SWIRLS AND WHORLS: LITIGATING POST-CONVICTION CLAIMS OF FINGERPRINT MISIDENTIFICATION AFTER THE NAS REPORT

Jacqueline McMurtrie*

I. INTRODUCTION

The National Research Council of the National Academies' recent report, *Strengthening Forensic Science in the United States: A Path Forward* ("NAS Report"), was heralded as "'a blockbuster that will completely change the legal landscape regarding forensic evidence.'"[1] As the NAS Report notes, "[t]he number of exonerations resulting from the analysis of DNA has grown across the country in recent years, uncovering a disturbing number of wrongful convictions—some for capital crimes—and exposing serious limitations in some of the forensic science approaches commonly used in the United States."[2] Those of us in the legal community representing individuals claiming they are innocent and that their convictions were based on flawed forensic science awaited the report with great anticipation.

It is undisputed that people are convicted for crimes they did not commit. To date, there have been 255 post-conviction DNA exonerations in the United States.[3] A study of the first 200 exonerations identified 113 cases (57 percent) where forensic evidence was presented against the defendant during the original trial.[4] As DNA technology has continued to improve, individuals convicted on the basis of other types of expert forensic testimony—including comparisons of bite marks, hairs, voiceprints, earprints, and fingerprints—were freed when post-conviction DNA tests proved the earlier forensic identifications wrong.[5] However, DNA

 Associate Professor of Law; Director, Innocence Project Northwest Clinic—University of Washington School of Law; J.D., University of Michigan Law School; B.G.S., University of Michigan. The author wishes to thank Simon A. Cole and Keith A. Findley for their helpful comments, Kelly Canary and John Pantazis for their research assistance, and Tesia Stanley and other members of the *Utah Law Review* for convening the symposium.

[1] Janie Magruder, *NAS Report to be 'Force of Change in Forensic Field,'* ASU NEWS [NOW], Feb. 9, 2009, http://asunews.asu.edu/20090209_forensicscience (last visited June 1, 2010).

[2] NATIONAL RESEARCH COUNCIL OF THE NATIONAL ACADEMIES, STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD 42 (2009) [hereinafter NAS REPORT].

[3] The Innocence Project, Facts on Post-Conviction DNA Exonerations, http://www.innocenceproject.org/Content/351.php# (last visited July 8, 2010).

[4] Brandon L. Garrett, *Judging Innocence*, 108 COLUM. L. REV. 55, 76 (2008).

[5] Jacqueline McMurtrie, *The Role of the Social Sciences in Preventing Wrongful Convictions*, 42 AM. CRIM. L. REV. 1271, 1272–73 & nn.4–8 (2005) (referencing post-conviction DNA exonerations in which bitemark, hair, voiceprint, earprint, and fingerprint comparisons were presented at trial).

testing cannot provide a remedy for all wrongful convictions because in the vast majority of cases the perpetrator does not leave biological material at the crime scene and, therefore, there is no evidence to test.[6]

Hence, non-DNA forensic evidence will continue to play a critical role in the criminal justice system, and the work of forensic science practitioners is "wide-reaching and important."[7] This Article's focus on fingerprint evidence may at first glance appear to be an inquiry in search of a problem. It is true that only one of the 255 post-conviction DNA exonerations involved an erroneous fingerprint identification.[8] However in 2004, the highly publicized Brandon Mayfield case (discussed in Part IV *infra*) brought national attention to the question of whether latent fingerprint identifications are reliable. Other documented cases of fingerprint misattributions are less renowned, but exist.[9] In the end, it is impossible to assess the prevalence of error of latent fingerprint identifications. First, no records document how many criminal prosecutions in federal and state courts in the United States are based totally or partially on fingerprint evidence.[10] Second, fingerprint misattributions go largely unnoticed, as there is "[n]o mechanism for recording, compiling, reviewing, or analyzing [the] cases."[11]

My own interest in the question of whether latent fingerprint evidence is prone to error is more than academic. I direct the Innocence Project Northwest (IPNW) Clinic at the University of Washington School of Law. The IPNW Clinic represents indigent people in Washington State who are serving long prison terms, who proclaim their innocence, and who no longer have a right to court-appointed counsel. Although the IPNW Clinic is particularly active in pursuing DNA testing on physical evidence to demonstrate innocence, we also represent clients in non-

---

[6] Garrett, *supra* note 4, at 116 (citing Protecting the Innocent: Proposals to Reform the Death Penalty: Hearing Before the S. Comm. on the Judiciary, 107th Cong. 221 (2002) (statement of Professor Barry Scheck, Co-Director of the Innocence Project) ("The vast majority (probably 80%) of felony cases do not involve biological evidence that can be subjected to DNA testing.")); Nina Martin, *Innocence Lost*, S.F. MAG., Nov. 2004, at 78, 105 (noting that "only about 10 percent of criminal cases have any biological evidence—blood, semen, skin—to test").

[7] NAS REPORT, *supra* note 2, at xix.

[8] Simon A. Cole, *The Prevalence and Potential Causes of Wrongful Conviction by Fingerprint Evidence*, 37 GOLDEN GATE U. L. REV. 39, 41 (2006) (identifying Stephan Cowans as the "first—and thus far the only—person to be exonerated by DNA evidence for a wrongful conviction in which fingerprint evidence was a contributing factor").

[9] Simon A. Cole, *More than Zero: Accounting for Error in Latent Fingerprint Identification*, 95 J. CRIM. L. & CRIMINOLOGY 985, 991 (2005) (documenting twenty-two cases of fingerprint misattribution that have been reported in the public record and concluding that the cases show "most likely only the tip of the proverbial iceberg of actual cases of fingerprint misattribution").

[10] Lyn Haber & Ralph Norman Haber, *Scientific Validation of Fingerprint Evidence Under* Daubert, 7 LAW, PROBABILITY & RISK 87, 87 (2008); *see also* Cole, *supra* note 9, at 1017 ("Although there is no information on how many times latent print identification has been used in crime investigation, the number is clearly large.").

[11] Cole, *supra* note 9, at 997.

DNA cases. We are currently investigating two cases where latent fingerprint "matches" were the only evidence linking the defendant to the crime. Because neither case is resolved, I will provide only minimal detail about the cases. In the first case, the defense presented expert witnesses to refute the latent print identification of the government's expert witnesses. In the second, the defense did not offer an expert to rebut the government's expert witness. In the first case, the government's expert testified that he had found nine "points of comparison" (*see* Part II, *infra*) between the latent print and the defendant's fingerprint. In the second case, the government's expert testified that she used the Analysis, Comparison, Evaluation, and Verification (ACE-V) (*see* Part III, *infra*) method of comparison to match the latent print to the defendant's fingerprint. Although both cases have the potential for post-conviction DNA testing, the chance of achieving conclusive results is stronger in one than the other. And so, I read the NAS Report with these cases in mind to assess what impact, if any, the report would have on post-conviction proceedings involving latent fingerprint identifications.

Part II of this Article provides a brief outline of latent fingerprint evidence as it is currently presented in courts. Numerous practical, scientific and legal articles, and books have been written on the subject of fingerprints and this Article cannot do justice to the vast body of literature. However, it will introduce three tenets at the heart of latent fingerprint evidence: (1) "uniqueness," i.e., that every person possesses a set of unique and permanent fingerprints; (2) "individualization," i.e., the determination that a latent print can be matched to its source to the exclusion of all others; and (3) "infallibility," i.e., that when the latent print comparison is properly conducted by a trained examiner, its error rate is zero.

Part III, in reverse chronological order, provides a condensed history of latent print individualization, describing its rapid and largely unquestioned acceptance in the courts as forensic identification evidence and its ascendancy to the "gold standard" of identification. Like other types of "trace evidence" left at a crime scene, fingerprint evidence gained court acceptance prior to its being validated through scientific research.[12]

Part IV briefly explores the legal challenges to latent print individualization, which only began in the last decade of the twentieth century. The challenges were based upon scientific studies and scholarly research that questioned the validity and reliability of latent fingerprint individualization. Early on, the debate split into two factions, with latent print examiners and courts on one side, and legal and scientific scholars on the other, resulting in the nearly uniform admissibility of latent fingerprint comparison evidence.

---

[12] Professors Wells and Loftus have argued that eyewitness identification evidence is another type of "trace" evidence that was accepted by the courts prior to its scientific validation. *See* Gary L. Wells & Elizabeth F. Loftus, *Eyewitness Memory for People and Events*, *in* 11 HANDBOOK OF PSYCHOLOGY 149, 149–50 (Alan M. Goldstein & Irving B. Weiner eds., 2003) (suggesting that one of the reasons the criminal justice system has failed to adopt a scientific model for eyewitness evidence is because eyewitness testimony was commonly used in criminal investigations long before any scientific studies of eyewitnesses had been conducted).

Part V examines the NAS Report's discussion of latent fingerprint identification (or "friction ridge analysis") and its conclusions regarding latent fingerprint examiners' claims of (1) uniqueness, (2) individualization, and (3) infallibility. It discusses the reaction of the latent fingerprint community to the report, as well as trial court decisions issued after the NAS Report was published.

Part VI sets forth the procedural requirements of bringing post-conviction motions based upon a claim of newly discovered evidence. It identifies the obstacles petitioners face in bringing such claims. However, it also discusses other areas, notably Comparative Bullet Lead Analysis and Shaken Baby Syndrome, where petitioners have successfully raised post-conviction claims based upon new developments in forensic science.

Part VII returns to the question of whether a petitioner who claims to have been wrongly convicted on the basis of latent fingerprint evidence can obtain relief from the courts based upon the findings of the NAS Report. Part VII concludes that petitioners will continue to face substantial hurdles despite the questions raised by the NAS Report regarding data collection, the ACE-V method of interpretation, and issues surrounding the conclusions in reporting results of fingerprint comparisons. The primary challenge will be to educate courts that the NAS Report findings are substantive evidence that challenge the underlying principles that have long been the claim of fingerprint identifications: uniqueness, individualization and infallibility.

II. LATENT FINGERPRINT EVIDENCE

The first premise of fingerprint identification is that of "uniqueness," i.e., every individual possesses a unique and permanent set of fingerprints.[13] Fingerprint identifications in criminal cases are generally made from traces of fingerprint fragments detected at crime scenes. These fragments are commonly referred to as "latent fingerprints," the word "latent" meaning hidden because the print is not readily visible.[14] Every ridge of the fingers, palms, and soles bears sweat pores, which in the average person exude perspiration.[15] Additionally, if the ridges come into contact with other parts of the body, such as hair or the face, or other objects, a film of grease or moisture may be deposited on the ridges.[16] When fingers or palms touch an object, the film, moisture, or grease may be transferred to the object, leaving an outline of the ridges. Various powders and chemicals are used to develop the print to make it visible so that it may be preserved and compared.[17] After a latent fragment is detected at a crime scene, it is then

---

[13] *See* SIMON A. COLE, SUSPECT IDENTITIES: A HISTORY OF FINGERPRINTING AND CRIMINAL IDENTIFICATION 191 (2001).

[14] UNITED STATES DEPARTMENT OF JUSTICE, FEDERAL BUREAU OF INVESTIGATION, THE SCIENCE OF FINGERPRINTS: CLASSIFICATION AND USES 170 (1985) [hereinafter SCIENCE OF FINGERPRINTS].

[15] *Id.*

[16] *Id.*

[17] *Id.* at 170, 173–86.

compared by a fingerprint examiner with inked or digitally scanned fingerprints taken directly from a suspect's fingers.

Prior to the introduction of computer technology, the fingerprint identification process was conducted by clerks and fingerprint technicians who sifted through thousands of cataloged paper fingerprint cards searching for a match.[18] In the late 1970s and early 1980s, law enforcement agencies in the United States began adopting Automated Fingerprint Identification Systems (AFIS) to improve efficiency and to reduce the amount of time it took to identify (or not exclude) a given individual from a latent fingerprint. Fingerprint examiners use computer workstations to mark the features of a scanned fingerprint image, encode the resulting data in a machine-readable format, and then search for similar fingerprints in an associated database of known fingerprints and records. The searches conducted by AFIS are rapid and allow examiners to search across the large pool of candidates in the database.[19] Latent print searches are inherently more difficult than ten-print (or criminal identification) searches because the examiner may only have a partial print from the crime scene, the prints are regularly of poor quality, and often the examiner does not know from which finger a given latent print came.[20]

When an optical image of a latent print is entered into the database, AFIS will retrieve optical images of candidate matches and display them in descending order of likelihood of matching.[21] It is then up to the human examiner to compare the prints generated by AFIS to determine whether there is a match. Although "AFIS systems are very good at quickly winnowing an enormous database into a small group of candidate matches," the systems are "relatively poor at selecting which, if any, of this small group is the actual match."[22]

It is then up to the fingerprint examiner to compare the latent fingerprint, or partial print, taken from the crime scene to the known exemplars generated by AFIS.[23] Fingerprint examiners base their analyses upon the ridge outlines that appear on the inside of the end joints of the fingers and thumbs.[24] The ridges have been categorized into several different general groups of ridge patterns: arches, loops, and whorls, which are further divided into multiple subgroups.[25]

---

[18] NAS REPORT, *supra* note 2, at 269.

[19] *Id.*

[20] *Id.* at 270.

[21] COLE, *supra* note 13, at 254–55.

[22] *Id.* at 255 (noting that in this particular context, "computers are fast but dumb").

[23] *Id.*

[24] SCIENCE OF FINGERPRINTS, *supra* note 14, at iv.

[25] *Id.* at 5. However, "there is no standard agreement among fingerprint examiners as to either the precise number or nomenclature of the different characteristics." Robert Epstein, *Fingerprints Meet* Daubert: *The Myth of Fingerprint "Science" is Revealed*, 75 S. CAL. L. REV. 605, 608 (2002) (citing JAMES F. COWGER, FRICTION RIDGE SKIN: COMPARISON AND IDENTIFICATION OF FINGERPRINTS 143 (1983) ("The terms used to define and describe these characteristics vary markedly among writers in the field and differ even among examiners depending upon the organization in which they were trained."); *see also*

The current technique used to examine and compare latent fingerprints to known print exemplars is described by the acronym ACE-V: Analysis, Comparison, Evaluation, and Verification, which, as its name implies, consists of four different stages.[26]

First, the examiner conducts an *analysis* of the latent print, which is most often viewed as a digital image.[27] The examiner looks at several different factors[28] to determine whether the latent print contains sufficient quantity and quality of detail to continue the analysis.[29] If the detail is insufficient, the prints are called "of no value" or "not suitable" for comparison.[30] If the examiner decides that there is sufficient detail, "the comparison of the latent print to the known print begins."[31]

Second, the visual *comparison* of the prints consists of "visually 'measuring,' and comparing—within the comparable areas of the latent print and the known prints—the details that correspond."[32] The details could include:

> [T]he overall shape of the latent print, anatomical aspects, ridge flows, ridge counts, shape of the core, delta location and shape, lengths of the ridges, minutia location and type, thickness of the ridges and furrows, shapes of the ridges, pore position, crease patterns and shapes, scar shapes, and temporary feature shapes . . . .[33]

Third, after the examiner completes the comparison, "the examiner performs an *evaluation* of the agreement of the friction ridge formations in the two prints and evaluates the sufficiency of the detail present to establish an identification (source determination)."[34]

Fourth, *verification*, the final step, occurs when a "qualified examiner repeats the observations and comes to the same conclusion, although the second examiner may be aware of the conclusion of the first."[35]

Fingerprint examiners, according to the standards promulgated by the Scientific Working Group on Friction Ridge Analysis, Science and Technology (SWGFAST) are only allowed to report one of three acceptable conclusions

---

John Berry & David A. Stoney, *History and Development of Fingerprinting*, *in* ADVANCES IN FINGERPRINT TECHNOLOGY 2–3 (Henry C. Lee & Robert E. Gaensslen eds., 2d ed. 2001) (illustrating seven basic ridge characteristics, while acknowledging that "[s]ome authorities consider that only two types of characteristics are present").

[26] NAS REPORT, *supra* note 2, at 137 (internal citations omitted).

[27] *Id.*

[28] *Id.* at 137–38 (listing factors).

[29] *Id.*

[30] *Id* at 138.

[31] *Id.*

[32] *Id.*

[33] *Id.*

[34] *Id.*

[35] *Id.*

resulting from their analysis: "individualization (or identification), exclusion, or inconclusive."[36]

Thus, the second premise of fingerprint identifications is one of "individualization." When fingerprint examiners conclude that there is a 'match' between the latent print and the suspect's print, it is expressed in absolute terms as an "individualization," meaning that "[t]he determination that corresponding areas of friction ridge impressions originated from the same source to the exclusion of all others (identification)."[37] "The fingerprint literature suggests that examiners testify as follows:

Q: How sure are you that those two prints were made by the same finger?

A: Absolutely sure! I don't testify to probabilities."[38]

This concept of "individualization" is most commonly understood to mean the narrowing of possible sources of a forensic specimen to a particular source, "to the exclusion of all other possible sources."[39] Fingerprint examiners, along with those who analyze crime scene evidence, including shoe and tire impressions, toolmarks, firearms, and handwriting, have "individualization" of specific types of evidence as their goal.[40] "Individualization" is a much stronger claim of source attribution than "identification" or "classification," where the potential source of the specimen is narrowed to a group (or "class") of similar items.[41] Examples of the latter include hair comparisons, which match a hair to a particular ethnic group, or analysis of paint marks that identifies a class of vehicle.[42]

And finally, the third premise of fingerprint identifications is one of "infallibility." Many in the latent fingerprint community also testify that the ACE-V comparison method has a "zero error rate." They claim that when the method is used by well-trained and experienced examiners, no errors are ever made, so that the method itself is error free.[43] Thus, the claim is that erroneous identifications are only made by poorly trained or inexperienced practitioners. In other words, the

---

[36] *Id.* at 141 (citing SWGFAST. 2002. *Friction Ridge Examination Methodology for Latent Print Examiners*, *available at* http://www.swgfast.org/documents/methodology/Friction_Ridge_Examination_Methodology_for_Latent_Print_Examiners_1.0.pdf).

[37] Scientific Working Group on Friction Ridge Analysis Study and Technology (SWGFAST), Glossary—Consolidated 12 (Sept. 9, 2003), http://www.swgfast.org/documents/glossary/030909_Glossary-Consolidated_ver_1.pdf.

[38] Simon A. Cole, *Grandfathering Evidence: Fingerprint Admissibility Rulings From* Jennings *To* Llera Plaza *And Back Again*, 41 AM. CRIM. L. REV. 1189, 1196 (2004) (citing Thomas W. Jones, *How Many Points Do You Need & Other Questions Asked by Ignorant Attorneys Trying to Rattle Your Cage*, THE PRINT, May/June 1998, at 2–4, *available at* http://www.scafo.org/library/140302.html (last visited June 1, 2010)).

[39] NAS REPORT, *supra* note 2, at 43–44.

[40] *Id.* at 43.

[41] *Id.* at 117–18.

[42] *Id.*

[43] Steve Berry, *Pointing a Finger at Prints: Fingerprint Matching, The Gold Standard in Courtrooms, Is Being Called into Question, Half the Examiners Flunk a Proficency Test*, L.A. TIMES, Feb. 26, 2002, at A1 (quoting FBI agent and fingerprint analyst Stephen Meagher's statement that "[latent print identification's] error rate is zero").

"methodological" (sometimes called "scientific") error rate is zero while the "practitioner" (sometimes called "human") error rate is unknown.[44]

Backed by the claims of uniqueness, individualization, and infallibility, it is no wonder that "[f]ingerprint evidence is so powerful that erroneous fingerprint evidence is likely to convict, convict securely, and never be exposed."[45]

III. LATENT FINGERPRINT'S RAPID ACCEPTANCE AS IDENTIFICATION EVIDENCE BY THE COURTS

The claim that latent fingerprint examiners' conclusions of "individualization" are infallible is remarkable for many reasons; beginning with the fact that fingerprint evidence was initially viewed as inferior to the Bertillon system of anthropomorphic identification, which measured the size and proportions of the human body.[46] Cloaked with the aura of sophistication that only a French nomenclature can impart, Bertillonage was used by criminal identification bureaus for the first decade of the twentieth century.[47] Early fingerprint examiners did not view fingerprinting as forensic evidence of "individualization" that could link criminals to evidence left at a crime scene.[48] Instead, fingerprinting served the record-keeping purpose of criminal identification, to link persons in custody to their criminal records.[49] Latent fingerprint individualization, which came about as a fringe benefit of criminal identification, requires endorsing the principle that fingerprint examiners can accurately match crime-scene fingerprints, even if they are partial prints, to one and only one source finger.[50] This principle came to be accepted despite the fact that latent prints, unlike prints taken from suspects using ink or scanners, which are generally of good quality, are "typically partial, smudged, or otherwise distorted."[51]

The earliest published decision in the United States addressing forensic evidence of fingerprint "individualization" is the 1911 case of Thomas Jennings.[52]

---

[44] *See* Cole, *supra* note 9, at 1034–43 (describing the latent finger print community's "parsing of errors" to support its claim that the method of fingerprint comparisons is free from error).

[45] *Id.* at 1021 (citing Tamara F. Lawson, *Can Fingerprints Lie?: Re-Weighing Fingerprint Evidence in Criminal Jury Trials*, 31 AM. J. CRIM. L. 1, 3 (2004) ("From my practical experience and scholarly research of the topic, the reliability of fingerprint identification evidence routinely goes unquestioned at all levels of the criminal process and by both sides of the litigation, prosecution, and defense.").

[46] COLE, *supra* note 13, at 150–52.

[47] *See id.* at 152.

[48] *Id.* at 168.

[49] *Id.*

[50] *Id.*

[51] Cole, *supra* note 9, at 991.

[52] People v. Jennings, 96 N.E. 1077, 1081 (Ill. 1911); *see also* COLE, *supra* note 13, at 159–160.

Jennings was tried for the murder of Clarence Hiller during a home invasion burglary. There was some circumstantial evidence linking him to the crime. Jennings was found by the police a few hours after the murder with a freshly fired revolver containing cartridges that were claimed to match those found near the dead body.[53] He was also identified at trial by eyewitnesses as the intruder in several other home invasions in the neighborhood on the same evening as the murder.[54] But the strongest evidence against Jennings came from four government witnesses who testified that fingerprints left in wet paint at the crime scene belonged to Thomas Jennings.[55] The witnesses testified that they had, in the course of their work with various Bureaus of Identification, examined thousands of fingerprints, and Jennings was convicted.[56] On appeal, Jennings's argument that the prints were not properly admitted was rejected. The court, citing such authorities as the Encyclopedia Britannica and a treatise on handwriting identification, emphasized that "standard authorities on scientific subjects discuss the use of fingerprints as a system of identification, concluding that experience has shown it to be reliable."[57] Thus, the court concluded "that there is a scientific basis for the system of fingerprint identification . . . and that this method of identification is in such general and common use that the courts cannot refuse to take judicial cognizance of it."[58]

Fingerprint evidence, once it was admitted, was quickly embraced by the judicial system. Courts engaged in little substantive analysis when admitting the testimony of fingerprint matches, instead relying upon *Jennings* and other precedent to admit the evidence.[59] The first legal challenges to fingerprint evidence focused upon the question of whether uncorroborated fingerprint evidence was sufficient to support a conviction.[60] Other challenges raised claims that fingerprint

---

[53] *Id.* at 1079. Although too late for Mr. Jennings, a recent study on ballistics concludes: "The validity of the fundamental assumptions of uniqueness and reproducibility of firearms-related toolmarks has not yet been fully demonstrated." NATIONAL RESEARCH COUNCIL, BALLISTICS IMAGING 3 (Daniel L. Cork et al. eds., 2008).

[54] *Jennings*, 96 N.E. at 1079–1080. None of the witnesses saw the intruder's face in the dark and "could only describe his build and say he was 'a colored man.'" COLE, *supra* note 13, at 178. Nonetheless, they all testified that Jennings looked like the man who broke into their houses on the night of the murder. *Id.* We now know that mistaken eyewitness identification is the leading cause of wrongful convictions. Garrett, *supra* note 4, at 78 (noting that a study of the first 200 DNA exonerations found that 158 (79 percent) of the convictions involved mistaken eyewitness identifications). Furthermore, cross-racial identification is particularly prone to error. *Id.* at 79.

[55] *Jennings*, 96 N.E. at 1080–82.

[56] *Id.* at 1082.

[57] *Id.* at 1081.

[58] *Id*. at 1082.

[59] Jennifer L. Mnookin, *Fingerprint Evidence in an Age of DNA Profiling*, 67 BROOK. L. REV. 13, 21 (2001).

[60] *See, e.g.*, State v. Minton, 46 S.E. 2d 296, 298 (N.C. 1948) ("The fact that fingerprints corresponding to those of an accused are found in a place where a crime was

evidence was obtained in violation of a person's constitutional rights. In response, courts ruled that fingerprinting an arrested person prior to conviction does not violate that individual's right to due process or the privilege against self-incrimination.[61] Nor does it represent a critical state of the proceedings requiring the presence of counsel.[62] However, the use of fingerprints taken from a person after an illegal arrest violates that person's right against unlawful search and seizure.[63]

Scholars have addressed the question of why fingerprinting was not subjected to more scrutiny when it was first offered as a new system of identification. Professor Michael Saks posits that fingerprint identifications, like many other forms of early forensic evidence, were not critically examined because courts primarily relied upon an informal and implicit "marketplace test" to determine the admissibility of expert testimony.[64] Under this test, individuals who had succeeded in making a living from marketing their services were presumed to have sufficient expertise to testify in court.[65] As Saks argues, courts failed to recognize that fingerprint evidence needed to be subjected to more serious scrutiny because the latent fingerprint discipline had no external constituency that would provide the safeguards imposed by the commercial market.[66] In addition, Saks notes that the judicial habit of relying upon precedent created a snowball effect: once a number of courts admitted fingerprint evidence, later courts merely followed their lead rather than conducting their own investigation of the validity and reliability of the evidence.[67] Professor Jennifer Mnookin has offered three additional explanations for why courts did not rigorously scrutinize the admissibility of fingerprint evidence.[68] First, the claim that every person's fingerprint is distinctive, just as every snowflake is unique, has "inherent cultural plausibility."[69] Second, fingerprinting was easily assimilated as legal evidence because it is a visible means of identification, allowing jurors to examine the fingerprints offered into evidence themselves, and to even compare them against their own prints.[70] Third, a fingerprint examiner's strong claim of "certain, incontestable knowledge" made fingerprinting especially appealing to prosecutors and judges.[71] As Mnookin

---

committed is without probative force unless the circumstances are such that the finger-prints could only have been impressed at the time when the crime was perpetrated.").

[61] *E.g.*, People v. Sallow, 165 N.Y.S. 915, 917–18 (N.Y.C. Gen. Sess. N.Y. County 1917).

[62] *E.g.*, Pearson v. United States, 389 F.2d 684, 686 (5th Cir. 1968).

[63] *E.g.*, Bynum v. United States, 262 F.2d 465, 466–67 (D.C. Cir. 1958).

[64] Michael J. Saks, *Merlin and Solomon: Lessons from the Law's Formative Encounters with Forensic Identification Science*, 49 HASTINGS L.J. 1069, 1073–74 (1998).

[65] *Id*. at 1074.

[66] *Id*. at 1104.

[67] *Id.* at 1105.

[68] Mnookin, *supra* note 59, at 32–36.

[69] *Id.* at 32–33.

[70] *Id*. at 33–35.

[71] *Id.* at 36.

describes, courts were searching for "the light of scientific truth" to provide scientific certainty and objectivity to authoritative judgments.[72] Fingerprint examiners rarely disagreed with each other and the lack of the "battles of the experts" apparent in other disciplines gave fingerprinting an air of objective authoritative judgment.[73]

One of the reasons that fingerprint examiners rarely disagreed with each other's conclusions, Professor Cole asserts, is that they "articulat[ed] norms of method and conduct that would *preclude* disagreement between experts."[74] Prior to the ACE-V method of comparison described in Part II, examiners were able to uniformly reach similar conclusions through what became known as the "point counting" method of matching corresponding ridge characteristics between the latent and inked prints.[75] Even though fingerprint examiners could in theory disagree about whether a corresponding point matched, and occasionally they did, the point counting method generated relatively little disagreement between examiners about their ultimate conclusions regarding identification. If an examiner was able to generate a comparison with a large number of matching points, there was very little chance that another examiner would disagree with the identification.[76]

However, one of the problems with "point counting" is that there were no standard professional norms as to how many matching points were necessary to conclude there was a match between a latent print and a known suspect's exemplar. Historically, the presence of twelve or more points of identity between the latent print and the known print was deemed sufficient for a positive identification, so long as there were no dissimilarities noted between the prints.[77] And yet, many authorities believed that eight point comparisons were sufficient for the purposes of individualization,[78] so long as the examiner paid attention to uniqueness, relative position, as well as to the number of identifying points.[79] Thus, latent fingerprint evidence was held admissible in cases where the examiner found five points of similarity[80] and even as few as four,[81] with the courts holding

---

[72] *Id.* (quotation omitted).

[73] *Id.* at 38–39.

[74] COLE, *supra* note 13, at 201.

[75] In the United States, "point counting" was eventually replaced by the ACE-V method of comparison. *See* Lisa J. Steele, *The Defense Challenge to Fingerprints*, 40 CRIM. L. BULL. 213, 221–22 (2004).

[76] COLE, *supra* note 13, at 201.

[77] HAROLD CUMMINS AND CHARLES MIDLO, FINGER PRINTS, PALMS AND SOLES 155 (3d ed. Research Publishing Co. 1976).

[78] *Id.*

[79] *See* ANDRE A. MOENSSENS, FINGERPRINTS AND THE LAW 14 (1969).

[80] *E.g.*, Breeding v. State, 151 A.2d 743, 746–47 (Md. 1959); People v. Willis, 230 N.W.2d 353, 355 (Mich. Ct. App. 1975).

[81] *E.g.*, Commonwealth v. Walker, 116 A.2d 230, 234 (Pa. Super. Ct. 1955).

that the minimal points of comparison went to the weight to be accorded to the examiner's testimony, and not to its admissibility.[82]

Latent fingerprint evidence came to be seen as so venerated by the courts that one described the evidence in deific terms: "[L]atent fingerprints are a corporeal signature of their maker, capable of conclusively identifying the individual who impressed them."[83]

IV. PRETRIAL CHALLENGES TO FINGERPRINT EVIDENCE

Questions about the scientific validity and admissibility of fingerprint evidence only began to arise in the last decade of the twentieth century. According to Professor Mnookin, early critics focused on three main arguments: First, fingerprint examiners lacked objective and proven standards for evaluating what supported a conclusion of "individualization"; second, the error rate for fingerprinting as a technique had not been adequately studied; and third, there was no "statistical foundation for assessing whether two people might have the same prints with any given number of corresponding characteristics."[84] Professor Cole has argued that the focus on uniqueness should be abandoned as irrelevant to the question of individualization and that it cannot, in and of itself, support individualization.[85] Instead he urges a focus on diagnosticity, or "the ability to assign traces of these objects to their correct source with a certain degree of specificity under certain parameters of detection and under certain rules governing such assignments."[86]

Several factors combined to bring about a change in the way latent fingerprint evidence was viewed outside the latent fingerprint community. During the twenty-first century, legal and scientific articles have criticized the lack of validation of latent fingerprint individualization.[87] Studies have been published documenting

---

[82] *Id.*

[83] People v. Clark, 214 P.3d 531, 536 (Colo. App. 2009), *cert. granted*, 2009 WL 2489064 (Aug. 17, 2009) (No. 09SC358) (examining "[w]hether the Court of Appeals erred in finding that crime scene DNA evidence, without further significant corroborative proof, is sufficient to identify [the defendant] beyond a reasonable doubt as the perpetrator in this case and therefore sustain his sexual assault conviction").

[84] *See* Mnookin, *supra* note 59, at 57–61 (discussing the three arguments in more detail).

[85] *See* Simon A. Cole, *Forensics Without Uniqueness, Conclusions Without Individualization: The New Epistemology of Forensic Identification*, 8 LAW, PROBABILITY & RISK 233, 242, 245–46 (2009).

[86] *Id.* at 246.

[87] *See* Simon A. Cole, *Out of the* Daubert *Fire and into the* Fryeing *Pan*? *Self-Validation, Meta-Expertise and the Admissibility of Latent Print Evidence in* Frye *Jurisdictions*, 9 MINN. J.L. SCI. & TECH. 453, 516 n.241 (2008) (identifying "twenty different authors or sets of authors" who question the validity of latent print individualization: "DAVID FAIGMAN, ET AL., MODERN SCIENTIFIC EVIDENCE: THE LAW AND SCIENCE OF EXPERT TESTIMONY § 27-2.3.1, at 386 (2d ed. 2002) ("Woe to fingerprint practice were such [*Daubert* admissibility] criteria applied."); Michael Saks, *Merlin and*

Solomon: Lessons from the Law's Formative Encounters with Forensic Identification Science, 49 HASTINGS L.J. 1069, 1106 (1998) ("By conventional scientific standards, any serious search for evidence of the validity of fingerprint identification is going to be disappointing. . . . A vote to admit fingerprints is a rejection of conventional science as the criterion for admission. A vote for science is a vote to exclude fingerprint expert opinions."); James E. Starrs, *Judicial Control Over Scientific Supermen: Fingerprint Experts and Others Who Exceed the Bounds*, 35 CRIM. L. BULL. 234, (1999) ("Instead of meaning incapable of error, fingerprint identifications are declared to be infallible on account of the uniqueness of fingerprints to each person. . . ."); David A. Stoney, *Measurement of Fingerprint Individuality*, *in* ADVANCES IN FINGERPRINT TECHNOLOGY 327, 383 (H. C. Lee and R. E. Gaensslen eds., 2001) ("From a statistical viewpoint, the scientific foundation for fingerprint individuality is incredibly weak."); Jennifer L. Mnookin, *Fingerprint Evidence In An Age of DNA Profiling*, 67 BROOK. L. REV. 13 (2001) ("In the case of fingerprinting, the general rate of error is simply not known."); SIMON A. COLE, SUSPECT IDENTITIES: A HISTORY OF FINGERPRINTING AND CRIMINAL IDENTIFICATION (2001); David L. Faigman, *Is Science Different for Lawyers*? 297 SCIENCE 339,(2002) (fingerprinting has "not been seriously tested"); Paul Giannelli, *Fingerprints Challenged!* 17 CRIM. JUST. 33, 35 (Spring 2002) ("In its interpretation of *Daubert*, *Plaza I* is a well-written opinion. *Havvard* is not."); Robert Epstein, *Fingerprints Meet* Daubert: *The Myth of Fingerprint "Science" is Revealed*, 75 SO. CAL. L. REV. 605, 657 (2002) ("Having considered the various indicators of reliability set forth by the Supreme Court in *Daubert*, it is evident that at the present time, latent fingerprint identifications do not constitute reliable evidence."); Jessica M. Sombat, *Latent Justice: Daubert's Impact on the Evaluation of Fingerprint Identification Testimony*, 70 FORDHAM L. REV. 2819, 2825 (2002) ("the result Judge Pollak reached when he excluded expert testimony concerning fingerprints [in *Llera Plaza I*] was fair."); *Recent Case*, 115 HARV. L. REV. 2349, 2352 (2002) ("Fingerprint expert testimony does not survive application of the Daubert factors. . . ."); Lyn Haber & Ralph Norman Haber, *Error Rates for Human Fingerprint Examiners*, *in* AUTOMATIC FINGERPRINT RECOGNITION SYSTEMS 339 (N. K. Ratha & R. Bolle eds., 2004) ("no data have been collected on how accurately latent print examiners match different images of the same finger."); Donald Kennedy, *Forensic Science: Oxymoron?* 302 SCIENCE 1625 (2003) (Fingerprinting's "reliability is unverified either by statistical models of fingerprint variation or by consistent data on error rates."); David H. Kaye, *The Nonscience of Fingerprinting:* United States v. Llera Plaza, 21 QLR 1073, 1087 (2003) ("As Llera-Plaza I so clearly reveals, this [the evidence advanced in support of the admissibility of latent fingerprint individualization] does not satisfy Daubert."); Jennifer L. Mnookin, *Fingerprints: Not a Gold Standard*, 20 ISSUES SCI. & TECH. 47, 47 (2003) ("Judge Pollak's first opinion [restricting latent fingerprint individualization testimony] was the better one."); Tamara F. Lawson, *Can Fingerprints Lie? Re-weighing Fingerprint Evidence in Criminal Jury Trials*, 31 AM. J. CRIM. L. 1, 65 (2003) ("Currently fingerprint analysis is under attack because of the lack of study done on the accuracy of the examiners . . ."); Tara Marie La Morte, *Sleeping Gatekeepers:* United States v. Llera Plaza *and the Unreliability of Forensic Fingerprinting Evidence under* Daubert, 14 ALB. L.J. SCI. & TECH. 171, 173 (2003) (discussing "strong indications that the fingerprinting field should not survive a rigorous Daubert analysis."); JANE CAMPBELL MORIARTY, PSYCHOLOGICAL AND SCIENTIFIC EVIDENCE IN CRIMINAL TRIALS § 12:15 (2004) ("The assumption of the validity of fingerprinting rests upon law, rather than science."); Simon A. Cole, *Grandfathering Evidence: Fingerprint Admissibility Ruling from* Jennings *to* Llera Plaza

that the error rate of fingerprint comparisons was "more than zero."[88] In addition, the effect of cognitive biases upon forensic sciences in general, and latent fingerprint identification in particular, began to emerge through the publication of scholarly articles and studies.[89] The studies revealed that the fingerprint examiner community was not immune from the common cognitive bias that results in a tendency for conclusions to be affected by the way that information is presented to an individual. As an example, a study asked experienced fingerprint examiners to analyze fingerprints that, unbeknownst to them, they had analyzed in previous years.[90] Half of the examiners were given contextually biasing information before the examinations. If the examiners had previously declared an exclusion, they were told the "suspect confessed to the crime," but in cases where examiners had previously declared a match, they were told the "suspect was in police custody at the time of the crime."[91] In four of the twenty-four examinations where examiners were provided with the biasing information prior to the examinations, they reached conclusions different from the ones they had previously reached.[92]

One of the most highly publicized cases of erroneous fingerprint identification, which also involved potential contextual bias, occurred when Brandon Mayfield was arrested for his purported involvement in the Madrid train

---

and Back Again, 41 AM. CRIM. L. REV. 1189, 1215 (2004) ("It is clear that no studies exist that measure the accuracy of fingerprint examiners when they make conclusions of identification."); Nathan Benedict, *Fingerprints and the* Daubert *Standard for Admission of Scientific Evidence: Why Fingerprints Fail and a Proposed Remedy*, 46 ARIZ. L. REV. 519, 538 (2004) ("[J]udges have generally relied on their instincts and the long history of judicial acceptance of fingerprint evidence to admit it without serious consideration of the science behind it."); Zabell, *supra* note 35, at 178 ("*ACE-V is an acronym, not a methodology*.") (emphasis in the original); Michael Mears & Therese M. Day, *The Challenge of Fingerprint Comparison Opinions in the Defense of a Criminally Charged Client*, 19 GA. ST. U. L. REV. 705, 745 (2003) ("Those forensic experts who have examined this issue, as opposed to those whose livelihood depends upon perpetuating the misconception that fingerprint analysis is based upon the scientific method, have found the fingerprint field to be scientifically deficient."). Not all of the cited quotations refer directly to lack of validation. (See, for example, the quotation from Professor Zabell.) However, in all of the cited works, the overall message of the article is one of non-acceptance. Moreover, many of the authors (such as Zabell) also gave further indication of their views by signing the amicus brief discussed above.").

[88] *See* Cole, *supra* note 9, at 1033–34; Paul C. Giannelli, *Scientific Evidence—Fingerprints: Misidentifications*, 20 CRIM. JUST. 50, 50–52 (2005) (discussing several cases of erroneous fingerprint identification).

[89] *See, e.g.*, D. Michael Risinger, Michael J. Saks, William C. Thompson & Robert Rosenthal, *The* Daubert/Kumho *Implications of Observer Effects in Forensic Science: Hidden Problems of Expectation and Suggestion*, 90 CAL. L. REV. 1, 5–6, 41–42 (2002) (noting that cognitive biases can undermine the forensic sciences, including fingerprinting).

[90] Itiel E. Dror & David Charlton, *Why Experts Make Errors*, 56 J. FORENSIC IDENTIFICATION 600, 606–07 (2006).

[91] *Id*. at 608.

[92] *Id*. at 610.

bombing in 2004.[93] Mayfield was identified as the source of a latent print left at the crime scene by the FBI, and the "match" was confirmed by an independent defense fingerprint examiner.[94] Mayfield served time in custody before Spanish authorities cleared him and matched the fingerprints to an Algerian national.[95] As part of the aftermath generated by the misidentification, an FBI examination of the case concluded that once the first FBI fingerprint examiner reached a conclusion that the latent print matched Mayfield, the result was shared with other examiners, who were influenced by their supervisor's conclusion and by the inherent pressures of such a high-profile case.[96]

The Mayfield case was subsequently used in a study that reaffirmed the effect contextual bias can have upon the results fingerprint examiners reach in their cases. After the Mayfield misidentification was revealed, researchers gave five expert latent fingerprint examiners a pair of prints, which, although unrevealed, they had previously identified as a match five years earlier in the normal course of their work.[97] Prior to examining the prints, the examiners were given the contextually biasing information that the set of prints was the one the FBI had erroneously matched to Mayfield in the Madrid bombing case.[98] The examiners "were asked to decide whether there was sufficient information" to make a decision and, if so, to assess whether there was a match or exclusion.[99] Only one participant made a decision consistent with the one made five years earlier by declaring a match between the prints.[100] The other four participants changed their identification decision; three determined that there was an exclusion, and one decided that there was insufficient information to declare a match or an exclusion.[101]

Because of the growing body of scientific and scholarly discourse questioning the scientific validity of the basic principles underlying fingerprint comparisons, the 1993 Supreme Court decision in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*,[102] was seen as opening a door to challenging the admissibility of the evidence, which many thought was closed under the previous *Frye v. United States*[103]

---

[93] NAS REPORT, *supra* note 2, at 123.

[94] Cole, *supra* note 9, at 985–86.

[95] *Id.* at 986; Sara Kershaw, *Spain and U.S. at Odds on Mistaken Terror Arrest*, N.Y. TIMES, June 5, 2004, at A1.

[96] Robert B. Stacey, *Special Report: A Report on the Erroneous Fingerprint Individualization in the Madrid Train Bombing Case*, 54 J. FORENSIC IDENTIFICATION 706, 713–14 (2004).

[97] Itiel E. Dror, David Charlton & Alisa E. Péron, *Contextual Information Renders Experts Vulnerable to Making Erroneous Identifications*, 156 FORENSIC SCI. INT'L 74, 75 (2006).

[98] *Id.* at 76.

[99] *Id.*

[100] *Id.*

[101] *Id.*

[102] 509 U.S. 579 (1992).

[103] 293 F. 1013 (D.C. Cir. 1923).

standard. The admissibility of fingerprint evidence in the *Jennings* case was shortly followed by the 1923 decision of *Frye v. United States*, which became the leading standard for the admissibility of scientific evidence.[104] In *Frye*, the defendant sought to admit the results of a favorable polygraph examination to prove his innocence.[105] The court rejected the evidence stating:

> Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, 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.[106]

For 70 years *Frye*'s "general acceptance" test "[was] the dominant standard for determining the admissibility of novel scientific evidence at trial."[107]

The "general acceptance" standard of *Frye* was generally assumed to preclude arguments against the admission of latent print comparisons because the "relevant scientific community" of latent print examiners "accepts" latent print evidence.[108] Moreover, *Frye* specifies that its standard applies only to novel scientific evidence.[109] Thus, forms of expert evidence which either: "(1) pre-date *Frye* altogether (as in the case of latent print individualization evidence), or (2) post-date *Frye*, but are not challenged until after they have become familiar enough to the criminal justice system to no longer be regarded as 'novel,' would not be challengeable under *Frye*."[110] For these reasons, the first case in which a court explicitly considered the admissibility of latent print individualization evidence under *Frye* did not occur until 2007.[111] In that year, a Maryland state trial court ruled in *State v. Rose* that latent print evidence in a capital murder trial was inadmissible under the state's *Frye* standard.[112] After reconsideration of the state

---

[104] *Id.*

[105] *Id.* at 1013.

[106] *Id.* at 1014.

[107] *Daubert*, 509 U.S. at 585.

[108] *See, e.g.*, United States v. Gary, 85 F. App'x 908, 909 (4th Cir. 2004) ("[F]ingerprint analysis is one of those forms of evidence where the reliability of the science and its general acceptance is apparent without a full reexamination of the science.").

[109] *See Frye*, 293 F. at 1014.

[110] Cole, *supra* note 87, at 464–65. Cole posits that arguments to exclude evidence of latent fingerprint individualization should be reconsidered under the *Frye* standard of admissibility given its lack of general acceptance among the relevant scientific community of scholars, scientists and practitioners. *Id.* at 466.

[111] *Id.* at 530.

[112] State v. Rose, No. K06-0545, slip op. at 31 (Md. Balt. Co. Cir. Oct. 19, 2007).

court ruling was denied in 2008, the United States Attorney's Office for the District of Maryland filed an indictment in federal court.[113] The federal trial court, applying the *Daubert* factors (discussed below), then ruled that the fingerprint identification evidence was admissible.[114]

In 1993, in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, the Supreme Court clarified that Federal Rule of Evidence 702,[115] not *Frye*, governed the admissibility of expert evidence in federal court.[116] As a result, it identified factors that a trial court could consider when deciding whether to admit expert testimony based upon scientific evidence: (1) whether the evidence "can be (and has been) tested" using the scientific method; (2) whether it has "been subjected to peer review and publication"; (3) the "known or potential rate of error" of the technique in question; (4) the "existence and maintenance of standards controlling the technique's operation"; and (5) the "general acceptance" of the technique within the relevant scientific community.[117] However, the Supreme Court specified that the inquiry under Rule 702 was a "flexible one."[118] In a later decision, *General Electric Co. v. Joiner*, the Court made clear that a trial court's decision was subject to review under the narrow "abuse-of-discretion" standard of review.[119] And finally, in *Kumho Tire Co. v. Carmichael*, the Court stated that *Daubert*'s factors might be applicable in a trial court's assessment of non-scientific expert testimony.[120] *Kumho* went on to state that "whether *Daubert*'s specific factors are, or are not, reasonable measures of reliability in a particular case is a matter that the law grants the trial judge broad latitude to determine."[121]

Initially, *Daubert* was viewed by many legal scholars to have "opened a door to reconsideration of the admissibility of latent print evidence, a door that had been closed under *Frye*," because latent print individualization was seen to have trouble meeting the first four criteria of *Daubert*.[122] However, many scholars initially conceded that latent fingerprint evidence probably satisfied the fifth *Daubert*

---

[113] United States v. Rose, 672 F. Supp. 2d 723, 724 (D. Md. 2009).
[114] *Id.* at 725–26.
[115] FED R. EVID. 702, as amended after the *Daubert* decision, provides:

> If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

[116] Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 588–89 (1992).
[117] *Id.* at 593–94.
[118] *Id.* at 594.
[119] 522 U.S. 136, 142–43 (1997).
[120] Kumho Tire Co. v. Carmichael, 526 U.S. 137, 150 (1999).
[121] *Id.* at 153.
[122] Cole, *supra* note 87, at 462–63.

criterion, which echoed the *Frye* "general acceptance" criterion.[123] Nonetheless, Professor Saks reasoned that under *Daubert* "[a] vote to admit fingerprints is a rejection of conventional science as the criterion for admission. A vote for science is a vote to exclude fingerprint expert opinions."[124]

The first challenge to latent print evidence was brought in federal court, where *Daubert* applied, in the 1999 case of *United States v. Mitchell*.[125] Two latent fingerprints were offered against Mitchell, who was charged with armed robbery.[126] Ten witnesses—seven for the government and three for the defense—spent five days in court debating whether latent fingerprint evidence was scientific.[127] The *Mitchell* case division of experts foreshadowed the polarization between practitioners and scientists that would occur in future court challenges. Three of the government witnesses were latent print examiners without any advanced scientific background, while the defense witnesses were scientists and scholars who had conducted research on the validity of latent fingerprint evidence.[128] At the *Daubert* hearing, the government contended that the reliability of latent print identification was demonstrated by the uniqueness of friction ridge skin and the longstanding use of the technique in casework and criminal trials,[129] that the error rate of the technique could be meaningfully parsed into "methodological" and "human" categories,[130] and that the methodological error rate was zero.[131] Mitchell's defense experts conceded "uniqueness" and argued that one could not infer the accuracy of the techniques from the uniqueness of its target of analysis, or from casework or trials, and that the error rate of fingerprint individualizations, although unknown, was certainly not zero.[132] Ultimately, the court, although not ruling on the question of whether fingerprint evidence was scientific (finding the question irrelevant because a witness's expertise could be based upon technical, rather than scientific, knowledge), accepted the prosecution's position that fingerprint evidence is reliable.[133]

Subsequent challenges to latent print evidence under *Daubert* have not been successful; nearly every state and federal court has held that latent print evidence is

---

[123] *Id.* at 463.

[124] Saks, *supra* note 64, at 1106.

[125] United States v. Mitchell, No. CRIM. 95-00252-03, 1999 WL 1129628 (E.D. Pa. 1999).

[126] COLE, *supra* note 13, at 284.

[127] *Id*. at 284–85.

[128] *See* Cole, *supra* note 87, at 502–04. Indeed, Cole demonstrates that "only with difficulty can the government produce any non-practitioner scientists who accept the claim that latent print individualization is valid. And yet, paradoxically, few courts have acknowledged this deficiency, and those that have have tended to deem it irrelevant to admissibility." *Id.* at 540–41.

[129] *See* United States v. Mitchell, 365 F.3d 215, 222–26 (2004).

[130] *See id.* at 239–41.

[131] *See id.*

[132] *See* Epstein, *supra* note 25, at 628–30, 632–35.

[133] COLE, *supra* note 13, at 285.

admissible, that it is generally accepted by the scientific community, and that ACE-V meets the requirements of *Daubert*.[134] Courts have opined that the reliability of latent fingerprint identification was established by its century of testing in the courts[135] and that its error rate is essentially zero.[136]

V. THE NAS REPORT'S FINDINGS ON LATENT PRINT EXAMINATION

It was against this backdrop of scientific and legal debate regarding latent fingerprint comparisons that the NAS Report was released. As a general matter, the report endorses the scientific method, concluding that every forensic discipline must be "founded on a reliable scientific methodology that gives it the capacity to accurately analyze evidence and report findings."[137] It rejects the idea that adversarial testing can serve as a substitute for the scientific method, instead finding that the process was "not suited to the task of finding 'scientific truth.'"[138] More specifically, the report examines the three premises underlying latent fingerprint evidence: (1) uniqueness, (2) individualization, and (3) infallibility.

Although the NAS Report notes that there is some scientific evidence supporting the presumption of uniqueness, it rejects the claim that reliability of latent print individualization can be inferred from the uniqueness of friction ridge skin.[139] It concludes that nuclear DNA testing is the only forensic method that can support a finding of individualization.[140]

Notably, the report rejects the claim made by many in the latent fingerprint community regarding infallibility, or the "zero-error rate," of a properly conducted test administered by a trained examiner. Instead, the report finds that because there is "limited information about the accuracy and reliability of friction ridge analyses, claims that these analyses have zero-error rates are not scientifically plausible."[141] The report repeatedly asserts that latent print comparisons are dependent upon the quality of the latent print, concluding that "not all fingerprint evidence is equally good, because the true value of the evidence is determined by the quality of the latent fingerprint image."[142] Furthermore, the NAS Report expresses concerns about the effect cognitive bias can have on conclusions reached by forensic

---

[134] *See generally* Cole, *supra* note 38, at 1225–38 (2004) (discussing how courts generally accept fingerprint evidence despite a lack of forensic validation); Jennifer L. Mnookin, *The Validity of Latent Fingerprint Identification: Confessions of a Fingerprinting Moderate*, 7 LAW, PROBABILITY & RISK 127, 127–30 (2009) (same).

[135] United States v. Havvard, 117 F. Supp. 2d 848, 854 (S.D. Ind. 2000).

[136] *See id.* at 854–55; *see also* United States v. Crisp, 324 F.3d 261, 268–69 (4th Cir. 2003).

[137] NAS REPORT, *supra* note 2, at 9.

[138] *Id.* at 12 ("The adversarial process relating to the admission and exclusion of scientific evidence is not suited to the task of finding 'scientific truth.'").

[139] *Id.* at 43–44, 144.

[140] *Id.* at 87.

[141] *Id.* at 142.

[142] *Id.* at 7–8, 86–87, 140.

examiners.[143] It singled out the Mayfield case as an example of a situation in which fingerprint examiners were influenced in their evaluations by the knowledge that an FBI examiner had declared a match.[144]

The NAS Report discusses data collection, the ACE-V method of interpretation, and issues surrounding the conclusions in the reporting of results. Regarding the ACE-V method, the report states:

> ACE-V . . . is not specific enough to qualify as a validated method for this type of analysis. ACE-V does not guard against bias; is too broad to ensure repeatability and transparency; and does not guarantee that two analysts following it will obtain the same results. For these reasons, merely following the steps of ACE-V does not imply that one is proceeding in a scientific manner or producing reliable results.[145]

Despite its critique and rejection of the principles of "individualization" and "infallibility," the NAS Report acknowledges the value of fingerprints as a method of forensic identification and calls for greater research to implement improved standards and training.[146] It urges the latent print community to provide sufficient documentation of the comparison of latent prints as well as the basis for conclusions to promote transparency in the identification process.[147] It supports further research to study ridge flow and crease patterns of the hands and feet, as well to assess the rarity and discriminating value of the patterns of ridge formations.[148] Finally, it states that there is room for improvement in conducting research upon the multiple factors that affect the quality of latent print images, to prevent examiners from "explain[ing] a 'difference' as an 'acceptable distortion' in order to make an identification."[149]

The reaction to the NAS Report, reminiscent of a "déjà vu all over again" experience, has echoed the polarized debate that preceded the report. The International Association for Identification (IAI), the largest professional organization of latent print examiners in the world, issued a response to the NAS Report that states: "[U]nique anatomical features . . . have become the foundation upon which the individualization of a fingerprint to a single person becomes scientifically accepted and legally defensible."[150] SWGFAST also has disagreed

---

[143] *Id.* at 122–25.

[144] *Id.* at 123.

[145] *Id.* at 142.

[146] *Id.* at 142–44.

[147] *Id.*

[148] *Id.* at 144.

[149] *Id*. at 145 (citing U.S. Dep't of Justice, Office of the Inspector General, *A Review of the FBI's Handling of the Brandon Mayfield Case*, 2006).

[150] Letter from Kenneth F. Martin, President, International Association for Identification, IAI Positions and Recommendations to National Academies of Sciences Committee to Review the Forensic Sciences (Sept. 19, 2007), *available at* http://www.theiai.org/current_affairs/nas_20070919.pdf.

with the report's findings, stating: "History, practice, and research have shown that fingerprints can, with a very high degree of certainty, exclude incorrect sources and associate the correct individual to an unknown impression."[151] Thus, the organizations continue to espouse the view, repudiated by the NAS Report, that claims of individualization are justified by assertions of uniqueness.

Other supporters of latent fingerprint individualization went back to the notion, also rejected by the NAS Report, that reliability of the technique could be inferred from adversarial testing in the courts:

> Despite over 100 years of court acceptance worldwide, this most venerable of the forensic methods, which at one time was called "the gold standard" against which all forensic techniques ought to be compared, came in for some very serious criticism, at least when it came to comparing unknown crime scene impressions to known prints.[152]

The authors go on to state: "The [NAS] report is affirmative of the technique and makes suggestions were (sic) additional research or the imposition of stricter standards—both of which have been advocated repeatedly by leaders in the profession—can strengthen forensic science in the United States."[153]

Ultimately, the question of whether the NAS Report will fulfill its promise as a legal "blockbuster" will be decided by the courts. In *United States v. Rose*, the federal trial court considered the findings of the NAS Report in its *Daubert* analysis and nonetheless concluded:

> [F]ingerprint identification evidence based on the ACE-V methodology is generally accepted in the relevant scientific community, has a very low incidence of erroneous misidentifications, and is sufficiently reliable to be admissible under Fed Rule Ev. 702 generally and specifically in this case.[154]

Shortly before the publication of this Article, a trial court in California denied a defendant's motion to exclude fingerprint evidence under the state's equivalent of the *Frye* test.[155] In *State v. Greenwood*, the court ruled that:

> Fingerprint comparisons, which "jurors essentially can see for themselves" . . . do not qualify for scrutiny under *Kelly*. Rather, the Defendant ought to address his concerns using the standard framework

---

[151] SWGFAST, STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD 3–4 (2009), *available at* http://www.swgfast.org/Comments-Positions/SWGFAST_NAS_Position.pdf.

[152] ANDRE A. MOENSSENS, CAROL E. HENDERSON & SHARON G. PORTWOOD, SCIENTIFIC EVIDENCE IN CIVIL AND CRIMINAL CASES § 1.03 (5th ed. Supp. 2009).

[153] *Id.* § 10.08.

[154] No. CCB-08-0149, 2009 U.S. Dist. LEXIS 114256, at *10 (D. Md. Dec. 8, 2009).

[155] State v. Greenwood, No. BA351185, slip op. at 4 (Cal. Super. Ct. Feb. 10, 2010).

> for expert opinion testimony. The [latent print examiner] will not be permitted to testify that her opinion is the result of an infallible scientific process, and the Defendant is free to vigorously cross-examine the LPE on the shortcomings of the ACE-V method raised in the 2009 National Academy of Science Report entitled *Strengthening Forensic Science in the United States: A Path Forward*. The fingerprint identification evidence is the quintessence of expert testimony, and the Defendant's numerous critiques of the ACE-V process go to the weight of the People's evidence, not its admissibility.[156]

At the very least, the NAS Report can serve to educate the judge and jury about the troubling questions raised by the preeminent committee that was tasked by Congress to study the forensic disciplines, including friction ridge analysis. If a court is not willing to exclude evidence that a latent print found at the crime scene matches a suspect, the report can be used (as it was in *Greenwood*) to refute or preclude claims of infallibility made by latent print examiners.

VI. SCIENTIFIC DEVELOPMENTS AS A BASIS FOR NEWLY DISCOVERED EVIDENCE CLAIMS

The initial reaction of trial courts to the question of whether the NAS Report supports pretrial exclusion of latent finger print comparisons does not bode well for petitioners challenging convictions based upon fingerprint "matches." Petitioners raising a claim post-conviction must overcome substantial hurdles to be successful. The next Part discusses obstacles petitioners face when raising claims of newly discovered evidence and highlights areas in which petitioners have successfully raised such claims based upon new developments in science. The Article then returns to the question of whether petitioners who claim to have been wrongly convicted on the basis of latent fingerprint evidence can obtain relief from the courts based upon the findings of the NAS Report.

Every state currently permits a motion for a new trial on the basis of newly discovered evidence.[157] Newly discovered evidence of innocence "represents a ground for relief through the principal state post-conviction remedies in thirty-two states."[158] However, petitioners who raise newly discovered evidence claims in state post-conviction collateral proceedings face difficult procedural and substantive obstacles. First, many jurisdictions impose a relatively brief statute of

---

[156] *Id.* (citation omitted).

[157] Daniel S. Medwed, *Up the River Without a Procedure: Innocent Prisoners and Newly Discovered Non-DNA Evidence in State Courts*, 47 ARIZ. L. REV. 655, 659 (2005) (citing 1 DONALD E. WILKES, JR., STATE POSTCONVICTION REMEDIES AND RELIEF: WITH FORMS 55–58 (2001)).

[158] *Id.* at 682 n.192 (discussing states that allow a free-standing innocence claim to be raised in habeas proceedings versus those that do not allow innocence claims to be raised and instead limit habeas proceedings to issues involving violation of constitutional rights or lack of jurisdiction).

limitations upon filing a motion for a new trial on the grounds of newly discovered evidence.[159] Second, the legal standard in most states for granting a new trial requires a petitioner to prove that the "newly discovered evidence is noncumulative, does not simply impeach the prosecution's witnesses, and would probably yield a different result in a new trial."[160] Third, if a trial judge rejects a new trial motion based on newly discovered evidence, "the standard of [appellate] review applied to that denial is extraordinarily deferential—[in most jurisdictions a petitioner] must prove the trial court abused its discretion in rendering its decision or failed to exercise that discretion."[161]

There are areas in which developments in the field of forensic science have not only altered the way in which cases are prosecuted, but also have offered avenues of relief for inmates erroneously convicted as a result of those findings. For example, post-conviction DNA testing using technology that was not available at the time of trial has been the basis for reversing a conviction and ordering a new trial.[162] However, DNA testing is not completely analogous to other methods of forensic analysis because the fundamental principles of the science supporting DNA testing have not been altered or discarded. However, recent developments in the scientific principles once used to support prosecutions based upon Comparative Bullet Lead Analysis (CBLA) and Shaken Baby Syndrome (SBS) are informative in demonstrating how new developments in forensic science have resulted in post-conviction relief for individuals convicted at trial on the basis of CBLA "matches" or evidence of SBS.

A. Comparative Bullet Lead Analysis (CBLA)

Bullet lead analysis, sometimes called compositional bullet lead comparison or comparative bullet lead analysis (CBLA), allows forensic investigators to identify the elemental composition and characteristics of bullets or bullet fragments found at a crime scene against unused bullets found in the possession of a suspect.[163] It was used for more than thirty-five years by expert witnesses,

---

[159] *Id.* at 676 ("[L]itigants in seventeen states must file their motions within sixty days of judgment, and one state still follows the common law rule that motions for a new trial can only be filed during the court term in which the original judgment was entered. Seventeen other states and the District of Columbia have time restrictions on new trial motions spanning from one to three years. Of the remaining states, six allow new trial motions to be filed beyond three years after conviction, with four of those jurisdictions boasting waivable time limits of less than 120 days. A sparse number of jurisdictions—nine—have no limitations period whatsoever." (internal citations omitted)).

[160] *Id.* at 678–79.

[161] *Id.* at 680 (internal citation omitted).

[162] *See, e.g.*, *In re* Bradford, 165 P.3d 31, 34–35 (Wash. Ct. App. 2007) (granting a new trial on the ground that post-conviction DNA test results, not available at the time of trial, would probably change the result of the trial).

[163] William A. Tobin & Wayne Duerfeldt, *How Probative is Comparative Bullet Lead Analysis?*, 17 CRIM. JUST. 26, 27 (2002).

primarily from the FBI, who testified that they were able to tell "where a bullet or bullet fragment was manufactured and even from which box it originated—all based on an analysis of the composition of the lead."[164] However, the FBI has recently rejected the basic tenets underlying CBLA, resulting in the reversal of convictions based solely on the now-discredited forensic science.

CBLA analysis is based on three premises:

> The first premise . . . [is that] a bullet or bullet fragment is assumed to be compositionally representative of a molten source of lead. . . . The second premise is that the molten source from which the sample lead originated is compositionally uniform or homogeneous. . . . And the third, and most significant premise is the claim that each molten source of lead is unique in composition, establishing a chemical and metallurgical "fingerprint."[165]

Using these premises, the examiner would begin by taking three samples from each bullet or bullet fragment and conduct a quantitative and qualitative analysis of the concentrations of seven selected elements in the bullet lead alloy of both the crime-scene and the suspect's bullets.[166] The examiner would then apply a statistical analysis to determine whether the samples were "analytically indistinguishable."[167] If so, the examiner would provide expert testimony that the "crime scene bullet(s) came from the same manufacturer, molten source, batch, or box as the bullet(s) traceable to the suspect."[168]

CBLA expert witness evidence was routinely and unquestionably accepted by the courts for thirty-five years.[169] The premises underlying the technique were not seriously challenged until early this decade, when William Tobin, the former chief metallurgist for the FBI laboratory, began questioning the technique in court testimony and scientific and legal articles.[170] In 2002, Tobin and Wayne Duerfeldt published an article calling into question the use of CBLA in criminal trials.[171] Tobin and Duerfeldt concluded that the metallurgical composition of bullets could either be fairly uniform throughout the melt, dramatically varied, or, most importantly, two different melts could be "compositionally indistinguishable."[172] They found that most bullet manufacturers obtained their lead from secondary

---

[164] *Id.*

[165] *Id.*

[166] *See id.* at 29, 31.

[167] *See id.* at 29.

[168] Edward J. Imwinkelried & William A. Tobin, *Comparative Bullet Lead Analysis (CBLA) Evidence: Valid Inference or* Ipse Dixit*?*, 28 OKLA. CITY U. L. REV. 43, 44–45 (2003).

[169] *Id.* at 45.

[170] Paul C. Giannelli, *Comparative Bullet Lead Analysis: An Update*, 23 CRIM. JUST. 24, 24 (2008).

[171] Tobin & Duerfeldt, *supra* note 163, at 27.

[172] *See id.* at 28.

refiners and that most secondary refiners obtained their scrap lead from old automobile batteries.[173] Because automobile batteries have tight specifications due to "electrical conductivity, corrosion, processing, and other considerations," Tobin and Duerfeldt found that bullets made from two different refiners could be "analytically indistinguishable" from one another.[174] They concluded "that compositional uniqueness as an underlying premise or universal statement for the practice of CBLA is not scientifically valid."[175]

As a result of this research, the FBI asked the National Research Council (NRC) of the National Academy of Sciences to convene an independent committee of experts to evaluate the scientific basis of CBLA.[176] The ensuing report—*Forensic Analysis: Weighing Bullet Lead Analysis*—concluded that an FBI examiner's testimony "matching" a fragment of a bullet found at a crime scene to bullets found in the possession of a defendant was so overstated that such evidence was "seriously misleading under Federal Rule of Evidence 403."[177] Specifically, the report found that the methods of statistical analysis used during the second step of the CBLA analysis were not the best available.[178] With regard to testimony concerning the statistical analysis, the report recommended that FBI expert witnesses limit their interpretations of findings to refer to "compositionally indistinguishable volumes of lead" instead of melts or boxes when discussing origin, and acknowledge uncertainties in the CBLA statistical analysis.[179] Although the report thoroughly discussed the general limitations of CBLA, it ultimately concluded that CBLA was a "reasonably accurate way of determining whether two bullets could have come from the same compositionally indistinguishable volume of lead" and can "in appropriate cases provide additional evidence that ties a suspect to a crime."[180]

However, in 2005, the FBI announced that after extensive study and consideration, it would no longer conduct examinations of bullet lead.[181] The Bureau's decision to discontinue CBLA was based primarily on the "inability of scientists and manufacturers to definitively evaluate the significance of an association between bullets made in the course of a bullet lead examination."[182] In 2007, the FBI took the unprecedented step of reviewing cases to determine

---

[173] *Id.* at 27.

[174] *Id.* at 28–31.

[175] *Id*. at 28.

[176] Press Release, Federal Bureau of Investigation, FBI Laboratory to Increase Outreach in Bullet Lead Cases (Nov. 17, 2007), *available at* http://www.fbi.gov/pressrel/pressrel07/bulletlead111707.htm.

[177] THE NATIONAL RESEARCH COUNCIL OF THE NATIONAL ACADEMIES, FORENSIC ANALYSIS: WEIGHING BULLET LEAD EVIDENCE 107 (2004), *available at* http://www.nap.edu/catalog.php?record_id=10924#toc.

[178] *Id.* at 26–70.

[179] *Id.* at 112.

[180] *Id.* at 109.

[181] Press Release, Federal Bureau of Investigation *supra* note 176.

[182] *Id.*

whether its CBLA testimony may have contributed to a wrongful conviction.[183] In such cases, the FBI issued letters identifying its error and seeking to remedy erroneous convictions based upon CBLA.[184]

The "newly discovered evidence" undermining the validity of CBLA "individualization" was used to overturn a defendant's conviction during post-conviction proceedings in New Jersey. In *State v. Behn*, the New Jersey Court of Appeals reversed the conviction of Michael Behn after considering studies that proved the CBLA testimony offered against Behn was unsupported by science.[185] At trial, an FBI examiner testified that "the lead fragments recovered from the decedent's body and the defendant's bullets came from the same source of lead, and both the fragments recovered from the decedent's body and the defendant's bullets came from the same box or boxes and were packaged on the same date by the manufacturer."[186] The court held that the newly discovered evidence, consisting of studies on composition bullet lead analysis that had not yet been developed and completed prior to the defendant's murder trial, would have "effectively neutralized" the testimony of the state's expert and was of such caliber that "it possessed, 'to a probability—not a certainty,' the capacity to change the jury's verdict."[187] Thus, the court ruled that the defendant was entitled to new trial based on the newly discovered evidence.[188]

B. Shaken Baby Syndrome (SBS)

Shaken Baby Syndrome (SBS) originated in the 1970s as a hypothesis to explain respiratory distress or death in a small group of infants from apparent head injury with an identifiable impact site and three diagnostic symptoms that came to be known as the SBS "triad."[189] Scholars have noted that the presence of the triad—retinal hemorrhaging, subdural hematoma, and cerebral edema—"was taken to mean that a baby had been shaken hard enough to produce what were conceptualized as whiplash forces."[190] The theory was that the disproportionately large heads and weak necks of infants allowed their heads to course back and forth during shaking, causing subdural hemorrhage through rupture of the bridging veins

---

[183] *See id.*

[184] *Id.*

[185] 868 A.2d 329, 344–46 (N.J. Super. Ct. App. Div. 2005).

[186] *Id.* at 335.

[187] *Id.* at 345 (internal citation omitted).

[188] *Id.* at 346.

[189] Deborah Tuerkheimer, *The Next Innocence Project: Shaken Baby Syndrome and the Criminal Courts*, 87 WASH. U. L. REV. 1, 4 (2009).

[190] *Id.* at 11 (citing John Caffey, *On the Theory and Practice of Shaking Infants*, 124 AM. J. DISEASES CHILDREN 161 (1972), and Mary E. Case et al., The Nat'l Ass'n of Med. Exam'rs Ad Hoc Comm. on Shaken Baby Syndrome, *Position Paper on Fatal Abusive Head Injuries in Infants and Young Children*, 22 AM. J. FORENSIC MED. & PATHOLOGY 112 (2001)).

between the brain and the dura.[191] If the "triad" was present, it was understood by experts to be "pathognomic—or exclusively characteristic—of SBS."[192]

SBS prosecutions became prevalent in the last decade of the twentieth century: fifteen hundred incidents of alleged SBS are reported nationwide every year.[193] In her seminal article on the topic, Professor Turkheimer notes that the science surrounding SBS has undergone a striking transformation since the mid-1990s.[194] Many of those in the scientific community who were early proponents of SBS's validity have come to perceive the diagnosis as illegitimate. New research conducted by neurosurgeons, biomechanical engineers, and pathologists have "eroded confidence in the existence of a pathognomonic relationship between shaking and the SBS triad."[195] Akin to some of the debates that are taking place in the field of latent print examinations, others in the medical field have responded to the new research with a passionate defense of SBS, making the debate highly polarized.[196] And yet, Turkheimer concludes that there is enough common ground between the two factions that each would agree that the scientific underpinnings of SBS have evolved.[197]

Turkheimer identifies three areas in which, from a perspective of "pure" science, the thinking on SBS has shifted, and where consensus has been achieved among supporters and opponents of SBS.[198] She calls the first area "*The Myth of Pathognomony*," explaining "[doctors] have conceded that the triad is not *necessarily* induced by shaking, and that a differential diagnosis must be considered."[199] The second area is called "*Lucid Intervals*."[200] In the past, doctors testified with certainty that there could be no "periods of lucidity" between the abuse and the loss of consciousness.[201] This necessarily meant that the caretaker who was with the infant immediately prior to the loss of consciousness was identified and prosecuted as the person who perpetrated the abuse.[202] Recent studies have shown, however, that children may in fact be lucid for more than seventy-two hours between the time of the fatal injury and its resulting death.[203] These findings have dramatically altered the forensic landscape because the

---

[191] *See* John Caffey, *The Whiplash Shaken Infant Syndrome: Manual Shaking by the Extremities with Whiplash Induced Intracranial and Intraocular Bleedings, Linked with Residual Permanent Brain Damage and Mental Retardation,"* 54 PEDIATRICS 396, 401 (1974).

[192] Tuerkheimer, *supra* note 189, at 4.

[193] Molly Gena, *Shaken Baby Syndrome: Medical Uncertainty Casts Doubt on Convictions*, 2007 WIS. L. REV. 701, 706 (2007).

[194] *Id.*

[195] *Id.* at 14.

[196] *Id.* at 16.

[197] *Id.*

[198] *See id.* at 17–18.

[199] *Id.* at 18.

[200] *Id.*

[201] *Id.*

[202] *Id.*

[203] *Id.*

identity of the perpetrator (if there is a crime) cannot be established by showing who was with the infant before he or she became unconscious.[204] Turkheimer calls the third area of consensus "*Removing the Shaking from the Syndrome*."[205] Biomechanical studies have established that shaking alone cannot create the forces necessary to cause subdural hemorrhage without damaging the infant's neck and cervical spinal cord or column.[206] These types of injuries are not present in most infants with the "triad" of symptoms, and therefore they could not have been simply shaken to death.[207] Thus, the possibility of "short-fall" incidents, although still controversial, must be considered as an explanation for the injuries, and other non-traumatic symptoms previously assumed to be pathognominic of shaking must be considered and evaluated.[208] Congenital malformations, metabolic disorder, hematological diseases, infectious diseases, and autoimmune conditions are types of differential diagnoses for symptoms that were previously exclusively associated with SBS.[209]

The transformation in the medical understanding of SBS formed the basis for Audrey Edmunds's request for a new trial after she was convicted for what was then determined to be an SBS death of an infant in her care.[210] In *State v. Edmonds*, the Wisconsin Court of Appeals summarized the trial evidence as follows:

> Audrey Edmunds was charged with first-degree reckless homicide following the death of seven month old Natalie on October 16, 1995, while Edmunds was caring for Natalie at Edmunds's home. At trial, the State presented numerous medical expert witnesses who testified to a reasonable degree of medical certainty that the cause of Natalie's death was violent shaking or violent shaking combined with impact that caused a fatal head injury. The State's witnesses also testified that after being injured, Natalie would have had an immediate and obvious response and would not have appeared normal. Natalie's mother, and the father of another child in Edmunds's care who observed Natalie, testified that Natalie was acting normally when she was dropped off at Edmunds's home on the morning of her death.[211]

As Turkheimer explains,

> In early 2007, the judge who presided over Audrey Edmunds's trial over a decade earlier conducted a five-day evidentiary hearing upon her motion for a new trial based on newly discovered evidence. The defense

---

[204] *Id.* at 18–19.
[205] *Id.* at 19.
[206] *Id.*
[207] *Id.* at 20.
[208] *Id.* at 21–22.
[209] *Id.* at 22.
[210] State v. Edmunds, 746 N.W. 2d 590, 592 (Wis. Ct. App. 2008).
[211] *Id*.

> experts testified that since the mid-1990s, "significant research has undermined the scientific foundations for SBS, creating substantial challenges to matters that were nearly universally accepted in the medical community at the time of Edmunds's trial."[212]

After defense experts—who told the court that they would have sided with the prosecution at trial—testified that the evolving science had changed their opinions as to the likely cause of death, the trial judge denied the motion for a new trial.[213] The judge acknowledged that "[s]tanding alone and unchallenged, the defense witnesses provide[d] a sufficient evidentiary basis to order a new trial based upon newly discovered medical evidence," but found that "the newly discovered evidence . . . is significantly outweighed by the evidence presented by the prosecution."[214] However, an appellate court reversed this decision and concluded that there was a reasonable likelihood that a different result would be reached at a new trial, because of the "shift in mainstream medical opinion since the time of Edmunds's trial."[215] Audrey Edmunds was released from prison after serving eleven years, having been convicted of a crime for which she had always maintained her innocence.[216] The State ultimately elected not to retry her at the request of the deceased baby's parents.[217] She returned home to reunite with her own three daughters, who were 11, 13, and 16 when she was finally released.[218]

VII. CONCLUSION

A petitioner seeking to challenge a conviction that was based upon a fingerprint match will face difficulties, even when armed with the findings of the NAS Report. In the areas described above, CBLA and SBS, there were "insiders" who began to challenge the science underlying the forensic conclusions reached by experts in the field. The community of latent print examiners has yet yielded a William Tobin, or multiple experts such as those in the *Edmunds* case who testified they had changed their opinion about the scientific validity of the conclusions they had once endorsed. The committee convened by Congress to study the forensic disciplines and issue the NAS Report was a highly credentialed and impressive assembly of scientists, academics, and judges. However, the

---

[212] Turkheimer, *supra* note 189, at 48 (citing Brief of Defendant-Appellant at 11, *Edmunds*, 746 N.W. 2d 590 (No. 2007AP933)).

[213] State v. Edmunds, No. 96 CF 555, slip op. at 6, 10–11 (Wisc. Cir. Ct. Mar. 29, 2007).

[214] *Id.*

[215] *Edmunds*, 746 N.W. 2d at 598–99.

[216] *See* Ed Treleven, *No Second Trial in Baby-Shaking Case so Conviction of a Former Waunakee Woman Who Spent 11 Years in Prison No Longer Stands*, WISC. ST. J., JULY 12, 2008, at A1.

[217] *See id.*

[218] Susan Lampert Smith, *A New World for Edmunds*, WISC. ST. J., Feb. 10, 2008, at A1.

committee appears to be viewed as a group of "outsiders" by the IAI and SWGFAST, who represent the "insider" community of latent fingerprint examiners. Both organizations have publicly rebutted the findings of the NAS Report. As a result, lines will continue to be drawn between practitioners and scientists. At this time, it is too early to determine which side the courts will ultimately align themselves with after the publication of the report.

As discussed above, petitioners raising post-conviction claims of newly discovered evidence face hurdles in addition to those confronted by a defendant during trial. The procedural requirements of a post-conviction newly discovered evidence claim universally require a petitioner to show that new evidence is "substantive" and not "merely impeaching." If the findings of the NAS Report are viewed as being admissible merely for the purpose of cross-examination, a reviewing court will deny a petitioner's claim for relief because cross-examination evidence is classic impeachment evidence. The challenge will be to educate courts that the NAS Report findings are substantive evidence challenging the underlying principles that have long been the claim of fingerprint identifications: "uniqueness," "individualization," and "infallibility." Indeed, as the report indicates, one of the claims (infallibility) is not "scientifically plausible," and the others have not been supported by reliable research.[219] Finally, to succeed on a claim of newly discovered evidence, a petitioner must show that the evidence would "probably change the outcome of the trial." This assessment is highly case-specific and will depend upon the nature of the expert testimony given and the importance of the fingerprint match in establishing the defendant's guilt.

And so, petitioners challenging convictions based solely upon what they claim are erroneous fingerprint "matches" may find themselves where they were before the publication of the NAS Report. They can seek out defense experts to examine and critique the conclusions of the government's expert witnesses, as did many of the individuals whose cases were discussed in Cole's recent study of latent fingerprint misattributions.[220] In the twenty-two cases he identified, ten were cases in which the individual was convicted on the basis of the fingerprint identification (the others were released prior to being charged or tried, or were acquitted).[221] Three of the ten convictions were overturned after the FBI conducted a review of a state fingerprint laboratory, and another three were overturned based upon the re-examination by defense expert witnesses.[222] However, a more promising avenue could be to seek experts outside the discipline to challenge the premises endorsed by fingerprint examiners at the petitioner's trial.

Ultimately, the success of petitioners challenging convictions based upon what they claim are erroneous fingerprint "matches" may depend upon the new "gold standard" of forensic evidence—DNA typing. Certainly, cases like those of Stephan Cowans will bring into question the claimed infallibility of latent print

---

[219] NAS REPORT, *supra* note 2, at 142–44.
[220] *See* Cole, *supra* note 9, *passim*.
[221] *Id.*at 1067–70 tbl.1.
[222] *Id.*

individualization. The most promising way at present to obtain post-conviction relief may be to use emerging DNA technology to obtain profiles from epithelial cells or perspiration left on the latent print.[223] These types of DNA exclusions will lend more unequivocal truth to the claim that "latent fingerprints are a corporeal signature of their maker, capable of conclusively identifying the individual who impressed them."[224]

[223] *See, e.g.*, Jennifer J. Raymond, Claude Roux and Simon J. Walsh, *Fricton Ridge Skin-Interaction Between Fingerprint Detection and DNA/Biological Material*, *in* WILEY ENCYCLOPEDIA OF FORENSIC SCIENCE [3] 1318 (A. Jaemison & Andre A. Moenssens eds. 2009); David E.O. Van Hoofstat et al., *DNA Typing of Fingerprints and Skin Debris: Sensitivity of Capillary Electrophoresis in Forensic Applications Using Multiplex PCR*, *in* PROCEEDINGS OF THE 2ND EUROPEAN SYMPOSIUM ON HUMAN IDENTIFICATION 131, 131–33 (Promega Corp. ed., 1998) (reporting on the successful use of DNA analyses on fingerprints and skin debris left on tools and clothing and bags); David E. O. Van Hoofstat, et al., *DNA Typing of Fingerprints Using Capillary Electrophroesis: Effect of Dactyloscopic Powders*, 20 ELECTROPHROESIS 2870, 2870–76 (1999) (examining the effect of different dactyloscopic powders on DNA typing performed on physical fingerprints left on glass and wooden plates and concluding that some powders may be used with DNA analyses so long as precautions are taken to avoid contamination).

[224] People v. Clark, 214 P.3d 531, 536 (Colo. App. 2009), *cert. granted*, 2009 WL 2489064.