

## ***Cops in Lab Coats and Forensics in the Courtroom***

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SANDRA GUERRA THOMPSON, *COPS IN LAB COATS: CURBING WRONGFUL CONVICTIONS THROUGH INDEPENDENT FORENSIC LABORATORIES* (Carolina Academic Press 2015)

*“Science is a truth-seeking instrument . . . but is the court system?”<sup>1</sup>*

### INTRODUCTION

Sandra Guerra Thompson’s book, *Cops in Lab Coats: Curbing Wrongful Convictions Through Independent Forensic Laboratories*, debuts when forensic flaws are reaching a pinnacle of exposure. The Federal Bureau of Investigation (FBI)—arguably the best of the best in the forensics world—has conceded that it is currently re-examining thousands of closed cases for errant and faulty forensic testimony. While the FBI has conducted this type of review on a previous occasion, this time the review is public and all of us—including criminal defendants—know about it. Law enforcement’s past cover-ups of faulty forensics is at the heart of Thompson’s book: she posits that forensic labs should be independent rather than controlled by prosecutors and used to convict persons no matter the human cost. In brief, Thompson’s book captures the recent history of forensic validation—and invalidation—and its critical impact on the criminal justice system.

*Cops in Lab Coats* traces the recent history of forensic reform in the context of the criminal justice system and exposes the damage inflicted on that system by forensic fraud. Thompson’s inclusion of wrongful convictions in her discussion mirrors the national conversation. Innocence is the primary impetus to ensure that forensic disciplines become more reliable, forensic findings more testable, and forensic inquiries more independent.

Forensic disciplines arose out of crime scene investigations, and law enforcement’s search for compelling evidence to convict. In this unusual development, forensic results were not tested in a lab but rather in the field. Their reliability and importance were indicated by the rate

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<sup>1</sup>Jessica Cino, *Language Barriers: Creating Standard Terminology to Mitigate Forensic Errors in the Courtroom*, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, available at [http://www.nist.gov/director/upload/language\\_barriers\\_creating\\_standard\\_terminology\\_to\\_mitigate\\_forensic\\_errors\\_inthe\\_courtroom-gable-legfact.pdf](http://www.nist.gov/director/upload/language_barriers_creating_standard_terminology_to_mitigate_forensic_errors_inthe_courtroom-gable-legfact.pdf) (International Forensics Symposium on Forensic Science Error Management, National Institute of Standards and Technology, Washington, D.C., July 20-24, 2015).

of convictions for crimes not by impartial scientific assessments. Given the intimate—indeed integral—association between forensics and law enforcement, “crime labs” have been influenced by cognitive bias, confirmation bias, and by an impetus to create results for the prosecution, and *not* for the impartial search and study of science.<sup>2</sup> This slant has led to the widespread use of ambiguous evidence in the race to convict individuals, including innocent men and women.

Thompson argues that police crime laboratories should be converted to independent forensic laboratories, and that such independence would reduce cognitive bias and enhance laboratory funding opportunities. Under the current regime, police administrators oversee scientific laboratories—a role far beyond their scope of education. (Pp. 181-82.) As Thompson potently explains, “[t]he truth is simple: One cannot properly supervise what one does not understand.” (P. 182.) *Cops in Lab Coats* documents the overt fraud and perjury of forensic findings that has historically plagued the criminal justice system as a result of a “scientific” work environment aligned with law enforcement and prosecution. This alignment taints findings in ambiguous test results through unconscious cognitive bias. (P. 183.) Consistent with the National Academy of Sciences’ (NAS) seminal report, *Strengthening Forensic Science in the United States: A Path Forward*,<sup>3</sup> Thompson establishes that such cognitive biases can cause even the most ethical and learned analyst to report findings that relegate an innocent person to prison. (P. 183.) Independent crime labs and the regular use of protocols frequently deployed in other scientific laboratories and university research labs, such as sequential unmasking and blind verifications, can minimize the impact of cognitive bias and confirmation bias. (P. 186.)

Notwithstanding the resistance to wresting labs from police control that Thompson details (p. 183-187), the NAS report’s overall goals regarding forensic reform are increasingly within reach. Crime labs are adopting more rigorous protocols, federal oversight is growing, and federal funding supports greater research.<sup>4</sup> Indeed, the National

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<sup>2</sup> Thompson discusses cognitive bias as motivational bias from group affiliation by analysts being police department employees, including departmental pressures from being subordinate to the Chief of Police. (THOMPSON 130-31.) She discusses confirmation bias as an unconscious tendency to “seek, perceive, interpret, and create new evidence in ways that verify their preexisting beliefs.” (THOMPSON 133, citing Saul M. Kassin, Itiel Dror, & Jeff Kukucka, *The Forensic Confirmation Bias: Problems, Perspectives, and Proposed Solutions*, 2 J. APPLIED RESEARCH IN MEMORY & COGNITION 42-52, at 44 (2013)).

<sup>3</sup> See generally *Strengthening Forensic Science in the United States: A Path Forward*, NATIONAL ACADEMY OF SCIENCES (Aug. 2009), available at <https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf> (hereinafter “NAS Report”).

<sup>4</sup> The National Institute of Standards and Technology (“NIST”) and the Department of Justice (“DOJ”) in 2013 collaborated to create the National Commission on Forensic Science (“NCFS”), to advise the Attorney General and recommend standards for federal laboratories.

Institute of Standards and Technology (NIST) hosted the first ever scientific conference on crime lab error management in 2015, an impressive step forward given that many forensic scientists would have been ashamed to admit crime lab error just a few years ago.<sup>5</sup> In short, the question is no longer whether, or how, but *how soon* we can learn more and strengthen these disciplines.

Despite the advancement in forensic disciplines and research, a significant obstruction remains to restoring reliability in our criminal justice system: the courts. Judges, defense attorneys, and prosecutors continue to misuse, mishandle, and misrepresent forensic findings with impunity. (Pp. 109-115.) Unfortunately, the wave of reform attendant to the forensic sciences seems to have eluded lawyers.

It seems self-evident that the myriad wrongful convictions attributable to forensic fraud would motivate meaningful, systemic reform. Indeed, Thompson deftly demonstrates throughout her book how forensic malfeasance has curtailed and compromised the liberty and lives of real people. Yet, criminal judges and attorneys appear unmoved by the possibility of a wrongful conviction due to faulty forensics. Practices such as admitting evidence without verification, relying on standards created by other courts, and refusing *Daubert* hearings on the reliability of expert testimony, force us down the same dangerous path where the fact-finder is left to rely entirely on an individual forensic analyst. It is in these proven unreliable waters that, no matter the advancement in the field, technicians are permitted to dry-lab results, falsify their credentials, and testify beyond the scope of their ambiguous findings. (P. 171.)

*Cops in Lab Coats* challenges our legal community to do what the forensic community has already done: wake up and take notice of the significant problems and responsibilities attendant to the non-surgical use of forensics in the courtroom.

This review of Thompson's book proceeds in three parts. Part One recounts the recent history of forensic science and criticisms of the

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In 2014, NIST established a Research Center of Excellence for Forensic Science to study the reliability of forensic science methods, and now houses 23 Organization of Scientific Area Committees (OSACs) to produce standard operating procedures and best practices for different disciplines. NIST furthermore, under 15 U.S.C. 272.2b, is tasked with the responsibility "to cooperate with other departments and agencies of the Federal Government, with industry, with State and local governments, ..., and with private organizations in establishing standard practices, codes, specifications, and voluntary consensus standards." See *Scientific Working Groups*, NIST: LAW ENFORCEMENT STANDARDS OFFICE, [http://www.nist.gov/oles/forensics/scientific\\_working\\_groups.cfm](http://www.nist.gov/oles/forensics/scientific_working_groups.cfm); *NIST to Establish Research Center of Excellence for Forensic Science*, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, <http://www.nist.gov/coe/forensics/forensic-081914.cfm>. See *National Commission on Forensic Science*, U.S. DEP'T OF JUSTICE, <http://www.justice.gov/nchs>.

<sup>5</sup> International Forensics Symposium on Forensic Science Error Management, National Institute of Standards and Technology, Washington, D.C., July 20-24, 2015.

field as developed by Thompson. Part Two explains how forensic faults have contributed to or caused wrongful criminal convictions, as noted both by Thompson and in my own experience. Finally, in Part Three, the essay shifts to question and review the role of the judiciary in both permitting faulty forensics to pervade courtroom and contributing to wrongful convictions.

While Thompson provides the background on a troublingly apathetic judiciary, I hope this book review lends some ideas and encouragement for the path forward. Members of the forensic community are striving to meet the NAS Report standards and reform their disciplines from within. In discussing wrongful convictions and the role of courts in these flawed forensics cases, our own legal community may be encouraged to take action: to build from the foundational reform insights of *Cops in Lab Coats* and accept the remaining responsibility that she lays at the feet of the court.

## I

### RECENT FORENSIC HISTORY: THE NAS REPORT AND UNCOVERING FORENSIC FAULTS

*“[The study] illustrates not only the imprecision of microscopic hair analyses, but also the problem with using imprecise reporting terminology such as ‘associated with,’ which is not clearly defined and which can be misunderstood to imply individualization.”*<sup>6</sup>

Thompson begins her analysis by highlighting the National Academy of Science’s pivotal 2009 report, *Strengthening Forensic Science in the United States: A Path Forward*. The NAS Report jolted the forensics world by documenting how many forensic professionals were over-representing their accuracy in the courtroom. Since release of the Report, media outlets have captured the tragic and salacious stories of men and women wrongfully convicted as the result of faulty “forensics” testimony: a dentist—or “forensic odontologist”—found conclusive human bite marks that were in reality bug bites,<sup>7</sup> an arson specialist testified sixty gallons of gasoline were used to torch a home that burned down without any gas accelerant,<sup>8</sup> and a medical examiner opined he

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<sup>6</sup> *Strengthening Forensic Science in the United States: A Path Forward*, NATIONAL ACADEMY OF SCIENCES 44 (Aug. 2009), available at <https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf> (hereinafter “NAS Report”).

<sup>7</sup> *Two Innocent Men Cleared Today in Separate Murder Cases*, INNOCENCE PROJECT, <http://www.innocenceproject.org/news-events-exonerations/press-releases/two-innocent-men-cleared-today-in-separate-murder-cases-in-mississippi-15-years-after-wrongful-convictions> (Feb. 15, 2008).

<sup>8</sup> Report and Recommendation, *Lee v. Tennis*, No. 4:CV-08-1972 at 18 ((M.D. Pa. June 13, 2014) available at <http://truthinjustice.org/FinalRulingHanTakLee.pdf>).

could ascertain that an assault gun was held by two people, merely by evaluating the bullet wound.<sup>9</sup> Forensic science is incredibly useful, but its findings have not only been overstated, they have been procured by poorly-trained individuals without the rigor of developing the science in a lab, rather than a courtroom. Thompson’s title is appropriate: many forensic analysts view themselves as cops in lab coats, reaching their results after consulting with prosecutors on the theory of the case and the suspected culprit, rather than after applying the scientific method in a blind setting.

#### A. The NAS Report and Individualization

Thompson appropriately identifies the “true battleground”: individualization. (Pp. 107-09.) Individualization is the key area of forensic testimony that is exaggerated, as analysts far too frequently claim a perfect match through the forensic evidence. Yet for which forensic disciplines is individualization even a scientific possibility?

Thompson discusses the findings of the NAS Report, as the Committee examined a number of forensic disciplines separately to determine their capacity for individualization, how they may best be used, and how useful they are for the criminal justice system within a determination of reliability.<sup>10</sup> (Pp. 92-107.) Ultimately, the NAS Report concluded that no forensic discipline—save DNA analysis—could make an exact match, *i.e.*, individuate, despite decades of representation in the courtroom of exact matches in the form of hair, bullets, bite marks, footprints, and fingerprints.<sup>11</sup>

To determine an exact match, analysts must have objective criteria against which to evaluate the evidence at issue. While DNA evidence provides objective criteria, fingerprint evidence, for example, does not. With DNA, the standard protocol is to test a sequence of base pairs at each of thirteen DNA segments. The standard analysis for fingerprints, the ACE-V (Analysis, Comparison, Evaluation, and Verification) accepted process, relies instead on human interpretation of ridges, whorls, and markings. ACE-V “does not specify particular

<sup>9</sup> *Edmonds v. State*, 955 So. 2d 787, 825 (Miss. 2007).

<sup>10</sup> *Strengthening Forensic Science in the United States: A Path Forward*, NATIONAL ACADEMY OF SCIENCES (Aug. 2009), available at <https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf> (hereinafter “NAS Report”). The disciplines analyzed by the 2009 NAS Report were biological evidence (DNA analysis), analysis of controlled substances, fingerprints (friction ridge analysis), pattern/impression evidence, tool mark and firearm identification, hair analysis, fiber evidence analysis, questioned document examination, paint and coatings analysis, explosives and fire analysis, forensic odontology (bite marks), bloodstain and pattern analysis, and digital and multimedia analysis.

<sup>11</sup> *Id.* at 7.

measurements or a standard test protocol, and examiners must make subjective assessments throughout.”<sup>12</sup> Because of its subjectivity, no empirical data can be developed to reliably determine population statistics (frequency) or a match certain. An analyst can only find “sufficient features in agreement.”<sup>13</sup> *How many* features in agreement are sufficient remains an open question. As noted by the NAS Report, “sufficient agreement” is not a measurable standard that can be exactly replicated.<sup>14</sup>

Forensic disciplines are still valuable even when they are not as objective as DNA evidence. Yet Thompson hits the nail on the head: forensics were designed to be self-serving because they did not evolve separate from the purpose and goal of prosecution. (P. 109.) Forensic findings are presented in court as neutral yet they are definitively discovered and discerned on only one side of the case. As Thompson makes clear, when this one-sidedness is coupled with cognitive bias, prosecutors routinely present courts with unreliable results.

## B. The FBI, Brandon Mayfield, and Bias Among Analysts

While the FBI is currently reviewing thousands of hair analysis cases, a singular example of forensic fault remains infamous: the mistaken identification of Brandon Mayfield as the Madrid bomber responsible for a terrorist attack in 2004.<sup>15</sup> The FBI arrested and detained Mayfield, convinced by its own fingerprint analysis that he was an international terrorist. When the Spanish National Police did not find that Mayfield’s prints matched that of the bomber, the FBI refused to re-analyze its own findings. Instead, it pressured the Spanish National Police to adopt its conclusions, arguing sufficient points of agreement.<sup>16</sup> The dispute highlights the lack of uniformity and consensus across law enforcement agencies on what even counts as an accurate match in fingerprint analysis, as well as the level of subjectivity involved in reaching any conclusion. Indeed, only because the Spanish National Police rejected the FBI’s fingerprint results, persevered in their

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<sup>12</sup> *Id.* at 139.

<sup>13</sup> *Id.*

<sup>14</sup> *Id.* at 155.

<sup>15</sup> U.S. DEPT. OF JUSTICE, A REVIEW OF THE FBI’S HANDLING OF THE BRANDON MAYFIELD CASE (Jan. 2006) available at <https://oig.justice.gov/special/s0601/exec.pdf>.

<sup>16</sup> Steven T. Wax, *A Multitude of Errors: The Brandon Mayfield Case*, CHAMPION MAGAZINE 6 (Sept./Oct. 2004) available at [http://www.nlada.org/Defender/forensics/for\\_lib/Documents/1107541411.93/](http://www.nlada.org/Defender/forensics/for_lib/Documents/1107541411.93/). The Spanish National Police positively identified an Algerian national named Ouhane Daoud as the bomber through a more complete fingerprint match.

investigation, and, ultimately, discovered the perpetrator, did Mr. Mayfield avoid a wrongful conviction.<sup>17</sup> Thompson uses this incident to spotlight problems that infect forensic examination at the highest level: cognitive bias and the lack of double blind procedures.<sup>18</sup> (Pp. 133-138.)

Thompson details how confirmation bias was a primary culprit in the FBI's faulty indictment of Brandon Mayfield. (Pp. 133-38.) The FBI's false findings were determined and confirmed by three separate examiners.<sup>19</sup> The supervisor/unit chief who reviewed the print evidence was well aware in advance of his review that one of his analysts and a fingerprint computer program had already identified the print as Mayfield's. (P. 136.) The ultimate verifier likewise knew that the unit chief as well as the original analyst had made a match between the prints.

While Mayfield and the individual ultimately convicted of the Madrid bombing, Ouhnane Daoud, have very similar prints, they are indisputably not identical. Thompson links the FBI's repeated errors with regard to the print evidence to unconscious bias. (Pp. 133-38.) Specifically, she reports that while Mayfield and the bomber's prints were incredibly similar, there were differences that the analysts "explained away." (P. 136.) Upon later review of the Mayfield case, the Department of Justice (DOJ) Office of the Inspector General and the FBI agreed that Mayfield's mistaken identification could have been prevented. In fact, both agencies released evaluations of the incident to provide guidance on how to avoid the influence of cognitive bias in the procedures of analyzing forensic evidence.

The issue of cognitive bias, and motivational bias from group affiliation, is pivotal to Thompson's explanation of the importance of independent forensic laboratories. (Pp. 127-44.) Because the vast majority of forensic laboratories are crime labs within a state's police department, forensic labs are often run and directed by police officers, not scientists. Moreover, the analysts often identify as law enforcement. Results are provided to the prosecution much more readily than to the defense, and crime lab analysts overwhelmingly testify for the state. (Pp. 187-88.) Such analysts are, after all, state police employees. In *Melendez-Diaz v. Massachusetts*, the United States Supreme Court

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<sup>17</sup> *Id.*

<sup>18</sup> According to the NAS Report, "Human judgment is subject to many different types of bias, because we unconsciously pick up cues from our environment and factor them in an unstated way into our mental analyses. Those mental analyses might also be affected by unwarranted assumptions and a degree of over-confidence that we do not even recognize in ourselves. Such cognitive biases are not the result of character flaws; instead, they are common features of decisionmaking, and they cannot be willed away." NAS Report, *supra* n. 4, at 122.

<sup>19</sup> An independent court appointed examiner also confirmed the match to Mayfield. Steven T. Wax, *A Multitude of Errors: The Brandon Mayfield Case*, CHAMPION MAGAZINE 6 (Sept./Oct. 2004) available at [http://www.nlada.org/Defender/forensics/for\\_lib/Documents/1107541411.93/](http://www.nlada.org/Defender/forensics/for_lib/Documents/1107541411.93/).

concluded that crime lab analysts were neither impartial nor neutral.<sup>20</sup> Instead, the Court noted that “[a] forensic analyst responding to a request from a law enforcement official may feel pressure—or have an incentive—to alter the evidence in a manner favorable to the prosecution.”<sup>21</sup> The 2009 NAS Report enumerated similar concerns about cognitive bias in crime labs.

Thompson notes how the Brandon Mayfield case continues as a primary example of cognitive bias in forensic analysis, and as a test for analysts. (Pp. 138-39.) In a now well-known experiment, Psychologist Itiel Dror sent two sets of fingerprints to a number of examiners. Although in actuality the fingerprint set sent to each analyst represented a complete match as determined by that individual within the past five years, Dror labeled the first set of prints as belonging to the Madrid bomber and the second set as those of Mayfield. Dror then asked the analysts to determine whether the prints matched.<sup>22</sup> Interestingly, 80% of those analysts reached the wrong conclusion and determined that the prints did not match because, under the circumstances, the labels—and not the actual print evidence—indicated that “no match” was the correct finding.<sup>23</sup>

As the Mayfield experiment makes clear, the influence of context and subconscious bias demands analysts blind test forensic evidence. Double blind procedures—where neither the supervisor nor the analyst know the source of the samples at issue—have been useful in reforming eyewitness identification protocols for law enforcement.<sup>24</sup> It has been likewise demonstrated that the sequential unmasking of information by labs reduces the influence of bias on analyst findings. (Pp. 141-42.) Thompson’s discussion of these standards for reducing bias supports an overall argument for change both within independent and police-governed crime labs. (Pp. 141-42.)

### C. Systemic Problems with Crime Labs

Thompson next details a number of the problems that have plagued crime labs over the past two decades. (Pp. 37-51.) As she explains, not only are crime labs costly and burdensome, crime lab

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<sup>20</sup> 557 U.S. 305, 318 (2009).

<sup>21</sup> *Id.*

<sup>22</sup> Itiel E. Dror et al., *Contextual Information Renders Experts Vulnerable to Making Erroneous Identification*, 156 FORENSIC SCIENCE INTERNATIONAL 74, 76 (2006).

<sup>23</sup> *Id.* at 76-77.

<sup>24</sup> Valena Beety & Ifeoma Ike, *Protecting West Virginia's Innocent*, W. VA. LAWYER, October-December 2013, at 30, 31-32. See also Valena Elizabeth Beety, *What the Brain Saw: The Case of Trayvon Martin and the Need for Eyewitness Identification Reform*, 90 DENV. U. L. REV. 331, 344 (2012).



employment constitutes a completely different type of work than that demanded by a traditional law enforcement position. (Pp. 37-39.) Worse yet, because they are both misunderstood and undervalued, crime labs frequently are inadequately funded in the budgeting process.<sup>25</sup> (Pp. 37-39.) Thompson also notes that, despite their unwillingness to advocate for adequate funds to support the scientific work of the forensic labs, law enforcement agencies often are resistant to relinquishing control over the labs. (Pp. 183-87.) Thompson suggests underfunding of crime labs leads to problems of fraud,<sup>26</sup> incompetence, cheating, backlogs, and drug theft. (Pp. 37-51.) Without sufficient funding and appropriate oversight, such problems have been rampant.

Thompson documents how fraud and incompetence issues are commonplace even at nationally accredited labs. (Pp. 193-97.) She notes one study by Marvin Schecter that found that at least fifty major laboratories reported fraud by analysts, evidence destruction, failed proficiency tests, misrepresenting findings in testimony, or tampering with drugs between 2005 and 2011; twenty-eight of these labs were nationally accredited. (P. 194.) Laboratory accreditation standards are currently in flux as accrediting agencies are in the process of revising previously lax standards and seeking to reduce cheating by analysts on proficiency tests, as well as misrepresentations of analyst credentials and accreditation. (Pp. 193-97.) Systemic error also exists with accreditation organizations producing their own publications and studies, and including only positive results. Publications in trade journals are presented (and accepted by courts) as the same as peer-reviewed scientific articles in science journals. (Pp. 103-04.) Finally, the individual lab technician often gets the blame for what are truly systemic problems.

#### D. FBI and Hair Analysis Cases

On July 18, 2013, the FBI and DOJ joined the Innocence Project and the National Association of Criminal Defense Lawyers to review thousands of FBI hair microscopy analysis cases in which crime lab analysts gave false or exaggerated testimony on forensic results.<sup>27</sup>

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<sup>25</sup> On a basic level, labs need to have properly calibrated equipment.

<sup>26</sup> One example is “dry-labbing,” in which results are submitted for drugs not actually tested.

<sup>27</sup> *Innocence Project and NACDL Announce Historic Partnership with the FBI and Department of Justice on Microscopic Hair Analysis Cases*, INNOCENCE PROJECT, <http://www.innocenceproject.org/news-events-exonerations/press-releases/innocence-project-and-nacdl-announce-historic-partnership-with-the-fbi-and-department-of-justice-on-microscopic-hair-analysis-cases> (July 18,

The review comes in the wake of the exonerations of three District of Columbia men, each of whom was convicted when FBI analysts testified using false information on hair results.<sup>28</sup> The preliminary results from the FBI's review show a 95% error rate in FBI lab analyst testimony.<sup>29</sup>

Thompson documents, however, how the FBI and the DOJ fought for decades against disclosure of their forensic analyses, even withholding data from the general scientific community.<sup>30</sup> (P. 188) In the 1990s, the FBI refused to make its own DNA database available for defense scientific experts to evaluate the FBI's DNA results in a particular case, even though the Bureau routinely released its DNA data to prosecution experts. (P. 188.) From 1996-2004, the FBI did a private, internal investigation of misconduct, creating a task force specifically for hair comparison.<sup>31</sup> The results of the review were never published, not even to the defendants whose cases were at issue and reviewed.<sup>32</sup> Instead, only prosecutors were notified of the results.

Now, the FBI is taking a more transparent approach to forensic fraud within the Bureau. In the initial agreement, the FBI agreed to review 2000 criminal cases in which FBI analysts testified to microscopic hair analysis findings; this agreement has since expanded.<sup>33</sup>

Importantly, the DOJ and FBI agreed to re-evaluate the testimony in its aforementioned hair analysis cases, provide free DNA testing for the defense, and waive any statute of limitations barriers without regard to the materiality of the evidence.<sup>34</sup> The presumption is that the materiality and weight of the evidence is a determination for the courts to make; theirs is instead to identify if the court was presented

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2013). See also *National Press Release: FBI Testimony on Microscopic Hair Analysis Contained Errors in at Least 90 Percent of Cases in Ongoing Review*, FBI, <https://www.fbi.gov/news/pressrel/press-releases/fbi-testimony-on-microscopic-hair-analysis-contained-errors-in-at-least-90-percent-of-cases-in-ongoing-review> (April 20, 2015).

<sup>28</sup> *Id.*

<sup>29</sup> Spencer S. Hsu, *FBI Admits Flaws in Hair Analysis Over Decades*, WASH. POST, [http://www.washingtonpost.com/local/crime/fbi-overstated-forensic-hair-matches-in-nearly-all-criminal-trials-for-decades/2015/04/18/39c8d8c6-e515-11e4-b510-962fcfab310\\_story.html](http://www.washingtonpost.com/local/crime/fbi-overstated-forensic-hair-matches-in-nearly-all-criminal-trials-for-decades/2015/04/18/39c8d8c6-e515-11e4-b510-962fcfab310_story.html) (April 18, 2015).

<sup>30</sup> See also Max M. Houck & Bruce Budowle, *Correlation of Microscopic and Mitochondrial DNA Hair Comparisons*, 47 J. FORENSIC SCI. 964 (2002), available at <http://www.bioforensics.com/conference/mtDNA/HairHouck%26Budowle.pdf>. (study reviewing human hair examinations and matches within the FBI laboratory between 1996 and 2000 and finding nine of the eighty “match” cases resulted in exclusions when re-tested using mitochondrial DNA testing).

<sup>31</sup> Spencer S. Hsu, *Convicted defendants left uninformed of forensic flaws found by Justice Dept.*, WASH. POST, [http://www.washingtonpost.com/local/crime/convicted-defendants-left-uninformed-of-forensic-flaws-found-by-justice-dept/2012/04/16/gIQAWTcgMT\\_story.html](http://www.washingtonpost.com/local/crime/convicted-defendants-left-uninformed-of-forensic-flaws-found-by-justice-dept/2012/04/16/gIQAWTcgMT_story.html) (April 16, 2012).

<sup>32</sup> *Id.*

<sup>33</sup> *Id.*

<sup>34</sup> FBI Testimony, *supra* note 17.

with false information. As a result, it is left to the courts to determine admissibility, relevance, and importance.

In addition, several states have taken up their own initiatives because of the FBI's faulty training of local analysts.<sup>35</sup> Many state analysts received a two-week training at Quantico, during which they learned invalid evidentiary presentation and processes from the FBI, learning to present evidence in a way that did not comport with basic scientific standards.<sup>36</sup> Texas<sup>37</sup> has a particular interest in conducting its own review of hair analysis testimony in state cases. In 2000, the state executed Claude Jones, a man convicted in part as the result of testimony that the hair at the crime scene matched Jones.<sup>38</sup> Ten years later, however, DNA testing showed that the crime scene hair was not that of Jones.<sup>39</sup> The Texas Forensic Science Commission has not only created a state review of forensic hair analysis cases, it has established a framework for notifying defendants that their case is under review for accuracy of forensic testimony.<sup>40</sup>

While the generality of hair analysis findings can now be made more reliable with DNA,<sup>41</sup> the crux of the historic problems with hair analysis has been the tendency of lab analysts to overstate the microscopic hair analysis science's capacity to individualize. In fact, while microscopic hair analysis findings are frequently accurate at excluding suspects, they are not helpful in identifying the true perpetrator.<sup>42</sup> Unfortunately, the critical scientific limits of microscopic hair analysis rarely are presented to courts.<sup>43</sup> Instead, analysts often

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<sup>35</sup> Spencer S. Hsu, *FBI Admits Flaws in Hair Analysis Over Decades*, WASH. POST, [http://www.washingtonpost.com/local/crime/fbi-overstated-forensic-hair-matches-in-nearly-all-criminal-trials-for-decades/2015/04/18/39c8d8c6-e515-11e4-b510-962fcfab310\\_story.html](http://www.washingtonpost.com/local/crime/fbi-overstated-forensic-hair-matches-in-nearly-all-criminal-trials-for-decades/2015/04/18/39c8d8c6-e515-11e4-b510-962fcfab310_story.html) (April 18, 2015). (Texas, North Carolina, and Illinois)

<sup>36</sup> Spencer S. Hsu, *Review of FBI Forensics Does Not Extend to Federally Trained State, Local Examiners*, WASH. POST, [http://www.washingtonpost.com/local/crime/review-of-fbi-forensics-does-not-extend-to-federally-trained-state-local-examiners/2012/12/22/b7ef9c2e-4965-11e2-ad54-580638ede391\\_story.html](http://www.washingtonpost.com/local/crime/review-of-fbi-forensics-does-not-extend-to-federally-trained-state-local-examiners/2012/12/22/b7ef9c2e-4965-11e2-ad54-580638ede391_story.html) (Dec. 22, 2012).

<sup>37</sup> It should be noted that Texas is the only state to have created a "junk science writ" - a right for defendants to appeal their convictions based on faulty forensic science. Procedure for an Application for a Writ of Habeas Corpus Based on Relevant Scientific Evidence, 2013 Tex. Sess. Law Serv. Ch. 410 (S.B. 344) (Vernon's) (2013).

<sup>38</sup> *Injustice in Texas: The Claude Jones Case*, INNOCENCE PROJECT, <http://www.innocenceproject.org/news-events-exonerations/injustice-in-texas-the-claude-jones-case> (November 10, 2010 12:00 AM).

<sup>39</sup> *Id.*

<sup>40</sup> TEXAS FORENSIC SCIENCE COMMISSION, POLICIES AND PROCEDURES 10 (Aug. 1, 2014) available at [http://www.fsc.texas.gov/sites/default/files/D\\_Policies%20and%20Procedures%20080114.pdf](http://www.fsc.texas.gov/sites/default/files/D_Policies%20and%20Procedures%20080114.pdf).

<sup>41</sup> Hsu, *supra* note 23.

<sup>42</sup> Brandon L. Garrett & Peter J. Neufeld, *Invalid Forensic Science Testimony and Wrongful Convictions*, 95 VA. L. REV. 1, 49 (2009)

<sup>43</sup> See e.g. *State v. Peterson*, 364 N.J. Super. 387, 396, (N.J. App. Div. 2003).

have testified that hair can match and identify a suspect—a position that is scientifically indefensible.<sup>44</sup> This individualization is impossible without population pools and statistics, which are not currently available for hair analysis.<sup>45</sup>

## II

### WRONGFUL CONVICTIONS AND FORENSIC FRAUD

*“The bottom line is simple: In a number of forensic science disciplines, forensic science professionals have yet to establish either the validity of their approach or the accuracy of their conclusions, and the courts have been utterly ineffective in addressing this problem.”*<sup>46</sup>

Faulty forensic science has led to the conviction of 116 DNA exonorees.<sup>47</sup> Sixteen of the exonorees were on death row.<sup>48</sup> These wrongful convictions inspired the creation of a National Commission on Forensic Science, funding for greater studies in the forensic science disciplines, and increased federal oversight. So why have these exonerations failed to increase scrutiny of forensics in the courtroom?

#### A. Criminal Courts Admitting Forensic Testimony: The Failure of *Daubert*

Thompson documents how forensic testimony is loosely admitted in the criminal courtroom, a practice often reduced to “trial by lab report.” (P. 149.) Under *Frye v. United States*, a “general acceptance” standard for admissibility of expert testimony attempted to serve to bar unreliable scientific evidence.<sup>49</sup> Then *Daubert v. Merrell Dow Pharmaceuticals, Inc.* required scientific knowledge testimony to stem from a reliable scientific method.<sup>50</sup> The U.S. Supreme Court was squarely concerned about “junk science” being admitted in the courtroom.<sup>51</sup> As

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<sup>44</sup> Brandon L. Garrett & Peter J. Neufeld, *supra* note 31, 53-63 (providing examples of cases in which expert testimony was given suggesting that hair “matched” the defendants’).

<sup>45</sup> *Id.* at 52.

<sup>46</sup> *Strengthening Forensic Science in the United States: A Path Forward*, NATIONAL ACADEMY OF SCIENCES 53 (Aug. 2009), available at <https://www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf>

<sup>47</sup> Innocence Project, *Wrongful Convictions Involving Unvalidated or Improper Forensic Science that Were Later Overturned through DNA Testing*, [http://www.innocenceproject.org/files/imported/dna\\_exonerations\\_forensic\\_science-1.pdf](http://www.innocenceproject.org/files/imported/dna_exonerations_forensic_science-1.pdf).

<sup>48</sup> *See id.*

<sup>49</sup> 293 F. 1013, 1014 (D.C. Cir. 1923) (“ . . . The thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.”).

<sup>50</sup> 509 U.S. 579 (1993).

<sup>51</sup> *Id.* See also <http://www.jaapl.org/content/33/2/150.full>.

Thompson underscores, *Daubert* and its successors<sup>52</sup> put judges in the direct role of determining the validity of scientific disciplines and their findings. (P. 149.) This evaluation includes whether the at-issue theory or technique has been tested, subjected to peer review or publication, has a known or potential error rate, and whether the technique is generally accepted.<sup>53</sup> This four-factor test was established to clarify what suffices as “scientific” and admissible in the courtroom.<sup>54</sup>

Yet courts frequently misunderstand what is meant by “testable,” “validation studies,” “peer review,” and “error rate.”<sup>55</sup> Ideally, a court holds a pre-trial *Daubert* hearing on whether a scientific discipline and its resultant findings are to be admitted as evidence at trial. However, even when requests for a *Daubert* hearing are made by counsel, many courts continue to admit testimony with and without a hearing.<sup>56</sup> The struggle is real: courts do not want to reject these experts and their areas of expertise, and likely feel unqualified to definitively exclude their evidence. Thompson documents a number of forensic disciplines that inherently fail the *Daubert* test and whose findings should not be admitted as evidence because they are subjective and unproven. (Pp. 97-107.) These disciplines do not meet *Daubert*’s reliability standards. Thompson lays out the reasoning for how multiple courts admitted this evidence—reliable or not.<sup>57</sup> (Pp. 97-107.)

As Thompson notes, judges are not the only officers of the court who fail to recognize forensic fraud: defense attorneys also fail to challenge the scientific validity of findings and of scientific experts, frequently refusing to even request a *Daubert* hearing.<sup>58</sup> (Pp. 90-91.) While the best route may be to hire a defense forensic analyst, a number of defense attorneys do not even meet with the forensic analyst

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<sup>52</sup> *General Electric Co. v. Joiner*, 522 U.S. 136 (1997), *Kumho Tire Co. Ltd. v. Carmichael*, 526 U.S. 137 (1999).

<sup>53</sup> *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579 (1993).

<sup>54</sup> *See id.*

<sup>55</sup> *See, e.g.*, Victor E. Schwartz & Cary Silverman, *The Draining of Daubert and the Recidivism of Junk Science in Federal and State Courts*, 35 Hofstra L. Rev. 217 (2006) (discussing the continued admittance of junk science in courtrooms).

<sup>56</sup> In the decade after the *Daubert* decision one study found civil defendants prevailed most of the time in *Daubert* challenges, while criminal defendants almost always lost their challenges to government forensic evidence. *See* Michael Risinger, *Navigating Expert Reliability: Are Criminal Standards of Certainty Being Left on the Dock?* 64 ALBANY L. REV. 99, 99 (2000).

<sup>57</sup> *See, e.g., United States v. Crisp*, 324 F.3d 261 (4th Cir. 2003) (“Under *Daubert*, a trial judge need not expend scarce judicial resources reexamining a familiar form of expertise every time opinion evidence is offered.”)

<sup>58</sup> In an analysis by Brandon Garrett of the first 93 DNA exonerations involving forensic fraud, “defense lawyers rarely made any objections and they rarely effectively cross-examined forensic analysts who provided invalid science testimony. Indeed, in forty-seven cases, or half of the ninety-three cases involving invalid forensic testimony, the defense lawyers failed to ask any questions at all about the areas in which the analyst testified erroneously.” Brandon L. Garrett, *CONVICTING THE INNOCENT: WHERE CRIMINAL PROSECUTIONS GO WRONG*, 113 (Harvard Univ. Press 2011).

for the state, let alone hire their own.<sup>59</sup> Many crime lab technicians report never speaking with a defense attorney over the entire course of their careers.<sup>60</sup>

Finally, if the forensic discipline has been admitted in another court as evidence, the forensic discipline questionably has sufficient reliability for the court in question likewise to admit it. Courts often decide that the disciplines presented have already been established as reliable based on other courts' acceptance.<sup>61</sup> Indeed, the NAS Report criticized courts on exactly this point, and for not applying *Daubert* as an actual standard for admissibility: “[t]he principle difficulty, it appears, is that many [forensic science] techniques have been relied on for so long that courts might be reluctant to rethink their role in the trial process . . . in many forensic areas, effectively no research exists to support the practice.”<sup>62</sup> Courts have apathetically permitted testimony on forensic disciplines that are “well-established areas of expertise” including fingerprint testimony,<sup>63</sup> firearms testimony,<sup>64</sup> bloodstain patterns testimony,<sup>65</sup> and toolmark testimony.<sup>66</sup>

Forensic odontology is one such case in point. Expanding from Thompson's foundation, this next section examines bite marks, a forensic discipline particularly fraught with fraud.

## B. Forensic Odontology

Forensic odontology is the study of examining marks on skin to determine if they are human bite marks and then matching those “bite marks” to a suspect's teeth mold.<sup>67</sup> The two primary assertions of bite

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<sup>59</sup> *See id.*

<sup>60</sup> Jessica Cino, *Language Barriers: Creating Standard Terminology to Mitigate Forensic Errors in the Courtroom*, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, available at [http://www.nist.gov/director/upload/language\\_barriers\\_creating\\_standard\\_terminology\\_to\\_mitigate\\_forensic\\_errors\\_inthe\\_courtroom-gable-legfact.pdf](http://www.nist.gov/director/upload/language_barriers_creating_standard_terminology_to_mitigate_forensic_errors_inthe_courtroom-gable-legfact.pdf)

<sup>61</sup> *See* Fabricant, *infra* note 58 at 47.

<sup>62</sup> NAS Report, *supra* note 4, at 110. The NAS Report also opined that the courtroom with its adversarial structure is not the arena for true recognition of scientific advancement - and that judges are not aptly equipped to make such a determination. *Id.*

<sup>63</sup> *United States v. Stone*, 2012 U.S. Dist. LEXIS 8973 (2012) (NAS Report is insufficient basis for excluding fingerprint analysis testimony, which is a well-established area of expertise); *Webster v. State*, 2011 OK CR 14 (Ok. Crim. App. 2011).

<sup>64</sup> *United States v. Casey*, 2013 U.S. Dist. LEXIS 43905 (2013) (unrestricted firearms testimony permitted).

<sup>65</sup> *Commonwealth v. Vasquez*, 462 Mass. 827 (Mass. 2012).

<sup>66</sup> *State v. McGuire*, 2011 WL 890748 (N.J. S. Ct. 2011) (toolmark testimony admissible based on long-standing history of admissibility, even without reliability factors).

<sup>67</sup> Steven Weigler, *Bite Mark Evidence: Forensic Odontology and the Law*, 2 HEALTH MATRIX 303, 304 (1992).

mark evidence remain unsubstantiated: that there is a discernible and classifiable distinction in dentation—a population analysis—and that skin can capture this unique dentation to identify an individual—individuation.

Odontology, however, has been exposed for its failings. In 2010, researchers determined that bite marks cannot be used to reliably exclude a suspect, let alone include a suspect, because there is no scientific basis underlying odontology and no evidence of its consistency or reliability.<sup>68</sup> In Spring 2015, the American Board of Forensic Odontology released results of its own test, questioning forensic odontologists on whether a sample was a human bite mark and whether there were unique distinctions to the print.<sup>69</sup> Even given a study that was about consensus of findings and not about accuracy in individual matching, the odontologists could not agree.<sup>70</sup> Moreover, the National Institute of Standards and Technology’s (NIST) Subcommittee on Odontology continues to question the field.<sup>71</sup> Even the Assistant Director of the White House Office of Science and Technology Policy is calling for the “eradication” of bite mark evidence.<sup>72</sup> The courts, however, continue to admit bite mark evidence.

The acceptance of forensic odontology (*i.e.*, bite mark evidence) by the majority of state courts as a valid scientific theory is a prime example of evidence being admitted based on sister courts’ acceptance, and not by individual court analysis of the validity of the field as required by *Daubert*. Damningly, the underlying state cases that established wide-spread acceptance of bite mark evidence ultimately were exposed as wrongful convictions. These conviction reversals completely discredited the use of bite marks in the courtroom to establish the identity of a perpetrator. And yet other courts continue to rely on those case decisions as precedent for the ongoing admittance of bite mark evidence in the courtroom today. Forensic odontology continues to be used at modern-day trials, even after some bite mark experts themselves have rejected the field and their own findings.<sup>73</sup> Bite

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<sup>68</sup> Mary A. Bush, Howard I Cooper, & Robert J. Dorion, *Inquiry into the Scientific Basis for Bitemark Profiling and Arbitrary Distortion Compensation*, 55 J. FORENSIC SCI. 1-8 (2010).

<sup>69</sup> Radley Balko, *A Bite Mark Matching Advocacy Group Just Conducted a Study that Discredits Bite Mark Evidence*, WASH. POST, <http://www.washingtonpost.com/news/the-watch/wp/2015/04/08/a-bite-mark-matching-advocacy-group-just-conducted-a-study-that-discredits-bite-mark-evidence/> (April 8, 2015).

<sup>70</sup> *Id.*

<sup>71</sup> OSAC Odontology Subcommittee, National Institute of Standards and Technology, <http://www.nist.gov/forensics/osac/sub-odont.cfm> (Last Updated May 26, 2015).

<sup>72</sup> Balko, *supra* note 44., (statement by Jo Handelsman at the NIST conference, July 21, 2015).

<sup>73</sup> The Associated Press, *Experts Deride Bite Marks as Unreliable in Court*, USA TODAY, <http://www.usatoday.com/story/news/nation/2013/06/16/bite-marks-court/2428511/> (June 16, 2013).

mark evidence has contributed to twenty-four wrongful convictions nationally, and at least fifteen people are currently on death row due in part to bite mark testimony.<sup>74</sup>

In fact, I have represented two women in post-conviction proceedings who were wrongly convicted because of fraudulent bite mark testimony. Dr. Michael West—a dentist and board-certified forensic odontologist—was the foremost proponent of bite mark evidence in Mississippi in the 1990s and 2000s. Of course an understanding of teeth as a dentist does not equate to an understanding of the texture, flexibility, and pliability of skin, nor to how an imprint is made, distorted, or stretched over time by teeth. Yet in the prosecution of Leigh Stubbs and Tami Vance, Dr. West was the state’s key witness<sup>75</sup> and testified he could identify bite marks on the victim, and furthermore match those bite marks to the defendants.<sup>76</sup> Dr. West was admitted at trial as an expert in forensic odontology, a field without reliable standards. His testimony was admitted whole cloth, and West’s expertise was never challenged by a *Daubert* hearing.<sup>77</sup> When asked in the expert colloquy about his error rate, he remarked it was “something less than that of my Savior Jesus Christ.”<sup>78</sup> The jury convicted.

Ten years later, however, Leigh and Tami’s wrongful convictions were finally overturned.<sup>79</sup> West had been admitted at trial not only as a forensic odontologist, but as a videographer, a subject on which he was not even remotely qualified to testify.<sup>80</sup> Unsurprisingly, his findings clashed with the determinations made by videography experts at the FBI in a report that was suppressed by the prosecution and never disclosed to the defense.<sup>81</sup> It was this *Brady* violation that prompted the Mississippi Supreme Court to grant Tami and Leigh a post-conviction evidentiary hearing in 2011. In a deposition in 2012, Dr. West not only retracted his own findings about the video, but he also rescinded his testimony regarding the bite marks. Dr. West stated that he no longer thought the science on which he had based his testimony was reliable, opining, “I don’t think it should be used in

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<sup>74</sup> Balko, *supra* note 44.

<sup>75</sup> Out of a roughly 600 page transcript, West testified for almost 200 pages. *See State of Mississippi v. Leigh Stubbs*, 00-362-MS (June 30, 2001).

<sup>76</sup> *See State of Mississippi v. Leigh Stubbs*, 00-362-MS (June 30, 2001).

<sup>77</sup> Radley Balko, *Leigh Stubbs, Mississippi Woman, Serving 44-Year Sentence Despite Discredited Testimony*, HUFFINGTON POST, [http://www.huffingtonpost.com/2011/08/09/leigh-stubbs-michael-west-forensics-discredited-testimony\\_n\\_922219.html](http://www.huffingtonpost.com/2011/08/09/leigh-stubbs-michael-west-forensics-discredited-testimony_n_922219.html) (October 9, 2011).

<sup>78</sup> *State of Mississippi v. Leigh Stubbs*, 00-362-MS (June 30, 2001) Tr. 518. West further testified that he never has given an error rate. *Id.*

<sup>79</sup> Leigh Stubbs/Tami Vance, Mississippi Innocence Project, <http://mississippiinnocence.org/case/leigh-stubbstami-vance/> (Date Last Accessed, Aug. 7, 2015).

<sup>80</sup> *See* Balko, *supra* note 49.

<sup>81</sup> *Id.*



court. I think you should use DNA, throw bite marks out. When I testified in this case, I believed in the uniqueness of human bite marks. I no longer believe in that.”<sup>82</sup> His retraction laid the final foundation for Lincoln County Circuit Court Judge Michael M. Taylor to reverse Leigh and Tami’s convictions and grant them a new trial.<sup>83</sup>

West may well retract his findings now, but the damage he has done under the lax admittance standards of the Mississippi courts is irreparable. In the ten years Leigh and Tami were wrongfully in prison, West was exposed as a pivotal witness in (at least) two other wrongful convictions where his determinations of bite marks on the bodies of the victims turned out to be nothing more than bug bites.<sup>84</sup>

Even more terrifyingly, the cases where Dr. West was admitted as a forensic odontologist, and his bite mark evidence was presented to the jury, were later used to support blanket admission of bite mark testimony in other cases, including in other states.<sup>85</sup> Despite Dr. West’s bite mark misidentifications, the Mississippi Supreme Court recently refused to grant a post-conviction *habeas* hearing in a death penalty case involving Eddie Lee Howard, stating: “In support of his post-conviction claim, Howard has offered numerous expert affidavits and other documents which attack Dr. West, his testimony, and bite mark evidence in general. These affidavits and other documents point out how many times Dr. West has been proven wrong and they discuss how unscientific his methods are . . . [j]ust because Dr. West has been wrong a lot, does not mean, without something more, that he was wrong here.”<sup>86</sup>

Howard remains on death row because of Dr. West’s testimony, waiting to see if the courts will grant his request for DNA testing that may prove his innocence.

This is not all. Nationally, court decisions later overturned because of false bite mark evidence are nonetheless routinely cited as

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<sup>82</sup> *Leigh Stubbs v. State of Mississippi*, 2011-387-LS-LT, deposition of Dr. Michael West, Tr. ln. 5-8, p.37, ln. 23-25, p. 37, ln. 1-3, p.38. February 11, 2012. (“And if I was asked to testify in this case again, I would say I don’t believe it’s a system that’s reliable enough to be used in court.”)

<sup>83</sup> *Vicki Leigh Stubbs v. State of Mississippi*, 2011-387-LS-LT, *Tammy Vance v. State of Mississippi*, 2011-388-LS-LT, Order Setting Aside Conviction and Sentence (June 27, 2012) (on file with author).

<sup>84</sup> In the case of Levon Brooks, West testified that the victim had sustained bite marks that “matched” Brooks’ teeth, stating “it could be no one but Levon Brooks that bit this girl’s arm.” Trial Transcript at 730, *State v. Brooks*, No. 5937 (Noxubee Cnty Cir. Ct. Jan 15, 1992). Brooks was exonerated by DNA testing in 2008. Levon Brooks, THE INNOCENCE PROJECT, [http://www.innocenceproject.org/Content/Levon\\_Brooks.php](http://www.innocenceproject.org/Content/Levon_Brooks.php).

<sup>85</sup> Fabricant, M. Chris and Carrington, William Tucker, *The Shifted Paradigm: Forensic Sciences’s Overdue Evolution from Magic to Law* (March 2, 2015). 4 VA. J. CRIM. L. (forthcoming 2016) available at <http://ssrn.com/abstract=2572480>.

<sup>86</sup> *Howard v. State*, 945 So.2d 326, 352 (Miss. 2006); Fabricant, M. Chris and Carrington, William Tucker, *The Shifted Paradigm: Forensic Sciences’s Overdue Evolution from Magic to Law* (March 2, 2015). 4 VA. J. CRIM. L. (forthcoming 2016) available at <http://ssrn.com/abstract=2572480>.

support by courts admitting bite mark testimony at trial.<sup>87</sup> In *State v. Armstrong*,<sup>88</sup> the West Virginia Supreme Court of Appeals became the first decision nationally to take judicial notice of “general acceptance” of bite mark evidence in the scientific community. It relied on a Wisconsin case of first impression, *State v. Stinson*.<sup>89</sup> Robert Lee Stinson was wrongfully convicted by bite mark evidence. In 2009 he was exonerated after serving 23 years in prison for a crime he didn’t commit.<sup>90</sup> Yet *Stinson*, and particularly *Armstrong*, remain relied-upon cases for admitting bite mark evidence at criminal trials today. Many courts continue to deny their role as true gatekeepers.

### III

#### COURTHOUSE APATHY: SCIENTIFIC DISCIPLINES ARE INTERNALLY REFORMING, WHY NOT THE COURTS?

*“...the opinions of experts on any question of science, skill, trade, or like questions shall always be admissible.”*

- Official Code of Georgia Annotated § 24-9-67 (2015)<sup>91</sup>

#### A. “Can’t Be Wrong” Culture and Prosecutorial Pressure

In 2014, NIST established the Organization of Scientific Areas Committees (OSAC): 23 committees composed of forensic science practitioners, academics, and experts to create standard operating protocols for each of the forensic science disciplines.<sup>92</sup> These protocols brought individual forensic disciplines more in line with traditional

<sup>87</sup> Fabricant, M. Chris and Carrington, William Tucker, *The Shifted Paradigm: Forensic Sciences' Overdue Evolution from Magic to Law* (March 2, 2015). 4 VA. J. CRIM. L. (forthcoming 2016) available at <http://ssrn.com/abstract=2572480>.

<sup>88</sup> 369 S.E.2d 870 (W.V. 1988); see also Fabricant, *supra* note 58 (“By the time the West Virginia Supreme Court became the first state high court to take judicial notice of the general acceptance of bite mark evidence, twenty-one states had already decided it was admissible, without a single dissenting opinion. . . . Subsequent cases of first impression became foregone conclusions.”)

<sup>89</sup> *State v. Stinson*, 397 N.W.2d 136 (Wis. Ct. App. 1986). See also Fabricant, *supra* note 58 at 47, 58-59 (includes a chart of courts citing one another “creating an echo chamber of ill-considered opinions.”), Adam Dietch, *An Inconvenient Tooth: Forensic Odontology is an Inadmissible Junk Science When it is Used to “Match” Teeth to Bitemarks in Skin*, 5 WISC. L. REV. 1207 (2009).

<sup>90</sup> <http://www.law.umich.edu/special/exoneration/Pages/casedetail.aspx?caseid=3666>

<sup>91</sup> This standard is now only applicable to criminal cases; additional standards were created for civil cases pursuant to O.C.G.A. § 24-9-67.1 (2005).

<sup>92</sup> OSAC Subcommittees, National Institute of Standards and Technology, <http://www.nist.gov/forensics/osac/subs.cfm> (last updated: May 26, 2015).

science. In contrast to traditional science fields, with standards of operation and a history of experimentation, as well as documentation of both error and success, many forensic analysts spoke of a working environment where they felt they could do no wrong. Because, as explained above, forensic disciplines were created by law enforcement to investigate and solve crimes, the “right” result became imperative to securing safety and justice in the broader community. This demand decreased the independence of forensic disciplines and diminished their scientific impartial approach.

Thompson refers to this pressure as the “kudos” effect, where crime lab analysts receive accolades for analyzing a case that leads to a conviction. (P. 127.) The flip side is the pressure to get a result—preferably a result that matches the suspect. This pressure can and does influence analyst behavior. For example, a confession by a suspect may put greater pressure on the analyst to find a “match” between the forensic evidence recovered at the crime scene and/or the confessor, despite our knowledge of the existence of false confessions and their potential unreliability.<sup>93</sup> These errors compound when the field narrows to a specific suspect and the analyst knows details of the case.

At the 2015 NIST Conference on Crime Lab Error Management, forensic experts discussed developing greater skills, instituting blind testing, implementing transparent reporting, and progressing with OSAC standards of procedure for forensic disciplines. With the development of new technology, and increases in awareness of forensic science, forensics are being used more integrally in criminal cases.<sup>94</sup> Forensic sciences are facing many challenges: trying to gather more information out of smaller source samples, and attempting to reach results more quickly and efficiently without sacrificing quality and proven reliability.<sup>95</sup> Forensic scientists want to prove the quality of their work, and to establish their methods as based in science. Many areas, such as fingerprinting, are advancing and becoming more objective. There is also an increased focus on data integrity and validating forensic methods, as well as processing cases timely to avoid the well-known backlogs of rape kits. To contribute effectively to court cases, analysts need to be both exact and fast, providing unbiased and objective opinions with quality. This is a necessarily high standard.

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<sup>93</sup> Richard A. Leo et al., *Promoting Accuracy in the Use of Confession Evidence: An Argument for Pretrial Reliability Assessments to Prevent Wrongful Convictions*, 85 TEMP. L. REV. 759, 765-66 (2013).

<sup>94</sup> Ralph Kleuskens, *Forensic Quality Management: Errors and Incidents*,

NETHERLANDS FORENSIC INSTITUTE, (July 2015) available at [http://www.nist.gov/director/upload/Forensic\\_Quality\\_Management\\_Errors\\_Incidents-kleuskens-plenary.pdf](http://www.nist.gov/director/upload/Forensic_Quality_Management_Errors_Incidents-kleuskens-plenary.pdf).

<sup>95</sup> *Id.*

If forensic experts are working to make their disciplines and results more reliable with standard operating protocols and double blind analyses, why are the courts clinging to the outmoded culture of “never being wrong”? The OSAC meetings may lead to major advancements in forensic disciplines and in the fields of forensic science because they bring together critics, academics, and scientists, but will courts nonetheless remain reliant on the individual lab analyst? As the labs are rebuilding confidence and trust, it seems as if such efforts are not even necessary in the view of too many courts. Ironically, while forensic analysts seek to ensure quality controls, the judiciary refuses to enforce their own quality controls.

Thompson’s observation of a “kudos” culture compelled me to reflect on a recent study that found that the majority of wrongful DNA matches and errors originated in the *post-analytical stage*.<sup>96</sup> The errors were made when the experts were explaining or showing the reports, not by their analysis in the lab. With prosecutors pushing for “exact match” language from analysts, and judges admitting such testimony, is it any surprise that, despite the efforts to establish ethical and impartial standards for these disciplines, they are still incorrectly presented to the jury?

If errors are predominantly made by analysts in the post-analytical stage, and prosecutors frequently press for misleading testimony concerning individualization, it is self-evident that attorneys and judges must be better educated. Education and evaluation were some of the primary suggestions of the NAS Report.<sup>97</sup> Just as quality issue notifications provide important information on the performance of a lab, an equal quality determination is necessary in determining how courts perform in discerning and admitting accurate and supported evidence. As long as judges fail to serve as true gatekeepers, what is reliable in the legal system will continue to be very different from what is reliable in science.

Lawyers want forensic results to be tangible to a jury, clear and simple. However, we must understand what those results truly mean, and accept the ambiguities of science, rather than looking for the easy linchpin for the conviction. Just as with any other scientific discipline, forensic results and testing need to be transparent, provided to both the defense and the prosecution. Ambiguous results should not decide any case.<sup>98</sup> The push for exact-match testimony encourages the individual analyst to exaggerate findings, establishes a standard of such language

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<sup>96</sup> Ate Kloostroom, *Framework for Registration, Classification and Evaluation of errors in the Forensic DNA Typing Process*, Netherlands Forensisch Instituut (May 2014), available at <http://www.nist.gov/forensics/upload/Kloosterman-DNA.pdf>.

<sup>97</sup> NAS Report, *supra* note 4 at 217-18.

<sup>98</sup> *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579 (1993).

being used in the courtroom, and reinforces direct but misunderstood or misused language as an easy bridge between attorneys and scientists.

## B. Communication Between Forensic Analysts and Attorneys: Bridging the Gap

As I have noticed in my own experience, and from conversations with forensic analysts, much of the misrepresentation concerning the forensic sciences in court is attributable to communication errors between law and science.

The National Commission on Forensic Science has issued a recommendation on inconsistent terminology, namely, that forensic disciplines should seek to standardize terms within individual disciplines as well as across disciplines.<sup>99</sup> The lack of standard language further widens the gap between forensic analysts and attorneys. If prosecutors and analysts do not share a common language on the meaning of “accuracy” and results, then forensic reports are ripe for misconstrual in the courtroom.<sup>100</sup>

The pressure placed on the analysts for a definitive result is palpable. Attorneys want a level of certainty that the forensics may or may not be able to provide. As with some of the above-mentioned cases, the prosecutor wants the expert to say he can look at the wound and tell who was shooting the gun or the intent of the shooter—and jurors want to believe it.<sup>101</sup> The legal system wants the forensic information, but does not want to slow down to check for errors or reliability.<sup>102</sup> In Georgia, *Daubert* hearings are not even permitted in criminal cases, leaving forensic evidence unchallenged and

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<sup>99</sup> <http://www.justice.gov/ncfs/file/477841/download>.

<sup>100</sup> Jessica Cino, *Language Barriers: Creating Standard Terminology to mitigate forensic errors in the courtroom*, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, available at [http://www.nist.gov/director/upload/language\\_barriers\\_creating\\_standard\\_terminology\\_to\\_mitigate\\_forensic\\_errors\\_inthe\\_courtroom-gable-legfact.pdf](http://www.nist.gov/director/upload/language_barriers_creating_standard_terminology_to_mitigate_forensic_errors_inthe_courtroom-gable-legfact.pdf); Judge Christopher Plourd, *Forensic Scientific Error and Omission within the Legal System – Forensic Science in the Courtroom Can we communicate Better?*, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, (July 2015) available at [http://www.nist.gov/director/upload/forensic\\_science\\_inthe\\_courtroom\\_can\\_we\\_communicate\\_better-plourd-legfact.pdf](http://www.nist.gov/director/upload/forensic_science_inthe_courtroom_can_we_communicate_better-plourd-legfact.pdf). All comparison fields of forensic sciences use different terms; don't use the same language on the same type of evidence. *Id.*

<sup>101</sup> See Radley Balko, *Mississippi Supreme Court overturns conviction involving Steven Hayne, Shaken Baby Syndrome*, WASH. POST (Dec. 16, 2014) available at <https://www.washingtonpost.com/news/the-watch/wp/2014/12/16/mississippi-supreme-court-overturns-conviction-involving-steven-hayne-shaken-baby-syndrome/>.

<sup>102</sup> For example, in Delaware, per statute, all DNA and toxicology findings are automatically admitted into evidence.

unquestioned.<sup>103</sup> Similar statutes bind even willing courts to admit unchecked and unverified evidence.

### C. Judges, Proactive Education, and Hearings

Some courts have indeed become willing to examine the unreliability of forensic disciplines. Since Thompson's book was released, Judge Alex Kozinski's has written an academic article challenging the far-too-easy admittance of forensic science. Consistent with Thompson's analysis, Kozinski explains that fingerprint forensics are unreliable, because prints can vary in their quality and analyst interpretation is subjective.<sup>104</sup> According to Kozinski, the uncertainty and variability of fingerprints is two to three times more likely than for other forensic disciplines.<sup>105</sup>

Other judges have also pushed for rigor in the courtroom. In one of her most well-known cases, former federal judge Nancy Gertner ruled that a handwriting expert could testify to the similarities between samples but not state an opinion on a match.<sup>106</sup> The Tenth Circuit has likewise held handwriting experts may testify to similarities and differences between samples, but not testify as to a "match."<sup>107</sup> Judge Gertner has also questioned the admission of ballistics and arson testimony.<sup>108</sup> One of her opinions states, "the *Daubert-Kumho* standard [for admitting expert witness testimony] does not require the illusory perfection of a television show (CSI, this wasn't), when liberty hangs in the balance—and, in the case of the defendants facing the death penalty, life itself—the standards should be higher . . . than [those that] have been imposed across the country."<sup>109</sup>

Similarly, a firearm examiner has been prevented from testifying to an exact match in federal court,<sup>110</sup> and even fingerprint testimony to

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<sup>103</sup> The legislation supplies a different test in criminal cases, in which "the opinions of experts on any question of science, skill, trade, or like questions shall always be admissible." Ga. Code. 24-9-67.

<sup>104</sup> Hon. Alex Kozinski, *Criminal Law 2.0*, 44 GEO. L.J. ANN. REV. CRIM. PROC. i, iv (2015) available at [http://georgetownlawjournal.org/files/2015/06/Kozinski\\_Preface.pdf](http://georgetownlawjournal.org/files/2015/06/Kozinski_Preface.pdf).

<sup>105</sup> *Id.*

<sup>106</sup> *U.S. v. Hines*, 55 F.Supp. 2d 62 (D.Mass. 1999). In the same case, Judge Gertner admitted expert testimony on the reliability of eyewitness identifications, including difficulties of cross-racial identification.

<sup>107</sup> Simone Ling Francini, *Note. Expert Handwriting Testimony: Is the Writing Really on the Wall?* 11 SUFFOLK J. TRIAL & APP. AD. 99, 108-9 (2006).

<sup>108</sup> *United States v. Green*, 405 F. Supp. 2d 104, 107-08 (D. Mass. 2005).

<sup>109</sup> Kozinski, *supra* note 70, at v (quoting *United States v. Green*, 405 F. Supp. 2d 104, at 109 (D. Mass. 2005)).

<sup>110</sup> *United States v. Jackson*, 1:11-cr-411-WSD (N.D. Ga. July 25, 2012).

exact matches has occasionally been limited.<sup>111</sup> The NIST OSAC includes a Legal Resource Committee, which include Superior Court Judge Christopher Plourd, who has represented individuals falsely convicted by bite mark evidence, and Judge Ronald Reinstein of the Arizona Supreme Court.<sup>112</sup> This Committee seeks to verify whether forensic disciplines create and implement suitable standards of care and operating procedures to obtain reliable and consistent findings suitable to be presented in court.<sup>113</sup> Finally, some judges and scholars have understandably recommended that a *Daubert* hearing be required before expert evidence can be admitted in criminal cases,<sup>114</sup> noting that civil cases often have lengthy *Daubert* hearings.<sup>115</sup>

#### CONCLUSION

*Cops in Lab Coats* informs the legal profession of the dicey interplay between forensics and the courtroom, and how the courts' lax admissibility standards vis-à-vis forensic evidence has led to wrongful convictions. The book also provides inspiration that, with knowledge and awareness, our courtrooms can be transformed and reject unreliable forensic evidence.

Simply because a forensic field has some subjectivity does not mean it should be excluded completely. Most forensic disciplines can provide helpful information. OSACs are creating standards of review for different forensic disciplines, but the courts continue to bear the responsibility to recognize and enforce those standards before admitting evidence into the courtroom. Far too much evidence is admitted without applying any standard. At a minimum, courts should stop admitting definitive-match testimony, and halt the overreach of forensic disciplines consistent with *Daubert*.

As recounted by Thompson in the first and final chapters of her book, such overreach and "admissible" exaggerated forensic testimony led to the wrongful conviction of George Rodriguez. Without individuals like Mr. Rodriguez fighting their wrongful convictions and challenging uncontested "science," forensic reform might never have

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<sup>111</sup> *United States v. Titus Faison*, No. 2008 CF2 16636 (D.C. Super. Ct. May 28, 2010) (disallowing testimony that a fingerprint is unique and only one person may have an exact match).

<sup>112</sup> <http://www.nist.gov/forensics/osac/lrf.cfm>

<sup>113</sup> *See id.*

<sup>114</sup> Kozinski. *supra* note 70.

<sup>115</sup> *See, e.g.,* Paul Gianelli, "Junk Science": *The Criminal Cases*, 84 J. CRIM. L. & CRIMINOLOGY 105 (1993) (noting the disparity between admission of junk science in civil cases versus in criminal cases).

occurred. The NAS Report itself was undertaken in part because of the plague of wrongful convictions—the realization that innocent people were going to prison while true perpetrators were free to commit other crimes. Thompson’s book and her tribute to Mr. Rodriguez personalize these harms and the absolute necessity for reform. As Thompson herself says, “bad science wreaks havoc.” (P. 3.) Independent crime labs and an informed judiciary can lead us to verified and reliable science, and the use of such “good science” to exonerate the innocent and establish justice in our criminal system.