RADICALLY REIMAGINING FORENSIC EVIDENCE

Maneka Sinha

INTRODUCTION ..................................................................................................... 880

I. ABOLITION AND FORENSICS IN CONTEXT .............................................. 888
   A. The Abolition Framework ...................................................................... 889
   B. The Forensic System Today ................................................................. 892
      1. The Carceral Origins of Forensic Methods ........................................ 894
      2. Carceral Culture in Forensics ............................................................. 898

II. FORENSIC SCIENCE REFORM EFFORTS .................................................... 904
   A. Policy Reforms .................................................................................... 904
   B. Legal Reforms ..................................................................................... 908
      1. The Change in Standards Governing Admissibility of Forensic Evidence .......................................................... 908
      2. Other Efforts to Regulate the Use of Forensic Evidence in Criminal Cases ............................................................... 913

III. STRATEGIC AVOIDANCE, STIFLED REFORM ........................................... 916
   A. Collective Prosecutorial Action Against Reform ...................................... 916
      1. Muffling the Alarms ........................................................................ 917
      2. Controlling Forensic Institutions ....................................................... 923
   B. Manufactured Reliability ..................................................................... 927
      1. Flawed Testing ................................................................................ 929
      2. Meaningless Peer Review ................................................................. 930
      3. Miscalculated Error Rates ................................................................. 932
      4. “Vacuous” Standards ...................................................................... 934

IV. RADICALLY REIMAGINING THE FORENSIC SYSTEM .............................. 938
   A. An Abolitionist Framework for Reimagining Forensics ......................... 938
      1. Constructing the Framework ............................................................. 939
      2. Looking Forward ............................................................................ 943
      3. Looking Backward .......................................................................... 948
   B. Is an Abolitionist Approach to Reimagining Forensics Realistic? .............. 951
      1. The Relationship Between the Forensic and Carceral Systems ............ 952
      2. The Practicality of Abolitionism ....................................................... 953

CONCLUSION ......................................................................................................... 956
RADICALLY REIMAGINING FORENSIC EVIDENCE

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Since the 1990s, when DNA retesting in closed cases first began to reveal flaws in forensic evidence, considerable positive work has been done to improve forensic methods and to prevent the use of unreliable forensic evidence in criminal cases. But reform efforts have also run up against resistance and have not resolved the serious questions about the reliability of forensic evidence and the validity of forensic methods decades after flaws were first uncovered.

Against this backdrop, this Article makes a new intervention in the forensic reform movement. As scholars and activists have done in other contexts, it draws from abolitionist principles to begin constructing a new framework for reimagining forensics based on an acknowledgment that forensic methods are carceral tools that enable and support surveillance, policing, prosecution, and punishment. It considers how the application of an abolitionist framework to forensic reform might illuminate new, previously unconsidered avenues for radical transformation of the forensic system. In doing so, this Article anchors the conversation about what is needed to meaningfully improve forensic methods in the broader, modern movement for criminal justice reform and begins to radically reimagine the forensic system.

**INTRODUCTION**

People in the crime lab are saying the tire prints match, the shoe prints match, the hair matches, the bite marks match. Because of these unreliable methods, innocent people are going to prison. It’s the whole profession. It’s the whole system. It’s the whole methodology. It’s all junk.

—Peter Neufeld, co-founder of the Innocence Project.¹

* * *

Many forensic disciplines, purportedly scientific staples of police investigation and prosecution, have never been established as scientifically valid.² A plethora of literature has shown that much forensic evidence that is

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¹ The Innocence Files: The Evidence: Indeed and Without Doubt (Netflix, Inc. 2020).
Radically Reimagining Forensic Evidence

presented in criminal cases is faulty because (1) the underlying method itself is inherently invalid (as with bitemark analysis and several other forensic techniques); (2) an otherwise valid method is misapplied to produce faulty results (such as when DNA analysis is pushed beyond reliable limits); or (3) because forensic examiners exaggerate results or come to scientifically unsupported conclusions (for example, when examiners testify to “absolute certainty,” a “zero percent” error rate, or an unqualified identification). Regardless of the reason, what gets presented in court often is unreliable, invalid, unsupported, or simply not science at all. It persuades judges and juries nonetheless.

See supra note 2 and accompanying text; see also Paul C. Giannelli, Forensic Science: Daubert’s Failure, 68 CASE W. RES. L. REV. 869, 876–909 (2018) (categorizing bitemark analysis, hair comparison analysis, fire science, and comparative bullet lead analysis as discredited forensic techniques).


5. See supra note 2, at 4; PCAST REPORT, supra, at 81–82 (noting that foundational validity is not established for some applications of DNA analysis of complex mixture samples); id. at 104–12 (noting that firearms analysis lacks foundational validity); id. at 117 (“finding that attempting to ‘associate shoeprints with particular shoes based on specific identifying marks’ is not scientifically valid”); id. at 95–102; BRANDON L. GARRETT, AUTOPSY OF A CRIME LAB: EXPOSING THE FLAWS IN FORENSICS 5–9 (2021) (explaining that “many forensic examiners do not use methods that are based on solid scientific research” and that the reliability of many forensic methods is “untested and unknown”).

6. See supra note 2, at 4; PCAST REPORT, supra, note 2, at 3 (“[A]ll . . . [forensic methods] have non-zero error rates.”); WILLIAM THOMPSON ET AL., AM. ASSN. FOR THE ADVANCEMENT OF SCI., FORENSIC SCIENCE ASSESSMENTS: A QUALITY AND GAP ANALYSIS 10, 60–67 (2017), https://www.aaos.org/sites/default/files/s3fs-public/reports/Latent%2520Fingerprint%2520Report%2520FINAL%2528%25205%2529_14.pdf?adobe_mc=MCMID%3D286415703826355094416438989230097469%7CMC%257CS%253D%257CorgID%3D242B6472541199F70%4C986%252540AdobeOrg%7CS%3D1639853770%7Csee%252520also%252520Williams%252520v.%252520United%252520States%25252C%252520130%252520A.3d%25252C%252520343%25252C%252520352%252520%252528D.C.%2525202016%252529%252529%252528Easterly%252C%252520J.,%252520concurring%252529%252529%252528observing%252520that%252520there%252520is%252520no%252520‘statistical%252520basis%252520for%252520asserting%252520the%252520certainty%252520of%252520a%252520match%252520in%252520some%252520forensic%252520disciplines%252529); 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/2015/04/18/39e898c6-e515-11e4-b510-962cfafbc310_story.html (reporting that “[o]f 28 examiners with the FBI Laboratory’s microscopic hair comparison unit, 26 overstated forensic matches in ways that favored prosecutors in more than 95 percent of the 268 trials reviewed” at the time of publication).

Ironically, the extent to which lay people without scientific training tend to trust forensic science evidence and mistakenly believe that it brings neutrality, fairness, accuracy, and certainty to the criminal process has allowed forensic evidence to do just the opposite. Forensic evidence is often not objective “science” in the way that most people perceive it to be: it can be manipulated to support unjust prosecutions, and it adds false legitimacy to illegitimate convictions even when faulty. The tactic has repeatedly proven successful: junk dressed up as scientific analysis has contributed to nearly a quarter of all documented convictions of innocent people to date.

These issues with forensics endure even though forensic methods have been the subject of much criticism and many attempts at reform through many phases of history. In cycle after cycle, evidence of questionable integrity has been used, a reform has been introduced as a corrective measure, the reform has proven unsuccessful, and the cycle has begun again.

One of the first such cycles arguably commenced over one hundred years ago, when fingerprint evidence was first used in a 1902 burglary trial in England. The evidence was admitted without any substantive analysis of the field despite concerns of one of the discipline’s founding fathers over the validity of the method’s fundamental premise that no two people possessed one matching fingerprint, the potential for police bias to infect judgment, and the discipline’s potential for error—concerns still at issue today. Fingerprint evidence was first admitted in an American court eight years later in a similarly...

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8. See, e.g., The Innocence Files: The Evidence: Indeed and Without Doubt, supra note 1; The Innocence Files: The Evidence: The Truth Will Defend Me (Netflix, Inc. 2020); The Innocence Files: The Evidence: The Duty to Correct (Netflix, Inc. 2020).

9. See Erica Beecher-Monas, Reality Bites: The Illusion of Science in Bite-Mark Evidence, 30 CARDOZO L. REV. 1369, 1372 (2009) (explaining that bitemark analysis is “a field replete with the trappings, if not the substance, of science” and describing how these “trappings of science” persuade nonscientist lawyers, judges, and juries).


12. Id. at 277–79. See generally THOMPSON ET AL., supra note 5.
uncritical fashion. In the years following, courts continued to admit fingerprint evidence readily without scrutiny.

Shortly thereafter came the reform. In 1923, amidst growing concerns over the liberal admission of scientifically questionable expert evidence, the District of Columbia Circuit considered the admissibility of an early iteration of a lie detector test. In *Frye v. United States*, it established a new test for the admissibility of scientific evidence that requires a method to have gained general acceptance in the relevant scientific community before it is admitted. But, *Frye* did little to stem the admission of scientifically unsupported evidence in courts. By the 1970s, more and more questionable forensic methods—like voiceprinting, hair analysis, and bitemark analysis—were being used in criminal prosecutions.

Then came the next corrective. In 1993, as an apparent response to the influx of such scientifically questionable expert evidence inundating the courts, the Supreme Court issued *Daubert v. Merrell Dow Pharmaceuticals Inc.*, which changed the legal standard governing admissibility of scientific evidence in federal courts. *Frye* did not require judges to directly assess the scientific validity of expert evidence before admitting it at trial, which *Daubert* sought to remedy. *Daubert* too, however, has done little to stem the admission of faulty forensic evidence in criminal cases.

At about the same time, DNA retesting in closed cases began to reveal significant flaws in forensic methods. High-profile efforts to educate the scientific community, lawyers, and the public about research demonstrating the unreliability of some forensic science followed. Two groundbreaking reports, the National Academies of Sciences’ *Strengthening Forensic Science in the United States: A Path Forward* (NAS Report), published in 2009, and the President’s

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14. Id. at 21.
20. *See Frye*, 293 F. at 1014.
Council of Advisors on Science and Technology’s Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods (PCAST Report), issued in 2016, made waves when they declared that a significant number of forensic disciplines routinely used to support convictions are deeply flawed and unreliable. Though these reports were critical of forensics, the blue-ribbon expert panels that authored them, each composed of elite, nationally renowned scientists, offered comprehensive policy proposals—a roadmap for how forensic methods can be improved. Among other proposals, the reports recommended removing forensics from law enforcement control and influence and infusing the forensic system with a culture of science that includes objectivity, independence, transparency, and continuous reexamination of methods.

Yet these reform efforts, too, have not yielded meaningful improvements. Neither report has had a significant impact on preventing the admission of faulty forensics in courts. While both are examples of positive developments in forensic reform, their failings are apparent to the critical observer. Inherent in these and other attempts to improve forensic methods is a recognition that, even after waves of attempted reforms, questions about the reliability and validity of forensic methods persist. Moreover, many reform efforts have been
stalled by resistance from both the law enforcement and forensic communities.32

Why do these cycles repeat? Why have these and other efforts to improve forensics faltered? This Article makes a new contribution to the significant literature that seeks to answer these questions. It draws from the principles and practice of carceral abolitionism33 to rethink forensic reform through a new lens. In doing so, it offers those interested in pursuing forensic reform the opportunity to perceive problems with forensics in new ways, to highlight flaws in reform approaches that have been made to date, and, crucially, to illuminate new pathways for meaningful change.

In recent years, outside of the forensic context, reformers have increasingly drawn from abolitionist theory and practice to consider new approaches to pervasive problems in criminal law enforcement, like police violence.34 In the wake of the historic protest movement sparked by the police killings of Breonna Taylor, George Floyd, and others,35 increasing numbers of people have criticized traditional approaches to police reform—like increasing police training, creating civilian police oversight agencies, improving management, or adding technological supports like body-worn cameras—for failing to prevent police violence and other abuses.36
In lieu of traditional reform measures, activists have increasingly proposed sweeping actions ranging from defunding or dismantling police forces to total police abolition.37 Central to their argument is the idea that the functions of the carceral system, like surveillance, policing, and imprisonment, have always oppressed Black and other marginalized communities and continue to do so today.38 The factors responsible for the injustice and oppression present in policing and mass criminalization, they argue, are so deeply rooted in the system itself that modest reforms at the margins cannot yield meaningful change.39 Rather, by accepting the premise that policing is fundamentally a legitimate state function that needs to be improved, not abolished, such traditional approaches merely provide a veneer of reform that legitimizes the continued injustice visited upon Black, Brown, and other marginalized communities.40 Activists and scholars, drawing from abolitionist theory to rethink criminal justice reform, encourage pursuing “non-reformist reforms,” or taking actions that shrink and delegitimize the carceral state.41

Forensics, however, has been left out of these emerging conversations. Yet, an abolition-based framework can be applied beyond policing and prisons to seemingly less obvious aspects of the criminal legal system.42 Forensic methods are squarely classifiable as carceral tools; they uniquely support law enforcement activity—investigation, prosecution, and punishment—and indeed, most

42. These principles can and have been applied outside the criminal legal context. See Akbar, supra note 41, at 112 (describing non-reformist reform approaches outside the criminal legal sphere including “cancel rent, give land back, abolish ICE, free them all, and make reparations”).
forensic methods were developed expressly for this purpose.43 Examining forensic reform through an abolitionist lens may offer interesting—and perhaps surprising—answers for how to improve the forensic system.

Against these backdrops, this Article begins to radically reimagine the forensic system by applying an abolitionist framework to the problem of forensic reform. It draws on the literature and advocacy around carceral abolition to consider the forensic problem anew. The Article proceeds in four parts. Part I provides context for understanding why adapting an abolitionist framework for forensic reform may be useful. It briefly outlines the core principles of abolitionism and then summarizes the state of the forensic system today. It traces the carceral origins of forensics and describes the deficiencies in scientific rigor and culture that endure in many forensic disciplines. Part II then outlines forensic reform efforts to date, finding that most have had minimal success.

In order to elucidate the potential utility of applying an abolition framework to forensic reform, Part III uncovers and examines dual forces entrenched in the forensic system that serve as roadblocks to meaningful reform. First is the efforts of prosecutors. While there has been substantial study of the power prosecutors wield in the criminal legal system and their contribution to mass criminalization,44 aspects of their contribution to criminal injustice remain overlooked.45 In the forensic arena, individual prosecutors’ efforts to secure convictions even through the presentation of problematic evidence have been well explored.46 Less explored, however, is their record of collective, organized action to prop up suspect forensic disciplines and stifle reform efforts—actions that continue today. They have acted, largely with impunity, to undermine research efforts aimed at improving forensic science, to reject reform proposals, and even to dismantle national agencies established to enhance the scientific


45. For example, advocacy around the 2020 Black Lives Matter protest movement has centered predominantly around dismantling or defunding police forces. See #DefundThePolice, BLACK LIVES MATTER (May 30, 2020), https://blacklivesmatter.com/defundthepolice/; see also Kesslen, supra note 37. Prosecutors, meanwhile, have managed to evade becoming a target of calls for reform, despite their significant role in contributing to criminal injustice. E.g., Rachel Cicurel, Opinion, Don’t Stop with the Police: Check Racism in the Prosecutor’s Office, WASH. POST (July 9, 2020), https://www.washingtonpost.com/opinions/2020/07/09/dont-stop-with-police-check-racism-prosecutors-office/.

validity of forensic methods. Part III thus provides an update to the literature considering the influence of prosecutors in the criminal legal system and their role in blocking forensic reform.

Part III also builds from Part II’s survey of reform efforts to include a critical analysis of two reform bodies, the National Commission on Forensic Science (NCFS) and the Organization of Scientific Area Committees (OSAC). It concludes that the efforts of these bodies, though well intentioned or incrementally positive, are insufficient to resolve the pervasive problems in forensics.

Additionally, Part III contains a novel examination of the role that various segments of the forensic community have played in resisting reform. It unearths ways in which forensic practitioners have advanced methods of questionable validity while resisting efforts to reform the system. It documents how segments of the forensic community have leveraged their understanding of the evidentiary admissibility rules in ways that perpetuate a perception of forensic methods as more scientific than they are.

Part IV begins to radically reimagine the forensic system. It utilizes an abolitionist prism to develop a three-pronged framework for evaluating forensic reform. The first prong asks how well the reform adheres to core principles of abolitionism. The second asks how the forensic method at issue is used and requires evaluation of whether the method at issue serves a purely carceral purpose—like criminal surveillance—or whether it has a nonpunitive purpose, like identification, that supports noncarceral functions, like achieving accountability. The third prong focuses on who uses the method. It examines whether a reform allows carceral actors, like police and prosecutors, to use a technique, or if it is aimed at remedying harm by supporting use by those ensnared in the criminal legal system and communities.

Part IV then utilizes the framework to evaluate a sampling of forensic reform proposals and exposes potential new avenues for transformational change consistent with abolitionist principles. Finally, it addresses potential criticisms of the approach.

I. ABOLITION AND FORENSICS IN CONTEXT

This Part provides the context necessary to understand the potential utility of applying an abolition-based framework to reimagining forensics. It begins with a brief overview of basic principles underlying abolitionism and then lays out the current state of the forensic system and the forces that have contributed to its insulation from the broader scientific community and entrenchment as a carceral force.

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47. See infra Part III.A.
48. See infra Part III.B.
A new criminal reform dialogue has emerged in the wake of the violent police killings of Breonna Taylor and George Floyd in 2020 and the historic Black Lives Matter (BLM) protest movement that took off in response. That dialogue has brought decades-old prison abolition theory and principles—long relegated to activist and scholarly circles—to mainstream consciousness.

Demands to defund, dismantle, and divest the police push beyond traditional calls for mere “reform” of the criminal legal system and bring to the fore a debate that has existed across academic and activist circles for years: whether conventional reforms that seek only to improve the current system as it exists can be effective in preventing the harms that flow from subjecting individuals to the carceral system or whether more transformative steps are necessary. On one side of the debate, legal scholars, legislators, and other traditionalist reformers have largely accepted the legitimacy of carceral institutions, believing that they serve important functions like community protection and maintenance of order or, at the very least, that such institutions are so entrenched in modern society that radical transformation is unrealistic. Those who subscribe to this view see harassment and carceral violence merely as abuses of power and, accordingly, call for modest reforms to correct what they characterize as aberrations. Their proposals have sought corrections, including racial bias training for authorities, increased funding for resource acquisition, implementation of accountability mechanisms like civilian oversight boards, and improved technological supports, like body-worn cameras or surveillance devices.

On the other side, abolitionism focuses on the root causes of carceral harm. Abolitionist critics of the conventional approach argue that such reforms invest in, expand, and legitimize the carceral system without grappling
with systemic problems.\textsuperscript{56} Abolitionists ground their approach in the idea that the entire carceral structure—which surveils, monitors, and inflicts violence on Black, Brown, and other marginalized communities—has white supremacist origins that date back to chattel slavery and was erected with the purpose of maintaining a racial hierarchy.\textsuperscript{57} They question the conventional narrative that incidents of carceral violence are singular aberrations, one-off abuses, or the product of “bad apples.”\textsuperscript{58} They emphasize that, despite generations of modest “reform,” the carceral system continues to function pursuant to its original intent to dominate Black lives and communities.\textsuperscript{59} They argue that this is by design: the “abuses” that the mainstream may only now cognize, like harsh sentencing practices, police violence, and other punitive aspects of criminal “justice,” are not abuses at all, but the system operating as intended.\textsuperscript{60} As a consequence, conventional reforms cannot correct the injustices frequently produced by the criminal legal system because they do not address its rotten roots. Rather, such reforms allow the system to carry on as it always has while legitimizing the process.\textsuperscript{61}

Although “defund,” “dismantle,” and similar calls mean different things to different people,\textsuperscript{62} they have a unifying thesis. They all call for an honest examination of the illegitimate history of carceral institutions—by, for example, spotlighting that modern policing is descended from slave patrols, violent Jim Crow-era police forces, and other early policing institutions that sought to control Black people and other marginalized groups through surveillance and brutality\textsuperscript{63}—and implementation of changes that honestly confront and dismantle these violent and harmful origins. While the term “abolition” may suggest a primary focus on tearing down the current system, the philosophy is just as much about building. Abolitionists seek to replace existing structures

\textsuperscript{56} See Akbar, supra note 51, at 1802; Dorothy E. Roberts, Abolition Constitutionalism, 133 HARV. L. REV. 1, 43 (2019).

\textsuperscript{57} Allegra M. McLeod, Prison Abolition and Grounded Justice, 62 UCLA L. REV. 1156, 1162 (2015).

\textsuperscript{58} May & Yancy, supra note 36.


\textsuperscript{60} See Akbar, supra note 51, at 1782, 1824–25.


with systems that promote safety and accountability through care. The idea is that meaningful change requires scaling back and divesting from carceral institutions that create harm and replacing them with institutions designed to value Black, Brown, and other marginalized lives.

While a singular abolitionist framework cannot be isolated, scholars and leaders within the movement have extracted principles fundamental to the theory and practice. Dorothy Roberts identifies three central tenets of abolitionist theory. First, the modern criminal legal system originates with and is rooted in chattel slavery and the racist capitalist economy it supported. Second, the carceral system does not promote safety or justice; rather, it is an institution that oppresses and controls Black, Brown, and other marginalized communities. Third, a society in which the carceral institution is unnecessary can be constructed by meeting the basic needs of communities and utilizing community-based alternatives to carceral punishment to correct societal harms.

Mariame Kaba similarly identifies obligations fundamental to abolitionist activism and practice. The first, by now likely obvious, is to eliminate policing, imprisonment, and surveillance altogether. In recognition of the fact that the current system oppresses and fails to ensure safety, wellbeing, or justice, the second obligation is to reject any expansion or legitimization of the carceral state. The third argues that the state has engaged in systematic abandonment of and disinvestment in vulnerable communities by allowing—and sometimes promoting—the dissolution of the social safety net and its replacement with surveillance, policing, and imprisonment. Critical to the abolitionist

64. See, e.g., Cullors, supra note 37.
65. Kushner, supra note 61; Mariame Kaba, We Do This ‘Til We Free Us: Abolitionist Organizing and Transforming Justice 2–5, 12–13 (Tamara K. Nopper ed., 2021).
67. Abolitionist theory is deep and nuanced; its literature is rich, robust, and voluminous. The brief descriptions of it contained in this Article are meant to be a snapshot, rather than a comprehensive overview. For a more thorough introduction, see generally Akbar, supra note 51; Roberts, supra note 56; Kaba, supra note 65; Patrisse Cullors, Abolition and Reparations: Histories of Resistance, Transformative Justice, and Accountability, 132 Harv. L. Rev. 1684 (2019); McLeod, supra note 40; Angela Y. Davis, Are Prisons Obsolete? (Greg Ruggiero ed., 2003); McLeod, supra note 57, at 1156; Dorothy E. Roberts, Constructing a Criminal Justice System Free of Racial Bias: An Abolitionist Framework, 39 Colum. Hum. Rts. L. Rev. 261 (2008); Dylan Rodriguez, Abolition as Praxis of Human Being: A Foreword, 132 Harv. L. Rev. 1575 (2019); Ruth Wilson Gilmore, Golden Gulag: Prisons, Surplus, Crisis, and Opposition in Globalizing California (2007).
68. Roberts, supra note 56, at 7–8.
69. Id. at 7, 19; Alexis Hoag, Abolition as the Solution: Redress for Victims of Excessive Police Force, 48 Fordham Urb. L. J. 721, 737 (2021).
70. See Roberts, supra note 56, at 7.
71. Id. at 7–8; Lartey & Griffin, supra note 61.
72. Kaba, supra note 65, at 133.
73. See id.
perspective is that the power to make decisions about how to promote safety and justice must be transferred directly to the communities impacted by carceral harm.75

Abolitionists recognize that a complete and immediate end to the carceral state is unrealistic; rather, dismantling it requires dedicated deliberate steps in furtherance of that ultimate goal.76 Accordingly, en route to total elimination of carceral institutions, non-reformist reforms, which aim to divest power from the carceral state while highlighting the harms it causes, may be implemented.77 A non-reformist approach prioritizes contraction of the carceral institution and its power and avoids actions that validate or condone the current system.78 Divest–invest models, which seek to reallocate funds from carceral functions like policing and prisons to investments that focus on the wellbeing of Black and other marginalized people, are one example of a non-reformist reform strategy.79 The movement to defund the police is another.80

B. The Forensic System Today

Abolitionist approaches can be adapted to call for deconstruction or transformation of institutions beyond policing and prisons. An abolitionist approach has been applied to call for abolition of criminal surveillance81 and beyond the criminal legal system entirely.82 Forensics is another aspect of the criminal legal system that these approaches can be applied to.

Forensic methods enable surveillance, prosecution, conviction, and punishment—the core inputs and outputs of the criminal legal system.83 Black, Brown, and other marginalized groups, overrepresented in the criminal legal system, are especially impacted by these methods. Forensic techniques allow

75. See Vitale, supra note 38, at 224–25.
76. See Kaba, supra note 65, at 13, 96, 137.
77. See Gilmore, supra note 67, at 242; see also Roberts, supra note 56, at 114; Akbar, supra note 41, at 101.
78. Akbar, supra note 41, at 101–02.
80. See Akbar, supra note 41, at 112–13.
83. See Jennifer L. Mnookin et al., The Need for a Research Culture in the Forensic Sciences, 58 UCLA L. REV. 725, 726 (2011).
law enforcement to surveil and monitor: DNA and fingerprint databases, in which Black and Brown people are overrepresented, house identifying information of millions of individuals, and allow police to monitor and supervise communities;\textsuperscript{84} police use, often in secret, sophisticated location tracking devices to surveil;\textsuperscript{85} and emerging technologies, like facial recognition systems, allow even greater mass monitoring and surveillance.\textsuperscript{86} Databases like the FBI’s Combined DNA Index System (CODIS), the Automated Fingerprint Identification System (AFIS), and even consumer DNA databases amass biometric data in seeming perpetuity, widening law enforcement’s net of possible suspects.\textsuperscript{87} Unsurprisingly, people of color, and Black people especially, are most affected by these tactics, as law enforcement monitors their communities more than those of other nonmarginalized populations.\textsuperscript{88} Not only do forensic methods enable carceral harm, they also launder and legitimize it by cloaking carceral functions with the allegedly neutral and objective aura of science.\textsuperscript{89}

Against this backdrop, this Part briefly outlines the carceral origins of forensics and the legacy of those origins.


\textsuperscript{87} Natalie Ram, Erin E. Murphy & Sonia M. Suter, Regulating Forensic Genetic Genealogy, 373 SCI. 1444, 1444 (2021).

\textsuperscript{88} See Murphy & Tong, supra note 84, at 1851.

\textsuperscript{89} See Jessica Gabel Cino, Roadblocks: Cultural and Structural Impediments to Forensic Science Reform, 57 HOUS. L. REV. 533, 540 (2020) (“[E]veryone can sleep better at night because ‘science’ solidified the conviction.”).
1. The Carceral Origins of Forensic Methods

“[M]any forensic fields (e.g., firearms analysis, latent fingerprint identification) are but handmaidens of the legal system, and they have no significant uses beyond law enforcement.”90

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The increased use of forensic techniques in criminal cases coincides neatly with the beginning of the forty-year period of mass criminalization responsible for the explosion of the prison population evident today.91 This is not a coincidence.

Most forensic methods were first developed in police departments as investigative aids meant to produce evidence that would connect suspects to crimes and secure convictions.92 Despite the nomenclature, other than DNA analysis, forensic disciplines did not arise out of academia, research institutions, or scientific laboratories—they do not have their origins in the sciences at all.93 Their development was financed by the “War on Crime,” launched by President Lyndon Johnson in 1965, and the better-known “War on Drugs,” which

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90. NAS REPORT, supra note 2, at 52.
brought federal funding to local police departments to effectuate national crime policy.94

In the mid-1960s, partially in response to unrest in urban cities related to discriminatory policing, mass fear around rising crime took hold across America and in national politics.95 As part of a federal response to the perceived threat of crime and disorder, in 1965, President Lyndon Johnson launched the War on Crime—the less famous precursor to Presidents Nixon and Reagan’s War on Drugs—and sent Congress the Law Enforcement Assistance Act.96 The passage of the Law Enforcement Assistance Act was a watershed moment in American law enforcement; it marked the beginning of the modern era of criminal justice in which the federal government plays a direct role in local law enforcement.97

The Law Enforcement Assistance Act paved the way not only for mass criminalization but also for the widespread use of forensic methods in law enforcement seen today.98 In the leadup to the passage of the Law Enforcement Assistance Act, President Johnson established a national commission to study the perceived crime problem and develop a national law enforcement program.99 The commission focused its efforts on urban Black communities, which it believed to be at the center of the crime problem, without consultation with members of those communities.100

The commission’s sweeping final report, issued in 1967, made hundreds of wide-ranging recommendations.101 Among these were recommendations to improve police ability to utilize technological advancements like fingerprint and voiceprint analyses and other forensic techniques by establishing additional crime labs and conducting research to facilitate the use of such techniques to aid in law enforcement efforts.102 The commission also suggested that future crime-solving would require the collection and forensic analysis of physical crime scene evidence, including fingerprints, weapons, shoeprints, and trace

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95. See id. at 55–56. In reality, and contrary to popular belief, reported rising crime rates corresponded to newly implemented crime statistics measures and reporting policies that coincided with new federal crime control funding tied to reported crime rates. Id. at 1–2.
96. Id.
97. Id.
100. Hinton, supra note 94, at 83–84.
102. Id. at 245–46, 255.
evidence, and encouraged investment in lab services and the establishment of a central fingerprint database. 103

These recommendations were a significant factor in paving the way for increased attention to the development and utilization of forensic methods. 104 The commission’s recommendations became the basis for legislation that provided unprecedented funding to local law enforcement agencies to facilitate these new initiatives. 105 Billions of dollars were ultimately sent to local law enforcement, which allowed for the development of methods to collect and analyze physical crime scene evidence and resulted in the proliferation of police crime labs. 106 Notably, War on Crime dollars also funded surveillance technologies focusing on Black communities that included helicopter systems, crime prediction programs, and mobile surveillance units. 107

Federal crime policy eventually transitioned to having a near-singular focus on drugs. 108 Grant funding was tied to drug enforcement, driving up arrests and prosecutions relating to drug crimes. 109 The new pace of policing in this period required tools to serve the needs of expanded law enforcement. 110 Forensics served as one such tool. 111 These policies resulted in the development of police crime labs centered initially around drug testing. 112 These labs went beyond drug testing, however, to develop or further the use of forensic techniques in criminal prosecutions. 113 The result was increased use in criminal prosecutions of then-new forensic methods, including voiceprinting, bitemark analysis, and hair-comparison analysis. 114

As a result of its law enforcement origins, forensic disciplines have a natural alignment with one side of the adversarial process: the prosecution. 115 That alignment runs deep. 116 Forensic practitioners both work for and communicate

104. See id. at 92.
105. See Hinton, supra note 94, at 2, 104; Peterson & Leggett, supra note 98, at 623.
106. Peterson & Leggett, supra note 98, at 625.
108. See id. at 317.
109. See id. at 318.
111. See Giannelli, supra note 17, at 1199.
113. See Giannelli, supra note 17, at 1199–200.
114. Bernstein, supra note 18; Giannelli, supra note 17.
116. See id.
heavily with prosecutors and rarely work collaboratively with defense lawyers without prosecutors listening in. As a result, forensic practitioners often see themselves as part of the prosecution team, exhibiting pro-prosecution bias and willingness to provide testimony that supports the prosecution’s case, even when unwarranted. Even those who do not view themselves as an arm of law enforcement may be pressured to return the result sought by the prosecution.

Though most forensic methods were developed outside the scientific process without integrating the fundamentals of the scientific method, law enforcement co-opted the term *science* as part of a strategy to professionalize police departments by connecting them to science to give weight and credibility to forensic techniques. Practitioners described themselves as forensic “scientists,” when they were often more aptly characterized as technicians focusing on the application of methods rather than research or theory. Police departments created crime laboratories not for testing theories and hypotheses but, at least in part, for public relations.

Because forensics inherited law enforcement’s concern for securing convictions, the scientific method and process were often left by the wayside in the development of forensic methods. Given that those targeted for prosecution and conviction are disproportionately Black, Brown, or otherwise of color, it comes as no surprise that those convicted by unreliable forensic evidence are also members of marginalized communities. The overlap between the increased use of forensic techniques and the mass expansion of the criminal legal system makes clear that those who have been hit hardest by nearly five decades of expanded criminalization, Black and Brown communities, are also the most likely to bear the brunt of flawed forensics in their cases. It is difficult to quantify the effects of flawed forensics, but the available data bear this out. The National Registry of Exoneration reports that problematic forensic

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117. See Nicole Bremner Cásarez & Sandra Guerra Thompson, *Three Transformative Ideals to Build a Better Crime Lab*, 34 GA. ST. U. L. REV. 1007, 1008 (2018). Of course, the accused use forensic evidence too but with far less frequency and typically in response to prosecution evidence. Id.


119. See NAS REPORT, supra note 2, at 23–24.


121. See Crist & Requarth, supra note 92; see also Saks & Faigman, supra note 121, at 157–58.


evidence has contributed to twenty-four percent of wrongful convictions.126 Of that group, fifty-four percent of those convicted are Black or Latine.127

2. Carceral Culture in Forensics

A consequence of these law enforcement origins is that forensic methods developed insulation from traditional scientific checks and balances like independent review, critique, and repeated testing, and in turn, a scientific culture designed to promote these features did not emerge.128 This lack of scientific culture remains entrenched today and has evolved into a significant hurdle for reform efforts.129

Because it is both outcome-oriented and influenced by adversarial interests, forensic science is distinct from the broader scientific community.130 Whereas the scientific process aims to generate knowledge via the scientific method by promoting continuous research and reevaluation of ideas and methods as opposed to the achievement of a specific outcome,131 forensic methods focus on processing cases and obtaining convictions.132

While counter influences, like profit motives, do exist in science, the broader scientific community utilizes incentive and feedback structures designed to guard against straying from scientific methodology and generating false results in pursuit of predetermined outcomes.133 It embraces a group-driven process for generating knowledge that involves multiple levels of evaluation of scientific work;134 researchers present findings to each other, and feedback is either approving or critical, potentially resulting in disproval of the presented work.135 Scientific accomplishment and professional recognition may


129. Lander, supra note 93; see also Giannelli, supra note 121, at 517–18 (“Instead of taking the lead in ensuring that the needed research was conducted, many forensic practitioners adopted a ‘circle the wagons’ mentality and attacked the critics.”).

130. See Cinos, supra note 89, at 534; Mnookin et al., supra note 83, at 731; see also Balko, supra note 93.

131. See Lander, supra note 93, at 1662; Cinos, supra note 89, at 534.


133. Risinger & Saks, supra note 128.

134. See id.

135. See Cinos, supra note 89, at 539.
be valued over profit or outcome. The threat of losing professional recognition by generating false information or techniques promotes adherence to the scientific method and serves as an additional deterrent to shortcuts to thorough research.

Another check is peer review, which, while imperfect, serves several functions for increasing the reliability and accuracy of science. As a threshold matter, before publication, research is reviewed to ensure that it meets scientific standards. Additionally, in the broader scientific community, scientific journals are listed in widely available indices and are available through libraries. Publication in widely disseminated journals encourages scrutiny, transparency, and continued reevaluation, particularly if underlying data are made available. Additionally, some databases maintain listings of journals that meet certain quality criteria and impact ratings, which measure the scholarly impact of a journal based on citation rate.

Peer review can take several forms. Review can be “double blind,” traditionally considered to be best practice, where the identity of the author is not disclosed to the reviewer and that of the reviewer is not disclosed to the author. The aim of double-blind peer review is to prevent bias from infecting the review process and to encourage honest review of work. Review can also be “single blind,” in which the reviewer knows the identity of the author, but the reverse is not true. Least tailored to ensure neutrality is open review, in which both parties know each other’s identities and can communicate about a draft.

Many peer-reviewed journals also encourage neutrality by requiring authors to disclose potential sources of bias, including grant sources, competing interests, and financial disclosures.

136. Id. at 536–37.
137. Id. at 536–37, 39.
140. See Mnookin et al., supra note 83, at 754–55.
141. Id. at 755–58.
144. Mnookin et al., supra note 83, at 771.
145. Anderson, Parsons & Rennie, supra note 143.
146. See id.
interests, and other affiliations. Some also disallow editors from having an interest in technologies or companies that may produce research that they may be required to review. For example, all but one of the 117 journals designated as “Core Clinical Journals” by the National Library of Medicine have a conflict policy requiring, at a minimum, authors to disclose financial conflicts of interest. A majority requires one or more additional conflict disclosures.

While forensic disciplines claim to have similar journals, many forensic journals lack the quality, rigor, transparency, and accessibility of mainstream scientific journals. They are not nearly as accessible or widely disseminated as mainstream scientific journals, shielding forensic work from scrutiny. Moreover, many do not utilize rigorous peer review, limiting the quality of checks on published work as well as insulation from bias. Many journals do not employ double-blind—or even single-blind—review. They also lack the transparency of peer-reviewed journals: many forensic journals are not widely accessible through major indexing services or libraries, and very few are listed among journal database listings as quality, high-impact journals.

On top of this, forensic researchers have purposefully failed to gather data and have been reluctant to release research data, limiting retesting and further research. Likewise, some forensic science journals have no conflict-of-interest policy whatsoever, while others employ watered-down versions of those of mainstream journals.

151. Id.
153. Mnookin et al., supra note 83, at 754.
154. Id. at 754–57.
155. See id.
156. Id.
157. See id. at 756; Sarfaraz Alam, List of Science Citation Index (SCI) Journals, RESEARCHGATE (Mar. 2019), https://www.researchgate.net/publication/331546716_List_of_Science_Citation_Index_SCI_journals; Chin, Ribeiro & Rairden, supra note 152, at 271.
158. Cino, supra note 89, at 538; see also, NIST DNA MIXTURE INTERPRETATION FOUNDATION REVIEW, supra note 4, at 75, 87.
Other safeguards, cues, and indicators exist to ensure that ideas, techniques, or products are valid. Basic market forces, like competition and consumer reviews, help give end-users confidence in the efficacy of products, devices, or treatments. Competition, for example, encourages innovation and the production of ideas.160 But competition in the traditional sense does not exist in forensics because forensic methods are predominantly practiced outside of traditional markets. Once a conviction is obtained, there is little incentive for prosecutors to encourage further research that might result in findings that undermine the forensic evidence that has proven persuasive to judges and juries.161 Instead, forensic practitioners often receive positive feedback, regardless of the accuracy of their findings.162

For-profit carceral technologies further demonstrate this point. Take ShotSpotter as an example. Essentially, ShotSpotter purports to be a gunshot detection system that uses a network of microphones installed in various locations to detect and locate gunfire.163 The system uses an algorithm to approximate the location of alleged gunshots.164 Investigations have shown that ShotSpotter microphones are installed mostly, if not exclusively, in predominantly Black and Latinx neighborhoods.165

ShotSpotter is sold and marketed exclusively to police departments and is incentivized to satisfy those customers.166 Independent investigations have revealed that ShotSpotter analysts sometimes reclassify sounds the system originally characterizes as non-gunfire as gunshots and alter other data.

162. See THOMPSON, supra note 93, at 127–28 (describing this process as a “kudos” effect).
164. Id.
including the location of the sounds.\textsuperscript{167} Frequently, these alterations are requested by ShotSpotter’s police customers.\textsuperscript{168}

Because of its law enforcement alignment, ShotSpotter has evaded scrutiny. According to reports, ShotSpotter itself has not conducted any scientific studies to assess its ability to distinguish between gunfire and other loud noises, nor has it allowed outside testing of its system.\textsuperscript{169} Recent investigations have exposed ShotSpotter as unreliable in unearthig crime and in impacting arrest rates.\textsuperscript{170}

Regulatory structures, though imperfect, also serve as a check on reliability. Approval of drugs by the U.S. Food and Drug Administration (FDA), for example, means that research and testing on a drug have been conducted pursuant to FDA regulations and have been reviewed by trained FDA regulators.\textsuperscript{171} If a drug does not work as intended, say a vaccine does not prevent contraction of a disease, it is less likely to earn FDA approval, and governments, hospitals, or pharmacies will instead turn to competitors.\textsuperscript{172}

Checks like these are largely absent in the forensic science system.\textsuperscript{173} Forensic practitioners operate largely independently without receiving critical—or any—feedback on their results from peers or end-users.\textsuperscript{174} The majority of forensic work is conducted in crime labs, and examiners are not encouraged to test and refine forensic techniques or conduct research to ensure sound scientific underpinnings or accuracy of methods.\textsuperscript{175} Instead, outcome-based, nonscientific markers—like whether a technique is admitted at trial, whether techniques can stand up to cross-examination, and whether they secure convictions—are sometimes substituted for evidence of validity.\textsuperscript{176}

Unlike general consumers in the marketplace, the “end-users” of forensic science, judges and juries,\textsuperscript{177} are typically not well-versed in science\textsuperscript{178} and are


\textsuperscript{169} Feathers, supra note 167; MacArthur Just. Ctr., supra note 166.

\textsuperscript{170} MacArthur Just. Ctr., supra note 166; Mitchell L. Doucette et al., \textit{Impact of ShotSpotter Technology on Firearm Homicides and Arrests Among Large Metropolitan Counties: A Longitudinal Analysis, 1999–2016}, 98 J. URB. HEALTH 609, 609 (2021) (“Results suggest that implementing ShotSpotter technology has no significant impact on firearm-related homicides or arrest outcomes.”).

\textsuperscript{171} Risinger & Saks, supra note 128.

\textsuperscript{172} Id.

\textsuperscript{173} Mnookin et al., supra note 83, at 745.

\textsuperscript{174} Cano, supra note 89, at 541; see also Balko, supra note 120.

\textsuperscript{175} See Lander, supra note 93, at 1668.

\textsuperscript{176} See NAS REPORT, supra note 2, at 42; Saks & Faigman, supra note 121, at 150.

\textsuperscript{177} See Risinger & Saks, supra note 128; Mnookin et al., supra note 83, at 758.

\textsuperscript{178} Risinger & Saks, supra note 128.
easily taken in by the aura of science around forensic evidence. They do not have the equivalent of Consumer Reports or the FDA to filter out bad products from good. Instead, judges and juries receive forensic evidence filtered predominantly through one party, the prosecutor, whom they may perceive as motivated to seek fairness and justice rather than convictions and whom they effectively have no choice but to trust. Many judges are also former prosecutors who, consciously or not, hold pro-prosecution biases that make them inclined to believe in the reliability of prosecutorial evidence. Moreover, judges and juries rarely, if ever, receive feedback on the true performance of forensic evidence. One result of all of this is that judges have allowed admission of forensic evidence over and over again regardless of validity.

Another major component of scientific culture is its connection to academic institutions. Doctoral programs, in particular, are significant engines of research within the broader scientific community. These programs train scientists in proper research methodology and instill an ethics geared towards testing hypotheses against scientific evidence, not achievement of predetermined outcomes. Thus, academic institutions serve both as another layer of insulation from partisan and profit-driven biases as well as a part of the larger group-driven scientific process.

The forensic system, however, lacks the same strong connection to academics that mainstream sciences maintain. Relatively few academic programs in forensic science disciplines are offered in the United States. The
forensic science programs that do exist focus more on training practitioners than on research training.\(^{188}\) Importantly, few forensic science Ph.D. programs exist.\(^{189}\)

On top of this, many forensic practitioners are not trained at academic institutions that promote scientific rigor.\(^{190}\) Because labs have traditionally not required practitioners to be college educated, some have no college degree at all and are trained exclusively or primarily by law enforcement laboratories.\(^{191}\) Thus, while many are competent technicians, they may have none of the expertise associated with the scientific method nor an understanding of what it means to practice science.

## II. FORENSIC SCIENCE REFORM EFFORTS

Researchers, legal experts, legislators, and others have proposed a range of reforms aimed either at improving the forensic system itself or at addressing how forensic evidence is handled once it enters the legal system. This Part surveys a sampling of reform proposals and evaluates their relative success at reforming forensic science. It includes a critical examination of two institutions created with the goal of improving the forensic system: the National Commission on Forensic Science and the Organization of Scientific Area Committees.

### A. Policy Reforms


\(^{188}\) Mnookin et al., supra note 83, at 765.

\(^{189}\) Id. at 764–67; see also Find a School, AM. ACAD. FORENSIC SCI., https://www.aafs.org/careers-forensic-science/find-school?_page=1&keywords=&_limit=18&degree=25&specialty=83 (last visited Mar. 16, 2022).

\(^{190}\) Mnookin et al., supra note 83, at 765–66.

\(^{191}\) See, e.g., Beety & Oliva, supra note 2, at 487 n.12 (citing JOHN J. LENTINI, SCIENTIFIC PROTOCOLS FOR FIRE INVESTIGATION at xv (Keith Inman & Norah Rudin eds., 2d ed. 2013)).

\(^{192}\) See generally NAS REPORT, supra note 2, at 1–2.

\(^{193}\) Id. at v–ix; Koehler, supra note 2, at 33 (describing the NAS Committee as being comprised of “some of the most accomplished scientists of our era”).
state of forensics.\textsuperscript{194} Its ultimate criticisms were scathing. The NAS Report declared that “[m]uch forensic evidence . . . is introduced in criminal trials without any meaningful scientific validation.”\textsuperscript{195}

The NAS Committee proposed a series of comprehensive reforms centered around the need for scientific culture in forensic science and for improving independence, objectivity, and transparency.\textsuperscript{196} Some recommendations were fairly modest. These included establishing best practices and industry-wide standards, encouraging mandatory accreditations of forensic labs, and developing a national code of ethics.\textsuperscript{197} Others were more robust, including recommendations to improve forensic science education for practitioners, to create mechanisms for critical and competitive research, and to obtain research funding.\textsuperscript{198} Many of the NAS recommendations received broad support from legislators or were echoed by academics and researchers.\textsuperscript{199}

Underlying the NAS Report’s reform proposals was an emphasis on removing and insulating forensics from law enforcement control and influence at both the federal and local levels.\textsuperscript{200} The NAS Committee emphasized the need to avoid bias and conflicts of interest in forensic labs by removing them from police departments.\textsuperscript{201} Scholars have made the same call,\textsuperscript{202} some well before the NAS Report was issued.\textsuperscript{203}

The Committee’s central and most sweeping recommendation was to create an independent “National Institute of Forensic Science” (NIFS) outside of law enforcement control that would influence, incentivize, and guide the implementation of the recommendations laid out above.\textsuperscript{204}

Though the NAS Report initially rocked the legal and forensic science communities,\textsuperscript{205} its recommendations have either remained unimplemented or have fallen flat. The most significant recommendations were never

\textsuperscript{194} NAS REPORT, supra note 2, at xix, 1–2.
\textsuperscript{195} Id. at 107–08.
\textsuperscript{196} Id. at 18–19.
\textsuperscript{197} Id. at 24–26.
\textsuperscript{198} Id. at 19–20, 22–23, 26–28.
\textsuperscript{200} NAS REPORT, supra note 2, at 16–17, 24, 80.
\textsuperscript{201} Id.
\textsuperscript{202} See, e.g., Cássarez & Thompson, supra note 117, at 1013.
\textsuperscript{203} Giannelli, supra note 118, at 441.
\textsuperscript{204} NAS REPORT, supra note 2, at 16–20.
implemented. Though some labs have become independent since the NAS Report was issued, the vast majority are still embedded in police departments. As described in Part III, law enforcement interests successfully prevented the establishment of a centralized forensic governing body.207

Research efforts have improved the validity of some forensic methods, like fingerprint analysis, and some more recommendations have been implemented. For example, most forensic labs are now accredited. Accreditation, however, is a safeguard with limited effectiveness; it does not guarantee competence of examiners or validity of methods. Because accrediting bodies are not independent of the forensic science community, they assess labs presuming that the forensic methods are generally valid, skipping over the crucial question of whether the techniques are sound and reliable in the first place.210 And, though prosecutors, forensic examiners, and labs frequently point to accreditation as an indicator of quality, accreditation has proven inadequate in ensuring the validity of methods or preventing errors.211

Two watered-down entities did grow out of the NAS recommendations. One was the National Commission on Forensic Science (NCFS), discussed in detail in Part III.A, established by the Department of Justice (DOJ) in conjunction with the National Institute of Standards and Technology (NIST).212 The NCFS, which was only in operation from 2013 to 2017, had a modest mission: it accepted that forensic methods would be embedded in and connected to law enforcement and sought only to advise the DOJ and make


207. See Gabel, supra note 29, at 286–87; Epstein, supra note 30, at 748. In response to this opposition, some have began to express concern that establishing a centralized forensic science institution is no longer viable and that instead reform efforts should involve grassroots, ground-up change rather than a top-down approach. Gabel, supra note 29, at 288–89.

208. Cásarez & Thompson, supra note 117, at 1054–56.


recommendations on how to improve forensic methods.\footnote{Reflecting Back, supra note 212, at 4; U.S. Dep’t of Just., Renewed Charter National Commission on Forensic Science (Apr. 23, 2015), https://www.justice.gov/archives/ncfs/file/624216/download [hereinafter NCFS Charter].} While its outputs were not insignificant, the NCFS recommendations did not result in the lack of scientific underpinning of forensic disciplines being addressed, nor did they change the way forensic evidence is used against the accused.\footnote{Epstein, supra note 30, at 754 ("At the most rudimentary level of analysis, from a data-driven perspective, the Commission’s work and indeed its existence can be seen as having had no relevance to the judiciary.").}

Second, in response to calls by the NAS and others to improve standards governing forensic science work,\footnote{NAS Report, supra note 2, at 23–25; see also Press Release, Off. of Sen. Patrick Leahy, supra note 199.} the Organization of Scientific Area Committees for Forensic Science (OSAC) was established in 2014.\footnote{Matthew F. Redle & Christopher J. Plourd, A Path Forward: The Value of Forensic Science Standards Development and Use to the American Legal System, 35 Crim. Just. 58, 58 (2020).} The OSAC, still in operation today, aims to produce “technically sound standards and guidelines” for use by the forensic community.\footnote{The Organization of Scientific Area Committees for Forensic Science, Nat’l Inst. of Standards & Tech., https://www.nist.gov/osac (last visited Apr. 19, 2022).} As described in detail in Part III.B, the standards produced through the OSAC process vary in quality and effectiveness.

The OSAC is an understandable and natural outgrowth of the NAS recommendations. But an unintended consequence of its work is to add a sheen of legitimacy to the forensic system without confronting more systemic concerns. A lack of standards has never been the primary problem with forensic methods. Although standards are necessary to ensure a baseline level of quality and consistency in forensic practice, standards themselves do not establish scientific validity.\footnote{Simon A. Cole, Who Will Regulate American Forensic Science?, 48 SETON HALL L. REV. 563, 566–68 (2018); Jonathan J. Koehler, Forensics or Fauxrensics? Ascertaining Accuracy in Forensic Sciences, 49 ARIZ. ST. L.J. 1369, 1388 (2017).} Moreover, despite the patina of legitimacy the OSAC adds, as a result of structure, composition, and red tape, standards are produced slowly and are often superficial rather than substantive.\footnote{See Cole, supra note 218, at 577–78.} And OSAC lacks enforcement power and thus cannot mandate adherence to standards at the lab level.\footnote{Id. at 580.}

Seven years after the issuance of the NAS Report, a working group of the PCAST, another body of the country’s leading independent scientists and engineers,\footnote{Koehler, supra note 2.} assembled to advise the President on matters relating to science and technology (PCAST Working Group),\footnote{PCAST Report, supra note 2, at iv–vii.} undertook a follow-up study to
determine what progress had been made since the issuance of the NAS Report in 2009 and to outline what reforms were still necessary.223

The report evaluated the scientific validity of a subset of forensic disciplines studied by the NAS Commission.224 The PCAST Working Group found minimal progress in addressing the scientific validity of forensic methods and concluded that several commonly used forensic science disciplines were not foundationally valid or that they were not even reliable in principle.225 Ultimately, it found deficiencies in every single discipline it examined.226

As with the NAS Report, the PCAST Report also provided a roadmap for improving the forensic system. Its recommendations centered around the need for additional research and other mechanisms for ensuring the validity of forensic evidence as well as development of new, objective forensic techniques.227

Some of these reform attempts have led to incremental or isolated successes including additional research in several disciplines. But despite high hopes, none have resulted in consistently greater reliability of the forensic evidence routinely used against criminal defendants.228

B. Legal Reforms

Attempts have also been made to regulate how forensic evidence can be used in the legal system. Although some recommended changes have been implemented, the same inherent structural problems within the forensic system remain, and the criminally accused remain vulnerable to convictions based on evidence of questionable validity.

1. The Change in Standards Governing Admissibility of Forensic Evidence

Judges are the gatekeepers of scientific evidence in criminal cases and are tasked with admitting only reliable, or trustworthy, evidence.229 The scientific

223. Id. at x–xi.
224. Id. at 7. These are DNA analysis, bitemark analysis, fingerprint analysis, firearms and toolmark examination, footwear analysis, and hair comparison analysis. Id. The report is careful to note that the evaluation of hair comparison analysis is not as exhaustive as those of the other disciplines. Id.
225. Id. at 4–5 (defining foundational validity), 5–13 (summarizing findings with respect to the forensic methods that were evaluated), 39. Even those techniques that the PCAST Working Group did find to be foundationally valid were not completely in the clear; the report outlines significant concerns with respect to even those disciplines, like fingerprint examination, that were found to be reliable in theory. Id. at 7–13.
226. Id. at 7–14.
227. Id. at 14–20.
228. Kaplan & Puracal, supra note 29, at 926; Cooley, supra note 29, at 397–98; Gabel, supra note 29, at 286, 309; Puracal & Kaplan, supra note 29, at 17.
229. Daubert v. Merrell Dow Pharms., 509 U.S. 579, 589 (1993); see also 1 MODERN SCIENTIFIC EVIDENCE, supra note 138, § 4:10 (describing legal reliability as a consolidation of both scientific reliability
corollary of “reliability” is “validity,” or the idea that a technique or method must fulfill the function that it aims to fulfill—that it does what it aims to do.230 A comparison of two fingerprints should reveal whether they were produced by the same source, a comparison of two shell casings should reveal whether they were fired from the same weapon, and a comparison of two DNA profiles should tell the analyst if both came from the same person or from different people.

Admissibility rules guide judges’ determinations of what may be admitted in and what must be excluded from trials.231 For decades, the governing admissibility standard was a permissive one, established in 1923 in Frye v. United States.232 The Frye standard does not require judges to conduct an independent assessment of a method’s reliability and allows judges to outsource the decision of whether forensic science evidence is admissible to those who are motivated to find it so. Under Frye, if a method is “generally accepted” as reliable by what a judge deems to be the “relevant” community of scientists, evidence deriving from it is admissible.233 In practice, then, the admissibility decision turns not on whether a method is reliable or accurate, but on whether it is commonly used and accepted by forensic practitioners.234

Courts have typically deemed the relevant scientific community to be composed of forensic practitioners themselves, notwithstanding the insular nature of forensics and its natural alignment with prosecutors.235 As a result, shoddy forensic evidence was and is frequently admitted under the Frye standard.236

In federal jurisdictions, the Frye standard was supplanted in 1993 by a new admissibility test laid out in Daubert v. Merrell Dow Pharmaceuticals.237 In Daubert, the Supreme Court decided that judges must directly assess whether a method is scientifically valid before scientific evidence may be presented in court—they were no longer, in theory, permitted to outsource that job via “general
acceptance.” The Court suggested several non-exhaustive factors to consider in evaluating scientific validity. These are: (1) whether the method at issue can and has been tested, (2) whether the method has been subjected to peer review and publication, (3) the known or potential error rate of the technique, (4) whether standards exist that control the field, and (5) the old Frye test, whether the method is generally accepted by the relevant scientific community. Since Daubert was decided, a majority of states have abandoned the Frye test in favor of Daubert’s. and in 2000, the Daubert standard was codified in Federal Rule of Evidence 702.

Many believed adoption of the Daubert standard would halt the flow of junk science in courts. But while it is a theoretical improvement over the Frye standard, it is not a perfect solution. Each of the Daubert factors can be manipulated to create an appearance of reliability, even when actual scientific validity has not been established. This is because most of the Daubert factors are not direct measures of validity.

The only factor that is directly relevant to scientific validity is the testing factor, but even that factor can be manipulated. Though testing a method to ensure its validity is an essential component of good science, not all testing is equal: the extent to which testing actually establishes validity necessarily depends on the quality and design of the test itself. Take breathalyzers, which are used to aid in determining if someone has been driving while intoxicated, as an example. Breathalyzers do not directly measure a person’s blood alcohol level (BAC); rather, they attempt to estimate BAC by determining the amount

238. Id.
239. Id. at 593–94. Because in Daubert “error rate and the existence and maintenance of standards controlling its operation” are described as a single factor, id. at 594, Daubert is frequently described as setting out four, not five, factors. Compare 1 MODERN SCIENTIFIC EVIDENCE, supra note 138, § 1:15 (identifying four Daubert factors), with 1 SCIENTIFIC EVIDENCE § 1.09 (Paul C. Giannelli et al., eds., 6th ed. 2019) (identifying five). Because error rate and standards are distinct measures of reliability, this Article describes Daubert as establishing five factors, not four.
240. Rochkind v. Stevenson, 236 A.3d 630, 633 (Md. 2020) (explaining that “[a] supermajority of states followed the Supreme Court’s lead and replaced their respective . . . standards with Daubert” in formally adopting the Daubert standard in Maryland); Motorola Inc. v. Murray, 147 A.3d 751, 752 (D.C. 2016) (adopting the Daubert admissibility standard in the District of Columbia). Of those few that retain Frye as their admissibility standard in name, many have adopted elements of Daubert’s reliability test. See, e.g., Sargon Enters., Inc. v. Univ. of S. Cal., 288 P.3d 1237, 1252 (Cal. 2012) (explaining that trial judges have a “gatekeeping” function that involves assessing whether an “expert opinion is founded on sound logic”).
241. FED. R. EVID. 702 advisory committee’s note to 2000 amendment.
244. See id.
245. 1 MODERN SCIENTIFIC EVIDENCE, supra note 138, § 1:16.
of alcohol present in an individual’s breath. 247 This is neither easy to measure, nor is it a straightforward determinant of the amount of alcohol in a person’s system; breathalyzers vary in accuracy. 248 Assume that a particular commercial breathalyzer is highly accurate in estimating BAC in those who are extremely intoxicated, but equally inaccurate in estimating BAC when used on those who are only mildly or moderately intoxicated. Assume also that the makers of the breathalyzer, who work for a for-profit company, are well aware of the variable accuracy of their technique and test it only on people who are extremely intoxicated. The results of such skewed testing would suggest that the breathalyzer was valid, when in fact, that is only true for a subset of applications. Such testing might well be seen as satisfying Daubert’s testing factor, notwithstanding the fact that it reveals nothing about the breathalyzer’s accuracy in a large set of applications, because judges typically do not engage in a deep assessment of the strength of testing. 249

Because error rates are determined through testing, satisfaction of this factor is subject to the same manipulability as the testing factor. Error rates are valuable because they suggest that a method has been tested and, in theory, give an indication of how well it was tested. 250 The error rate produced by the breathalyzer testing just described, however, would be misleadingly low for the same reason that the validity would appear misleadingly high: the testing was deliberately skewed to avoid scenarios that would produce a high error rate. The Daubert analysis does not usually prevent admissibility of evidence produced by such a method as judges tend not to investigate application-specific testing or error rates. 251

The remaining factors are less useful as markers of validity because they do not actually measure validity; they are proxies for it, making them especially subject to manipulation. Whether standards exist that control the field would, in theory, allow for confidence that a method can be reliably applied if such standards are followed, but the standards are not themselves measures of validity. As with testing, the degree to which standards are useful in this context depends on the quality of the standards. Standards in the breathalyzer context may help end-users of the machine, like police officers, employ the test properly, but they do not reveal anything about validity, or reliability, of the breathalyzers themselves. Daubert does not safeguard against the admission of evidence produced by such techniques because the standards factor is often

250.  See Giannelli, supra note 128, at 60.
251.  See Gissantaner, 990 F.3d at 468–70.
treated as a superficial one that does not require analysis of the quality of standards.252

The “peer review and publication” factor is meant to uncover whether a methodology has been subjected to the degree of scrutiny necessary to reveal—and ultimately correct—flaws.253 The prong is not meant to be satisfied merely if peer-reviewed publications exist; the body of literature should establish that the technique held up to unbiased, rigorous examination.254 All too often, however, the peer review factor is treated as a box to check off; courts deem it satisfied if they can point to a number or quantity of publications, without deeper analysis of whether the publications indicate that the method in question has held up to rigorous scientific scrutiny.255

As with the others, this factor is only as good as the journals are. Daubert does nothing to ensure that the peer-review process is doing what it is meant to in any given case. To extend the breathalyzer hypothetical, the makers of the device might publish several articles in journals with lax or non-existent standards. That quantity of publications might seem to satisfy the peer-review factor and also create an appearance of general acceptance in the scientific community, but, of course, would say little, if anything, about the breathalyzers’ overall validity.

“General acceptance” overlaps with peer review; publication in peer-reviewed journals can result in general acceptance, and reciprocally, general acceptance is often judged by the degree of publication and peer review of a method.256 General acceptance, though, turns on who constitutes the “relevant scientific community,” a subject of much debate.257 In the context of forensics, prosecutors and forensic practitioners have argued that the relevant scientific community consists only of forensic practitioners.258 Makers and administrators of the breathalyzer considered above might argue that their method of BAC measurement to be reliable. Critics, on the other hand, have argued that this definition is self-serving—of course forensic practitioners

252. Id.
254. See Jonakait, supra note 253, at 2105.
255. See, e.g., Oral Argument, United States v. Gissantaner, 990 F.3d 457 (6th Cir. 2021) (No. 19-2305), https://www.opn.ca6.uscourts.gov/internet/court_audio/aud2.php?link=audio/01-20-2021%20-%20Finish%20-%20Gissantaner.mp3&name=19-2305%20USA%20-%20Gissantaner.mp3 (In response to counsel for Gissantaner’s argument that the DNA testing method at issue had not “been adequately peer reviewed because most of the literature and the studies that have been performed are coming from the law enforcement community or from the developer[,]” a Sixth Circuit judge suggested that “it’s the fact of publication is the important component, not the author. That is my understanding of what peer review is. . . . That was traditionally my understanding of peer review, but am I mistaken on that?” (cleaned up).
256. See Giannelli, supra note 128, at 60; Anderson, Parsons & Rennie, supra note 143, at 649.
258. Id. at 483.
believe the discipline they have dedicated their careers to is reliable. Critics maintain that the relevant scientific community is much broader and necessarily includes independent scientists willing to critically evaluate forensic methods. Judges, however, have frequently been reluctant to define the relevant scientific community this broadly.

Empirical data demonstrates that adoption of the Daubert standard has not stemmed the admission of problematic forensic evidence in trials. As the breathalyzer hypothetical demonstrates, Daubert factors can be manipulated to create an appearance of validity. Judges, however, are not well equipped to identify such manipulation. More importantly, judges often do not apply the test critically. Instead, they frequently rely on precedent to continue to admit flawed forensic evidence merely because it has been admitted previously. The result is that Daubert is now blamed for too liberal admission of junk science in criminal cases.

2. Other Efforts to Regulate the Use of Forensic Evidence in Criminal Cases

Other front-end efforts have been made to improve judges’ ability to filter unreliable expert evidence out of trials. These include proposals to amend or modify Rule 702 to clarify the rule or to expand its scope. Some recommend that judges rely more frequently on court-appointed experts, not affiliated with either party, for testimony or advice regarding the reliability of a given method.

Others suggest that admissibility decisions should be taken entirely out of courts’ hands and advocate for special masters to be employed to resolve complex scientific issues. Michael Saks, among others, has suggested that a national scientific panel should be in charge of determining which forensic techniques have sufficient scientific support to be deemed admissible. Finally,
some suggest that judges just need to do better—that they should be more critical of purportedly scientific evidence and educate themselves on scientific issues.\footnote{271}{See, e.g., Saks & Faigman, \textit{supra} note 121, at 166; Radley Balko, Opinion, \textit{We Need to Fix Forensics. But How?}, \textit{WASH. POST} (June 20, 2019), https://www.washingtonpost.com/opinions/2019/06/20/we-need-fix-forensics-how/; Damon-Moore, \textit{supra} note 181.}

Despite such recommendations, no major modifications to Rule 702 have yet been made.\footnote{272}{Stylistic amendments were added to the Rule in 2011. See \textit{FED. R. EVID. 702} advisory committee’s note to 2011 Amendment. \textit{See generally Capra, \textit{supra} note 267, at 1463; No Amendment to Federal Rule of Evidence 702, At Least for Now}, \textit{NAT’L L. REV.} (Aug. 17, 2020), https://www.natlawreview.com/article/no-amendment-to-federal-rule-evidence-702-least-now.} Although amendments to the rule were proposed in 2021 and are set to take effect in 2023, they serve to clarify existing elements of the admissibility framework rather than to make substantive modifications.\footnote{273}{\textit{COMM. ON RULES OF PRAC. AND PROC., JUD. CONF. OF THE U.S., PRELIMINARY DRAFT OF PROPOSED AMENDMENTS TO THE FEDERAL RULES OF APPELLATE, BANKRUPTCY, CIVIL, AND CRIMINAL PROCEDURE, AND THE FEDERAL RULES OF EVIDENCE 3, 308–12 (2021),} https://www.uscourts.gov/sites/default/files/preliminary_draft_of_proposed_amendments_2021_0.pdf (proposing amendments to Rule 702 clarifying the burden and standard of proof and emphasizing judges’ gatekeeping function).} DOJ objected to more substantive changes, including the addition of a new subsection to the rule that would regulate overstatement of expert testimony and the addition of an Advisory Committee note specifically addressing forensic evidence.\footnote{274}{Advisory Comm. on Evidence Rules, Minutes of the Meeting of May 3, 2019 18–19, https://www.uscourts.gov/sites/default/files/final_{minutes_of_the_spring_2019_meeting_of_the_evidence_rules_committee}.pdf; Advisory Comm. on Evidence Rules, Minutes of the Meeting of November 13, 2020 5, 6–7, 9, https://www.uscourts.gov/sites/default/files/evidence_rules_minutes_fall_2020_0.pdf; \textit{see also Advisory Comm. on Evidence Rules, Minutes of the Meeting of April 30, 2021 3,} https://www.uscourts.gov/sites/default/files/evidence_rules_minutes_spring_2021_0.pdf (describing DOJ objection to proposed language “limiting” an expert’s opinion to one based on reliable application of principles and methods).}

No expert panel to resolve thorny admissibility questions has been convened. While on rare occasions courts do appoint their own experts for testimony and advisement, this is the exception, rather than a rule that has seen widespread implementation.\footnote{275}{\textit{See, e.g., United States v. Gissantaner, 417 F. Supp. 3d 857 (W.D. Mich. 2019), rev’d, 990 F.3d 457 (6th Cir. 2021).}}

In addition to recommendations regarding the courts’ gatekeeping function, some have proposed that discovery rules be modified to require more comprehensive disclosures to defendants relating to forensic analyses.\footnote{276}{\textit{See Marjorie Anne McDermid, Mandating Meaningful Forensic Discovery: A Proposal to Fuel the Engine of Truthfulness}, 51 \textit{IND. L. REV.} 641, 659 (2018); NAT’L COMM’N ON FORENSIC SCI., \textit{RECOMMENDATIONS TO THE ATTORNEY GENERAL: PRETRIAL DISCOVERY} (2017), https://www.uscourts.gov/sites/default/files/report_national_commission_forensic_science_recommendation_prettrial_discovery.pdf [hereinafter NCFS RECOMMENDATION ON PRETRIAL DISCOVERY].} In 2021, the Advisory Committee on Criminal Rules recommended amendments to the federal criminal discovery rule that expand and clarify the scope of expert...
disclosure requirements. Though the changes are moderate, they are likely to have a positive effect in allowing the parties to understand and evaluate the reliability of proposed testimony and better prepare for litigation.

Others have proposed back-end reforms to detect and remedy errors, like wrongful convictions, after they occur. The American Bar Association proposed that states enact legislation to create a substantive right to challenge convictions by showing that forensic evidence used to convict has been “undermined or discredited by reliable scientific research or technological advances.” Others have recommended the establishment of “innocence commissions,” independent bodies to investigate causes of wrongful convictions and recommend policies to reduce the contribution of flawed forensic evidence to unjust outcomes.

Some of these postconviction proposals have been implemented. A few jurisdictions have passed laws allowing challenges to convictions based on flawed forensic evidence. North Carolina established the North Carolina Innocence Inquiry Commission (NCIIC) with the specific focus of correcting errors that occurred in actual cases. Since 2006, the NCIIC has reviewed nearly three thousand claims, yielding fifteen exonerations to date.

While back-end solutions like these do call attention to forensic errors and get some out of prison, they are not designed to—and have not—fundamentally changed forensic practice. They are not systemic reforms. As Jessica Gabel put it, “[r]elying on the postconviction process to correct the problem simply puts a Band-Aid on a gaping wound.”

Aside from specific legal rules and procedures, many have also identified a need to provide more resources and forensic education to defense attorneys, particularly those charged with the representation of indigent clients. Many


280. RESOLUTION 108B & REPORT, supra note 278, at 6; Overturning Wrongful Convictions Involving Misapplied Forensics, supra note 10.


284. See Kronick, supra note 181, at 624.
argue that flawed forensic evidence continues to be relied upon in criminal trials because poor defendants are often unable to put on a full-throated challenge to the admissibility of forensic evidence or to respond with authoritative experts of their own. But this state of affairs has remained largely unchanged for decades.

Though the need for forensic reform is frequently discussed and some recommendations have been implemented, the system as a whole has not substantially been altered. Reform efforts have not prevented admission of unreliable forensic evidence against the accused. Why the forensic system is so resistant to change is discussed next.

III. STRATEGIC AVOIDANCE, STIFLED REFORM

The resistance of the forensic science system to reform has arisen as a result of two powerful forces. First, prosecutors have acted collectively as a powerful body to fend off efforts to improve forensic disciplines and disentangle them from law enforcement. At the same time, actors within the forensic community have attempted to protect and grow their industry by manufacturing a perception that forensic methods are more scientific than they really are.

A. Collective Prosecutorial Action Against Reform

Prosecutors have tremendous control over what forensic evidence is collected and produced, which evidence is used in court, and even how that evidence is presented. Prosecutors’ influence is not just limited to their roles as individual actors, however. As organized bodies seeking to influence policy, prosecutors have played a major role in halting forensic reform in order to retain forensics as a tool, under their control, that can be used to secure criminal convictions.


1. Muffling the Alarms

Over and over again, attempts to improve the forensic system have been answered with attacks by prosecutorial bodies aimed at stifling reform. The response to the NAS Committee’s findings is an early example of such efforts.

The Committee faced prosecutorial opposition from the start. The DOJ was alarmed by the assembly of a body of notable, independent nonforensic scientists with superlative credentials tasked with scrutinizing forensic methods—a staple of prosecutions—and actively sought to undermine the Committee’s work. The National Institute of Justice (NIJ), the DOJ’s research and development arm, attempted to withhold funding for the NAS study and even control its output, demanding permission to review the results and recommendations before release of the report. It was not until Congress stepped in to fund and insulate the study that the NAS Committee’s work began.

Members of NIJ, along with former DOJ employees-turned-lobbyists, participated in additional efforts to undermine the report. Their efforts included conducting counter-studies aimed not at unearthing the truth, but at undercutting the report’s conclusions.

If the DOJ cared about the pursuit of truth and the reliability of criminal convictions, it should not have been so threatened by the NAS’s report—while it was critical of most forensic methods, its aim was not to dismantle the forensic system, but, rather, to bolster it by suggesting pathways for improvement. In service of that goal, the NAS Committee made detailed recommendations for reform, chief among them the recommendation to develop an independent NIFS.

But prosecutorial bodies including the DOJ and the National District Attorneys’ Association (NDAA), the largest organization of prosecutors in the United States, opposed the recommendation, instead seeking to retain

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288. See Giannelli, supra note 128, at 88.
291. Id.
292. Id.
294. See generally NAS REPORT, supra note 2.
296. NAS REPORT, supra note 2, at 14–33; supra Part II.A.
297. See supra notes 178–190 and accompanying text.
control over the generation of forensic evidence despite widespread agreement that any national forensic body must remain outside the control of prosecutors and other law enforcement to avoid bias or conflicts of interest.299

The extent to which they were able to influence reception of the 2016 PCAST Report further illustrates the power of prosecutors as a lobbying entity. Despite its praiseworthy origins and the fact that the report’s conclusions came only after exhaustive study of published literature, consultation with expert advisors, and input from members of the forensic and laboratory communities, in many ways, the report was dead on arrival.300 As soon as the report’s findings began trickling out of the PCAST Working Group, prosecutorial bodies took immediate steps to limit its influence. As soon as PCAST voted to release the report, the NDAA issued a press release denouncing and undermining the report and its findings.301

The DOJ worried the report’s conclusions would threaten prosecutors’ ability to present forensic evidence against the accused and could undermine convictions that had already been secured, and the agency acted to prevent its release.302 As the PCAST Working Group came close to releasing its findings, it met with DOJ representatives.303 According to Eric Lander, Chair of the PCAST Working Group and co-chair of the entire PCAST,304 upon learning of the group’s findings, DOJ officials pressed to prevent or delay release of the report305 and argued that the report’s conclusions should not be applied to closed cases.306 The Working Group declined to delay release, concluding that such a move would be inconsistent with its role as an independent scientific research panel, and declined to limit its findings to future cases, as there was no scientific justification to distinguish between closed and open cases.307 The DOJ nevertheless continued its efforts to block publication, going so far as to (unsuccessfully) lobby the White House to prevent its release.308

On the day the PCAST report was published, the country’s top prosecutor, then-Attorney General Loretta Lynch, swiftly denounced it.309 Instead of

299. NAS REPORT, supra note 2, at 17; Giannelli, supra note 93, at 249.
300. PCAST REPORT, supra note 2, at 2.
302. See Capra, supra note 267, at 1522 (testimony of Eric Lander).
303. See Lander, supra note 93, at 1674.
304. PCAST REPORT, supra note 2, at v, vii.
305. Id; see also Lander, supra note 93, at 1674.
306. Lander, supra note 93, at 1674.
307. Id.
308. Id. at 1675.
vowing to put the weight of the DOJ behind efforts to strengthen the forensic sciences, Lynch released a statement asserting that the DOJ would not adopt or implement a single one of the report’s recommendations. She instead claimed that “when used properly, forensic science evidence helps juries identify the guilty and clear the innocent, and the department believes that the current legal standards regarding the admissibility of forensic evidence are based on sound science and sound legal reasoning.”

Not only did the statement ignore the mounting evidence that forensic evidence is all too frequently not “used properly,” it also failed to recognize that unvalidated science cannot be used properly and absolved the forensic community from having to improve its methods. Lynch’s lauding of admissibility standards shifted attention away from the core issue tackled by the PCAST Report: judicial gatekeeping does not obviate the need for improvement of forensic methods. While a necessary check, gatekeeping is not a perfect filter—it cannot prevent faulty scientific evidence from being produced or being offered against the accused. In light of the DOJ’s wholesale rejection of the PCAST Report’s recommendations and consistent attempts to derail both the NAS and PCAST findings, Lynch’s additional claim that reforms were unnecessary because “the Justice Department had taken unprecedented steps to strengthen forensic science,” was more than a little ironic.

Other attempts to discredit the PCAST Report bordered on transparently disingenuous. NDAA president Michael Ramos followed the organization’s press release up with a nine-page letter to then-President Barack Obama making a number of new accusations, including that the report’s authors were biased. The sole evidence offered to support the accusation was Lander’s service on the board of the Innocence Project. The letter attacked additional unnamed PCAST members as having a “stake in the outcome” of the report without any elaboration. Ramos also made the bold assertion, undermined by

[310. Id.](#)

[311. Id.](#)

[312. See supra notes 10, 127.](#)


[314. Fields, supra note 309.](#)

[315. Letter from Michael A. Ramos, supra note 298, at 1, 7.](#)

[316. See id. at 1. The Innocence Project has done much to expose the extent to which many wrongful convictions have been based on junk science. See, e.g., Eric Lander Calls for Officials to Uphold Best Forensic Practices, INNOCENCE PROJECT (Apr. 21, 2015), https://www.innocenceproject.org/eric-lander-calls-for-officials-to-uphold-best-forensic-practices/.](#)

[317. See Letter from Michael A. Ramos, supra note 298, at 1.](#)
considerable research,\textsuperscript{318} that “[t]here is no evidence the scientific basis for forensic feature comparisons are [sic] responsible for wrongful convictions.”\textsuperscript{319}

Others accused the PCAST Working Group of failing to consider relevant literature establishing the validity of forensic disciplines. The NDAA claimed that the Working Group ignored large bodies of research without indicating what research it believed the PCAST missed.\textsuperscript{320}

The Federal Bureau of Investigation (FBI), the DOJ’s investigatory arm, claimed the report failed to assess “numerous published research studies which seem to meet PCAST’s criteria for appropriately designed studies providing support for foundational validity,” arguing that this “omission discredits the PCAST report as a thorough evaluation of scientific validity.”\textsuperscript{321} The Working Group responded by soliciting additional material that interested parties felt it had failed to consider.\textsuperscript{322} Instead of providing the PCAST with additional studies, the NDAA responded by claiming that the PCAST’s solicitation of further literature was a “fool’s errand” and speculated that the PCAST would disregard any such materials.\textsuperscript{323} The DOJ, meanwhile, indicated that it could find no further studies to provide.\textsuperscript{324}

Although the Working Group’s criteria for establishing the validity of forensic methods is not controversial among scientists or academics,\textsuperscript{325}

\begin{thebibliography}{9}
\bibitem{} See Letter from Michael A. Ramos, supra note 298, at 1, 7–8.
\bibitem{} \textit{PRESIDENT’S COUNCIL OF ADVISORS ON SCIENCE & TECHNOLOGY, AN ADDENDUM TO THE PCAST REPORT ON FORENSIC SCIENCE IN CRIMINAL COURTS} 2–3 (2017), https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/PCAST/pcast_forensics_adendum_finalv2.pdf [hereinafter ADDENDUM TO THE PCAST REPORT].
\bibitem{} ADDENDUM TO THE PCAST REPORT, supra note 322.
\end{thebibliography}
prosecutors and law enforcement bodies, including the NDAA and the DOJ, took issue with them. The PCAST Working Group emphasized that before forensic methods can be considered reliable, multiple empirical studies reflecting real-world casework that provide estimates of a method’s accuracy must be conducted. Despite their complaints, none of these bodies immediately suggested alternative criteria for establishing the validity of forensic methods. Notably, despite its public denunciation of the report, the DOJ acknowledged in closed-door meetings with the PCAST that there were insufficient empirical studies to establish the validity of some forensic methods. Its concern, then, was not the method, process, or criteria the PCAST Working Group employed in its analysis, but that the report’s findings might jeopardize convictions.

In 2021, five years after its publication, the DOJ made a brand-new attempt to undermine the PCAST Report. That effort, an unsigned statement riddled with scientific inaccuracies and mischaracterizations, appeared as a last-ditch effort to discredit the PCAST Report before judges gave it greater consideration in admissibility determinations.

These attempts to undermine the PCAST and NAS Reports are among the most prominent collective efforts by prosecutors to exert influence over the forensic landscape but are by no means the only ones. As Paul Giannelli has thoroughly documented, prosecutors have lobbied at the highest levels of government to prevent forensic reform.

326. See Addendum to the PCAST Report, supra note 322, at 2; Capra, supra note 267, at 1519 (comments of Ted Hunt, DOJ Senior Advisor on Forensic Science) (“[T]he Department of Justice . . . reject[s] PCAST’s premise that there exists a singular and exclusive means by which to establish the foundational validity of these methods.”). See generally Letter from the National District Attorney’s Association to PCAST, supra note 323.

327. PCAST Report, supra note 2, at 5–6.


329. Lander, supra note 93, at 1674.

330. Id.


333. See generally Giannelli, supra note 128.
ground because the DOJ conditioned its sponsorship of the project on a right to review the findings.334 Through NIJ, the DOJ has opposed presentation of rigorous analyses of the scientific underpinnings of forensic methods at government conferences.335 Prosecutors have also made direct attempts to control research by funding interested parties willing to pursue research agendas aligned with its strategic avoidance of reform efforts.336

The NAS and PCAST Reports’ ultimate aim was to make forensic disciplines more scientific and more reliable. Efforts by prosecutorial bodies to undermine those aims and block forensic reform, however, have borne fruit. Such strategies have trickled down to the trial level, where they have been successfully adopted by individual prosecutors.337 After the PCAST Report was released, to assist prosecutors in combatting the recommendations of the report in litigation, various attorney general associations published advice to help prosecutors respond to attacks on forensic evidence based on the report.338

While the DOJ failed to block the PCAST Report entirely, it has succeeded in getting courts to reject the report in practice.339 The few reported decisions on the matter reveal that strategies by prosecutorial bodies to undercut the report have trickled into judges’ admissibility rulings.340 Rather than scrutinize these methods in light of growing research underscoring how little “science” underlies many forensic methods, judges have instead reverted to reliance on

334. Donald Kennedy, Forensic Science: Oxymoron?, 302 SCIENCE 1625, 1625 (2003); Giannelli, supra note 128, at 64, 80.
335. Giannelli, supra note 128, at 80–81; Kennedy, supra note 334.
336. See Giannelli, supra note 128, at 65.
340. See, e.g., United States v. Romero-Lobato, 579 F. Supp. 3d 1111, 1118 (D. Nev. 2019) (“The PCAST Report refused to consider any study that did not meet its strict criteria . . . . [T]he PCAST Report was criticized by a number of entities, including the DOJ, FBI, ATF, and AFTE.”).
prosecutors’ rhetoric about the report and precedent that predates the criticisms.\textsuperscript{341}

2. Controlling Forensic Institutions

To avoid the establishment of a national forensic body that would be entirely outside of its influence, the DOJ did exactly what the NAS Committee warned against: it took over efforts to govern the forensic system even though “[t]he potential for conflicts of interest between the needs of law enforcement and the broader needs of forensic science [is] great.”\textsuperscript{342} The DOJ successfully pressed for a far more constrained body that it could maintain substantial control over;\textsuperscript{343} the result was the NCFS.\textsuperscript{344} The NCFS was designed in a way that limited its contributions to forensic reform. Although the NCFS was composed of roughly thirty voting commissioners of diverse backgrounds within the forensic, broader scientific, and legal communities,\textsuperscript{345} the DOJ control was embedded throughout. The NCFS charter established that senior DOJ officials would direct the NCFS’s work and set its agenda, including determining what issues it would consider and prioritize.\textsuperscript{346}

Most importantly, like the OSAC, NCFS had no enforcement power. Its recommendations to the Attorney General were advisory only; the DOJ was not bound to adopt any recommendations made, giving the DOJ total freedom to ignore or implement reforms as it deemed fit.\textsuperscript{347}

The DOJ also determined who was selected to serve on the commission.\textsuperscript{348} At the time the NCFS charter expired in 2017, the DOJ’s influence was reflected in the makeup of its commissioners. While a significant proportion were independent scientists or academics (eleven), more were affiliated with law enforcement (twelve), including four active or former prosecutors.\textsuperscript{349} Only two commissioners were affiliated with the defense.\textsuperscript{350}

\textsuperscript{341}. \textit{See}, e.g., \textit{State v. DeJesus}, 436 P.3d 834, 842 (Wash. Ct. App. 2019) (rejecting defense challenge to the admissibility of firearms evidence based on the NAS and PCAST Reports in part because “[c]ourts from around the country have universally held that toolmark analysis is generally accepted”); \textit{Patel}, 2016 Conn. Super. LEXIS 3440, at *18-26, *30 (relying on pre-NAS and PCAST Report precedent to admit footwear comparison testimony).

\textsuperscript{342}. NAS \textit{REPORT}, supra note 2, at 17.

\textsuperscript{343}. \textit{See id.; Lander, supra note 93, at 1674–75.}

\textsuperscript{344}. Lander, supra note 93, at 1674.


\textsuperscript{346}. NCFS BYLAWS, supra note 345, at 1; NCFS \textit{Charter, supra note 213, at 1–2.}

\textsuperscript{347}. Lander, supra note 93, at 1674.

\textsuperscript{348}. NCFS BYLAWS, supra note 345, at 2.

\textsuperscript{349}. \textit{REFLECTING BACK, supra note 212, at app. A.}

\textsuperscript{350}. Of the twelve commissioners affiliated with law enforcement, six served at law enforcement laboratories including the Drug Enforcement Agency (DEA), Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF), Federal Bureau of Investigation (FBI), and county crime labs.  \textit{REFLECTING BACK, supra
Because recommendations to the Attorney General required a two-thirds vote to pass,\textsuperscript{351} law enforcement members of the NCFS could prevent recommendations from passing.\textsuperscript{352} The result was that, although the NCFS was able to pass many recommendations, others were diluted in order to gain sufficient votes for passage.\textsuperscript{353} Consequently, most NCFS recommendations were moderate by design. Two examples include a recommendation that forensic examiners and prosecutors abandon the scientifically meaningless term “reasonable scientific certainty,” and that judges refrain from declaring forensic examiners as “experts” in front of a jury to avoid putting a thumb on the scale for the proponent of the witness.\textsuperscript{354} While these recommendations do have value, more meaningful recommendations were never made or were not implemented. One such recommendation, that research be conducted into the technical merit of forensic disciplines, was abandoned by the FBI after the NCFS was disbanded.\textsuperscript{355}

The DOJ also worked to undermine proposals made by the NCFS outside of the formal process. When the NCFS decided to recommend that expanded discovery relating to forensic evidence be provided to the defense, Deputy Attorney General Sally Yates called the head of the subcommittee working on the discovery proposal, Judge Jed Rakoff of the Southern District of New York, to block its work.\textsuperscript{356} Although forensic reformers have emphasized the

\begin{footnotes}
\footnote{212}{Note 212, at app. A. Two additional members were high-level police officials. Id. Three judges also served as commissioners: Barbara Hervey, Pam King, and Bridget Mary McCormack. Id. Two of the judges were former defense attorneys and one a former prosecutor. Id. But see Epstein, supra note 30, at 743 (describing the NCFS as “dominated by the defense community”).}

\footnote{213}{NCFS Bylaws, supra note 345, at 4; see also Jed Rakoff, Keynote Address, 57 Hous. L. Rev. 475, 479 (2020).}

\footnote{214}{For example, a document recommending what information should be included in a forensic case report and case record was voted down by eleven members. Nat’l Comm’n on Forensic Science, Meeting #13: Apr. 10–11, 2017, at 11 (2017), https://www.justice.gov/ncfs/page/file/976566/download. Of the eleven negative votes, nine were affiliated with either law enforcement or crime labs. Id.; Reflecting Back, supra note 212, at app. A.}

\footnote{215}{Reflecting Back, supra note 212, at 5.}


\footnote{218}{Jed S. Rakoff, Full Text: Judge’s Protest Resignation Letter, Wash. Post (Jan. 28, 2015), https://www.washingtonpost.com/local/full-text-judges-protest-resignation-letter/2015/01/29/41659da0-a7e1-11e4-22b2-77605f53b72_story.html?tid=a_inl_manual. The subcommittee planned to recommend that prosecutors in criminal cases be required to provide to the defense the same detailed discovery as in civil}
\end{footnotes}
importance of improved discovery to ensure accuracy of information presented to juries. Yates claimed that discovery was outside the scope of the NCFS’s mission even though a stated purpose of the NCFS was to “develop proposed guidance concerning the intersection of forensic science and the courtroom,” which, as Rakoff noted, could hardly be interpreted as omitting discovery. Rakoff resigned in protest and issued a scathing public letter charging the DOJ with “placing [strategic] advantage over a search for the truth” and attempting to “preserve a courtroom advantage.”

Amidst the media storm over Rakoff’s open call-out and resignation, Yates backed down and asked Rakoff to return, which he did. The public reconciliation, however, should not have suggested that the DOJ intended to accept Rakoff’s subcommittee’s suggestions to expand forensic discovery practice. Indeed, the subcommittee made a number of important recommendations that were passed overwhelmingly by the NCFS, including several not already provided for in discovery rules. But, in January of 2017, the DOJ issued supplemental discovery guidance for forensic evidence that largely mirrored existing discovery requirements or practice and did not address or adopt the majority of the Commission’s recommendations.

357. McDiarmid, supra note 276, at 1.
359. Id.
361. The NCFS’s discovery recommendations were approved by 78% of Commissioners. NCFS Recommendation on Pretrial Discovery, supra note 276, at 1.
362. These included that prosecutors provide to the defense all exhibits that will be used to support an expert’s opinions, a list of all publications authored by the expert in the previous ten years; a list of all cases in which the expert testified in the previous four years; and a summary of how the expert is compensated. Compare id. at 2–3, with FED. R. CRIM. P. 16.
364. Federal Rule of Criminal Procedure 16 requires, inter alia, that the defense generally be provided with documents and objects, results, and reports of “scientific tests” as well as a written summary of expert testimony the government intends to offer at trial, along with the expert’s opinions, the bases and reasons for those opinions, and the expert’s qualifications. FED. R. CRIM. P. 16(a)(1)(E) to (G). The supplemental guidance requires little, if any, additional discovery be provided. For example, it requires the prosecutor to “obtain the forensic expert’s laboratory report,” “disclose . . . a written summary,” of expert testimony, and “provide to the defense information on the expert’s qualifications.” Memorandum from Sally Q. Yates, supra note 363, at 2–3. Each of these disclosures is already required by Rule 16. FED. R. CRIM. P. 16. It does instruct prosecutors to provide the defense with the relevant “case file,” which can include bench notes, photographs taken during analysis, the raw data on which conclusions are based, chain of custody information, communication logs, proficiency test results for the examiner who conducted the analysis in question, documentation of the review process for forensic examinations, among other documentation of the particular forensic analysis process at issue. Id. at 2; e.g., Houston Forensic Science Ctr., Crime Scene Unit: Crime Scene Case Records: Evidence Collection Division (Dec. 7, 2015),
As described, improvements have since been made with respect to forensic discovery despite the stalemate at the NCFS.365

Notwithstanding the significant output of the NCFS, few of its recommendations were adopted by the Attorney General.366 Nevertheless, it made some incremental progress. It made over forty recommendations to improve and strengthen the nation’s forensic science system367 and most were approved by a strong majority of commissioners, even if not adopted by the DOJ.368 Aside from its official outputs, the NCFS created unprecedented dialogue between forensic stakeholders and added a layer of transparency to a system usually hidden behind the curtain of law enforcement.369

This success, however, contributed to the commission’s demise. As its term progressed, the NCFS began working on thornier issues that had the potential to have wider impact on the forensic system.370 But in April 2017, its term was set to expire371 as many of its recommendations were still in progress.372 To complete its work, the NCFS sought an extension of its term.373 The request was rejected; Jeff Sessions disbanded the body after he was appointed as Attorney General.374 Peter Neufeld was blunt about the import of the NCFS’s disbanding: “[T]he [D]epartment [of Justice] has literally decided to suspend the search for the truth . . . As a consequence innocent people will languish in prison or, God forbid, could be executed.”375

Sessions announced that the DOJ would take the task of improving forensics in-house.376 Rather than choosing an independent scientist, or a panel of leaders with broad interests to lead the effort, Sessions chose a career prosecutor, Ted Hunt, to helm the program.377 Hunt lacked scientific training and was accused of employing questionable tactics in his practice, including

https://houstonforensicscience.org/sop/57729903RhZ06-21-16.pdf. Case files are routinely provided in discovery. Some of the subcommittee’s proposals are included in the proposed amendments to Federal Rule of Criminal Procedure 16. See supra note 277 and accompanying text.
365. See supra note 277 and accompanying text.
366. Lander, supra note 93, at 1674.
367. REFLECTING BACK, supra note 212, at 5.
368. Rakoff, supra note 351, at 479.
370. Rakoff, supra note 351, at 480.
371. NCFS Charter, supra note 213, at 2, 3.
373. Id.
374. Id.
375. Id.
376. Id.
Radically Reimagining Forensic Evidence

2022

mischaracterizations of scientific statements.\textsuperscript{378} His anti-reform track record\textsuperscript{379} earned him the nickname, the “Mike Pence of forensics.”\textsuperscript{380} To this day, no similarly transparent and broad-based body of experts has yet been established to replace the NCFS.

B. Manufactured Reliability

While prosecutors resist reform efforts, segments of the forensic community have worked to facilitate the admission of unsound forensic evidence in criminal cases. They understand admissibility standards and leverage that knowledge, following the roadmaps provided by courts, to increase the likelihood of admission of forensic methods, even those lacking meaningful scientific underpinnings.\textsuperscript{381}

The breathalyzer hypothetical highlights the unpleasant reality that commonly used forensic techniques can be made to appear admissible by wrapping them in the trappings of science—as laid out by relevant admissibility standards—even when what lies beneath has hardly been established as reliable science. Studies are manipulated to achieve desired outcomes.\textsuperscript{382} Results that are contrary to the position of the sponsor are sometimes suppressed.\textsuperscript{383} Research is frequently funded or commissioned either by parties themselves or others, like drug manufacturers, who have an interest in the outcome of litigation or the admissibility of certain evidence.\textsuperscript{384}

The hypothetical is not merely a warning; examples of manipulation of admissibility factors to manufacture a perception of reliability are well known in civil litigation.\textsuperscript{385} What is less known is that many of the same strategies are being employed in forensic communities on the criminal side—and going unnoticed.

An examination of firearms analysis serves as a useful case study for understanding how segments of the forensic community, aligned with law enforcement and insulated from the broader scientific community, have leveraged an understanding of the Daubert factors to manufacture a perception

\textsuperscript{378} Lander, supra note 93, at 1675.
\textsuperscript{380} Liliana Segura & Jordan Smith, Bad Evidence: Ten Years After a Landmark Study Blew the Whistle on Junk Science, the Fight over Forensics Rages On, INTERCEPT (May 5, 2019, 7:00 AM), https://theintercept.com/2019/05/05/forensic-evidence-aafs-junk-science/.
\textsuperscript{381} See NAS REPORT, supra note 2, at 46-47.
\textsuperscript{382} See Anderson, Parsons & Rennie, supra note 143, at 666.
\textsuperscript{384} Anderson, Parsons & Rennie, supra note 143, at 623–26, 655; Patterson, supra note 383, at 1346–47.
\textsuperscript{385} Anderson, Parsons & Rennie, supra note 143, at 620–21.
that their method is reliable—thereby winning it widespread admissibility—despite significant data to the contrary.

Firearms and toolmark examination is one of the most widely used forensic methods today. The fundamental theory behind firearms examination is that the hard tools used in the weapons manufacturing process impart markings or patterns on the softer metal of the guns being manufactured. These manufacturing irregularities, along with changes to a weapon’s surfaces caused by wear and tear, the theory goes, leave small, even microscopic, features on the surfaces of the interior of a gun that are imparted on the surface of ammunition after it is fired and travels through the weapon. Firearms examiners believe that these features are unique to a specific weapon and that, as a result, each weapon leaves a distinct set of markings on ammunition fired from it. According to firearms examiners, the markings on two bullets or shell casings can be compared to determine whether they were fired from the same weapon.

The method has come under sharp criticism because there is little evidence that the discipline’s foundational premises—that weapons pass on a unique set of markings to fired ammunition, repeated from firing to firing—is true. Worse, there is also little evidence that, even if weapons do pass on distinct patterns to ammunition, examiners are capable of discerning those differences with a high level of accuracy.

Despite this lack of scientific grounding, the firearms analysis community has utilized its knowledge of the Daubert factors to regularly secure admission of firearms evidence at trial, creating a perception of reliability when the discipline may not be valid. As one court has noted, without deeper scrutiny, each factor can be made into a box to easily check off:

[It is possible, at a superficial level, to conclude that his methodology satisfies the Daubert requirements. Replicability? Check. . . . Other forensic examiners trained in ballistics comparisons can perform an examination using the same basic methodology. In fact, double check: a forensic examiner in this very case did a second comparison and came to the same conclusion. Error rate? Check.


387. NAS REPORT, supra note 2, at 150.


389. Id. at 150–51; What is Firearm and Toolmark Identification?, supra note 388.

390. Id. at 150.

391. PCAST REPORT, supra note 2, at 105.

392. Id.

Testing seems to indicate an error rate hovering around two percent. Testing and standards? Check.[\cite{1} Publication? Check. Journals put out by associations of forensic examiners have published hundreds of relevant articles. Acceptance? Check. All reputable forensic examiners accept the ballistics comparison method used in this case as valid.

It is only when you look beneath the surface that the problems with [firearms and toolmark examination] methodology begin to emerge.\cite{2}

1. Flawed Testing

*Daubert’s* testing factor purports to establish a validity-based requirement for admissibility: without sufficient empirical testing establishing validity, the testing factor cannot be met, and a method cannot be deemed admissible.\cite{3} Superficial satisfaction of the testing factor does not necessarily indicate validity, however, as a number of design flaws plague the majority of the studies that purport to establish the validity of forensic methods.

In order for testing to reliably reflect the accuracy of a forensic method, it must test the method as it is actually used in the real world. Problematically, however, judges often find the factor satisfied even when testing says little about reliability.\cite{4} In firearms analysis, many studies employ “testing” that is both unrealistically easy and divorced from actual casework.\cite{5} The result is that these studies have little value in establishing whether firearms analysis is actually valid.\cite{6}

The majority of, though not all, published studies relating to firearms examination accuracy do not mirror the types of cases encountered in actual case work and are, in fact, far easier problems than those encountered in typical cases.\cite{7} For example, many employ what the PCAST Report describes as a “closed-set” design, in which examiners can deduce the correct answers.\cite{8} In actual case work, however, the universe of conclusions is not a closed one with a limited number of possible choices, one of which is definitively right.\cite{9}

Moreover, many, if not most, studies that attempt to determine the accuracy of firearms examiners through empirical testing are designed by

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\begin{itemize}
  \item \textit{Daubert v. Merrell Dow Pharmas.}, 509 U.S. 579, 592 (1993); PCAST REPORT, \textit{supra} note 2.
  \item \textit{Id.}
  \item \textit{Id. at} 106; \textit{Adams}, 444 F. Supp. at 1266.
  \item PCAST REPORT, \textit{supra} note 2, at 106. The PCAST Report offers a detailed overview of what the Working Group perceived to be the design flaws in the majority of firearms studies. \textit{Id. at} 106–08.
  \item Some critics have argued that closed-set studies do resemble certain types of case work, particularly cases involving police shootings in which the source weapon is known. \textit{Id. at} 107–09. Though closed-set studies do more closely resemble such cases, these cases are the exception, not the rule. \textit{Id.}.
\end{itemize}
firearms practitioners whose expertise is not in research science or study design. The result is that these studies often fail to account for test-taking bias or to control for variation in test-takers’ approaches to study problems. These issues make results difficult to interpret and assess, limiting their utility for establishing validity.

The sum total of these design flaws is that forensic testing often provides a veneer of reliability, specifically designed to satisfy a “testing” requirement for admissibility, rather than a meaningful check of validity. This aura of reliability has apparently been sufficient to convince judges to admit potentially problematic firearms evidence with regularity. Judges have not only largely found firearms and toolmarks testimony admissible, but they have also gone so far as to declare that the discipline has been thoroughly vetted.

2. Meaningless Peer Review

Peer review is potentially the most manipulable of the Daubert factors. Judges often treat this factor as satisfied by the mere existence of peer-reviewed publications relating to a discipline—a box to check—rather than by assessing whether those publications reflect meaningful scrutiny verifying a method’s reliability. They also readily accept publications in professional journals that are not, or are only minimally, peer-reviewed. Within the firearms discipline, for example, the majority of literature is published in the journal of the Association of Firearms and Tool Mark Examiners (AFTE), a professional organization for firearm and toolmark examiners. Though the firearms community disputes this, the AFTE Journal has been described as a trade journal rather than a peer-reviewed scientific publication, written for firearms practitioners rather than for the scientific community at large to test or evaluate research and theories underlying the discipline. Publications submitted to the journal are reviewed by other firearms practitioners who, like the author(s), “have a vested, career-based interest in publishing studies that validate their own field and methodologies.”

403. Id. at *41–42, *44–45. See also Itiel E. Dror & Nicholas Scurich, (Mis)use of Scientific Measurements in Forensic Science, 2 FORENSIC SCI. INT’L.: SYNERGY 333, 336 (2020).
404. Id. at *41–42.
405. Id. at *24 ([V]irtually every court that has evaluated the admissibility of firearms and toolmark identification has found the . . . method to be testable and that the method has been repeatedly tested.).
406. See KAYE, BERNSTEIN & MNOOKIN, supra note 138, § 7.6.3; see also Tibbs, 2019 D.C. Super. LEXIS 9, at *28–29.
407. KAYE, BERNSTEIN & MNOOKIN, supra note 138, § 7.6.3.
408. Tibbs, 2019 D.C. Super. LEXIS 9, at *28–32. See also Chin, Ribeiro & Rainden, supra note 152, at 287 (describing the AFTE Journal as a “guild journal”).
Radically Reimagining Forensic Evidence

Moreover, the AFTE Journal’s insulation from the outside scientific community protects the work it publishes from independent scientific scrutiny: the journal is not freely available to the scientific community or to the public, and it cannot be obtained through most university libraries or research engines.411

At every level of review, the AFTE Journal publication process is permeable to bias. In contrast to double-blind and single-blind procedures meant to limit bias in the peer-review process, the AFTE Journal’s peer-review process, until just 2020, was totally open,412 meaning that authors and reviewers could discuss draft publications together. Because authors and reviewers are often known to each other, this type of review dampens the likelihood of any submission receiving critical feedback.413 Though AFTE has since moved to a double-blind review process, submissions are still reviewed by an editorial board that consists entirely of AFTE members414 who have no less an interest in the field being deemed valid than article authors and other practitioners.

Importantly, these issues are not limited to firearms analysis. Handwriting and bitemark analysis have also been credibly accused of publishing studies in self-serving journals.415

Even journals relating to DNA analysis, still considered the most reliable among forensic disciplines,416 have been similarly criticized. Today, DNA analysis is typically conducted using sophisticated probabilistic genotyping software (PGS) systems that utilize algorithms to interpret complex DNA


413. See Kaye, Bernstein & Mookin, supra note 138, § 7.32(b).


415. See Almeciga v. Ctr. for Investigative Reporting, Inc., 185 F. Supp. 3d 401, 420 (S.D.N.Y. 2016) (“[T]he key question here is what constitutes a ‘peer,’ because just as astrologers will attest to the reliability of astrology, defining ‘peer’ in terms of those who make their living through handwriting analysis would render Daubert factor a charade. While some journals exist to serve the community of those who make their living through forensic document examination, numerous courts have found that ‘[t]he field of handwriting comparison . . . suffers from a lack of meaningful peer review’ by anyone remotely disinterested.”); Beecher-Monas, supra note 9, at 1389; Orenstein, supra note 46, at 1143.

416. Lauren Kirchner, Where Traditional DNA Testing Fails, Algorithms Take Over, Propublica (Nov. 4, 2016, 8:00 AM), https://www.propublica.org/article/where-traditional-dna-testing-fails-algorithms-take-over.
mixtures.\textsuperscript{417} A number of studies have been conducted to attempt to establish the validity of these methods, but most of these have been conducted by the primary creators of the software.\textsuperscript{418} The authors’ relationship with the software they are attempting to validate represents a conflict of interest; they stand to gain financially and professionally from having their work found to be valid.\textsuperscript{419}

While the authors’ conflicts certainly do not invalidate their work, they demonstrate a need for greater independent scrutiny of the fields.\textsuperscript{420} The whole point of “peer review” is that one’s work is reviewed by their peers who will scrutinize it and identify shortcomings; “self-review,” while helpful, is not an adequate substitute.\textsuperscript{421}

3. Miscalculated Error Rates

The reason \textit{Daubert} includes error rates as a reliability factor is simple: judges need to know the likelihood of an expert getting it wrong before allowing expert evidence that might result in a conviction to be heard by a jury.\textsuperscript{422} Despite the importance of understanding the real chance of error, courts have routinely accepted low reported error rates as true without scrutinizing the studies reporting those rates.\textsuperscript{423} This is problematic for several reasons. Take the reported low error rates in firearms examinations, for example. As described, many of the studies purporting to validate the firearms discipline involve test problems that are easier than real-life case work problems.\textsuperscript{424} Easy problems


\textsuperscript{418} PCAST REPORT, supra note 2, at 80; Kwong, supra note 4, at 289; see also Peer Reviewed Publications for STRmix IV, JOHN BUCKLETON (last updated Apr. 21, 2021), https://johnbuckleton.files.wordpress.com/2020/06/peer-reviewed-publications-for-strmix-iv.pdf (listing publications relating to STRmix, the most prevalent PGS system used today and indicating that a majority are authored entirely or in part by one or more of STRmix’s three developers: Jo-Anne Bright, John Buckleton, and Duncan Taylor); STRmix, JOHN BUCKLETON (last updated Apr. 21, 2021), https://johnbuckleton.wordpress.com/strmix/; Scientific Validation Studies, Magazine Articles, Book Chapters and More, CYBERGENETICS, https://www.cybgen.com/information/publication/page.shtml (last visited Apr. 19, 2022) (listing a majority of publications related to TrueAllele, another PGS software, as authored entirely or in part by Mark Perlin, its primary developer).

\textsuperscript{419} See Kwong, supra note 4, at 289; Tibbs, 2019 D.C. Super. LEXIS 9, at *33.

\textsuperscript{420} PCAST REPORT, supra note 2, at 79 (recommending additional “studies by multiple groups, not associated with the [PGS] software developer”); see also id. at 81 (encouraging PGS studies by researchers with no stake in the system being studied).

\textsuperscript{421} Kwong, supra note 4, at 289 (“Peer review of validation studies conducted by interested parties is not the equivalent of rigorous third-party evaluation studies for the purposes of general acceptance in the scientific community.”).

\textsuperscript{422} Koehler, supra note 218, at 1372–74.

\textsuperscript{423} See, e.g., United States v. Adams, 444 F. Supp. 3d 1248, 1264 (D. Or. 2020) (describing reported error rates as ranging from 0.9 to 2.2 percent); Tibbs, 2019 D.C. Super. LEXIS 9, at *38, *40.

\textsuperscript{424} PCAST REPORT, supra note 2, at 12, 150.
artificially drive the false positive error rate down, meaning that the reported error rates relied upon by courts likely do not reflect reality. This is further evidenced by the fact that calculated error rates in firearms analysis and other disciplines increase with the difficulty of the test.

Additionally, in most forensic disciplines, including firearms examination, an examiner can come to one of three conclusions: (1) an elimination, meaning two items can be eliminated as having been fired by the same weapon; (2) identification, meaning two items can be identified as having the same source; or (3) inconclusive, meaning no conclusion can be reached about whether or not two items have the same source. In firearms studies, test takers often choose inconclusive when, in fact, two items could have been identified or eliminated as having been fired from the same source. But inconclusive findings are not included in the false-positive error rate calculation, creating another way in which error rates calculated from studies are driven below real-world error rates.

Only recently has inconclusive reporting in forensics begun to be studied. There is a debate as to whether inconclusive should be tallied as an “incorrect” answer in calculating false positives, but there is a growing recognition that, particularly in simulated study scenarios in which there is sufficient data to render a conclusion, inconclusive findings represent some form of error. It is concerning because these studies do not incorporate inconclusive results in error rate calculations, meaning reported error rates are likely significantly lower than the actual error rates in case work.

425. See id. at 12. In firearms examination, the false positive error is the rate at which examiners incorrectly conclude that two items were fired from the same weapon when they were in fact fired from different weapons. See id. at 151.

426. See Adams, 444 F. Supp. 3d at 1265.

427. Id. at 1264–65; Jonathan J. Koehler & Shiquan Liu, Fingerprint Error Rate on Close Non-Matches, 66 J. FORENSIC SCI. 129, 129 (2020) (reporting high false positive error rates where fingerprint analysts were asked to compare two prints from different sources with many common features).

428. See e.g., AFTE Range of Conclusions, ASSN OF FIREARM AND TOOL MARK EXAM’RS, https://afte.org/about-us/what-is-afte/afte-range-of-conclusions (last visited Apr. 10, 2022). The inconclusive category is sometimes broken down further to reflect scenarios in which some, but not sufficient, evidence supports either an identification or elimination. Id.

429. Dror & Scurich, supra note 403, at 336. This is true even though the study designers take pains to ensure that test samples are of high enough quality such that a definite conclusion can be rendered. See United States v. Tibbs, No. 2016 CFI 19431, 2019 D.C. Super. LEXIS 9, at *58–60 (D.C. Super. Ct. Sept. 5, 2019) for a more fulsome summary of how this is accomplished.

430. Dror & Scurich, supra note 403, at 336. Why test takers report so many inconclusives is the subject of speculation. One reason is that because only false positives and false negatives are considered errors, there is an incentive for test takers to make an inconclusive call rather than risk an error. Id.; Adams, 444 F. Supp. 3d at 1265.


432. Id.; Dror & Scurich, supra note 403, at 334; see also Tibbs, 2019 D.C. Super. LEXIS 9, at *62.

433. On top of all this, error rates cannot even be calculated from many of firearms studies. Calculating the false positive error rate requires, in simple terms, dividing the number of false positive conclusions by the total number of comparisons conducted in which the two items were fired from different weapons. PCAST
Though these examples are taken from firearms and toolmark examination, these are not issues isolated to that field. A prominent statistician, Karen Kafadar, recently discovered significant undercalculation of error rates in forensic glass analysis using inferential techniques that she asserts “you would never see in the statistics literature.” Likewise, undercalculation of error rates has been found in studies relating to additional forensic disciplines including bitemark and fingerprint analysis.

4. “Vacuous” Standards

The aim of standards development is to promote use of best practices and consistency in applying the forensic methods across labs and analysts. That can only happen, however, when standards offer specific, tailored guidance for practitioners. Frequently, so-called standards developed for forensic science fields do not meet this metric.

For example, the governing standard in conducting firearms and toolmark identification centers around the “AFTE theory.” The AFTE theory provides that an examiner can conclude that two items were fired by the same weapon:

when the unique surface contours of two toolmarks are in “sufficient agreement.” . . . Agreement is significant when the agreement in individual characteristics exceeds the best agreement demonstrated between toolmarks known to have been produced by different tools and is consistent with agreement demonstrated by toolmarks known to have been produced by the same tool. The statement that “sufficient agreement” exists between two toolmarks means that the agreement of individual characteristics is of a quantity and quality that the likelihood another tool could have made the mark is so remote as to be considered a practical impossibility.

REPORT, supra note 2, at 151–152. In set-based studies, the number of actual comparisons an examiner makes is unknown. The examiner may compare each item in the set to each other item in the set or may just compare a few items to each other and reach conclusions based on inferences made from the set. Id. at 107–108. This means that a false positive error rate cannot be calculated. While set-based studies allow the number of false positive errors, or misidentifications, to be tallied, they do not allow one to know the total number of comparisons. Id. at 106–08. For a more fulsome overview of statistical issues relating to error rate calculation, see id. at 151–54.

Kafadar, supra note 206, at 10. Forensic glass analysis involves comparing element concentrations of glass samples found at a crime scene to glass samples associated with a suspect to determine if the samples originated from the same source. See id. at 9–10.

435. See PCAST REPORT, supra note 2, at 86, 97.


The AFTE theory *sounds* scientific, but, as several courts have noted, the theory is entirely circular. As one court put it recently, “the AFTE ‘sufficient agreement’ standard is a tautology that doesn’t *mean* anything.” “Significant” or “sufficient” agreement is defined subjectively by the examiner in relationship to their own personal experience.

Despite this, courts routinely point to the AFTE theory as evidence that the *Daubert* “standards” factor is satisfied. The discipline, here too, has leveraged a *Daubert* factor to create an air of reliability when in fact the core principle underlying the discipline is subjective and undefined, precisely what a standards requirement ought to protect against.

Again, firearms and toolmark examination provides a useful case study, but these problems are not limited to the firearms field. Examination of the OSAC standards development process reveals deficiencies in standards development across forensic disciplines.

The OSAC structure embeds several layers of what should serve as checks on the quality of standards. Standards development usually starts at the subcommittee level. After a proposed standard is drafted by a subcommittee, stakeholders—human factors, legal resource, quality, statistics, and terminology task groups—and, in some cases, a technical review panel, can provide comments, advice, and guidance to subcommittees on draft standards. After comments are received, the subcommittee may revise the proposed standard.

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441. *Id.* at 1262.
442. *See id.* at 1262–63 (quoting *Shipp*, 422 F. Supp. 3d at 779); AFTE Theory of Identification as It Relates to Toolmarks, supra note 438.
and then vote to send it to the Forensic Science Standards Board (FSSB), OSAC’s governing body, for review and potential placement on the OSAC Registry.446 Once a proposed standard is approved for placement on the OSAC Registry, it is sent to an external standards developing organization (SDO) for additional development, another open comment period, and publication.447 Next, the subcommittee votes again to replace the proposed standard with the published standard on the OSAC Registry.448 If approved by the subcommittee, the FSSB may petition for review and vote to approve the standard for placement on the OSAC registry.449 If the FSSB does not seek review, the published standard will automatically replace the proposed standard on the OSAC Registry.450 At all levels, approval for a standard to move on to the next phase of development requires a two-thirds vote.451

The OSAC’s process for developing standards appears quite rigorous and may well have been intended to be so. Review is required at multiple levels, public comments are considered, and a supermajority is required to approve a draft standard at any phase of the process. To a judge, in particular, the OSAC’s standards development process may appear more than enough to satisfy Daubert’s standards prong.

But a look beneath the surface reveals shortcomings. First, of the OSAC’s nearly 500 members, over fifty percent are forensic practitioners.452 The subcommittees also have significant law enforcement membership.453 Consequently, standards, whether or not they promote scientific validity, can be pushed through the process despite well-founded concerns and dissenting votes from nonforensic scientists, legal experts, or others.

447. Registry Approval Process, supra note 444.
448. Id.
449. Id.
450. Id.
Second, despite the tiered standards approval process, research scientists have recently brought to light the fact that standards lacking meaningful substance have been published. These “vacuous” standards, as they call them, have minimal requirements, are vague, easy to satisfy, or otherwise do not promote scientific validity. In one example, a bloodstain pattern analysis standard calls for forensic providers to “have a series of written procedures” without indicating what the content of any such procedures should be. Another standard, purporting to provide guidance on how to test a method to ensure its scientific validity or fitness for its intended purpose, says merely that “[m]ethods shall be evaluated to determine whether they work as intended and are fit for purpose.” These “standards” are meaningless: the OSAC’s stated goal of promoting consistency cannot be served by standards that offer absolutely no guidance on how labs should validate bloodstain pattern analysis methods.

The troubling statistical techniques that Kafadar discovered were set to go into three separate OSAC standards on forensic glass analysis methods when she reported her findings to the FSSB. Even still, the FSSB overwhelmingly approved the standards; glass analysts can readily claim that their field is controlled by the existence of standards even though the standards codify questionable techniques.

Standards like these create a perception that forensic disciplines are progressing when, in fact, they maintain and reinforce the unscientific status quo. This creates the “danger . . . that a court may not look further than the fact that a standard exists, and be misled into believing that conformity to a vacuous standard is indicative of scientific validity, even though it is not.” As the researchers note, standards that allow faulty forensic techniques to be used do not strengthen scientific validity.

455. Id. at 206.
456. Id. at 207.
457. Id. (internal quotations omitted).
458. Id.
460. See id.
461. Morrison et al., supra note 454, at 206–07.
462. Id. at 207.
463. Id. General acceptance is the final Daubert factor. Daubert v. Merrell Dow Pharms., 509 U.S. 579, 594 (1993). Its manipulability has been discussed in detail previously in Part II.B. In the firearms context, prosecutors and forensic scientists have successfully persuaded courts to, with near unanimity, treat the relevant scientific community as limited to the community of firearms and toolmark examiners despite the fact that the “scientific community at large disavows” the firearms examination method. United States v. Tibbs, No. 2016 CFI 19431, 2019 D.C. Super. LEXIS 9, at *73 (D.C. Super. Ct. Sept. 5, 2019) (collecting cases); People v. Ross, 129 N.Y.S.3d 629, 639 (Sup. Ct. 2020); United States v. Adams, 444 F. Supp. 3d 1248, 1266 (D. Or. 2020).
IV. RADICALLY REIMAGINING THE FORENSIC SYSTEM

Understanding the degree to which these two sets of interested actors have stood in the way of reform is important in its own right, but what does it reveal about how to overcome the resistance and propel positive change in the forensic context? Recently, activists and scholars have drawn from abolitionist theory in developing strategies for change.464 This Part now begins to build an abolition-based framework for reimagining the forensic system. Application of the framework may reveal new strategies and offer new explanations for why the forensic system has remained insulated from reform efforts.

A. An Abolitionist Framework for Reimagining Forensics

What processes could be applied to construct a forensic system that satisfies the goals and obligations of abolitionism? For forensic reformers who acknowledge the carceral applications of forensics and who desire to pursue a non-reformist agenda, abolitionist tenets and principles can be adapted to formulate a framework for forensic reform. This approach, which acknowledges structural racism built into the modern carceral system, is not the only perspective from which the forensic system can be reimagined; this Article does not suggest that the framework it proposes is the sole way of approaching forensic reform.465 Rather, it encourages an acknowledgement that the forensic system is part of the carceral system, cannot be extracted from it, and enables carceral harm. And it aims to enable a new conceptualization of the forensic system based on that acknowledgment.

It is worth emphasizing that there is no single model for reimagining forensics that draws on abolitionism.466 Instead of focusing on the construction of a singular roadmap, a broad approach can be derived from core abolitionist principles and an understanding of ways in which forensic techniques are used in the criminal legal system. From there, a framework for reimagining forensics in a manner consistent with the broader abolitionist vision can be developed.

This Part uses an abolitionist lens to propose a three-pronged framework for reimagining forensics. The first prong examines how well a proposal

464. See supra notes 34–37 and accompanying text.
465. See DERECKA PURNELL, BECOMING ABOLITIONISTS 9 (2021) (“I write about prison and police abolition . . . as one way to think about and experiment with problems and solutions. Abolition is important to me, but not abolition alone. I try my best to study abolition alongside other paradigms, such as feminism, decolonization, and internationalism . . . .”). Other frameworks may be the subject of future scholarship but are outside the scope of this Article. See, e.g., BERNARD HARCOURT, THE ILLUSION OF FREE MARKETS: PUNISHMENT AND THE MYTH OF NATURAL ORDER (2011) (arguing that conventional belief in the legitimacy and necessity of both free markets and a governmental role in carceral punishment are myths and that, instead, free markets and carceral punishment operate in concert to entrench societal inequities.).
adheres to core principles of abolitionism. The second considers how the forensic method at issue is used; it requires evaluation of whether the method at issue serves a purely carceral purpose (like criminal surveillance) or if it has a nonpunitive purpose (such as identification) that supports noncarceral functions (like achieving accountability). The third prong focuses on who uses the method. It examines whether a proposal allows use of a technique by carceral actors, like police and prosecutors, or if it is aimed at remedying harm by supporting use by communities and those ensnared in the criminal legal system.

1. Constructing the Framework

To conduct the evaluation under prong one, this Article identifies five core principles of abolitionism that relate to the use of forensics. As described previously, abolitionism is not easily captured in a single definition or set of principles. The principles laid out below, however, facilitate development of a framework for non-reformist forensic reform in two ways: (1) they encapsulate the central elements of the core theory and (2) they are pragmatic; they enable a straightforward approach for applying abolitionist theory to reimagining forensics, particularly for those considering such an approach for the first time.

The first such principle is that non-reformist forensic reform efforts should seek the elimination or, at minimum, alleviation of the harms caused by the use of forensics to facilitate carceral functions. Because forensic methods are used to power carceral function, these are the same harms caused by the carceral system, which, as previously described, include ensnarement in the punitive criminal legal system generally, violence, harassment, surveillance, monitoring, and criminal punishment more specifically. An abolition-based model for non-reformist forensic reform must acknowledge these harms in the first instance and work to remedy them in the second. As a baseline then, an abolition-based model does not permit the use of scientifically invalid methods.\footnote{To be clear, use of forensic methods that are not scientifically valid is inconsistent with even a reformist vision for forensic reform.} Under any model for reimagining forensics, scientific validity and reliability are threshold requirements necessary to prevent unjust outcomes—harms well-known to be caused by forensic evidence.\footnote{See supra note 10.}

The second principle is to acknowledge the carceral origins of forensics and, accordingly, eschew expansion or further legitimization of the carceral system overall in pursuing non-reformist forensic reform. Third, forensic reform efforts must acknowledge the historical exclusion of communities from decision-making about accountability and punishment and seek to avoid the continuation of that trend.\footnote{See Jocelyn Simonson, Police Reform Through a Power Lens, 130 Yale L.J. 778, 791 (2021).} Fourth, the model should incorporate the value
of investing in new systems that obviate the need for carceral punishment—
systems that build up communities by investing in health, education, wellbeing,
and other basic needs. Finally, a forensic reform model that relies on
abolitionist principles must avoid describing and treating the carceral system as
broken or in need of fixing. Abolitionists argue that such rhetoric works against
the core abolitionist mission of eliminating the carceral state by constraining
people’s ability to conceptualize a world without a carceral institution and
allows that mission to be portrayed as unrealistic, impossible, or naïve.

Practically speaking, what can non-reformist forensic reform look like? As
described previously, forensics is intimately entwined with carceral function.
Most obviously then, it would be consistent with these principles to abandon
all use of forensics for criminal legal purposes entirely. But the project of
reenvisioning forensic reform is not meant to be naïve. As abolitionists who
recognize the unlikelihood of immediate eradication of current carceral
structure encourage, lesser, deliberate steps that incorporate non-reformist
principles should be taken.

The second prong, then, requires categorizing forensic methods by
purpose. Not all forensic methods serve the same function in general or in a
given case. The forensic system is vast; it encompasses a variety of methods
used for a variety of purposes depending on the case or task at hand. What
follows is that, whether abolition-based or otherwise, no forensic reform
strategy can be one-size-fits-all. On the contrary, understanding the function or
range of functions of a particular method opens up a way in which to evaluate
that method or proposed reforms according to the above principles. Thus, as a
starting point, reformers need to ask: which forensic functions may be desirable
in a post-abolition world? Which are inextricably intertwined with carceralism
and thus contrary to a reimagined forensic system?

Forensics methods can be categorized along two dimensions: the degree to
which a method serves a sweeping data-amassing or surveillance purpose and
the degree to which a method serves a narrow identification purpose. Take
DNA as an example. In an individual case in which a person is charged with a
sex offense, DNA analysis of intimate swabs from a sex kit might, where a
suspect is known, allow confirmation of the suspect as the person of interest.
Of course, the identification then enables that suspect’s prosecution, but its
primary purpose was to identify someone.

Where the suspect is unknown, however, entry of a DNA profile developed
from testing of the swab into a database serves more than an identification
function. Forensic databases, including law enforcement DNA databases,
fingerprint databases, photo databases that enable facial recognition searches,

470. See Purnell, supra note 465, at 9 (“Abolition . . . includes eliminating the reasons people think
they need cops and prisons in the first place.”); Kaba, supra note 65, at 2.
471. See Kaba, supra note 65, at 2.
472. See supra notes 76–80 and accompanying text.
and even commercial DNA databases that are increasingly used for law enforcement purposes, support more insidious carceral purposes: surveillance and monitoring. They maintain and store highly personal biometric information, often in perpetuity, creating an ever-growing and expanding net from which the carceral system can draw suspects. The database search draws on the surveillance function of the vast DNA databanks that house biometric data, disproportionately those of members of marginalized communities. It also encourages expansion of such databases to increase the pool of suspects available to law enforcement. This concern is not theoretical: apart from legislatively created databases like CODIS, law enforcement entities are actively creating unregulated, secret DNA databases built by applying pressure to people to give up their DNA to avoid harsh punishments.

This identification-surveillance categorization helps clarify ways in which non-reformist forensic reforms might be pursued. Because abolitionism is not inconsistent with a desire for accountability, it does not necessarily require total abandonment of forensic methods. One strategy may permit the use of forensic methods strictly for identification purposes. Abolition of the carceral system would mean that forensic methods would cease to serve a purpose in the criminal context. However, forensic methods might continue to play a role in accountability and harm reduction. Indeed, abolitionists do not propose that those who cause harm not be held accountable. Rather, they propose noncarceral consequences—meaning, forensics might still be used to identify those who cause harm, so long as such methods are not used to funnel people into the carceral system and so long as communities are empowered to determine how, and for what purposes, forensic methods may be used in achieving accountability.

Even if forensic identification methods continued to be used for individual identification purposes, an approach consistent with the above five principles might focus on elimination of or placement of a moratorium on use of forensic technologies (1) to collect and amass biometric data that can be used later for surveillance, policing, and prosecution; (2) that widens the pool of people who can be ensnared in the criminal legal system; and which thus (3) allow people to be swept into the carceral process without specific ties or suspicion of

474. See, e.g., GEDmatch.com Terms of Service and Privacy Policy, GEDMATCH, https://www.gedmatch.com/terms-of-service-privacy-policy (last visited Feb. 8, 2022) (stating a general policy of indefinitely retaining DNA data until receipt of a request to delete the data or discovery that the data was uploaded in violation of the privacy policy).
475. Murphy & Tong, supra note 84, at 1851.
477. These can include isolation from people or places, required restitution or labor, public apology, ineligibility for community leadership, among other consequences. KABA, supra note 65, at 136–37.
involvement in a crime. Such an approach reckons with the historically racialized application of surveillance technologies, acknowledges and seeks to redress the harms of surveillance, and attempts to limit the use of forensic methods for carceral purposes. Any moratorium could only be ended after meaningful community-driven consensus on how, if at all, to resume use of such techniques. What such a community-based consensus might look like is beyond the scope of this Article, but what is clear is that different communities will have different needs and priorities. Consensus in one community may look different than in others.479 And indeed, it is possible that community-led decisions about surveillance may not eliminate punitive uses of surveillance technologies.480

Undoubtedly, some forensic disciplines evade easy categorization along axes of identification and surveillance. For example, forensic psychology and psychiatry techniques used to evaluate mental state, predict risk, or determine competency or intellectual disability, among myriad other purposes, do not serve either an identification function or surveillance function.481 But a direct application of the above-identified five principles can still be used to approach reform that applies to these disciplines as well. Where a forensic technique can be classified this way, the identification–surveillance classification is a means of identifying uses that raise red flags because of acutely carceral functions.

The third prong requires examination of who may use the method at issue. A non-reformist approach to forensic reform might seek to ban the use of forensic methods by carceral actors, whose role it is to police, prosecute, and punish, and who have proven not to be honest brokers when it comes to the use of forensics and any others who have a stake in the continuation of the current system. It is important to recognize that private organizations that

478. Criminal surveillance functions as we recognize them today likely have no place in a post-abolition society. See McLeod, supra note 40, at 1617 (quoting Miriame Kaba) (“Prison abolition is . . . the complete and utter dismantling of prisons, policing, and surveillance as they currently exist within our culture.”). But this may not mean that a total abandonment of data collection and analysis is required. See Erin Collins, 

479. Simonson, supra note 460, at 789 (“Communities, however defined, are not monolithic, a reality that has become especially salient as communities of color have disagreed internally over the summer of 2020 about calls to defund the police.” (footnote omitted)).

480. Id; Trevor G. Gardner, By Any Means: A Philosophical Frame for Rulemaking Reform in Criminal Law, 130 YALE L.J. 798, 806–807 (explaining that “crime policymaking at the level of community” may “produce[] inequitable crime policy and inequitable crime-policy outcomes” where “punitive crime politics . . . permeate marginal communities”).

produce forensic technologies for their own use or use by law enforcement are carceral actors too,482 and thus, should be scrutinized in the same ways that traditional carceral actors—police and prosecutors—are. Use of forensic methods by carceral actors entrenches carceral harms and treats miscarriages of justice as remedial aberrations of the system. A strategy that restricts or eliminates use of forensics by carceral actors acknowledges that forensics enables carceral harm and seeks to redress those harms by eliminating the use of forensic evidence by those who pursue carceral functions.

Reciprocally, such an approach might permit interim use of forensics for exculpatory purposes by individuals suspected of, charged with, or convicted of crimes. By eliminating the ability of the carceral institution to inflict harm using forensic methods, allowing exculpatory use of forensic evidence both acknowledges and operates to redress those very harms at the individual level.

It is imperative to be precise about the meaning of “exculpatory” here. To be consistent with the identified principles, exculpatory use of forensics must mean the exclusive use of evidence to negate guilt or mitigate punishment, without implicating alternative suspects for prosecution. This is in contrast to contemporary strategies for exonerating the innocent, in which the availability of an alternative suspect is often central to a determination of innocence.483 But any action that leads to the infliction of additional harm by the carceral system, like pointing the finger at an alternative suspect, is inconsistent with the principles of abolition identified previously.

2. Looking Forward

The framework outlined above can be used to evaluate contemporary proposals for reform to determine whether they meet the goals of abolitionism. This Subpart evaluates three such proposals: (1) calls for forensic lab independence; (2) demands for increased research to shore up the scientific underpinnings of forensic methods; and (3) proposals for progressive prosecutors to eliminate or limit use of forensics in prosecutions in their jurisdictions.

A common call for reform is to remove labs from law enforcement control and establish them as independent agencies.484 While moving forensic labs out

482. See Why, CARCERAL TECH RESISTANCE NETWORK (Mar. 30, 2020), https://static1.squarespace.com/static/5d7edafec15c71734412dat2/t/5e842016a28f9416638f6d98/158571728776/documentation+2F+2020-03-30+%2F+why (“carceral tech industries exploit the visibility and exposure our communities face for financial gain, and do so under the guise of innovation, security, and academic knowledge production.”).

483. See, e.g., Robert P. Mosteller, N.C. INNOCENCE INQUIRY COMMISSION'S FIRST DECADE: IMPRESSIVE SUCCESSES AND LESSONS LEARNED, 94 N.C. L. REV. 1725, 1736–37, 1760–61 (2016) (explaining that, by design, the North Carolina Innocence Inquiry Commission is charged with providing law enforcement agencies evidence of guilt of alternative suspects and highlighting the importance of investigating an alternate suspect in one of its investigations).

484. See, e.g., NAS REPORT, supra note 2, at 184, 190–91.
of police departments may be a starting point for decoupling forensic science from law enforcement, perhaps surprisingly, application of an abolitionist framework suggests that even this proposal will not always be classifiable as non-reformist.485 First, even independent labs serve law enforcement’s crime-solving needs and, thus, operate in service of the carceral state.486 Second, unless specifically designed to place limits on what methods can be used, what can be tested, or under what circumstances law enforcement can seek testing, there is little reason to believe that establishment of independent labs would contract the carceral establishment or alleviate harm. And while taking law enforcement personnel from a police lab and moving them to another, theoretically independent agency, as some independent labs do,487 might appear to divest power from and to contract the carceral institution, it cannot ensure meaningful insulation from law enforcement influence because of the inherited cultural alignment between law enforcement and the forensic system. Examiners and analysts carry over their education, training, experience, and alignments.488

Not only that, but because forensic methods are used with far greater frequency in prosecuting than by the accused,489 examiners will remain targets of defense requests to uncover errors, mistakes, and other failures and will continue to be subjected to aggressive cross-examinations aimed at undermining qualifications, accuracy of results, and the validity of entire disciplines. These tactics, though ethical, lawful, and necessary to adequately defend the accused within the adversarial process, may further entrench existing alignments.

Even independent labs, though not under direct law enforcement control, continue to serve law enforcement needs as their primary function. They are also typically state-funded and controlled, with little community involvement or oversight.490

485. Some forensic reformers have begun hinting at this. See Sarah Chu (@SarahPChu), TWITTER (Dec. 15, 2021, 7:57 AM), https://twitter.com/SarahPChu/status/1471117123930017792 (“True independence is not about putting walls up—it’s about tearing walls down. Independence requires transparency, putting science first, and owning the past . . . .”).
486. See e.g., Jacqulyn Powell, Austin’s New, Independent Forensic Science Department Nearing Deadline to Open, KXAN (June 30, 2021, 10:00 AM), https://www.kxan.com/news/local/austin/austins-new-independent-forensic-science-department-nearing-deadline-to-open/ (noting that a proposed independent forensic lab in Austin will process police evidence).
487. See, e.g., id. (explaining that the lab head hired to run Austin’s police lab will continue to run the lab after it is moved out of the police department); SNA INT’L, DC DEPARTMENT OF FORENSIC SCIENCES LABORATORY ASSESSMENT REPORT 11 (2021) (“[M]any MPD [Metropolitan Police Department] staff were ‘grandfathered’ into the DFS without formally vetting their prior training, competency, or proficiency.”).
488. SNA INT’L, supra note 487.
Independence might nevertheless fit within a non-reformist vision of “gradual application of a coherent program of reforms” that may lead to transformative change if implemented in tandem with other transformative strategies. As an interim strategy, lab independence has the potential to benefit the criminally accused languishing in the existing criminal legal system. Independence could aid in avoiding battles for discovery and prevent suppression of documents; it could help arm the accused with materials needed to mount a defense or admissibility challenge. But as recent lab scandals have demonstrated, independence does not always prevent error, mishandling of evidence, or other fundamental lab failures. Moreover, independence does not change forensics’ enablement of carceral functions. True independence and transparency would require a radically new vision for forensic labs separate and insulated from carceral influence that begins to incorporate principles of neutrality and adherence to the scientific method long before the lab does any work.

Privatization of labs is no better tailored to solve these problems. With the bulk of forensic service demand coming from law enforcement, for-profit labs cannot eliminate the use of forensics for carceral purposes. Indeed, for-profit DNA analysis software companies are already criticized for pursuing analyses beyond the reliable limits of the software system and for lack of transparency around how their systems operate. Privatization may serve only to place an unearned gloss of neutrality on labs that continue to be beholden to law enforcement needs.

These examples reveal that seemingly transformative reform can be implemented in ways that serve to further entrench the forces they are meant to dismantle. Recently, Valena Beety, recognizing the need for and supportive of calls to defund the police, has called not just for independence of labs, but for crime scene investigators to be moved out of police departments entirely, to civilian agencies. Her proposal might be classified appropriately as a non-reformist reform because it seeks to divest from the carceral institution and because it reflects an inherent recognition that, even if labs are made

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491. See Engler & Engler, supra note 41 (quoting Andre Gorz, Reform and Revolution, in THE SOCIALIST REGISTER 111-12 (Ralph Miliband & John Saville eds., 1968)); see also Akbar, supra note 41, at 106.

492. NAS REPORT, supra note 2, at 82.


independent, forensic investigation can be weaponized in the same ways it has been historically if law enforcement agents remain in charge of investigation. Put another way, traditional attempts to make labs independent may not sufficiently divest the state of carceral power or transfer control and oversight of labs to the community; proposals to remove forensic labs from police departments that do not confront forensics’ role within the prosecutorial system fail to satisfy the obligations of an abolitionist agenda.

Calls are frequently made for research to shore up the scientific underpinnings of forensic disciplines, but would such research be consistent with an abolition-based reform agenda? Because forensic techniques may be used consistently with an abolitionist agenda to identify those who cause harm to others, the reliability and accuracy of forensic methods remain important precisely because accountability cannot be achieved if forensic methods cannot be relied on to produce accurate results.

It is important, however, to focus on how research is conducted. The scientific underpinnings must be shored up, and the limitations of methods must be determined through research that pulls forensics away from the carceral intuition. Thus, any research model must be separate and insulated from carceral influences. Identifying the specific contours of such a model is left for future scholarship, but a non-profit- or university-based research structure might be appropriate. Various research models—some that meet an anti-carcel agenda and some that do not—have already been proposed.

It is additionally important to push for research not to be funded by for-profit entities or to support for-profit products. So long as a carceral state exists, the biggest customers of private companies that produce forensic technologies will remain law enforcement clients. Thus, profit-driven research will have the potential to be influenced by incentives that seek to maintain the status quo.

Finally, there is an ongoing “progressive prosecutor” movement to leverage the power that prosecutors wield in the criminal legal system towards a decarcel agenda. The precise contours of what constitutes a progressive prosecutor have been debated, but the central idea behind the movement is that prosecutors have great power within the criminal legal system that can be leveraged to decarcerate. Applied to forensics, a policy for progressive

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496. See e.g., PCAST REPORT, supra note 2, at 124–25 (encouraging research to establish the validity of forensic science disciplines and routine evaluation of methods’ validity).

497. Id. at 125 (proposing a variety of organizations to conduct validation research including law enforcement agencies like the FBI); NAS REPORT, supra note 2, at 190.

498. Darcy Covert, Transforming the Progressive Prosecutor Movement, 2021 Wis. L. Rev. 187, 188.

499. See Benjamin Levin, Imagining the Progressive Prosecutor, 105 MINN. L. REV. 1415, 1418 (2021) (arguing that there are multiple ways in which prosecutors might be fairly characterized as “progressive”); Rachel Foran, Mariame Kaba & Katy Naples-Mitchell, Abolitionist Principles for Prosecutor Organizing: Origins and Next Steps, 16 STAN. J.C.R. & C.L. 496, 500 (2021) (noting that there is “no generally accepted definition of a ’progressive prosecutor’”).

prosecution would require that prosecutors (1) decline to use unvalidated forensic evidence and ensure that forensic evidence that is used to prosecute is valid in principle and also as applied in any given case, (2) commit to continuous evaluation of new scientific literature even if it undermines old methods, and (3) prevent overstatement of forensic conclusions.\footnote{See \textit{Fair & Just Prosecution}, 21 PRINCIPLES FOR THE 21ST CENTURY PROSECUTOR 22 (2018), https://www.brennancenter.org/sites/default/files/2019-08/Report_21st_century_prosecutor.pdf.} Simply, a progressive prosecution approach to forensics would require prosecutors to limit use of forensics to reliable methods and applications.

At first blush, such an approach may appear consistent with an abolition-based framework. Limiting the use of forensics in prosecutions might redress some harm. Moreover, the progressive prosecutor movement is premised on the idea that progressive prosecutors derive their authority from those who elect them and, as a result, will institute progressive policies supported by their constituents.\footnote{Jeffrey Bellin, \textit{Theories of Prosecution}, 108 CALIF. L. REV. 1203, 1218 (2020).} So, according to that premise, putting progressive prosecutors in charge of how and when to use forensics may feel like democratization of forensic policy.

But upon closer scrutiny, the progressive prosecutor model does not satisfy the agenda for several reasons. Fundamentally, abolitionism seeks to end prosecution because it constitutes a core function of the criminal legal system;\footnote{Foran, Kaba, & Naples-Mitchell, supra note 499, at 519.} prosecutors cannot eliminate the carceral state.\footnote{Jeffrey Bellin, \textit{Expanding the Reach of Progressive Prosecution}, 110 J. CRIM. L. & CRIMINOLOGY 707, 713 (2020) (listing abolition on a “nonviable list [of normative theories of prosecution] because prosecutors cannot be the source of abolition”); Foran, Kaba, & Naples-Mitchell, supra note 499, at 498–500 (arguing that because prosecution is an essential criminal legal function, it cannot be progressive). For a comprehensive abolitionist critique of progressive prosecution, see generally Foran, Kaba, & Naples-Mitchell, supra note 499.} Moreover, abolitionists argue that progressive prosecution cannot serve as a meaningful democratizing force because of the insurmountable power imbalance between prosecutors and communities.\footnote{Foran, Kaba, & Naples-Mitchell, supra note 499, at 520.}

Even setting these fundamental barriers aside, there are additional pragmatic issues specifically related to use of forensics that make putting progressive prosecutors in charge of forensic policy contrary to abolitionist principles. First, any policy attempting to define the circumstances under which forensics may be used will necessarily be murky because what methods and applications are reliable is under debate. The murkiness, then, is destined to allow continued enablement of traditional prosecutorial use of forensics, including use of unreliable methods.

Second, it is unlikely that the elected progressive prosecutor could limit police’s use of forensic evidence before charging. This is particularly true in light of heated tension between police and progressive prosecutors over law
enforcement policy in many jurisdictions. A progressive prosecutor policy for limiting use of forensics in prosecution does not stop individuals from being swept into the carceral system by policing that uses forensic methods.

Third, setting aside the murkiness of any such policy, decision-making authority on whether and how to use forensics under the progressive prosecutor model is still centered in the carceral actor, not the party likely to suffer some harm from its use, the accused. Moreover, community members would not have an influence on day-to-day decisions on whether and how to use forensic evidence; prosecutors would retain complete control over such decisions. It seems unreasonable, if not naïve, to believe that prosecutors would consistently adhere closely to such a policy in the face of pressures.

The primary reason a progressive prosecutor model for forensic reform is inconsistent with a non-reformist agenda is that, beneath the surface-level fix, such a model fails to register a forceful critique of the way in which the criminal legal system, and the use of forensics within it, operates today. Rather, it seeks to place limits on the current system while tolerating the overall structure. The model would do nothing to contract or delegitimize the system overall. Rather, it would create the appearance of meaningful reform by suggesting that progressive prosecutors can be entrusted to use forensics as part of a decarceration strategy without reducing funding to or the scale of prosecution, challenging the conventional idea that policing and prosecution promote public safety, or transferring meaningful decision-making authority to the community.

3. Looking Backward

Evaluating past reform efforts through the abolition frame also yields interesting and often surprising results. First, application of the framework suggests that most reform efforts to date have largely aligned with conventional criminal justice reform efforts and, accordingly, can squarely be classified as reformist reforms. Reformers have assumed the intrinsic utility and legitimacy


508. See McLeod, supra note 57, at 1207–08 (arguing that one distinguishing feature between abolition and reform models is that abolitionism is “oriented toward displacing criminal law as a primary regulatory framework and replacing it with other social regulatory forms, rather than only or primarily moderating criminal punishment or limiting its scope or focus”).
of the use of forensic evidence in criminal prosecutions, attempting to improve it by tweaking at the margins without serious confrontation of systemic flaws.509

The NAS Report’s recommendations exemplify this. While the report is ultimately critical of some applications of the forensic system, it assumes the intrinsic value of both the carceral establishment and of forensic techniques to support it, largely accepting forensics as legitimate science that need only be cleaned up.510 Its recommendations, for example, creation of a national forensic governing body and infusion of funding for forensic research and education, would result in expansion of the forensic system and, thus, might well result in greater use of forensic methods for carceral purposes. Other recommendations—for instance, accreditation of labs, development of guiding standards, and adoption of a forensic code of ethics—are analogs of conventional policing reform. They are meant to fine-tune and would aid in legitimizing the role of forensics in carceral functions.

The NAS Report's outgrowths, the NCFS and OSAC, have, perhaps unintentionally, already enlarged the forensic system and enabled even more forensics-aided law enforcement while adding a gloss of scientific legitimacy to forensic practice even if their work products have not significantly improved forensic methods or operations.

Application of the framework reveals additional examples of forensic reform proposals that correspond with conventional reform efforts in the broader criminal legal context and, thus, do not fit within an abolitionist agenda. Take for example forensic science commissions or advisory boards that aim to serve as accountability mechanisms by conducting oversight of forensic labs.511 Like civilian oversight boards in the policing context, however, such commissions add a veil of legitimacy without either confronting the root causes of harm caused by the forensic system or providing a meaningful check on forensic work. Rather, such commissions expand the forensic system while reinforcing the perception that forensic methods need only minor corrections; they presume that miscarriages of justice are aberrations rather than expected outcomes of the use of carceral technologies.512 In reality, of the minority of

509. NAS REPORT, supra note 2, at xix (describing a need for greater resources, policies and support in the forensic system); PCAST REPORT, supra note 2, at 1 (describing the report’s aim as to “close gaps” in particular forensic methods); see also Kafadar, supra note 206, at 7 (“Our [the NAS Committee’s] goal was supportive—to strengthen the value of forensic evidence . . . .”); see also, e.g., Jessica Gabel Cino, Bad Science Begets Bad Convictions: The Need for Postconviction Relief in the Wake of Discredited Forensics, 7 U. DENV. CRIM. L. REV. 1, 2 (2017) (“Undoubtedly, forensic science is a vital component of the criminal justice system.”). This Author, too, has suggested reforms that do not grapple with the systemic fissures in the forensic science system. See generally Sinha, supra note 267.

510. NAS REPORT, supra note 2, at xix (“The work of forensic science practitioners is so obviously wide-reaching and important . . . .”); id. at 4 (“For decades, the forensic science disciplines have produced valuable evidence that has contributed to the successful prosecution and conviction of criminals as well as to the exonerations of innocent people.”).


512. See Reformist Reforms vs. Abolitionist Steps in Policing, supra note 54.
jurisdictions that even have such commissions, few actually oversee forensic operations.\textsuperscript{513}

Application of the abolitionist framework suggests that even the national, centralized forensic governing body proposed by the NAS Committee—the most sweeping reform recommendation made to date—may not fit within a non-reformist agenda. Fundamentally, the proposed version of such a body accepts the role of forensic methods in support of carceral function as legitimate. Indeed, the very aim of that recommendation is to further develop forensic fields and ultimately divert more resources to the continued use of forensics in order to enable policing and prosecution.\textsuperscript{514} In other words, such a body would—by design—take the legitimacy of the forensic system for granted without confronting its origins and abet an institution that has historically caused harm.\textsuperscript{515} And, granting a national forensics governing body governance authority, control over disbursement of funding, and other regulatory authority might well equate to a transfer of power to the carceral establishment rather than divestment from it.\textsuperscript{516}

Consideration of legal efforts to reform the forensic system through this lens yields equally interesting results. Proposals for improved forensic discovery echo reformist calls for greater transparency in policing (e.g., for mandatory use of body-worn cameras). Calls to increase scrutiny of forensic evidence, like those for more stringent rules governing admissibility or for assistance to judges making admissibility determinations, assume that forensic methods play a valid role in carceral functions that need only be improved. Like police accountability boards, back-end reforms, including statutes creating avenues for challenging wrongful convictions, postconviction commissions, and even innocence projects, create the impression that errors are being corrected but do not grapple with fundamental concerns stemming from the forensic system’s origins and natural allegiance to police and prosecutors. Needless to say, each of these proposals can alleviate the significant harms suffered by those being churned through the criminal legal system. Thus, if tailored carefully to a non-reformist agenda, some of these proposals may be appropriately taken as

\textsuperscript{513} Garrett, supra note 511, at 615 (“[T]hirteen states and Washington D.C. have created forensic science commissions . . . [b]ew of these groups, however, actually conduct oversight of forensic methods and work.”).

\textsuperscript{514} See NAS REPORT, supra note 2, at 19–20.

\textsuperscript{515} Id. at 14–18.

\textsuperscript{516} It may nevertheless be possible to design a forensic regulatory body consistent with a non-reformist agenda. Cf. KABA, supra note 65, at 97 (explaining that some abolitionists believe that police regulatory structures “could be an interim way to begin to erode the power of the police” as “part of the long evolution on your way to abolition” by “taking away power from the institution of policing.”). For example, a body designed for purposes identified by and with the input of communities and individuals harmed by the carceral system that is committed to transparency and seeks to ensure the validity of forensic methods exclusively for noncarceral purposes by noncarceral actors might satisfy abolitionist obligations. For the reasons identified, proposals for a national forensic governing body made to-date, however, do not satisfy these criteria. Whether such a body can be designed consistently with a non-reformist agenda and the contours of such a body are left for future scholarship.
2022] Radically Reimagining Forensic Evidence

intermediate harm-reduction steps alongside more transformative actions. Still, it is important to recognize that such proposals seek to remedy the problems caused by bad science at the margins while allowing the bulk to be admitted, as it always has been. They may also serve to entrench existing perceptions of the carceral system as legitimate or create new harms; indeed, the NCIIC funnels evidence uncovered in innocence inquiries back to law enforcement for the potential prosecution of new suspects.

Ironically, the forensic system is itself borne of an attempt to reform policing by nibbling at its edges. Like calls for increased training, funding, standards, technology, accountability measures, and other traditional reforms, forensic techniques are themselves reforms to policing that help legitimize a system of law enforcement that decimates Black and Brown lives and communities.

B. Is an Abolitionist Approach to Reimagining Forensics Realistic?

This Article represents the first scholarly attempt to connect forensic reform efforts to the burgeoning movement for carceral abolition. It invites an uncomfortable confrontation with the fundamental carceralism of forensics. The ideas it explores are novel; further development of them is necessary and encouraged. Thus, critiques of the approach outlined here, which distinctly diverges from the models for reform currently being considered or attempted, are inevitable. Valid initial questions that may arise, related to common concerns surrounding abolitionism, include (1) what precise structures might replace the forensic system as it exists today and (2) whether there can be agreement on the answers to that question. Another critique may be that, if the central thesis of abolitionism is that the carceral system must be replaced, abolitionist goals are more likely to be achieved if reformers focus their efforts on core carceral functions like surveillance, policing, prosecution, and imprisonment rather than on forensics. This may be true; this Article does not seek to resolve that question. Rather, its approach merely acknowledges that many people currently focus their attentions on forensic reform and will continue to do so. With that backdrop, it attempts to include forensic reform in the larger, ongoing conversation on criminal legal reform that draws on abolitionist principles and offers a framework for doing so.

517. See Daniel Harawa, Lemonade: A Racial Justice Reframing of The Roberts Court’s Criminal Jurisprudence, 110 CALIF. L. REV. (forthcoming 2022) (arguing that while “big picture” radical reimagination of the criminal legal system is necessary, “the millions of Black and Brown people who are arrested each year need some solutions now.”).
518. See KABA, supra note 65, at 96 (warning of the danger of pursuing reforms that “end up reproducing the system in another form.”).
520. See supra note 125 and accompanying text.
This Article leaves these questions open for exploration in future scholarship. Recognizing that the answers to these questions may affect what avenues reformers choose to pursue, this Part briefly addresses two anticipated critiques that have not been examined earlier.

1. The Relationship Between the Forensic and Carceral Systems

As a threshold matter, critics may question how well the abolitionist framework maps on to forensics. Indeed, the forensic system is not limited to the criminal legal sphere; it intersects with the greater scientific institution, and forensic methods are also utilized in noncriminal contexts. Some may further argue that forensics is distinct from other punitive aspects of the carceral system because, in their view, forensics does not take sides; it merely searches for the truth. And indeed, forensic methods are employed by the accused and convicted, not only by carceral actors.

It is equally true, however, that forensic methods are enmeshed with—and cannot be disaggregated from—the carceral system as a whole. Forensic methods enable policing and prosecution, the core functions of the carceral system. As a result of insulation from competitive and scientific checks, forensic evidence often does take sides. As this Article has reminded, forensic methods originated as criminal legal tools and the original carceral DNA is embedded in the modern forensic system. Context-less statements about the purportedly truth-seeking function of forensics purposely obscure this history and the reality that most forensic evidence is produced to prosecute.

The more global defect with this argument is that by attempting to extract forensics from the overall criminal legal system, it inherently accepts the punitive outcomes and damage to communities the system imposes. To seek the “true” perpetrator is to enable the existing criminal legal system. Identification of a person within the confines of a criminal prosecution suggests that what happens next in the criminal process is justified. It allows the system to exert its punitive power over that person, and the next, and the next, and so on, all under the guise of uncontaminated, scientific justice.

522. See James M. Anderson et al., The Unrealized Promise of Forensic Science—A Study of Its Production and Use, 26 BERKELEY J. CRIM. L. 121, 123 (2021) (arguing that “[t]he forensic science process is, at least potentially, also independent of much of the rest of the criminal process”).

523. Forensic Science, NAT’L ASS’N OF CRIM. DEF. LAWS., https://www.nacdl.org/Landing/ForensicResources (last visited Apr. 19, 2022) (“Evidence is the crux of every criminal case, making forensic science one of the most (if not the most) critical elements of an investigation and defense.”).

524. See supra notes 110–114 and accompanying text.

525. See supra notes 92, 115–116 and accompanying text.

526. See McLeod, supra note 57, at 1207 (“[A]n abolitionist ethic more accurately identifies the wrong entailed in holding people in cages or policing them with the threat of imprisonment, as well as more fully recognizes the transformative work that would be required to meaningfully alter these dynamics and practices.”).
2. The Practicality of Abolitionism

Another critique may be that, to some observers, the defund the police movement, and the carceral abolition movement more broadly, appear to have been unsuccessful. According to this reasoning, abandoning what are currently believed to be sound reform efforts may be misguided.

Critics who take this view will find support in media narratives and among politicians and others. In the immediate wake of George Floyd’s murder, demands to defund and dismantle appeared to influence policy across the country. At least sixteen cities proposed or promised some version of defunding the police. These proposals ranged from reducing police budgets and rerouting funding to community resources to shrinking police forces. As one prominent example, in the initial aftermath of BLM protests, the Minneapolis City Council committed to disbanding its police force.

Many of those cities did make at least minimal early progress on fulfilling such promises by reducing police budgets or manpower. Austin drastically cut its police budget and reallocated that money into non-law enforcement agencies that address health and housing issues. Its city council voted to reallocate millions from its police budget to remove its crime lab from the police department. Los Angeles reduced school police and used the windfall to fund education initiatives for Black students.


529.  Id.


533.  Powell, supra note 486.

After making early inroads, however, activists faced challenges in securing more than promises. Stated commitments to defunding did not always translate to community control or oversight of how diverted funds would be redistributed.535

Setbacks like these brought into focus larger concerns about the long-term viability of abolitionism and how much popular support movements could maintain. Less than two years after demands to defund took hold, political backlash and rhetoric attributing rising crime rates to defunding of police forces emerged and earned support.536 Not long after the Minneapolis City Council promised to disband the police department, several council members walked back their positions.537 Voters ultimately rejected a ballot measure to replace the police department with a Department of Public Safety.538 By the end of 2021, New York City, Los Angeles, Austin, and other cities raised police budgets, and nationwide polling indicated a loss of support for police budget cuts.539

Scholars have explained that a non-reformist approach may be undermined even when abolitionist calls do garner widespread support. Amna Akbar noted that some liberal reformers who did not previously advocate defunding accepted variations of such calls in response to protests and grassroots organizing.540 She warned that these reformers’ efforts, which simultaneously advocate for conventional reforms alongside defunding, might end up simply relegitimizing status quo policing.541

Critiques based on such challenges are well founded. They serve as a warning about the limits of non-reformist approaches. Yet, others have countered that there are historical examples of efforts to reduce reliance on

535. See Fola Akinnibi, Sarah Holder & Christopher Cannon, Cities Say They Want to Defund the Police. Their Budgets Say Otherwise., BLOOMBERG CITYLAB (Jan. 12, 2021), https://www.bloomberg.com/graphics/2021-city-budget-police-funding/ (describing challenges faced by activists in influencing how funds diverted from the Los Angeles Police Department are used).


540. Akbar, supra note 41, at 111–12.

541. Id. at 112.
policing that demonstrate the feasibility of abolitionist models.\textsuperscript{542} And, both movement leaders and scholars have framed challenges positively. Leaders of the campaign to replace the police department in Minneapolis noted that a sizeable portion of the population supported the move; with record voter turnout, forty-four percent of voters voted for the measure.\textsuperscript{543} They argued that their efforts reframed the public conversation around the relationship between policing and public safety, possibly signifying larger changes in how people think about policing in the future.\textsuperscript{544} Akbar described the “interest convergence” between abolitionist organizers and liberal reformers not just as a challenge, but also as an opportunity for transformative change.\textsuperscript{545}

The challenges do not necessarily lead to the conclusion that an abolition-based approach to reform cannot work. Rather, they suggest that attention to how reforms are approached and implemented is critical. Care must be taken to ensure that even seemingly transformative approaches are not executed in ways that re-root the established system.\textsuperscript{546}

An additional overarching response to objections to adapting an abolition-based framework to reimagine forensics is simply that, over many years, many varied conventional reform efforts have failed or faltered in improving the forensic system or its enablement of carceral harm. It is not clear that adherence to existing models will succeed any more in the future than they have in the past. Instead, allegiance to existing approaches to reform, though well-intentioned, may reflect an inability to break the mold of dominant thinking.\textsuperscript{547} Innocently entrenched thinking, however, may also be affirmatively harmful. Failing to acknowledge the dominance the current system exerts may contribute to further embedding of carceral power.\textsuperscript{548} But recognizing this may pave the way for more open-mindedness towards abolitionist approaches to reform. As abolitionists have argued, thinking beyond the system as it exists is intensely

\textsuperscript{544} See Adams, supra note 543.
\textsuperscript{545} Akbar, supra note 41, at 112 (citing Derrick A. Bell, Jr., Brown v. Board of Education and the Interest-Convergence Dilemma, 93 HARV. L. REV. 518, 523–28 (1980) to explain Bell’s theory that alignment of interests between White and Black Americans was a prerequisite to a positive outcome in Brown v. Board of Education, 347 U.S. 483 (1954)).
\textsuperscript{546} See id.
\textsuperscript{547} See KA BA, supra note 65, at 4 (“[W]hen we set about trying to transform society, we must remember that we ourselves will also need to transform. Our imagination of what a different world can be is limited. We are deeply entangled in the very systems we are organizing to change.”).
\textsuperscript{548} See e.g., Roberts, supra note 56, at 43; Rodriguez, supra note 67, at 1597.
difficult. It requires consistent effort, but it can be achieved through diligent practice.549

CONCLUSION

The label of science has frequently been used as a fig leaf to legitimize prosecutions rather than advance justice. Recognition that forensics have been used as an engine for control and criminalization of marginalized communities demonstrates the need for a reimagining of the forensic system. This Article reframes the conversation around forensic reform and invites scholars, researchers, and reformers to consider the benefits of scaling back the forensic system and disentangling it from law enforcement rather than implementing “reforms” that fail to bring about change and, instead, expand and legitimize the use of forensics to abet mass criminalization. It offers a new framework for considering reform through this lens. What precise approaches will fit the framework is a subject for future scholarship, but the conversation on how to unveil new pathways for structural, systemic, radical forensic reform must begin now.

549. Yang, supra note 542, at 1081 (describing abolition as a “discipline”); Foran, Kaba, & Naples-Mitchell, supra note 499, at 521 (explaining that “abolition is a practice.”).