.⁸⁵

Indeed, American courts have (and will continue) to accept forensic fingerprint identification without subjecting it to the kind of scrutiny that would be required of novel scientific or technical evidence today. Courts accepted the untested arguments that fingerprint identification was: (1) generally accepted, (2) science, and (3) reliable. Courts also accepted the claim that there were no two fingerprints in the world exactly alike. None of these claims were subjected to adequate scrutiny from either a scientific or a legal standpoint.⁸⁶ This logic requires a leap of faith rather than a fact of science: that if no two fingerprints are exactly alike in all the world, then the method of forensic fingerprint identification must be correspondingly reliable. Judicial acceptance (and in some cases judicial notice) became an important source in legitimating forensic fingerprint evidence. That is, people outside the legal system believed that fingerprinting was scientific and reliable because courts said it was so.

Consequently, the interpretation of forensic fingerprint evidence must rely upon the expertise of latent print examiners rather than on science. The NAS Report underscored the shortcomings and called for research to measure the accuracy and reliability of latent print examiners' decisions. Seven years later, however, research is still wanting. Even later reports and investigations cannot seem to give courts pause on the admissibility of fingerprint evidence. A 2012 report by a Committee of 34 scholars and forensic scientists, including at least 12 working latent print examiners, jointly convened by the National Institute of Standards and Technology ("NIST") and the National Institute of Justice ("NIJ") recommended that the report of the examination should ensure that the findings and their limitations are intelligible to non-experts.⁸⁷

Another report by the U.S. Justice Department Office of the Inspector General⁸⁸ noted that the FBI Laboratory Standard Operating Procedures "now re-

84. See *United States v. Havvard*, 117 F. Supp. 2d 848, 852 (S.D. Ind. 2000) ("In roughly 100 years since fingerprints have been used for identification purposes, no one has managed to falsify the claim of uniqueness by showing that fingers of two persons had identical fingerprints.").

85. Simon A. Cole, *Does "Yes" Really Mean Yes? The Attempt to Close Debate on the Admissibility of Fingerprint Testimony*, 45 JURIMETRICS J. 449, 450 (2005).

86. Jessica D. Gabel, *Realizing Reliability in Forensic Science from the Ground Up*, 104 J. CRIM. L. & CRIMINOLOGY 283, 285 (2014).

87. EXPERT WORKING GROUP ON HUMAN FACTORS IN LATENT PRINT ANALYSIS, LATENT PRINT EXAMINATION AND HUMAN FACTORS: IMPROVING THE PRACTICE THROUGH A SYSTEMS APPROACH 94 (National Institute of Justice, National Institute of Standards and Technology, 2012), http://www.nist.gov/customcf/get_pdf.cfm?pub_id=910745.

88. DEPARTMENT OF JUSTICE, A REVIEW OF THE FBI'S PROGRESS IN RESPONDING TO THE RECOMMENDATIONS IN THE OFFICE OF THE INSPECTOR GENERAL REPORT ON THE FINGERPRINT

quire that examiners create sufficient documentation, including annotated photographs and case notes, to allow another examiner to evaluate the examination and replicate any conclusions, and they include specific documentation requirements for each phase of the ACE-V process.”⁸⁹ Rarely does this occur, and there’s little incentive to effectuate a change. Such requirements have failed to sway the perception that latent print evidence is sufficiently reliable such that it deserves an automatic “pass” into admissibility.

In a recent (and fairly notable) decision, the Seventh Circuit, in *Herrera v. United States*,⁹⁰ effectively approved of the free pass. Judge Posner, writing for the court, concluded that a proponent of fingerprint evidence need not demonstrate reliability because it possessed some preternatural form of inherent reliability. The court’s substitution of its own unsupported indicia of reliability effectively created a series of logical leaps that exceed the bounds of current fingerprint research. *Herrera* found fingerprint identification evidence to be reliable for five reasons: (1) the prosecution’s fingerprint experts were certified by the International Association for Identification (“IAI”); (2) none of the first 194 prisoners exonerated by the postconviction DNA testing in the United States was convicted by faulty fingerprint evidence;⁹¹ (3) Francis Galton estimated the “probability of two people in the world having identical fingerprints” to be 1 in 64 billion;⁹² (4) “errors in [fingerprint] matching appear to be very rare;” and (5) examiner training encompassed “instruction on how to determine whether a latent print contains enough detail to enable a reliable matching to another print.”⁹³

Unfortunately, some of these points are factually inaccurate. Moreover, not one point supports a conclusion that fingerprint identification evidence could be admitted through expert testimony without a *Daubert* analysis. It is worth, however, scrutinizing the Seventh Circuit’s analysis and reliability conclusion because it represents one of the more recent (albeit bewildering) assessments of fingerprint analysis.

MISIDENTIFICATION IN THE BRANDON MAYFIELD CASE (2011), <http://www.justice.gov/oig/special/s1105.pdf>.

89. *Id.* at 40; NAS REPORT, *supra* note 16, at 143 (citation omitted); *see also id.* at 105–06 (“In *Maryland v. Rose*, a Maryland State trial court judge found that the Analysis, Comparison, Evaluation, and Verification (ACE-V) process . . . of latent print identification does not rest on a reliable factual foundation. The opinion went into considerable detail about the lack of error rates, lack of research, and potential for bias. The judge ruled that the State could not offer testimony that any latent fingerprint matched the prints of the defendant. The judge also noted that, because the case involved the possibility of the death penalty, the reliability of the evidence offered against the defendant was critically important. The same concerns cited by the judge in *Maryland v. Rose* can be raised with respect to other forensic techniques that lack scientific validation and careful reliability testing.”).

90. *United States v. Herrera*, 704 F.3d 480 (7th Cir. 2013).

91. *Id.* at 486–87.

92. *Id.* at 487.

93. Bradford T. Ulrey et al., *Accuracy and Reliability of Forensic Latent Fingerprint Decisions*, 108 PROCEEDINGS OF THE NAT’L ACAD. OF SCI. 7733, 7735–36 (2011).

The fact that an occupation runs a certification program does not constitute evidence about how accurately (or “reliably”) members of that occupation perform various tasks. To have such evidence effectively creates a *per se* rule that certification breeds reliability.⁹⁴ Beyond that, it seems misplaced to pin an argument on the fact that the “first 194 prisoners in the United States exonerated by DNA evidence” lacked a conviction based on erroneous fingerprint matches. This is, in part, because Stephan Cowans, the 141st person exonerated by postconviction DNA testing in the United States, was convicted in large measure on the basis of erroneous fingerprint evidence.⁹⁵ In addition, data demonstrates that at least five cases involving fingerprint analysis errors are among the 337 postconviction DNA exonerations to date.⁹⁶ Finally, postconviction DNA exonerations neither provide a representative sample nor statistically valid information about the prevalence of fingerprint analysis errors.

The Seventh Circuit’s assertion that the “great statistician Francis Galton” estimated a probability of “1 in 64 billion” for two people bearing identical fingerprints is also incorrect.⁹⁷ Galton’s estimate stemmed from a calculation of one specific “fingerprint” to *another* specific fingerprint (i.e., a 1:1 comparison).⁹⁸ Galton’s true estimate for the probability that a given fingerprint would be identical to *any* other fingerprint in the world population (estimated in 1892 at 1.6 billion) was a far more humble 1 in 4.⁹⁹ At the end of the day, the pertinent probability related to the court’s question should have been the probability of finding the common features between a suspect’s known prints and the latent prints offered into evidence against him *if* someone other than the suspect was the source of those latent prints. It is well understood in the literature, and it was stated in the NAS Report,

94. *Id.*

95. BRANDON L. GARRETT, CONVICTING THE INNOCENT: WHERE CRIMINAL PROSECUTIONS GO WRONG, 106-07 (2011); Simon A. Cole, *More Than Zero: Accounting for Error in Latent Fingerprint Identification*, 95 J. CRIM. L. & CRIMINOLOGY 985, 1014-16 (2005); Brandon L. Garrett & Peter Neufeld, *Invalid Forensic Science Testimony and Wrongful Convictions*, 95 VA. L. REV. 1, 73-74, 95 (2009); Elizabeth F. Loftus and Simon A. Cole, *Contaminated Evidence*, 304 SCI. 959 (2004); Jennifer L. Minoakin, *A Blow to the Credibility of Fingerprint Evidence*, BOSTON GLOBE (Feb. 2, 2004), http://archive.boston.com/news/globe/editorial_opinion/oped/articles/2004/02/02/a_blow_to_the_credibility_of_fingerprint_evidence/; see also Brief of Amici Curiae Interested Scientists and Scholars in Support of Petition for Writ of Certiorari at 15 n.22, *United States v. Herrera*, 704 F.3d 480 (2013) (No. 12-1461), 2013 WL 3773550, at *15 n.22 [hereinafter *Herrera* Amicus Brief].

96. The Innocence Project, *The Cases*, <http://www.innocenceproject.org/all-cases/#forensic-other,exonerated-by-dna> (last visited Jan. 18, 2016).

97. *Herrera*, 704 F.3d at 487.

98. *Herrera* Amicus Brief, *supra* note 95, at 16 n.24.

99. FRANCIS GALTON, FINGER PRINTS 110-11 (1892); see SIMON A. COLE, SUSPECT IDENTITIES: A HISTORY OF FINGERPRINTING AND CRIMINAL IDENTIFICATION 80 (2001); Stephen M. Stigler, *Galton and Identification by Fingerprints*, 140 GENETICS 857, 858 (1995); David A. Stoney and John I. Thornton, *A Critical Analysis of Quantitative Fingerprint Individuality Models*, 31 J. FORENSIC SCI., 1187, 1188 (1986).

that neither Galton's estimate nor any estimate of the probability of exact duplication addresses this question.¹⁰⁰

The Seventh Circuit's fourth reason for reliability—that “errors in [fingerprint] matching appear to be very rare”—is a nebulous one. It lacks any empirical data to support the “appearance” of error rarity. The NAS Report found a dearth of information on the error rate of fingerprint identification in 2009, and not much has changed since then.¹⁰¹ Finally, the Seventh Circuit focused on the presence of training as part of its indicia of reliability. Simply because some examiners are trained does not propel fingerprint analysis to reliability. If reliability can be understood to be a three-legged stool, then one of those legs encompasses the reliability of the specific examiner (the other two being the reliability of the method and the reliability of the application of that method). That type of information would be one of the subjects of a *Daubert* inquiry—not a reason to discount it altogether. Yet, time and again courts have done just that.

As a post-script, there is hope for fingerprint analysis. In 2015, the National Institute for Standards and Technology awarded \$20 million to several universities to begin the process of developing comparable standards, research, and statistics in pattern evidence analysis, including fingerprints.¹⁰²

D. COMMUTED CALCULATIONS: DNA MIXTURES

For decades, fingerprints were the gold standard in criminal evidence. By the late 1980s, however, DNA was poised to inherit that label. DNA brought a new level of science to forensics—one built upon foundations of biochemistry, molecular biology, and genetics. But even DNA evidence can produce errors, and the potential for miscalculations is particularly ripe in DNA mixture cases. DNA mixtures occur when two or more donors have contributed to a forensic sample.¹⁰³ Because of the prevalence of this type of sample, many samples collected and processed in forensic laboratories are DNA mixtures.¹⁰⁴ Standard mixture analysis involves taking a separate sample of DNA from a suspect and comparing it to the mixture being tested.¹⁰⁵ This means it is “inherently subjective – the analyst sees the subject's genotype during the analysis.”¹⁰⁶

100. NAS REPORT, *supra* note 16, at 43, 144.

101. *Id.* at 142.

102. *New NIST Center of Excellence to Improve Statistical Analysis of Forensic Evidence*, NAT'L INST. STANDARDS & TECH. (Sept. 21, 2016), <https://www.nist.gov/news-events/news/2015/05/new-nist-center-excellence-improve-statistical-analysis-forensic-evidence>.

103. MARK W. PERLIN, OBJECTIVE DNA MIXTURE INFORMATION IN THE COURTROOM: RELEVANCE, RELIABILITY, AND ACCEPTANCE 4 (Sept. 15, 2015), <https://www.cyngen.com/information/publication/2015/NIST/Perlin-Objective-DNA-mixture-information-in-the-courtroom-relevance-reliability-and-acceptance/paper.pdf>.

104. *Id.*

105. *Id.*

106. *Id.*

This method of comparison and analysis has been criticized because it relies heavily on interpretation. For example, an individual reference sample may have two allele peaks in common with the mixture sample.¹⁰⁷ While this may seem like conclusive evidence, one out of every fifteen people could match those two peaks out of the sample.¹⁰⁸ For unmixed samples, “analysts look at two sets of peaks at a given locus: one for the victim and one for the perpetrator.”¹⁰⁹ But mixtures are a different story: analysts look at multiple peaks at the same loci “with no indication of which pairs go together, or which source they came from.”¹¹⁰ Sorting out which peaks belong to which individual is “highly subjective,” but this DNA evidence, combined with a statement from another involved perpetrator (given in exchange for a lenient sentence), was enough to send a Georgia man to prison.¹¹¹

In the summer of 2015, the FBI discovered that numerous labs had been using incorrect protocol when calculating the probability of a match from a DNA mixture.¹¹² Originally, the FBI believed this error would not affect too many cases.¹¹³ But when labs began reanalyzing results, it became clear that the change in protocol significantly changed the probabilities in some (but not all) cases.¹¹⁴ For example, a Texas lawyer describes a case in which the original probability of the DNA sample matching his client was more than one million to one.¹¹⁵ With the new protocols in place, the lawyer believes the probability was significantly lower – in the neighborhood of thirty or forty to one.¹¹⁶ Nonetheless, the Texas Forensic Science Commission data states that the greatest difference in probability was from 1 in 260,900,000 to 1 in 225,300,000.¹¹⁷ Regardless of the true probability changes, any change is concerning because it is not difficult to imagine a scenario where a conviction was based solely, or at least primarily, on a seemingly conclusive

107. Chris Berdik, *Dubious DNA*, RESEARCH (July 21, 2015), <http://www.bu.edu/research/articles/dna-profiling/>

108. *Id.*

109. Douglas Starr, *Forensics Gone Wrong: When DNA Snares the Innocent*, SCI. (Mar. 7, 2016, 10:00 AM), <http://sciencemag.org/news/2016/03/when-dna-snares-innocent>.

110. *Id.*

111. *Id.*

112. TEX. FORENSIC SCI. COMM’N, *CLARIFICATION REGARDING THE TERM “CURRENT AND PROPER MIXTURE INTERPRETATION PROTOCOLS”* (2015), <http://www.fsc.texas.gov/sites/default/files/Clarification%20on%20current%20and%20proper%20mixture%20interpretation%20protocols.pdf> [hereinafter *CLARIFICATION*].

113. *Id.*

114. *Id.*

115. Martin Kaste, *‘Great Pause’ Among Prosecutors as DNA Proves Fallible*, NPR (Oct. 19, 2015, 5:30 PM), <http://www.npr.org/2015/10/09/447202433/-great-pause-among-forensic-scientists-as-dna-proves-fallible>.

116. *Id.*

117. TEX. FORENSIC SCI. COMM’N, *UNINTENDED CATALYST: THE EFFECTS OF 1999 AND 2001 FBI STR POPULATION DATA CORRECTIONS ON AN EVALUATION OF DNA MIXTURE INTERPRETATION IN TEXAS* (Aug. 21, 2015), <http://www.fsc.texas.gov/sites/default/files/documents/Unintended%20Effects%20of%20FBI%20Database%20Corrections%20on%20Assessment%20of%20DNA%20Mixture%20Interpretation%20in%20Texas%20NOTICE.pdf> [hereinafter *EFFECTS ON DNA MIXTURE INTERPRETATION*].

DNA match from a mixed sample.¹¹⁸ If there are doubts surrounding DNA mixture evidence (whether it is in the accuracy of the result or the accuracy of the statistics), it could affect many cases.

Because of these drastic differences, the Texas Forensic Science Commission began investigating the discrepancies.¹¹⁹ The Commission noted that the science behind DNA analysis is still sound, but “well-defined guidelines for interpretation are necessary when analyzing DNA samples containing multiple contributors, because of the complexity of the samples and the possibility of missing data (e.g., allele dropout and other stochastic effects).”¹²⁰ In August 2015, the Commission released a letter to the Texas Criminal Justice Committee explaining these issues and encouraging lawyers to determine whether their evidence was calculated using “current and proper mixture interpretation protocols.”¹²¹ A few months later, the Commission released a list of criteria for evaluating laboratories’ DNA mixture interpretation protocol.¹²²

Texas is not the only state to take notice of the limits of DNA mixture analysis. In 2015, a New York supreme court discussed and analyzed the viability of DNA mixture analysis in *People v. Collins*.¹²³ Specifically, the court looked at the “Forensic Statistical Tool” or FST, a computer program created by the New York City Office of Chief Medical Examiner to calculate the likelihood that a sample contains the DNA of a specific subject.¹²⁴ The court notes that “[t]he enormous value of such statistical results, compared to simple statements like ‘the individual cannot be excluded as a contributor’ is obvious—if the statistics are accurate.”¹²⁵ The operative phrase here is *if* the statistics are accurate. After examining the FST and hearing from experts in the field (on both sides of the issue), the court ruled that the FST did not pass the *Frye* test and was not admissible.¹²⁶ The court also noted that it did not exclude the evidence because it was proven to be false, but merely because it had yet to be accepted in the relevant scientific community.¹²⁷

118. Katie L. Dysart, *Managing the CSI Effect in Jurors*, AMERICAN BAR ASSOCIATION: SECTION OF LITIGATION TRIAL EVIDENCE (May 28, 2012), <http://apps.americanbar.org/litigation/committees/trialevidence/articles/winterspring2012-0512-csi-effect-jurors.html>.

119. See CLARIFICATION, *supra* note 112.

120. *Id.*

121. See EFFECTS ON DNA MIXTURE INTERPRETATION, *supra* note 117.

122. TEX. FORENSIC SCI. COMM’N, *CRITERIA FOR EVALUATION OF DNA MIXTURE INTERPRETATION PROTOCOLS* (Oct. 15, 2015), [http://www.fsc.texas.gov/sites/default/files/Texas%20Forensic%20Lab%20Mixture%20Criteria%20101515%20\(FINAL\).pdf](http://www.fsc.texas.gov/sites/default/files/Texas%20Forensic%20Lab%20Mixture%20Criteria%20101515%20(FINAL).pdf)

123. *People v. Collins*, 15 N.Y.S.3d 564 (N.Y. Sup. Ct. 2015)

124. *Id.* at 577.

125. *Id.*

126. *Id.* at 587.

127. *Id.* at 584.

It is, however, important to note that DNA mixture interpretation has not been completely discredited. Even with the issues described above, many experts believe that the science behind DNA mixture analysis is still sound.¹²⁸ Keith Inman, a forensic science professor, says that laboratories are stuck in a hard place.¹²⁹ The newest analysis method for DNA mixtures, probabilistic genotyping, takes time to implement, which has left laboratories knowing that a better method exists but still being required to analyze samples using the old method.¹³⁰ Similarly, the New York court in the *Collins* case did not dismiss the DNA mixture analysis entirely – it merely determined that the method was not up to the standards required by the scientific community.¹³¹

Nonetheless, juries still tend to give a great deal of weight to any DNA evidence that points to a defendant.¹³² Until the technology and analysis methods have progressed to the point of eliminating the potential for the results to vary based on which laboratory completes the analysis, the criminal justice community needs to be wary of placing too much emphasis or reliance on DNA evidence.¹³³

E. RIDING SHOTGUN: FIREARMS EXAMINATIONS

Firearms analysis is another forensic science that has been subject to criticism, but has not been completely discredited. Firearm examination can be divided into two groups: internal and external ballistics. External ballistics refers to the bullet's flight before it strikes a target, and terminal or impact ballistics, referring to the bullet striking a target.¹³⁴ It also includes the study of the flight path of projectiles.¹³⁵ "Internal ballistics" pertains to what happens inside the gun from the time it is fired until the bullet leaves the muzzle.¹³⁶ This can also be referred to as firearm tool mark analysis.¹³⁷ Internal ballistics often revolves around examinations of rifling marks on a bullet and comparing those marks to those left by a gun in evidence.¹³⁸ This section focuses on internal ballistics.

128. CLARIFICATION, *supra* note 112.

129. Kaste, *supra* note 115.

130. *Id.*

131. *Collins*, 15 N.Y.S.3d 564 at 577-82.

132. Dysart, *supra* note 118.

133. Kaste, *supra* note 115. "A lab using one method may find a match, while another lab, using a more conservative analysis, may judge the same sample to be inconclusive." *Id.*

134. *Firearms & Ballistics*, FORENSICS LIBRARY, <http://aboutforensics.co.uk/firearms-ballistics/> (last visited Dec. 20, 2016).

135. *Id.*

136. *Id.*

137. Adina Schwartz, *Challenging Firearms and Toolmark Identification—Part One*, 32 CHAMPION 10, 11 (2008).

138. *Firearms & Ballistics*, *supra* note 134. Rifling refers to the series of spiraling lands and grooves is produced along the inside of the barrel. *Id.* It will be cut with either a left or a right hand twist. *Id.* Rifling leaves characteristic marks on bullets, which is the basis for the comparison. *Id.*

Firearms examination evidence has widely been accepted by courts, even when evidence was challenged under the *Daubert* standard.¹³⁹ Much like other pattern examinations, internal ballistics has come under criticism for its subjectivity.¹⁴⁰ As the 2008 NAS Ballistics Imaging Report noted, gun identification comes down to a subjective assessment on whether or not the reference sample matches the bullet from the gun in evidence.¹⁴¹ Firearms experts often testify that the bullet in evidence was fired by the specific gun in evidence, to the exclusion of any other gun.¹⁴² This statement has been walked back some (in response to criticism), but it effectively operates the same—that it is a “practical impossibility” that another gun could have made the same marks. The conclusion of the report was succinct: “The validity of the fundamental assumptions of uniqueness and reproducibility of firearms-related toolmarks has not yet been fully demonstrated.”¹⁴³ That conclusion, however, was handicapped by a further statement that the “baseline level of credibility” has been met by the existing research and the acceptance in judicial proceedings for years.¹⁴⁴ Judicial acceptance should not be scientific evidence of credibility.

The 2009 NAS Report also addressed this issue, noting that there is not enough known about the differences between guns to establish how many points of similarity are required to attain a statistically significant quantification about the accuracy of the conclusion.¹⁴⁵ The report suggested that additional studies should be conducted in order to make the analysis more “precise and repeatable.”¹⁴⁶

Adina Schwartz, professor at John Jay College of Criminal Justice, lists three central pitfalls related to toolmarks and firearms.¹⁴⁷ First, she discusses the possibility that individual characteristics are actually a combination of non-unique marks.¹⁴⁸ It is entirely possible that examiners confuse marks that are made by two separate tools with marks that are made by one unique tool.¹⁴⁹ Second, she notes that characteristics of marks can change over time.¹⁵⁰ In fact, “firearms and toolmark examiners do not expect the toolmarks on bullets fired from the same gun to ever be exactly alike.”¹⁵¹ This is because the gun will change as it is used, as well as from damage or corrosion.¹⁵² The final difficulty identified by Schwartz is

139. Paul C. Giannelli, *Ballistics Evidence Under Fire*, 25 CRIM. JUST. 50, 50 (2011).

140. NAT'L RES. COUNCIL BALLISTICS IMAGING 54-57 (2008), <http://www.nap.edu/read/12162/chapter/1>.

141. *Id.*

142. *Id.*

143. *Id.* at 81.

144. *Id.*

145. NAS REPORT, *supra* note 16, at 154.

146. *Id.*

147. Schwartz, *supra* note 137, at 12.

148. *Id.*

149. *Id.*

150. *Id.*

151. *Id.* at 13.

152. *Id.*

the danger of an examiner confusing an individual characteristic with what is known as a subclass mark.¹⁵³ A subclass mark is a microscopic mark that distinguishes one type of gun from another, not an individual gun of the type from another gun of the same type.¹⁵⁴ Subclass marks are common to all guns of a certain type.¹⁵⁵ This type of confusion could lead to either false positives or false negatives.¹⁵⁶

III. THE CURRENT MODEL: INCONSISTENT AND INEFFECTIVE APPROACHES TO BAD SCIENCE

The preceding section discussed how conjecture and exaggeration, masquerading as science, failed innocent people. The Innocence Project estimates that faulty forensic evidence played a role in at least 51 percent of the convictions overturned by DNA evidence.¹⁵⁷ It is impossible to know how many other innocent people have been convicted based on the same faulty forensic evidence where DNA is not available to exonerate them. Moreover, the preceding section only identified a handful of problematic forensic fields. There are other forensic specialties with similar weaknesses.

While DNA has become the new arbiter of guilt and innocence, it has also negatively affected prisoners who cannot take advantage of such compelling evidence. States have enacted statutes that provide for postconviction DNA testing in cases of alleged innocence. Lost in the shuffle, however, is DNA's other implication: that many fields of forensic science, despite widespread acceptance, frequently yield incorrect results. This section discusses the current framework for how a factually innocent person can challenge faulty forensics if DNA evidence is not available. As this section makes clear, the current postconviction framework (absent exculpatory DNA evidence) is ineffective to handle cases involving unreliable science.

A. AVAILABLE METHODS OF SEEKING DIRECT AND COLLATERAL REVIEW OF CONVICTIONS

1. DIRECT REVIEW

A motion for a new trial is the first form of direct review by which convicted individuals can seek to overturn their convictions on the basis of newly discovered evidence. All federal and state jurisdictions provide a mechanism by

153. *Id.*

154. *Id.*

155. *Id.*

156. *Id.* (quoting *United States v. Green*, 405 F. Supp. 2d 104, 108 (D. Mass 2005)).

157. See Innocence Project, *Unvalidated or Improper Forensic Science*, <http://www.innocenceproject.org/causes/unvalidated-or-improper-forensic-science/> (last visited Dec. 21, 2016) (“In about half of DNA exonerations, unvalidated or improper forensic science contributed to the wrongful conviction.”).

which prisoners can move for a new trial. The rules of most jurisdictions explicitly recognize newly discovered evidence as a basis for such a motion.¹⁵⁸

In most jurisdictions, prisoners have only three years or less from a particular event—usually the verdict or finding of guilty, entry of judgment, or sentencing—to request a new trial based on new evidence¹⁵⁹ (though many jurisdictions extend or toll this time limit if newly discovered evidence is the primary basis for bringing the motion).¹⁶⁰ The time limits vary widely among jurisdictions, ranging from three years or more in federal court, the District of Columbia, and four states,¹⁶¹ to a month or less in fifteen states.¹⁶² In four other states, a prisoner may

158. *See, e.g.*, CAL. PENAL CODE § 1181(8) (Westlaw current through 2016 Reg. Sess.). The exceptions are Arkansas, Florida, Georgia, Hawaii, Illinois, Massachusetts, Michigan, Missouri, Montana, New Hampshire, Tennessee, Texas, Utah, Virginia, and Wisconsin. *See* ARK. R. CRIM. P. 33.3 (Westlaw current through Nov. 1, 2016); FLA. R. CRIM. PROC. 3.590 (Westlaw current through Aug. 15, 2016); GA. CODE ANN. §§ 5-5-40, 5-5-41 (Westlaw current through 2016 Session of the Georgia General Assembly); HAW. REV. STAT. § 635-56 (Westlaw current through Act 1 (End) of the 2016 Second Special Session); 725 ILL. COMP. STAT. 5/116-1 (Westlaw current through P.A. 99-912 of the 2016 Reg. Sess.); MASS. R. CRIM. P. 30 (Westlaw current through Nov. 1, 2016); MICH. CT. R. CRIM. P. 6.431 (Westlaw current through Nov. 15, 2016); MO. REV. STAT. § 547.020 (Westlaw current through end of 2016 Regular Session and Veto Session of the 98th General Assembly, pending changes received from the Revisor of Statutes); MONT. CODE ANN. § 46-16-702 (Westlaw current through 2015 session); N.H. REV. STAT. ANN. § 526:1 (Westlaw current through Chapter 330 (End) of the 2016 Reg. Sess., not including changes and corrections made by the State of New Hampshire, Office of Legislative Services); TENN. R. CRIM. P. 33 (Westlaw current through Nov. 15, 2016); TEX. R. APP. P. 21.2 (Westlaw current through Sept. 1, 2016); UTAH R. CRIM. P. 24 (Westlaw current through Sept. 15, 2016); VA. SUP. CT. R. 3A:15 (Westlaw current through Dec. 1, 2016); WIS. STAT. § 809.30 (Westlaw current through 2015 Act 392, published Apr. 27, 2016).

159. *See, e.g.*, ARK. R. CRIM. P. 33.3(b) (entry of judgment); OHIO R. CRIM. P. 33(b) (Westlaw current through Aug. 1, 2016) (verdict); TENN. R. CRIM. P. 33(b) (sentencing).

160. *See, e.g.*, ALASKA R. CRIM. P. 33 (Westlaw current through Aug. 1, 2016) (increasing time from 5 days to 180 days); DEL. SUPER. CT. R. CRIM. P. 33 (2016) (increasing time from seven days to two years); MD. R. 4-331 (Westlaw current through Dec. 1, 2016) (increasing time from ten days to one year); N.M.R. 5-614 (Westlaw current through Aug. 1, 2016) (increasing time from ten days to two years); W. VA. R. CRIM. P. 33 (Westlaw current through Sept. 1, 2016) (removing ten-day limit).

161. FED. R. CRIM. P. 33(b)(1) (Westlaw current through Dec. 1, 2016); CONN. GEN. STAT. § 52-582 (Westlaw current through 2016 Sept. Special Session); D.C. SUPER. CT. R. CRIM. P. 33(b)(1) (Westlaw current through Oct. 1, 2016); NEB. REV. STAT. § 29-2103(4) (Westlaw current through the end of the 104th 2nd Regular Session (2016)); N.H. REV. STAT. ANN. § 526:4; N.D.R. CRIM. P. 33(b)(1) (Westlaw current through July 1, 2016).

162. ALA. CODE § 15-17-5(a) (Westlaw current through the end of the 2016 Regular Session and through Act 2016-485 of the 2016 First Special Session) (thirty days); ARK. R. CRIM. P. 33.3(b) (thirty days); FLA. R. CRIM. P. 3.590(a) (Westlaw current through Aug. 5, 2016) (ten days); HAW. R. PENAL P. 33 (Westlaw current through July 1, 2016) (ten days); 725 ILL. COMP. STAT. 5/116-1(b) (thirty days); IND. R. CRIM. P. 16(A) (Westlaw current through Nov. 1, 2016) (thirty days); MINN. R. CRIM. P. 26.04 subd. 1-1(3) (Westlaw current through May 1, 2016) (fifteen days); MISS. UNIF. R. CIR. & COUNTY CT. PRAC. 10.05 (Westlaw current through June 1, 2016) (ten days); MO. R. CRIM. P. 29.11 (Westlaw current through Nov. 1, 2016) (fifteen to twenty-five days); MONT. CODE ANN. §46-16-702(2) (2007) (thirty days); S.D. CODIFIED LAWS § 23A-29-1 (Westlaw current through 2016 Session Laws, Supreme Court Rule 16-68, and 2016 general election ballot measures) (ten days); TENN. R. CRIM. P. 33(b) (thirty days); TEX. R. APP. PROC. 21.4(a) (thirty days); UTAH R. CRIM. P. 24(c) (ten days); VA. SUP. CT. R. 3A:15(b) (twenty-one days for motion to set aside verdict); WIS. STAT. § 809.30(2)(b) (twenty days). In

potentially bring a new trial motion on the basis of newly discovered evidence at any time, subject to the court's discretion.¹⁶³ Only seven states allow a prisoner to seek a new trial at any time.¹⁶⁴

In addition to the often-limited amount of time available to seek a new trial based on newly discovered evidence, a prisoner may only make such a motion if several other requirements are met. For example, the evidence must not have been discoverable by "reasonable diligence" prior to the time of trial.¹⁶⁵ Also, the newly discovered evidence may only be sufficient to require a new trial if a prisoner can show that the evidence, if available at the time of trial, would have changed the verdict.¹⁶⁶ Many jurisdictions do not allow new trials based on new evidence where that evidence would be used only for impeachment or is cumulative of other evi-

Hawaii, a court may extend the ten-day limit indefinitely, but may only do so within that ten-day period, in Utah, a court may extend the fourteen-day limit before expiration of the time for filing a motion for new trial. *See* HAW. R. PENAL P. 33; UTAH R. CRIM. P. 24(c). In California, a motion for a new trial must be made before judgment is entered. CAL. PENAL CODE § 1182.

163. GA. CODE ANN. §§ 5-5-40(a), 5-5-41(a) (Westlaw current through 2016 Session of the Georgia General Assembly) (motion for new trial must be made within thirty days of judgment "except in extraordinary cases"); KY. R. CRIM. P. 10.06 (Westlaw current through Sept. 1, 2016) (motion for new trial based on newly discovered evidence must be made within one year of judgment "or at a later time if the court for good cause so permits"); OHIO R. CRIM. P. 33(B) (motion for new trial based on newly discovered evidence must be made within 120 days of judgment unless "it is made to appear by clear and convincing proof that the prisoner was unavoidably prevented from the discovery of the evidence upon which he [or she] must rely"); OR. R. CIV. P. 64(F) (Westlaw current with 2016 Reg. Sess. legislation eff. through July 1, 2016 and ballot measures approved at the Nov. 8, 2016 General Election, pending classification of undesignated material and text revision by the Oregon Reviser) (motion for new trial must be made within ten days of judgment "or such further time as the court may allow").

164. COLO. R. CRIM. P. 33(c) (motion for new trial based on newly discovered evidence must be filed "as soon after entry of judgment as the facts supporting it become known to the defendant"); MASS. R. CRIM. P. 30(b) (Westlaw current through Nov. 1, 2016) (no time limit for new trial motions); N.J.R. CRIM. P. 3:20-2 (Westlaw current through Aug. 15, 2016) (no time limit for new trial motions based on newly discovered evidence); N.Y. CRIM. PROC. LAW § 440.10.1 (Westlaw current through L.2016, chapters 1 to 503.) (no time limit for motions to vacate judgment); N.C. GEN. STAT. § 15A-1415(c) (Westlaw current through the end of the 2016 Regular Session of the General Assembly, pending changes received from the Revisor of Statutes) (new trial motion based on newly discovered evidence must be filed "within a reasonable time of its discovery"); 234 PA. CODE § 720(C) (Westlaw current through Pa. Bull., Vol. 46, Num. 50, dated Dec. 10, 2016) (new trial motion based on newly discovered evidence must be filed "promptly after such discovery"); W.VA. R. CRIM. P. 33 (no time limit for new trial motions based on newly discovered evidence).

165. *See, e.g.*, ALA. CODE § 15-17-5(a)(5) (20); CAL. PENAL CODE § 1181(8); IDAHO CODE ANN. § 19-2406(7) (Westlaw current through the 2016 Second Regular Session of the 63rd Idaho Legislature); MD. RULE 4-331(c); NEB. REV. STAT. § 29-2101(5) (2007); N.Y. CRIM. P. LAW § 440.10.1(1)(g); OHIO R. CRIM. P. 33(A)(6); S.D. CODIFIED LAWS § 15-6-59(a)(4); WASH. SUPER. CT. CRIM. R. 7.8(b)(2) (Westlaw current through June 15, 2016).

166. *See, e.g.*, LA. CODE CRIM. PROC. ANN. art. 851(3) (Westlaw current through the 2016 First Extraordinary, Regular, and Second Extraordinary Sessions); MISS. UNIF. R. CIR. & COUNTY. CT. P. 10.05.3; N.Y. CRIM. PROC. LAW § 440.10.1(1)(g).

dence introduced at trial.¹⁶⁷ As a result, the requirements a prisoner must meet to get a new trial all but ensure that an innocent person in many jurisdictions will not be able to do so under direct review procedures.

2. COLLATERAL REVIEW

A. STATE POSTCONVICTION PROCEDURES

Every state has at least one postconviction remedy by which a prisoner can challenge the validity of his or her conviction after direct approaches have failed. These postconviction remedies may or may not be available to a prisoner who claims that newly discovered evidence establishes his or her innocence. In some states, a free-standing, or “bare” claim of innocence, which is a claim of innocence that is not accompanied by a constitutional claim,¹⁶⁸ cannot be the basis for postconviction relief.¹⁶⁹ Even where such a claim is cognizable, the standards a prisoner must meet to establish entitlement to relief can be quite strict and nearly impossible to meet.¹⁷⁰

Each jurisdiction has particular procedural requirements that a prisoner must satisfy to bring a petition for postconviction relief. In several jurisdictions, there is no time limit on when a prisoner may apply for such relief.¹⁷¹ In most others, however, a court may waive the time limit only if the prisoner: (a) has a claim based on new evidence that, with “due diligence” could not have been discovered in time to be presented at trial;¹⁷² (b) has filed a claim within a certain time after discovery of the evidence;¹⁷³ (c) has a claim of actual innocence;¹⁷⁴ and/or (d) can

167. See, e.g., *Hester v. State*, 647 S.E.2d 60, 63 (Ga. 2007); *Stephenson v. State*, 864 N.E.2d 1022, 1048 (Ind. 2007); *Pippitt v. State*, 737 N.W.2d 221, 226 (Minn. 2007); *State v. Tester*, 923 A.2d 622, 626 (Vt. 2007); *Hicks v. State*, 913 A.2d 1189, 1193-94 (Del. 2006).

168. See Michael J. Muskat, Note, *Substantive Justice and State Interests in the Aftermath of Herrera v. Collins: Finding an Adequate Process for the Resolution of Bare Innocence Claims Through State Postconviction Remedies*, 75 TEX. L. REV. 131, 133 (1996).

169. See, e.g., LA. CODE CRIM. PROC. ANN. art. 930.3; OHIO REV. CODE ANN. § 2953.21(A)(1)(a); *Jackson v. State*, 573 P.2d 637, 639 (Kan. Ct. App. 1977); *Barbee v. Warden of Md. Penitentiary*, 151 A.2d 167, 169 (Md. 1959).

170. For example, several jurisdictions require a prisoner to make a showing of actual innocence. See, e.g., 725 ILL. COMP. STAT. 5/122-1(2) (requiring that petitioner be sentenced to death and evidence “establish[] a substantial basis to believe that the defendant is actually innocent” in order to establish entitlement to relief based on newly discovered evidence); *In re Weber*, 523 P.2d 229, 243 (Cal. 1974) (requiring newly discovered evidence must “point[] unerringly to innocence,” to warrant habeas relief).

171. See, e.g., HAW. R. PENAL P. 40(a)(1); MASS. R. CRIM. P. 30(a); N.M. STAT. ANN. § 31-11-6(A) (Westlaw current through the end of the Second Regular and Special Sessions of the 52nd Legislature (2016)); N.Y. CRIM. PROC. LAW § 440.10.1(1).

172. See, e.g., FLA. R. CRIM. P. § 3.850(b)(1); 42 PA. C.S.A. § 9545(b)(1)(ii) (Westlaw current through 2016 Regular Session Acts 1 to 169 and 171 to 175); see also N.J. R. 3:22-4 (excusing time limit for claims that “could not reasonably have been raised” in a prior petition); OR. REV. STAT. § 138.510(3) (2005).

173. See, e.g., GA. CODE ANN. § 9-14-52(b) (2007); MCA § 46-21-102(2) (2005) (requiring petition based on newly discovered evidence be filed within a year of when evidence was or could have

show that barring the petition on procedural grounds would be unjust.¹⁷⁵ Generally, second or successive petitions for postconviction relief are not allowed.¹⁷⁶ Nonetheless, a prisoner may be able to bring a successive petition if he or she could not have raised the claim in a previous petition.¹⁷⁷

The various hurdles placed in postconviction procedures work against the wrongly convicted. Their entitlement to counsel suffers from similar disabilities. In several states, the appointment of counsel is up to the discretion of the court or the state public defender.¹⁷⁸ Even where a prisoner has the right to counsel in a postconviction proceeding, the appointment of counsel usually does not occur until after the petition is filed. Without counsel, prisoners must either resort to proceeding *pro se*, or forego postconviction remedies altogether. The lack of counsel diminishes (and perhaps prohibits) an innocent person's ability to challenge his or her conviction.

B. FEDERAL POSTCONVICTION PROCEDURES

The disjointed patchwork of postconviction procedures is not unique to state law. The federal system also establishes similar indefinite and unreasonable requirements. State prisoners who have exhausted state postconviction remedies and whose claims are not procedurally barred may seek habeas relief from the federal courts under 28 U.S.C. § 2254.¹⁷⁹ As in many states, federal courts do not recognize a freestanding claim of actual innocence as a basis for relief. In *Herrera v. Collins*, the United States Supreme Court affirmed that without an accompanying claim of a constitutional violation, a bare claim of innocence based on newly discovered evidence does not warrant federal habeas relief for a state prisoner.¹⁸⁰

The *Herrera* majority assumed for the sake of argument that a state prisoner sentenced to death may be entitled to federal habeas relief where the prisoner makes "a truly persuasive demonstration of actual innocence" and there is no way to pursue the claim under state law.¹⁸¹ While the Supreme Court has subsequently

been discovered); S.C. CODE ANN. §17-27-45(c) (Westlaw current through the 2016 session, subject to technical revisions by the Code Commissioner as authorized by law before official publication.).

174. See, e.g., ALASKA STAT. § 12.72.020(b)(2); TENN. CODE ANN. § 40-30-102(b)(2).

175. See, e.g., KAN. STAT. ANN. § 60-1507(f)(2) (Westlaw current through laws enacted during the 2016 Regular and Special Sessions of the Kansas Legislature).

176. See, e.g., IDAHO CODE § 19-4908; ME. STAT. tit 15, § 2128(3) (Westlaw current through July 29, 2016); MD. CODE ANN., CRIM. PROC. § 7-103(a) (Westlaw current through all legislation from the 2016 Regular Session of the General Assembly).

177. See, e.g., COLO. R. CRIM. P. 35(c)(3)(VI); GA. CODE ANN. § 9-14-51; OKLA. STAT. tit. 22, § 1086 (Westlaw current through Chapter 395 (End) of the Second Session of the 55th Legislature (2016)); TEX. CODE CRIM. PROC. ANN. art. 11.07 sec. 4(a)(1), (c).

178. IND. R. POST-CONVICTION REM. 1 § 9(a) (2015); MASS. R. CRIM. P. 30(c)(5).

179. See generally 28 U.S.C. § 2254 (Westlaw current through P.L. 114-254. Also includes P.L. 114-256.).

180. *Herrera v. Collins*, 506 U.S. 390, 400-01 (1993).

181. *Id.* at 417.

declined to decide whether the exception suggested in *Herrera* does in fact exist,¹⁸² most circuits have recognized it in post-*Herrera* cases.¹⁸³ Because the exception would apply in such a narrow set of hypothetical circumstances, however, federal habeas relief is effectively unavailable to prisoners convicted under state law who seek to advance bare claims of innocence.

Federal prisoners who have unsuccessfully challenged their convictions on direct appeal may petition for habeas relief under 28 U.S.C. § 2255. While the Supreme Court has not ruled on the issue, two circuits have extended *Herrera*'s rationale to petitions brought under § 2255, the counterpart to § 2254 for federal prisoners.¹⁸⁴ Considering that the trend is for courts to extend *Herrera*'s rationale to § 2255 petitions, federal prisoners with bare claims of innocence likely may only bring those claims in a motion for a new trial.

In more recent renderings, the Supreme Court has allowed a proper showing of "actual innocence" to excuse the Anti-Terrorism and Effective Death Penalty Act's ("AEDPA") statute of limitations. But those cases (as Justice Ginsburg noted) are few and far between: "[A]ctual innocence, if proved, serves as a gateway through which a petitioner may pass whether the impediment is a procedural bar, as it was in *Schlup* and *House*, or, as in this case, expiration of the statute of limitations. We caution, however, that tenable actual-innocence gateway pleas are rare."¹⁸⁵

3. CLEMENCY OR PAROLE

Clemency is the "historic remedy for preventing miscarriages of justice where judicial process has been exhausted."¹⁸⁶ It is available under federal law and the law of all fifty states.¹⁸⁷ The United States Constitution vests the power to pardon in the President, and most state constitutions similarly vest the power to par-

182. *Dist. Attorney's Office v. Osborne*, 557 U.S. 57, 71 (2009); *House v. Bell*, 547 U.S. 518, 554-55 (2006).

183. *See, e.g., United States v. Sampson*, 486 F.3d 13, 27-28 (1st Cir. 2007); *Albrecht v. Horn*, 485 F.3d 103, 121-24 (3d Cir. 2007), *abrogated on other grounds by United States v. Berrios*, 676 F.3d 118, 126 (3d Cir. 2012); *Cress v. Palmer*, 484 F.3d 844, 854 (6th Cir. 2007); *In re Davis*, 565 F.3d 810, 823 (11th Cir. 2009); *Cox v. Burger*, 398 F.3d 1025, 1031 (8th Cir. 2005); *Clayton v. Gibson*, 199 F.3d 1162, 1180 (10th Cir. 1990); *Carriger v. Stewart*, 132 F.3d 463, 476 (9th Cir. 1997) (en banc); *Milone v. Camp*, 22 F.3d 693, 699-700 (7th Cir. 1993); *Spencer v. Murray*, 5 F.3d 758, 765-66 (4th Cir. 1993). *But see United States v. Quinones*, 313 F.3d 49, 68 (2d Cir. 2002) (emphasizing that *Herrera* did not hold such an exception exists); *Dowthitt v. Johnson*, 230 F.3d 733, 741 (5th Cir. 2000) (rejecting existence of such an exception), *overruled in part on other grounds by Lewis v. Thaler*, 701 F.3d 783, 791 (5th Cir. 2012).

184. *Conley v. United States*, 323 F.3d 7, 13-14 (1st Cir. 2003); *Guinan v. United States*, 6 F.3d 468, 470 (7th Cir. 1993), *overruled in part on other grounds by Massaro v. United States*, 538 U.S. 500, 503-04 (1993); *see also Sims v. United States*, No. 98-1228, 1999 U.S. App. LEXIS 34746, at *5-6 (6th Cir. Oct. 29, 1999).

185. *McQuiggin v. Perkins*, 133 S. Ct. 1924, 1928 (2013).

186. *Herrera v. Collins*, 506 U.S. 390, 412 (1993).

187. Holly Schaffer, Note, *Postconviction DNA Evidence: A 500 Pound Gorilla in State Courts*, 50 *DRAKE L. REV.* 695, 724 (2002).

don in governors.¹⁸⁸ Clemency is not without its own cast of procedural nightmares.

In most jurisdictions a prisoner seeking clemency must have exhausted all other possible avenues of relief.¹⁸⁹ In several jurisdictions a prisoner must have additionally served a certain portion of his or her sentence before being eligible to apply for clemency.¹⁹⁰ If an application for clemency is denied, the prisoner may have to wait a certain amount of time before reapplying, or may be barred from reapplying altogether.¹⁹¹

While some jurisdictions permit the grant of a full pardon, including the restoration of civil rights,¹⁹² other jurisdictions allow for the commutation of a sentence only.¹⁹³ As a result, a grant of clemency will not necessarily lead to a prisoner's immediate release.¹⁹⁴ The grant of clemency may be revocable in some jurisdictions, subject to the grantee's compliance with certain conditions.¹⁹⁵ Consequently, clemency is available in highly specialized circumstances and even when granted may not provide adequate relief for innocent prisoners.

Parole does not offer any better alternative for a claim of innocence, and most do not have that option. For those that do, they are generally required to admit guilt as a condition of parole.

Fred Swanigan was 20 years old when he was convicted of murder in 1980. With no physical or forensic evidence to link Swanigan to the crime, prosecutors built the case on four eyewitnesses who identified Swanigan as the killer. While the California appeals court did not find those eyewitnesses to be terribly

188. U.S. CONST. art. II, § 2, cl. 1; *see, e.g.*, ALASKA CONST. art. III, § 21; CAL. CONST. art. V, § 8(a); FLA. CONST. art. IV, § 8 (a); ILL. CONST. art. V, § 12; ME. CONST. art. V, § 11; N.Y. CONST. art. V, § 4; OHIO CONST. art. III, § 11; VA. CONST. art. V, § 12; WIS. CONST. art. V, § 6; *But cf.*, PA. CONST. art. V, § 9 (a) (allowing governor to grant clemency only upon recommendation of a Board of Pardons); S.C. CONST. art. IV, § 14 (vesting only partial power to grant clemency in governor); TEX. CONST. art. IV, § 11(b) (permitting governor to grant clemency only after a recommendation from the Board of Pardons).

189. *See, e.g., Apply for Clemency*, NEW YORK STATE DEPARTMENT OF CORRECTIONS AND COMMUNITY SUPERVISION EXECUTIVE CLEMENCY BUREAU, <https://www.ny.gov/services/apply-clemency> (last visited May 15, 2016).

190. *See, e.g.*, OR. REV. STAT. § 137.225(1)(a); *Clemency Form*, CONNECTICUT BOARD OF PARDONS AND PAROLES, <http://www.ct.gov/doc/lib/doc/PDF/form/PardonClemencyInstructions.pdf> (last visited May 15, 2016); *see also* ALA. CODE § 15-22-28(e) (requiring a unanimous vote to grant parole unless prisoner has served certain amount of time).

191. *See, e.g.*, MINN. STAT. § 638.02; ILL. PRISONER REVIEW BD., GUIDELINES FOR EXECUTIVE CLEMENCY 1, <https://www.illinois.gov/prb/Pages/prbexcleme.aspx> (last modified April 03, 2013).

192. *See, e.g.*, ARKANSAS LEGAL SERVICES PARTNERSHIP, PARDON (*EXECUTIVE CLEMENCY*), <https://www.arlegalservices.org/files/FSPardon.pdf> (last updated October 2014); MASS. PAROLE BD., EXECUTIVE CLEMENCY OVERVIEW, <http://www.mass.gov/eopss/law-enforce-and-cj/parole/exec-clemency-unit/executive-clemency-overview.html> (last updated Dec. 10, 2015).

193. *See, e.g.*, FLA. BD. OF EXEC. CLEMENCY, RULES OF EXECUTIVE CLEMENCY, https://www.fcor.state.fl.us/docs/clemency/clemency_rules.pdf (last updated Mar. 9, 2011).

194. *See, e.g.*, IDAHO ADMIN. CODE R. 50.01.01.450(1)(c) (2016).

195. *See, e.g.*, MONT. ADMIN. R. 20.25.901A(2) (2005); VT. STAT. ANN. tit. 28, § 810 (2015).

persuasive or reliable, the 1981 jury convicted Swanigan and he received a sentence of 27 years-to-life in prison.¹⁹⁶

Before, during, and after the trial, Swanigan maintained his innocence. Once he became eligible for parole in 1996, he never waived on his innocence and refused to admit guilt. Admitting guilt—holding oneself accountable for the crime—often factors as the key component of the consideration for granting parole (in addition to risk assessment and recidivism).¹⁹⁷ Recently, the California Court of Appeals ruled that his claim of innocence should not be a bar to release.¹⁹⁸ But for the inmate who is innocent, this presents a problem: admit guilt and get out, or maintain innocence and stay put. It is a no-win situation that often boils down to a personal decision of how badly a person wants to get out of prison and what he or she is willing to say to make that happen. Swanigan's case may seem like a rare glitch in the system, but it is a common-enough occurrence that it even has its own Wikipedia entry.¹⁹⁹

B. PROBLEMS WITH CURRENTLY AVAILABLE METHODS OF RELIEF

As the foregoing overview suggests, a prisoner with a free-standing claim of innocence based on the discrediting of a forensic technique faces a litany of obstacles in seeking to overturn his or her conviction. The passage of time is a particular problem: relief simply may be unavailable after a certain amount of time has passed. Even if there are available avenues for challenging a conviction, the high standards for establishing exceptions to procedural bars and entitlement to relief may effectively preclude a successful challenge.

1. FORECLOSURE OF CLAIMS BY THE PASSAGE OF TIME

In several jurisdictions, the time for moving for a new trial is limited and claims of innocence based on newly discovered evidence are not cognizable in petitions for postconviction relief. For example, if three years have passed since a federal prisoner's conviction, he or she may not move for a new trial on the basis of newly discovered evidence.²⁰⁰ In addition, under *Herrera v. Collins*, he or she may not seek habeas relief for a bare claim of innocence.²⁰¹ In Louisiana, a prisoner can only move for a new trial on the basis of "new and material evidence" within a year after the verdict or judgment,²⁰² and a claim of actual innocence is not a

196. Seth Augenstein, *Calif. Inmate Who Maintains Innocence After 35 Years Won't Be Released Soon, Despite Court Victory*, FORENSIC MAG. (Sept. 14, 2015), http://www.forensicmag.com/articles/2015/09/calif-inmate-who-maintains-innocence-after-35-years-wont-be-released-soon-despite-court-victory?et_cid=4813634&et_rid=883093763&location=top.

197. *Id.*

198. *Id.*

199. *Innocent Prisoner's Dilemma*, WIKIPEDIA, https://en.wikipedia.org/wiki/Innocent_prisoner%27s_dilemma (last visited Apr. 19, 2017).

200. FED. R. CRIM. P. 33(b)(1).

201. 506 U.S. 390, 400-01 (1993).

202. LA. CODE CRIM. PROC. ANN. art. 851(3), 853.

cognizable ground for postconviction relief unless the claim rests on the results of DNA testing.²⁰³ In other states, a prisoner with a claim of actual innocence has an even shorter window of time to bring a claim of actual innocence. For example, in Arkansas, a prisoner must move for a new trial within thirty days after entry of judgment,²⁰⁴ and newly discovered evidence is not a ground for postconviction relief.²⁰⁵ The overriding theme is that time does not stop for innocence.

In addition to time constraints, jurisdictions impose substantive criteria on prisoners seeking relief for claims of innocence that may result in limiting relief to narrow circumstances. For example, in Illinois, only prisoners sentenced to death may bring claims based on newly discovered evidence, and even then only if the evidence “establishes a substantial basis to believe that the defendant is actually innocent by clear and convincing evidence.”²⁰⁶ Because the time limit for bringing a new trial motion in Illinois is thirty days after the verdict,²⁰⁷ a prisoner convicted of a non-capital crime is not able to challenge his or her conviction on the basis of a claim of innocence after that time has passed. The crazy part to this is that Illinois abolished the death penalty in 2011, but this draconian law remains on the books.²⁰⁸

Even if a claim of innocence on the basis of newly discovered evidence is cognizable in a petition for postconviction relief, strict procedural requirements for bringing such petitions, in combination with the time limit for bringing a motion for a new trial, may also render relief unavailable after a certain amount of time has passed. For example, while Alaska law recognizes newly discovered evidence as a basis for postconviction relief, a prisoner may only file one motion for postconviction relief, without exception.²⁰⁹ Where a prisoner cannot bring either a motion for a new trial or a petition for postconviction relief after a certain period of time, clemency will be the only form of relief left. The granting of clemency, however, is extremely rare.²¹⁰ A prisoner whose only chance at being exonerated is to

203. *Id.* at art. 930.3.

204. ARK. R. CRIM. P. 33.3(B).

205. *Chisum v. State*, 625 S.W.2d 448, 449 (Ark. 1981). In Tennessee, a prisoner must move for a new trial within thirty days after sentencing, and postconviction relief is only available for claims of constitutional error, not claims based on newly discovered evidence of innocence. TENN. R. CRIM. P. 33(b); *see also* *Myers v. State*, No. M2004-02411-CCA-MR3-PC, 2005 LEXIS 676, at *11-14 (Tenn. Crim. App. June 29, 2005).

206. 725 ILL. COMP. STAT. 5/122-1 (a)(2).

207. *Id.* at 5/116-1(b).

208. *Illinois Abolishes the Death Penalty*, NRP (Mar. 9, 2011), <http://www.npr.org/2011/03/09/134394946/illinois-abolishes-death-penalty>.

209. ALASKA STAT. §§ 12.72.010(4), 12.72.020(a)(6) (2006). *See generally id.* at §12.72.020. Similarly, in Delaware, a prisoner must apply for postconviction relief within a year of final judgment, regardless of what the claimed ground for relief is. DEL. R. CRIM. P. 61(i)(1). In combination with the sixty day limit on bringing a motion for a new trial, this strict statute of limitations bars any review of a conviction after a certain amount of time has passed. DEL. R. CRIM. P. 33.

210. Molly M Gill, *FAMM Seeks Commutation Cases to Spark Sentencing Reform*, National Association of Criminal Defense Lawyers, Nov. 2007, at 8 (observing that clemency is rarely granted); Adam M. Gershowitz, *The Diffusion of Responsibility in Capital Clemency*, 17 J.L. & POLITICS 669, 671

seek clemency faces an uphill battle, both because of the political considerations that make executives reluctant to grant pardons and because of the lack of checks on an executive's discretion to refuse relief.²¹¹

When a motion for a new trial or a postconviction petition are no longer available, even an innocent prisoner has little hope of gaining freedom. On the whole, states differ dramatically in the availability and procedural aspects of postconviction relief. In practice, however, the effect is the same: an innocent person may well be in no better position to be released from prison than a guilty one.

2. THE DIFFICULTY OF ESTABLISHING EXCEPTIONS TO PROCEDURAL BARS AND ENTITLEMENT TO RELIEF

Even if a claim of innocence based on the discrediting of a forensic technique may be a basis for postconviction relief, there are usually high standards for establishing entitlement to relief and exceptions to procedural bars. It may be difficult for prisoners with such claims to advance them through traditional postconviction remedies. One potential pitfall is that the discrediting of a forensic technique is not a traditional form of newly discovered evidence, so that the substantive and procedural rules which involve a showing of newly discovered evidence may not be easy to meet. A related problem is that the discrediting of a forensic technique may nullify evidence used to convict a person at trial, but does not have the potential to conclusively prove that person's innocence. Thus, prisoners convicted on the basis of a discredited forensic testing technique may not be able to make a sufficient showing of innocence. Finally, because the laws of many jurisdictions either do not provide for a right to counsel in postconviction proceedings or do so only after a petition is filed, many prisoners will be in the position of filing a petition for postconviction relief without the assistance of counsel. As a result, petitioners with meritorious claims may not have the chance to present them adequately, if at all, much less obtain relief based upon them.

Characterizing a recently discredited forensic technique as newly discovered evidence raises the issue of when a technique is sufficiently discredited to constitute new evidence. To illustrate the gravity of these cases, look to the case of Santae Tribble. He was convicted of killing a taxi driver in 1978.²¹² During the in-

(2001) (nothing that the granting of clemency "has dramatically declined in the last few decades."), <http://scholarship.law.wm.edu/facpubs/1260>.

211. Arleen Anderson, *Responding to the Challenge of Actual Innocence Claims After Herrera v. Collins*, 71 TEMP. L. REV. 489, 514-15 (1998) ([E]xecutive clemency is vulnerable to the whims of the political process . . . [and] 'possesses. . . a lack of guaranteed procedural safeguards and, given the degree of discretion, a risk of arbitrary denial.' (quoting Vivian Berger, *Herrera v. Collins; The Gateway of Innocence for Death-Sentenced Prisoners Leads Nowhere*, 35 WM. & MARY L. REV. 943, 1009 (1994)); Nicholas Berg, Note, *Turning a Blind Eye to Innocence: The Legacy of Herrera v. Collins*, 42 AM. CRIM. L. REV. 121, 145-146 (2005) ("[T]he clemency process poses three major problems: (1) it is subject to the whims of the political process, (2) it lacks guaranteed procedural safeguards, and (3) its use is approaching the vanishing point.").

212. 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->

vestigation, a police dog uncovered a stocking mask one block away from the crime scene; the stocking contained a total of 13 hairs. The FBI's hair analysis concluded that one of the 13 hairs belonged to Tribble. Tribble took the stand in his defense, testifying that he had no connection to the taxi driver's death. Nevertheless, the jurors gave weight to the one "matching" hair and found Tribble guilty of murder. The judge sentenced him to 20 years-to-life in prison.²¹³

Both in prison and later, while on parole, Tribble maintained his innocence, and in January 2012, Tribble's lawyer, succeeded in having the evidence retested. A private lab concluded through DNA testing that the hairs could not have belonged to Tribble.²¹⁴ A more thorough analysis at the time of the crime—even absent DNA testing—would have revealed the same result: one hair had Caucasian characteristics and Tribble is African-American. Tribble served 25 years, plus an additional three years for failing to meet the conditions of his parole for a crime he did not commit.²¹⁵

In another case, Kirk L. Odom was convicted of sexual assault in 1981.²¹⁶ The star prosecution witness—an FBI Special Agent—testified that a hair discovered on the victim's nightgown was microscopically similar to Odom's hair, "meaning the samples were indistinguishable."²¹⁷ To illustrate the credibility of the evidence, the agent also testified that he had concluded hair samples to be indistinguishable only "eight or 10 times in the past 10 years, while performing thousands of analyses."²¹⁸ Odom presented alibi evidence, but the jury convicted him after just a few hours of deliberation. Odom was paroled in March 2003 and required to register as a sex offender.²¹⁹

That would have been the end of Odom's story had it not been for his lawyer's crusade to right the wrongs resulting from the erroneous hair comparisons.²²⁰ In February 2011, Sandra Levick (who had also represented Tribble) filed a motion for DNA testing under the D.C. Innocence Protection Act.²²¹ In response, the government located stained bedsheets, a robe, and the microscopically exam-

defendants-left-uninformed-of-forensic-flaws-found-by-justice-dept/2012/04/16/gIQAWTcgMT_story.html?tid=a_inl.

213. *Id.*

214. *Id.*

215. *Id.*

216. *Id.*

217. *Id.*

218. *Id.*

219. Innocence Project, *Kirk Odom*, <http://www.innocenceproject.org/cases/kirk-odom/> (last visited Dec. 21, 2016).

220. Spencer S. Hsu, *Kirk L. Odom Officially Exonerated; DNA Retesting Cleared Him in D.C. Rape, Robbery*, WASH. POST, (July 13, 2012), https://www.washingtonpost.com/local/crime/kirk-l-odom-officially-exonerated-dna-retesting-cleared-him-in-dc-rape-robbery/2012/07/13/gJQAuH3piW_story.html.

221. See *Kirk Odom*, *supra* note 219; Innocence Project, *Santae Tribble*, <http://www.innocenceproject.org/cases/santae-tribble/> (last visited Dec. 21, 2016).

ined hair from the crime scene.²²² Subsequent DNA testing of those items, in addition to mitochondrial testing of the suspect hair, excluded Odom.²²³ A convicted sex offender would later be linked to the crime, and Odom was exonerated on July 13, 2012.²²⁴

The Tribble and Odom cases illustrate one potential conundrum for prisoners using currently available avenues to challenge convictions based on a claim of a forensic testing technique being discredited: the evidence must cast sufficient doubt upon a forensic testing technique in order to support a claim. Thus, prisoners must wait for scientists to do research that discredits the technique to a satisfactory degree. On the other hand, once evidence that does sufficiently discredit the technique becomes available, a prisoner may have to bring a claim based on that evidence quickly in order to comply with applicable time limits. Consequently, the prisoner must negotiate the fine balance between waiting to gather enough evidence to demonstrate that a forensic technique is unreliable and risking the possibility that more conclusive research will be done but will not come to the prisoner's attention.

3. POSTCONVICTION DISCOVERY AND PRESENTATION OF EVIDENCE

Another problem faced by prisoners in using current procedures to challenge their convictions is obtaining the evidence necessary to establish their claims. Postconviction DNA testing statutes provide a procedure by which prisoners can obtain testing of biological evidence associated with their convictions, usually at the state's expense if the prisoner is indigent.²²⁵ In addition, DNA testing statutes may provide for access to other relevant evidence, such as the results of previous testing.²²⁶ In contrast, the rules governing new trial motions and postconviction procedures are usually silent on the issue of discovery. As a result, there is no clear mechanism by which prisoners can acquire the physical evidence used in a particular forensic technique and other relevant information that may be used to prove their innocence.

Further, even if prisoners can gather the relevant evidence, they may be handcuffed by the high standards they must meet to show their innocence. In Texas, for instance, "[e]stablishing a bare claim of innocence is a Herculean task."²²⁷ To establish entitlement to relief, "the applicant must show 'by clear and convincing evidence that, despite the evidence of guilt that supports the conviction, no reasonable juror could have found the applicant guilty in light of the new evidence.' This showing must . . . unquestionably establish [the] applicant's innocence."²²⁸ In

222. See *Kirk Odom*, *supra* note 219.

223. *Id.*

224. See *id.*

225. See, e.g., 18 U.S.C. §§ 3600(a), (c)(3); N.C. GEN. STAT. §§ 15A-269(a), (d5).

226. CAL. PENAL CODE § 1405(d)(1).

227. *Ex parte Brown*, 205 S.W.3d 538, 546 (Tex. Crim. App. 2006).

228. *Id.* (quoting *Ex parte Elizondo*, 947 S.W.2d 202, 205 (Tex. Crim. App. 1996)).

addition, the applicant must provide “affirmative evidence” of innocence, not just raise doubt about his or her guilt.²²⁹

As explained below, it may be easier to discredit forensic science in Texas than it is to demonstrate actual innocence. The innocent applicant would need “affirmative evidence” that “unquestionably establishes” a prisoner’s innocence. Even assuming that a forensic technique was shown to be completely unreliable, it will not provide affirmative evidence of a prisoner’s innocence.

For example, if a prisoner showed that hair evidence was not a legitimate technique, it would, at most, exclude a hair from belonging to the suspect or the victim. While this might remove a critical piece of evidence from the conviction equation, such a showing would not prove that a prisoner did not commit the crime at issue. Because hair evidence cannot be used to tie individual hairs to individual persons, it cannot be used to prove that a person was or was not associated with the crime or the victim. Thus, a prisoner challenging his or her conviction in a jurisdiction that requires a strong showing of innocence probably will not be entitled to relief even if he or she conclusively shows that a forensic testing technique has insufficient probative value.

In many cases, even if a prisoner could otherwise establish exceptions to procedural bars to relief, he or she will not have the help of counsel in preparing a petition for postconviction relief. Where the discrediting of a forensic technique is the basis for a claim, it is important to obtain scientific research in support of the technique’s discreditation. Without the aid of counsel, a prisoner will be poorly positioned to marshal the evidence necessary to support a petition and avoid its summary dismissal. Texas law does not make any provision for the appointment of counsel to aid indigent, non-capital prisoners in filing habeas petitions.²³⁰ After filing, for the petition to proceed, the judge must find “controverted, previously unresolved facts which are material to the legality of the applicant’s confinement.”²³¹ Even then, the judge has the discretion to decide whether to hold an evidentiary hearing.²³² In light of such stringent requirements for establishing a claim of innocence, a prisoner who files a petition without the aid of counsel may not be able to highlight the new evidence establishing his or her innocence and state a claim sufficient to require further consideration.

The need for the aid of counsel is even more pronounced in jurisdictions that have detailed requirements governing the contents of postconviction petitions. For example, in Virginia, a prisoner with a claim of innocence based on newly discovered evidence may file a petition for a “writ of actual innocence.”²³³ If newly discovered “nonbiological evidence” is the basis for the petition, the prisoner must

229. *Ex parte Franklin*, 72 S.W.3d 671, 678 (Tex. Crim. App. 2002).

230. See TEX. CODE CRIM. PROC. ANN. art. 26.05(a); *cf. id.* at art. 11.071 § 2.

231. *Id.* at art. 11.07 § 3(d).

232. *Id.*

233. VA. CODE ANN. § 19.2-327.2 to 19.2-327.14.

allege, “categorically, and with specificity,” a detailed list of eight facts.²³⁴ In addition, the “petition [must] contain all relevant allegations of facts that are known to the petitioner at the time of filing, [must] be accompanied by all relevant documents, affidavits and test results, and [must] enumerate and include all relevant previous records, applications, petitions, appeals and their dispositions.”²³⁵ Compliance with these requirements is necessary to avoid summary dismissal.²³⁶ Unfortunately, a petitioner is entitled to counsel only after, and only if, the petition is not summarily dismissed.²³⁷ Furthermore, it is up to the court’s discretion whether to appoint counsel before deciding whether to summarily dismiss a petition.²³⁸ Without the aid of counsel, it is much less likely that a prisoner with a claim of innocence based on a discredited forensic technique will be able to prepare a petition that complies with Virginia’s strict requirements.

IV. WRIT LARGE: THE NEED FOR JUNK SCIENCE STATUTES

The previous section provided just a handful of examples that illustrate the obstacles in proving that bad science produced a wrongful conviction. As the foregoing demonstrates, current postconviction remedies are insufficient to manage the evolution or test the bounds of science in the courtroom. Absent changes to currently available methods of relief, innocent people will remain in prison, convicted by unreliable science. However, two states have made positive steps toward statutory schemes aimed squarely at addressing bad science.

A. THE TEXAS TWO-STEP: A FORENSIC SCIENCE BOARD AND A JUNK SCIENCE STATUTE

In June 2013, the Texas legislature adopted Article 11.073 of the Code of Criminal Procedure to provide postconviction relief to individuals wrongfully con-

234. *Id.* at § 19.2-327.11(A) (“The petitioner shall allege categorically and with specificity, under oath, all of the following: (i) the crime for which the petitioner was convicted, and that such conviction was upon a plea of not guilty; (ii) that the petitioner is actually innocent of the crime for which he was convicted; (iii) an exact description of the previously unknown or unavailable evidence supporting the allegation of innocence; (iv) that such evidence was previously unknown or unavailable to the petitioner or his trial attorney of record at the time the conviction became final in the circuit court; (v) the date the previously unknown or unavailable evidence became known or available to the petitioner, and the circumstances under which it was discovered; (vi) that the previously unknown or unavailable evidence is such as could not, by the exercise of diligence, have been discovered or obtained before the expiration of 21 days following entry of the final order of conviction by the court; (vii) the previously unknown or unavailable evidence is material and when considered with all of the other evidence in the current record, will prove that no rational trier of fact could have found proof of guilt beyond a reasonable doubt; and (viii) the previously unknown or unavailable evidence is not merely cumulative, corroborative or collateral.”).

235. *Id.* at § 19.2-327.11(B).

236. *Id.* at §§ 19.2-327.11(B), (D).

237. *Id.* at § 19.2-327.11(E).

238. *Id.*

victed as a result of unavailable or erroneous scientific evidence.²³⁹ The statute was initially enacted in response to the denial of Neal Hampton Robbin's application for writ of habeas corpus for a conviction of capital murder under Article 11.07 of the Code of Criminal Procedures, the state's false evidence statute, and a claim of actual innocence.²⁴⁰ In *Ex Parte Robbins*, the defendant was convicted of capital murder based in part on the testimony of the assistant medical examiner who performed an autopsy on the child victim's body and declared the cause of death to have been homicide.²⁴¹ After the medical examiner revised her opinion, finding the cause of death to have been "undetermined,"²⁴² Robbins applied for a writ of habeas corpus.²⁴³ The court denied relief, holding that the State did not use false evidence to obtain the defendant's conviction because, although subsequently revised, the medical examiner's trial testimony was not false and did not create a false im-

239. TEX. SESS. LAW SERV. ch. 410 (S.B. 344) (West 2013), *amended by* TEX. SESS. LAW SERV. Ch. 1263 (H.B. 3724) (West 2015).

The Statute provides:

- (a) This article applies to relevant scientific evidence that:
 - (1) was not available to be offered by a convicted person at the convicted person's trial; or
 - (2) contradicts scientific evidence relied on by the state at trial.
- (b) A court may grant a convicted person relief on an application for a writ of habeas corpus if:
 - (1) the convicted person files an application, in the manner provided by Article 11.07, 11.071, or 11.072, containing specific facts indicating that:
 - (A) relevant scientific evidence is currently available and was not available at the time of the convicted person's trial because the evidence was not ascertainable through the exercise of reasonable diligence by the convicted person before the date of or during the convicted person's trial; and
 - (2) the court makes the findings described by Subdivisions (1)(A) and (B) and also finds that, had the scientific evidence been presented at trial, on the preponderance of the evidence the person would not have been convicted.
 - (d) In making a finding as to whether relevant scientific evidence was not ascertainable through the exercise of reasonable diligence on or before a specific date, the court shall consider whether the field of scientific knowledge, a testifying expert's scientific knowledge, or a scientific method on which the relevant scientific evidence is based has changed since:
 - (1) the applicable trial date or dates, for a determination made with respect to an original application; or
 - (2) the date on which the original application or a previously considered application, as applicable, was filed, for a determination made with respect to a subsequent application.

Id.

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

241. *Robbins v. State*, 27 S.W.3d 245 (Tex. App. 2000), *aff'd*, 88 S.W.3d 256 (Tex. App. 2002).

242. *Id.*

243. *Ex parte Robbins*, 360 S.W.3d 446 (Tex. Crim. App. 2011).

pression. The court further held that the medical examiner's re-evaluation of her trial opinion did not unquestionably establish defendant's innocence.²⁴⁴

Initially proposed in February 2013, adopted in June 2013, and effective as of September 2013, Article 11.073 expanded the basis for postconviction relief based on inadequate evidence provided in 11.071 to address faulty science specifically. The statute thus applies to "scientific evidence that . . . (1) was not available . . . at trial; or (2) contradicts scientific evidence relied on by the state . . ."²⁴⁵ The statute allows a writ of habeas corpus to be granted if, first, "the evidence was not ascertainable through the exercise of reasonable diligence" before or during the trial and, second, the court finds that "had the scientific evidence been presented at trial, on the preponderance of the evidence the person would not have been convicted."²⁴⁶ The statute further asks the court to "[c]onsider whether the scientific knowledge or method on which the relevant scientific evidence is based has changed since" the trial date or dates of previously considered applications for writ of habeas corpus.²⁴⁷

Under the newly enacted statute, the Texas Court of Criminal Appeals granted Robbins's second application for habeas relief on the same factual basis and allowed for a new trial.²⁴⁸ The court held that the change in opinion constituted a change in the relevant "scientific knowledge" that contradicted scientific evidence relied upon by the State because both the expert's original and revised opinions were derived from the scientific method.²⁴⁹ The court further held that, had the new evidence been available at trial, the defendant would not have been convicted of capital murder.²⁵⁰

The initial five-to-four vote granting habeas relief in *Robbins II* reflected judicial unease and uncertainty with the recently enacted statute. In May 2015, a less favorable Court of Criminal Appeals, with three of the *Robbins II* majority judges retired and all of the dissenting judges remaining, granted the state's motion for rehearing in *Robbins II*, making defendant's second writ application again a pending writ application.²⁵¹ In response to the court's grant of the state's motion, the Texas legislature moved quickly to codify the *Robbins II* interpretation of the statute and amended Article 11.073 by House Bill 3724 to explicitly include expert

244. *Id.*

245. TEX. CRIM. PROC. CODE ANN. § art. 11.073.

246. *Id.*

247. *Id.*

248. *Ex parte Robbins*, No. WR-73484-02, 2013 WL 6212218, at *1 (Tex. Crim App. Nov. 27, 2013). Among the issues requested to be briefed by the Courts were "whether Article 11.073 is a new legal or factual basis under Article 11.07, § 4(a)(1)" and "whether 'the scientific knowledge or method on which the relevant scientific evidence is based,' as set out in Article 11.073(d), applies to an individual expert's knowledge and method." *Id.*

249. *Ex parte Robbins*, 478 S.W.3d 678, 692 (Tex. Crim. App 2014) [hereinafter *Robbins II*].

250. *Id.*

251. *Ex parte Robbins*, No. WR-73,484-02, 2016 WL 370157, at *11 (Tex. Crim. App. Jan. 27, 2016) [hereinafter *Robbins III*].

testimony in the definition of “scientific knowledge.”²⁵² Approved on June 20, 2015, this amendment became effective on September 1, 2015.²⁵³ The intent to expand the meaning of “scientific knowledge” is made explicit: “House Bill 3724 amends the Code of Criminal Procedure to *expand* the factors a court must consider when making a finding as to whether scientific evidence constituting the basis for an application for a writ of habeas corpus was not ascertainable.”²⁵⁴

Following the adoption of the amendment, the Texas Court of Criminal Appeals concluded that the state’s motion for rehearing was improvidently granted and denied the state’s motion for rehearing.²⁵⁵ In his concurrence, Judge Alcala asserted that it was the change in the court’s constitution that led to the granting of the state’s motion and expressed his unease about the uncertainty of the statutory meaning:

I do not envy the position of future litigants who must try to decipher this Court’s position on when relief is warranted under the new-science statute. . . This Court’s judicial decisions should not require litigants to run to the Legislature for a statutory response to correct our judicial mistakes. This Court’s judicial decisions should not give the appearance of indecision or manipulation for the achievement of a desired result. And this Court’s judicial decisions should not come half a decade too late

252. TEX. CODE CRIM. PROC. ANN. art. 11.073, *amended by* Act of June 20, 2015, H.B.3724, 84th Leg. (Tex.). The amended section reads as follows:

(d) In making a finding as to whether relevant scientific evidence was not ascertainable through the exercise of reasonable diligence on or before a specific date, the court shall consider whether the *field of scientific knowledge, a testifying expert’s scientific knowledge, or a scientific method* on which the relevant scientific evidence is based has changed since:

(1) the applicable trial date or dates, for a determination made with respect to an original application; or

(2) the date on which the original application or a previously considered application, as applicable, was filed, for a determination made with respect to a subsequent application.

Id. (emphasis added).

253. Act of Sept. 1, 2015, ch. 1263 (H.B. 3724), 2015 Tex. Sess. Law Serv.

254. *Id.* (emphasis added). The Background and Purpose section of the Bill further makes explicit the intent to codify specifically the holding of *Robbins II*:

The observers contend that a recent Texas Court of Criminal Appeals opinion held that a change in the scientific knowledge of a testifying expert would be a basis for habeas relief under the law. C.S.H.B. 3724 seeks to codify this decision . . . The bill specifies that the change in scientific knowledge that the court is required to consider is a change in the field of scientific knowledge.

Crim. Juris. Comm. Rep. C.S.H.B. 3724, 84th Leg. (Tex. 2015).

255. *Robbins III*, *supra* note 251, at *1.

while a defendant remains incarcerated based on what is clearly a wrongful conviction.²⁵⁶

The ambiguity of the young statute has led to judicial uncertainty in Texas. Its efficacy in expanding relief is still unclear. Other judicial renderings of the statute take a different, more limited approach leading to a hodgepodge of reasoning over legislative intent and science.²⁵⁷ These judicial interpretations should be brought in line with the express legislative intent to expand avenues of postconviction relief for convictions based on junk science.

Some case law suggests that 11.073 successfully expanded the relief initially granted under 11.071. In *Ex parte Reed*, the defendant's execution was stayed pending further order of the Texas Court of Criminal Appeals in response to the defendant's sixth application for writ of habeas corpus on the basis of new scientific evidence under the newly enacted statute.²⁵⁸ The writ alleged that the state presented false, misleading, and scientifically invalid testimony which violated due process. The previous three applications were dismissed for failure to satisfy Article 11.071.²⁵⁹ The order of the court is still pending.²⁶⁰

The same appellate court came to a different result in *Pruett v. State*. There, the defendant was convicted of capital murder of a correctional officer and sentenced to death.²⁶¹ The conviction was affirmed on direct appeal,²⁶² and the first writ of habeas corpus denied.²⁶³ In 2013, the court granted the defendant's motion for postconviction DNA and palm-print testing, which brought back inconclusive results.²⁶⁴ The defendant's second writ of habeas corpus was dismissed because the trial court judge, relying on the Texas DNA statute, held that it was not reasonably probable that the applicant would have been acquitted had the new DNA and palm-print results been available at trial.²⁶⁵ The decision was affirmed on appeal.²⁶⁶ The

256. *Id.* at *3 (Alcala, J. concurring).

257. *Ex parte* Garrett, No. WR-46210-11, 2014 WL 2491114, at *1 (Tex. Crim. App. May 7, 2014); *Ex parte* Marascio, 471 S.W.3d 832, 851 (Tex. Crim. App. 2015).

258. *Ex parte* Reed, No. WR-50,961-07, 2015 WL 831673, at *1 (Tex. Crim. App. Feb. 23, 2015) (per curiam).

259. *Ex parte* Reed, Nos. WR-50,961-04 & WR-50,961-05, 2009 WL 97260, at *1 (Tex. Crim. App. Jan. 14, 2009), and No. WR-50961-06, 2009 WL 1900364, at *2 (Tex. Crim. App. July 1, 2009).

260. *Id.*

261. *State v. Pruet*, No. B-01-M015-0-PR-B, 2002 WL 34391803, at *1-3 (Tex. Dist. Apr. 30, 2002).

262. *Pruett v. State*, No. 74370, 2004 WL 3093232, at *5 (Tex. Crim. App. Sept. 22, 2004).

263. *Ex parte* Pruet, 207 S.W.3d 767 (Tex. Crim. App. 2005).

264. *Pruett v. State*, NO. AP-77,037, 2014 WL 5422573, at *1 (Tex. Crim. App. Oct. 22, 2014).

265. *Id.* The Texas DNA statute provides:

After examining the results of testing under Article 64.03 and any comparison of a DNA profile under Article 64.035, the convicting court shall hold a hearing and make a finding as to whether, had the results been available during the trial of the offense, *it is reasonably probable* that the person would not have been convicted.

TEX. CODE CRIM. PROC. ANN. art. 64.04 (emphasis added).

266. *Pruett*, 2014 WL 5422573, at *2.

court subsequently denied defendant's application for a writ of habeas corpus brought under 11.073 on the same factual basis,²⁶⁷ because its previous holding that the new evidence did not support a reasonable probability of applicant's acquittal foreclosed habeas relief under Article 11.073, which calls for a "preponderance of the evidence" standard.²⁶⁸

The defendant's subsequent writ application brought under Article 11.073 relied on a different form of recently discredited scientific evidence relied upon by the state at his initial trial — physical match comparisons of masking tape, discredited by the NAS Report.²⁶⁹ The Texas court's holding turned on its reading of the timeliness requirement under 11.073(c), which requires "a *finding* as to whether *relevant scientific evidence was not ascertainable* through the exercise of reasonable diligence on or before a specific date."²⁷⁰ The court held the consideration of the claim procedurally barred for failure to satisfy the requirement.²⁷¹ The court reasoned that the applicant's counsel could have raised this new-scientific-evidence claim in his 2014 writ application because the 2009 NAS Report serving as the basis of the current claim was available at the time.²⁷² The court thus dismissed the application and denied the stay of execution without reviewing the merits of the claim.²⁷³

In his dissent, Judge Alcala argued for a grant of the stay and a closer examination of the evidence to fully "consider the merits of [the] complaint that junk science played a primary role in [the defendant's] conviction" while the statutory language regarding the timeliness requirement is clarified.²⁷⁴ According to the judge, the majority misread the statute by failing to consider its meaning in the context of the larger statutory scheme, specifically the legislative intent to allow

267. *Ex parte* Pruett, 458 S.W.3d 535, 536-37 (Tex. Crim. App. 2015).

268. *Id.*

269. *Ex parte* Pruett, 458 S.W.3d 537, 539-40 (Tex. Crim. App. 2015) (Alcala, J. dissenting).

270. *Id.* at 538, 540-41.

271. *Id.*

272. *Id.*

273. *Id.*

274. *Id.* at 539 ("Too many unanswered questions with respect to the meaning and application of Article 11.073 to permit a person to be executed for capital murder in a case in which it appears that junk science was used to corroborate the inherently questionable inmate testimony."). The dissenting Judge further laid out the still ambiguous elements of the statute:

Because the meaning of the temporal requirements of this statute are a matter of first impression before us, this Court should grant applicant's motion to stay the execution to fully consider whether it is this Court or the habeas court that should determine whether an applicant has pleaded facts to make a prima facie showing of "reasonable diligence" to secure the new-science evidence, whether such a pleading requirement exists at all in this context, and whether a habeas court rather than this Court must make a finding on the question of reasonable diligence as part of the trial court's findings and conclusions as to the merits of a complaint.

Id. at 542.

postconviction challenges to conviction based on junk science.²⁷⁵ Furthermore, because it is unclear whether the report date is enough to defeat the timeliness requirement, the decision at a pleading stage is not appropriate, and the case should be determined on its merits.²⁷⁶

By effectively holding that a case will be dismissed if an applicant cannot make a prima facie case that relevant scientific evidence was not ascertainable through the exercise of reasonable diligence on or before a specific date, the majority thus affirmed the existence of a narrow procedural bar on subsequent writ applications.²⁷⁷ According to the dissenting Judge, this is in clear conflict with the legislative intent.²⁷⁸

B. CALIFORNIA: THE WRIT OF WRATH

The California Penal Code § 1473 was amended in 1975 to include a claim of false evidence as a basis for a writ of habeas corpus application.²⁷⁹ The existing statute was amended further in 2014 by Senate Bill No. 1058 to specifically include the opinion of experts in the definition of “false evidence,” either repudiated by the original expert or undermined by scientific or technological advances.²⁸⁰ The amendment was in large part a reaction to the case of William Joseph

275. *Id.* at 541.

276. *Id.*

277. *Id.* at 541-542.

278. *Id.* at 542.

279. CAL. PEN CODE § 1473. The 1975 Amendment added subsections (b) through (d) to the statute:

(b) A writ of habeas corpus may be prosecuted for, but not limited to, the following reasons:

(1) *False 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.

(2) *False physical evidence*, believed by a person to be *factual, probative, or material on the issue of guilt*, which was known by the person at the time of entering a plea of guilty, which was a material factor directly related to the plea of guilty by the person.

(c) Any allegation that the prosecution knew or should have known of the false nature of the evidence referred to in subdivision (b) is immaterial to the prosecution of a writ of habeas corpus brought pursuant to subdivision (b).

(d) This section shall not be construed as limiting the grounds for which a writ of habeas corpus may be prosecuted or as precluding the use of any other remedies.

Id. (emphasis added.) Subsection (b) thus distinguished between (1) false evidence *substantially material or probative of guilt* and, in cases of a guilty plea, (2) material *false physical evidence*. *Id.*

280. CAL. PEN CODE § 1473 (2013 California Senate Bill No. 1058, California 2013-2014 Regular Session, 2014 Cal. Legis. Serv. Ch. 623 (S.B. 1058) (WEST)) The 2014 Amendment, approved in September 2014 and effective January 2015, added subsection (e) to the existing Cal Pen Code § 1473:

(e)(1) For purposes of this section, “*false evidence*” shall include *opinions of experts* that have either been repudiated by the expert who originally provided the

Richards, where a 4-3 majority of the California Supreme Court denied Richards habeas relief under the then existing § 1473 based on a repudiated forensic expert testimony.²⁸¹

Richards was convicted for first degree murder in 1997 in part on the bite mark analysis testimony of a forensic dentist, who testified that the marks found on the victim were both bite marks and consistent with the defendant's teeth.²⁸² At trial, the defense expert sought to repudiate the testimony by asserting that the photograph distortions prevented an accurate assessment of whether the marks were even human.²⁸³ Richards was sentenced to 25 years in prison.²⁸⁴

In 2007, Richards filed a habeas petition alleging, first, that the bite mark evidence introduced at trial was false and, second, that new forensic evidence indicated that he was wrongfully convicted.²⁸⁵ The state's dental expert filed a declaration supporting Richards's petition, repudiating his earlier opinion.²⁸⁶ The expert stated that his initial testimony was not based on scientific data and that he was no longer certain that the mark on the victim's body was in fact a bite mark.²⁸⁷ Additional experts testified at the evidentiary hearing that new technology which removed the distortions from the photographs made it doubtful that the indentation was a bite mark at all.²⁸⁸

While the trial court granted Richards habeas corpus relief, the California Court of Appeals reversed the decision and the Supreme Court of California affirmed, upholding his conviction.²⁸⁹ The California Supreme Court held that the expert's repudiated testimony did not constitute "false evidence" under § 1473 because he did not prove it to be "objectively false."²⁹⁰ The repudiated testimony was

opinion at a hearing or trial or that have been undermined by later scientific research or technological advances.

(2) This section does not create additional liabilities, beyond those already recognized, for an expert who repudiates his or her original opinion provided at a hearing or trial or whose opinion has been undermined by later scientific research or technological advancements.

Id. (emphasis added).

281. Cal S.B. 1058 (NS) (2013), 2013 CA S.B. 1058 (NS), California Committee Report; *In re Richards*, 289 P.3d 860 (2012). See also Radley Balko, *California's Senate has Approved an Important New Forensics Bill*, WASH. POST (Apr. 11, 2014), <https://www.washingtonpost.com/news/the-watch/wp/2014/04/11/californias-senate-has-approved-an-important-new-forensics-bill>.

282. *In re Richards*, 289 P.3d 860, 864-66.

283. *Id.* at 866

284. *Id.*

285. The new forensic evidence included: (1) DNA evidence on one of the alleged murder weapons; (2) hair found under victim's fingernail; and (3) a tuft of fiber resembling fiber in his shirt not lodged under the victims' fingernail. *Richards v. Superior Court*, Cal. App. 4th Dist. unpub. LEXIS 8542, *1, *10-11 (Nov. 26, 2014).

286. *Id.* at 11.

287. *Id.* at 11-12.

288. *In re Richards*, 289 P.3d 860, 863 (Cal. 2012).

289. *Id.*

290. *Id.* at 873.

instead merely a “good faith expert opinion about a question as elusive as what may have caused an indistinct bruise.”²⁹¹ Furthermore, considered as “new evidence,” the repudiated testimony did not justify habeas relief as it did not “point unerringly to innocence,” even when considered cumulatively with the other new forensic evidence.²⁹²

The *Richards* dissent noted that § 1473(b) did not make a distinction between lay and expert testimony and that there was no reason to make such a distinction, where the majority opinion placed a heavier burden on a defendant seeking relief from false expert testimony.²⁹³ In 2013, *Richards* filed a motion requesting further DNA testing which was subsequently denied because “favorable DNA test results would raise only an abstract, indeed speculative possibility of a more favorable verdict.”²⁹⁴

In light of this decision, the California legislature passed two bills addressing wrongful convictions: Senate Bill No. 1058 (amending Section § 1473) and Senate Bill 618 (codifying the *In re Clark* standard for new evidence relied on in *Richards*). While Senate Bill No. 1058 amended § 1473 to include the opinion of experts in the definition of “false evidence,” as part of 2013 Cal SB 618, the legislature also passed § 1485.55, codifying “new evidence” as a possible basis for habeas relief.²⁹⁵ Section 1485.55 (g) defines “new evidence” as evidence “not available or known at the time of trial that completely undermines the prosecution case and points unerringly to innocence.” The section thus incorporates both a timeliness and sufficiency of evidence requirement. Case law interpreting the statutory changes has been limited to date.²⁹⁶

291. *Id.* at 873. The court points to the “tentative” nature of the opinion by emphasizing the language used, that “petitioner’s dentition is ‘consistent with’ the bite mark.” The court elaborates further: “. . . in the case of a tentative opinion regarding a subjective question, the opinion is not proved false if, as here, the petitioner’s experts concede it might be true. Otherwise, every criminal case becomes a never-ending battle of experts over subjective assertions that can never be conclusively determined one way or the other.” *Id.*

292. *Id.* at 868-69 (quoting *In re Clark*, 855 P.2d 729, 766 (Cal. 1993)).

293. *Id.* at 869-70, 877-78.

294. *Richards*, Cal. App. 4th Dist. unpub. LEXIS 8542, *20.

295. Cal. S.B.618, 2013 Chapter 800. (Cal. 2013). The relevant portion of Section 1485.55 states, “(g) For the purposes of this section, ‘new evidence’ means evidence that was not available or known at the time of trial that completely undermines the prosecution case and points unerringly to innocence.”

296. See *Jones v. Davis*, 2015 U.S. Dist. LEXIS 120213, *1, *4-5 (E.D. Cal. Sept. 8, 2015) (imposing a diligence requirement on false evidence and filing findings and recommendations denying capital defendant’s stay-and-abeyance motion and writ of habeas corpus in part due to a lack of diligence because defendant could have obtained the psychologist expert’s changed opinion sooner, despite the only recent explicit inclusion of repudiated expert opinion as “false evidence” warranting relief under § 1473). *Jones v. Davis*, 2016 U.S. Dist. LEXIS 42823 *1, *2 (E.D. Cal. Mar. 29, 2016) (affirming the magistrate’s findings after conducting a de novo review). See also *Keiper v. Holland*, 2015 U.S. Dist. LEXIS 175016 *1, n.8 (C.D. Cal. Dec. 7, 2015) (filing findings and recommendations holding that the forensic pathologist’s later testimony does not constitute “false evidence” under Cal. Pen. Code §1473 because it has not been repudiated or undermined by later scientific advances and Cal. Pen. Code §1473 inapplicable as a basis for habeas relief after the pathologist stated that there were “smaller abrasions

Further amendments are currently pending in the legislature affecting both § 1473 and § 1485.55. The proposed amendments set forth the evidentiary and timeliness requirements governing habeas claims based specifically on new evidence.²⁹⁷ While significantly lessening the sufficiency of evidence standard under which a writ of habeas corpus may be granted based on new evidence, the proposed amendments include a repeated timeliness requirement. Like the existing statute, the proposed amendments do not explicitly address forensic or scientific evidence but continue to defer to broad language of “false” and “new” evidence.

The initial version of the bill added “new evidence” as a basis for habeas relief to § 1473 and lowered the bar from evidence that “points unerringly to innocence” to evidence that “raises a reasonable probability of a different outcome.”²⁹⁸ The subsequent version of the bill further replaced the “reasonable probability” standard with evidence “of such decisive force and value that it would have more likely than not changed the outcome of the trial.”²⁹⁹

The proposal defined “new evidence” as evidence discovered after trial “that could not have been discovered prior to trial by the exercise of due diligence,” thereby articulating a temporal and diligence requirement.³⁰⁰ The currently pending proposal further reiterates the timeliness component by requiring that the “new evidence” be “presented without substantial delay.”³⁰¹ References to “new

that you might be able to exclude” from being the cause of death when pathologist earlier testified that the cause of death were multiple and combined blunt impact injuries to the head). *See also People v. Johnson*, 235 Cal. App. 4th 80, 91 (Cal. App. 1st Dist. 2015) (holding that even while the new version of the DSM may cast doubt on the validity of a paraphilic coercive disorder diagnosis, it does not reflect “scientific research that undermines expert testimony diagnosing that disorder and renders that testimony false evidence” when the commitment of a sexually violent predator does not have to be based on a disorder uniformly recognized by the mental health community).

297. CA S.B. 69 (2015)- Failed.

298. 2015 Bill Text CA S.B. 694, Reg. Leg. Sess. (Cal. Feb. 27, 2015). In the initial proposal, Section 1473(b) was to include an additional section that states: “(3) NEW EVIDENCE EXISTS WHICH WOULD RAISE A REASONABLE PROBABILITY OF A DIFFERENT OUTCOME IF A NEW TRIAL WERE GRANTED. *Id.* The identical phrase “RAISES A REASONABLE PROBABILITY OF A DIFFERENT OUTCOME IF A NEW TRIAL WERE GRANTED” was added throughout Section 1485.55 to lessen the petitioner’s evidentiary burden.

299. 2015 Bill Text CA S.B. 694, Reg. Leg. Sess. (Cal. July 16, 2015). The proposed **1473(b)(3)(A)** states: “New evidence exists ~~which would raise a reasonable probability of a different outcome if a new trial were granted.~~ THAT IS CREDIBLE, MATERIAL, AND OF SUCH DECISIVE FORCE AND VALUE THAT IT WOULD HAVE MORE LIKELY THAN NOT CHANGED THE OUTCOME AT TRIAL. *Id.*

300. *Id.* The added Section 1473(b)(3)(B) states: “FOR PURPOSES OF THIS SECTION, “NEW EVIDENCE” MEANS EVIDENCE THAT HAS BEEN DISCOVERED AFTER TRIAL, THAT COULD NOT HAVE BEEN DISCOVERED PRIOR TO TRIAL BY THE EXERCISE OF DUE DILIGENCE, AND IS ADMISSIBLE AND NOT MERELY CUMULATIVE, CORROBORATIVE, COLLATERAL, OR IMPEACHING.” *Id.*

301. 2015 Bill Text CA S.B. 694, Reg. Leg. Sess. (Cal. Feb. 28, 2016).

evidence” are removed from Section 1485.55,³⁰² which is designed only to regulate appropriations in cases of granted habeas relief.³⁰³

These statutes are not perfect, but they are necessary. The procedural options a prisoner might embark on to demonstrate innocence do not offer a true road to challenging a conviction based upon old or bad science. The lack of these statutes may be of little concern to legislators in an era when criminal justice reform is popular but letting people out of prison is not. I am reminded of the late Supreme Court Justice Antonin Scalia’s message in the Troy Davis case: “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.”³⁰⁴ What might be discredited science today was okay yesterday and that seems to make it fair.

V. PROPOSAL: DON’T MESS WITH TEXAS (WELL, MAYBE JUST A LITTLE. . .)

Junk science statutes are difficult pieces of legislation to stitch together. Regardless of the amount of work invested, these laws necessarily lean more toward a one-size-fits-all rather than an individualized remedy. Moreover, by their nature, junk science statutes must be reactive rather than proactive because it applies solely to the postconviction phase. Consequently, junk science statutes cannot prevent a wrongful conviction from occurring. Criminal justice remedies are imperfect for a number of reasons, but the imperfection is particularly acute in the field of wrongful convictions because even a positive end result (freedom) will always be tainted by the harm (years of wrongful imprisonment).

None of those are good reasons to avoid putting junk science statutes on the books, but with only two states entering the fray, it certainly appears that most lawmakers would rather not have the tough conversation (or admit) that sometimes even science gets it wrong and produces bad convictions. There should be something unsettling and unfair about someone spending the rest of (or even a portion of) his or her life in prison because we put too much confidence behind shoddy science.

There is no wiggle room: we have a responsibility to correct inaccurate forensic conclusions and remedy unjust results. Even if the justice system holds fast to finality rather than fairness, our moral code should provide an avenue of relief for discredited science—such as the hundreds of cases that now hang in the balance due to the revelation that microscopic hair evidence is unreliable. In its

302. *Id.*

303. *Id.*

304. *In re Davis*, 557 U.S. 952, 955 (2009) (Scalia, J. dissenting). In 1994, Justice Scalia also voted against a petition asking the Supreme Court to review the case of Henry McCollum. McCollum was North Carolina’s longest-serving death row inmate. McCollum and his half-brother Leon Brown were convicted of raping and killing an 11-year-old girl. They were later exonerated in 2014 after DNA evidence cleared them of the crime. Corey Adwar, *Justice Scalia Says Executing the Innocent Doesn’t Violate the Constitution*, BUS. INSIDER (Sept. 4, 2014), <http://www.businessinsider.com/antonin-scalia-says-executing-the-innocent-is-constitutional-2014-9>.

starkest form, when corrupted evidence is used to sustain a conviction it causes our criminal justice system itself to be unreliable.

I will quickly dispose of the California statute because in my mind it requires such a narrow situation that it is mostly useless to address the real problem with flawed forensic evidence. True, there is at least an attempt to retrofit that bill to make it more accessible. The rewrite, if passed, may change my assessment, but as it stands, that statute helps but a few individuals who are able to demonstrate that the evidence is false. For inmates, the message is “don’t bother.” The Texas statute, on the other hand, merits real consideration for widespread adoption.

At base, the Texas statute is fundamentally a good statute, and we do not need to reinvent the wheel when we can instead plug a few holes. First, it gets the standard of proof right. Preponderance of the evidence appreciates the realities of these cases: they are difficult to bring and rarely win. Sometimes DNA exists, but in other cases there is no DNA, and imposing any higher burden would (practically speaking) likely derail most of the non-DNA cases *ab initio*. Of course, cases based mostly on eyewitness testimony would still be doomed under this standard.³⁰⁵

My endorsement of the Texas statute, however, should not be interpreted as an assessment of perfection, but rather a reflection of practicability. Texas is a large, conservative state that to its credit is attempting to tackle problems in forensic science. I do take issue with some of its phrasing, namely the use of “changed” science. What constitutes a change in science? As Simon Cole notes, there are many ambiguities attached to the nebulous phrase “changed scientific knowledge” which make it difficult to deduce an objective assessment:

[D]oes it inhere in an individual or a collective; which individual or collective; and what constitutes change –mean that courts will as ample leeway for interpretation as they have had over the admissibility of scientific evidence. What constitutes changed scientific knowledge will be, unfortunately, in the eye of its judicial beholder.”³⁰⁶

I cannot agree more. Much like the assessment of the reliability of forensic science on the front end of a case, the determination by a judge as to what qualifies as “changed scientific knowledge” is inherently treacherous. Is it along the lines of undermining an entire forensic discipline, such as hair microscopy or bite mark evidence? Is it something less—such as a voluntary certification body changing reporting terminology such that older convictions could be called in to question like latent print comparisons? Do changed probability calculations meet the threshold, as in the DNA mixture cases? As Cole observes, “change is more conceptual; it

305. First, experts on the problems with eyewitness testimony often are not allowed to testify because courts deem it to be within the common knowledge of a jury that eyewitnesses might be wrong, so any “change” in the science of eyewitness identification probably would not qualify under this statute.

306. Simon A. Cole, *Changed Science Writs*. ___ AM. BAR ASSOC. J. LIT. ___ (forthcoming 2016)

concerns the proper way of interpreting and reporting the testimony. Moreover, the scientific change did not consist of anyone ‘inventing’ or ‘discovering’ anything.³⁰⁷

Indeed, for years, lawyers and scholars have attempted to draw attention to the shortcomings of pattern identification evidence—hair, fiber, toolmarks, fingerprints and the like. Until 2009, (when the NAS Report was released), these criticisms seemed like picky defense attorneys seizing the research of scientists untrained in the forensic disciplines to try and poke holes in well-established techniques. The tide appears to be changing—if ever slowly—with research now underway by the National Institute of Technology and other research partnerships among crime labs and universities to develop standards and probabilistic methodologies for the strength and quantification of forensic evidence. But that does little for the “thousands of inmates [who] were convicted on forensic evidence reported in a categorical, qualitative fashion that. . . often overstated the probative value of the evidence.”³⁰⁸ Mechanisms that help these prisoners challenge that evidence are lacking (with Texas as the standout) or poorly written (see California’s statute).

I would eliminate the word “changed” all together because it is too narrow. Moreover, while the delineated circumstances in which a court can consider the so-called change—“the field of scientific knowledge, a testifying expert’s scientific knowledge, or a scientific method on which the relevant scientific evidence is based”³⁰⁹—seem broad, they also seem to be an exclusive list. If interpreted narrowly, this omits other circumstances that might warrant a junk science statute, such as fraud, misrepresentation, or lack of qualification by the examiner. A change in probabilistic formulas might also escape review. Additionally, I would not link those delineated circumstances to the determination of whether the scientific evidence could have been discovered (as section 11.073(d) does). Instead, I would link those (and broaden them) to the determination of whether the evidence would have produced a different result by a preponderance of the evidence.

Of course, this begs the question of whether there is a way to craft a junk science statute that affirmatively addresses all of the concerns and in a way that does not deter or impede the current research being done to improve forensic science. There must also be an understanding that these statutes are not the proper mechanism for wide-scale case reviews, like those taking place for hair microscopy and bite marks. Beyond case-based reviews, the American Association for Advancement of Science is undertaking sweeping reviews of forensic science disciplines, and NIST and the National Commission on Forensic Science have spent the better part of three years evaluating forensics from top-to-bottom.³¹⁰ These case

307. *Id.*

308. *Id.*

309. TEX. CODE CRIM. PROC. ANN. Art. 11.073.

310. *Forensic Science Assessments: A Quality and Gap Analysis*, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, <http://www.aaas.org/page/forensic-science-assessments-quality-and-gap-analysis>. Unfortunately, recent events are poised to bring the work of the National Commission on Forensic Science to a possible standstill. The Trump administration announced on April 10, 2017 that it would dismantle the Commission. See Jessica Gabel Cino, *Sessions Assault on Forensic Science Will*

and science reviews are perhaps in a better position to study and *prevent* future wrongful convictions and eliminate the continued use of shoddy science. Correspondingly, the junk science statute is the most direct way for an innocent person to *respond* to the findings of those reviews and investigations and obtain relief. The various entities should work in tandem and share information because keeping an innocent person in limbo while a reviewing body performs long-term evaluations may only extend the time spent in prison.

Thus, I propose a few tweaks to the Texas statute (see Appendix). The proposal is an effort to correct the shortcomings of challenges to scientific evidence under current postconviction procedures married with the promise of junk science statutes. It removes “changed” from the calculus altogether, because that term is plagued by ambiguity and detriment. I also think it is important that a person neither runs afoul nor exhausts other state or federal remedies by taking advantage of this legislation. Foreclosure and finality may have a place in the criminal justice system, but the time has come to stop letting them be the drivers of the system. Science is not static: what is thought to be reliable today may require more than one challenge as the science improves, so I have attempted to correct the concern that a successive petition might be outright denied. Science evolves, as should the way in which we approach innocence and wrongful convictions.

VI. CONCLUSION

French mathematician and physicist Jules Henri Poincare wrote: “Science is facts; just as houses are made of stones, so is science made of facts; but a pile of stones is not a house and a collection of facts is not necessarily science.”³¹¹ Our criminal justice system depends increasingly on forensic science to fill the gaps that ordinary facts cannot. We should therefore expect more from science if we continue to couch convictions within its confines. Because the criminal justice infrastructure devotes a tremendous amount of energy to preserving convictions, it is difficult to see its weaknesses laid bare as something that ultimately will strengthen the system. But the unmasking of those weaknesses will be the opportunity to correct decades of fundamentally flawed forensic applications.

Being right should not matter more than doing right. Perhaps part of the reason that admitting a mistake becomes so untenable is that it opens up the figurative floodgates to questions about other cases. Numerous crime lab scandals around the country have made the cogs of the criminal justice system leery of coming forward with errors. Junk science statutes provide the system with a much needed ability to be more accepting of mistakes. While we have made some strides through the work of the Innocence Project and other groups, changing the status quo is an uphill battle. DNA statutes that provide for postconviction testing were a good starting point for innocence, but they cannot also be our end point. Relief

Lead to More Unsafe Convictions, NEWSWEEK (April 20, 2017) <http://www.newsweek.com/sessionss-assault-forensic-science-will-lead-more-unsafe-convictions-585762>.

311. Jules Henri Poincare (1851-1912).

cannot exist in a vacuum and we cannot make it available only to those who have testable biological evidence. DNA testing alone cannot eliminate wrongful convictions.

If our criminal justice system demands that guilt be proven beyond a reasonable doubt, then that same system should demand accurate and reliable science. Until we acknowledge and make an effort to correct the shortcomings of science, the headlines on shoddy science will continue. “Changed science writs are undoubtedly a promising trend with the potential to bring justice to many individuals to whom it might otherwise be denied due to an excessive legal attachment to the principle of finality.”³¹² We should not be content with operating a criminal justice system that remains wedded to inferior science and continues to tolerate a certain margin of error when things go awry. Evidence left behind at a crime scene does not always lend itself to reliable analysis, and appreciating the limitations of forensic science is a necessary step to improving the system as a whole. I submit that widespread adoption of junk science statutes would not be the Armageddon that some may fear. Instead, they might provide a collective sigh of relief by giving us the opportunity to do something to correct otherwise impenetrable injustice.

312. Cole, *supra* note 306.

APPENDIX

(a) This article applies to relevant scientific evidence that:

(1) was not available to be offered by a convicted person at the convicted person's trial; or

(2) contradicts scientific evidence relied on by the state at trial.

(b) A court may grant a convicted person relief on an application for a writ of habeas corpus if:

(1) the convicted person files an application, in the manner provided by *state law*, containing specific facts indicating that:

(A) relevant scientific evidence is currently available and was not available at the time of the convicted person's trial because the evidence was not ascertainable through the exercise of reasonable diligence by the convicted person before the date of or during the convicted person's trial; and

(B) the scientific evidence would be admissible under the [*applicable state*] Rules of Evidence at a trial held on the date of the application; and

(2) the court makes the findings described by Subdivisions (1)(A) and (B) and also finds that, had the scientific evidence been presented at trial, on the preponderance of the evidence the person would not have been convicted.

(c) *In making a finding as to whether relevant scientific evidence was not ascertainable through the exercise of reasonable diligence on or before a specific date, the same claim or issue could not have been presented previously in an original application or in a previously considered application if the claim or issue is based on relevant scientific evidence that was not ascertainable through the exercise of reasonable diligence by the convicted person on or before the date on which the original application or a previously considered application, as applicable, was filed.*

(d) *In making a finding as to whether a preponderance of evidence exists such that the person would not have been convicted, the court shall consider the field of scientific knowledge, the testifying expert's scientific knowledge; the scientific method on which the relevant scientific evidence, or any other relevant scientific testimony.*

(e) *Nothing in this provision shall preclude a later habeas corpus motion brought under existing state or federal law for any other claim unrelated to this statute.*