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THE CHALLENGE OF FINGERPRINT COMPARISON OPINIONS IN THE DEFENSE OF A CRIMINALLY CHARGED CLIENT

Michael Mears*
Therese M. Day**

INTRODUCTION

Just before 2:00 a.m. on September 19, 1910, an unknown man slowly walked down South State Street in Chicago until he came to West 104th Street. He turned west onto the street and kept walking until he came to the home of Clarence Hiller. Near the front door of the Hiller house he spotted an outside stairway that led to an upstairs bedroom. Grasping the handrail on the stairway, he slowly walked up the stairs and entered the bedroom occupied by Clarence Hiller's ten-year-old daughter, Florence. As the intruder attempted to fondle her, she awakened and screamed. Clarence Hiller raced into the bedroom to assist his daughter, and after a brief struggle, the assailant shot him twice before fleeing back down the stairway.¹

Police apprehended Thomas Jennings near the residence a short time later and charged him with the murder of Clarence Hiller. He proclaimed his innocence but the facts made him a prime suspect: he had only recently been released from Joliet State Prison after serving time for burglary, scratches on his arms showed signs of a recent struggle, and he did not live in the neighborhood.² He went to trial in the Criminal Court of Cook County on the charge of murder.

During the trial, the prosecutors called several witnesses who testified about their comparison of photographs of finger marks left

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1. See *People v. Jennings*, 96 N.E. 1077 (Ill. 1911).

2. See *id.* at 1079.

on the stairway railing with enlarged photographs of fingerprints taken from Thomas Jennings.³ One of the witnesses, Edward Foster, testified that he was an inspector with the Ottawa, Canada Police Department and that he had studied the subject of fingerprint identification at Scotland Yard. He also testified that he had taken about 2,500 fingerprints during his career with the Ottawa Police Department. In his opinion, the photographs of the fingerprints taken from the railing of the stairway were the same as the fingerprints taken from Thomas Jennings. Another witness, Michael Evans, told the Court that he had been working with the Bureau of Identification in the Chicago, Illinois Police Department for more than twenty-seven years. He told the court that he had been using the system of fingerprint impressions for identification purposes since 1905. He too testified that the photograph of the fingerprint from the stairway railing was the same as the fingerprint taken from Thomas Jennings. The Supreme Court of Illinois took the case on appeal.

Chief Judge Orrin N. Carter, writing for the court, noted that the issue of the admissibility of fingerprint comparisons had never been raised in any cases known to the court and that no statutes authorized or forbade such evidence, nor did any statutes or cases from any other jurisdiction deal with the subject.⁴ Justice Carter recognized:

This class of evidence is admitted in Great Britain. In 1909 the Court of Criminal Appeals held that finger prints might be received in evidence, and refused to interfere with a conviction below though this evidence was the sole ground of identification While the courts of this country do not appear to have had occasion to pass on the question, standard authorities on scientific subjects discuss the use of finger prints as a system of identification, concluding that experience [in Great Britain] has shown it to be reliable.⁵

Based upon the fingerprint comparison evidence, the Illinois

3. *See id.* at 1082.

4. *Id.* at 1081.

5. *Id.*

Supreme Court upheld the conviction and death sentence of Thomas Jennings.⁶ Despite his continuing assertions of innocence, Jennings was sentenced to die at five o'clock in the afternoon of the sixteenth day of February 1912.⁷

In 1912, the American judicial system faced serious questions about the efficacy and scientific reliability of fingerprint comparison evidence, leading the Illinois court to seek authority for the admission of such evidence from judges in Great Britain. Ninety years later, the question of the admissibility of fingerprint comparison evidence was once again the subject of legal debate and deliberation.⁸ In 2002, another American judge, facing a serious challenge to the scientific reliability of fingerprint comparison evidence, resorted to the British courts for authority to avoid dealing with the question of the scientific reliability of this type of evidence.⁹ The courts have once again relied on what is being done in the English courts without questioning what is being done, and not done, in the crime laboratories of state and federal police agencies.

On January 7, 2002, in the Eastern District Court of Pennsylvania, Federal District Court Judge Louis H. Pollak¹⁰ ruled that a fingerprint expert:

[W] ill not be permitted to . . . present "evaluation" testimony as to their "opinion" (Rule 702) that a particular latent print is in fact the print of a particular person. The defendants will be permitted to present their own fingerprint experts to counter the government's fingerprint testimony, but defense experts will also be precluded from presenting "evaluation" testimony.

6. *Id.*

7. *Id.*

8. *See United States v. Llera Plaza*, 188 F. Supp. 2d 549 (E.D. Pa 2002).

9. *Id.* at 549.

10. President Carter appointed Judge Louis H. Pollak to the United States District Court, Eastern District of Pennsylvania, in 1978. He has sat on that bench for the past twenty-five years. Judge Pollak received his legal degree from Yale Law School. He clerked for Justice Wiley B. Rutledge on the United States Supreme Court. He was an associate at Paul, Weiss, Rifkind, Wharton & Garrison; Special Assistant to Ambassador-at-Large Philip Jessup, United States Department of State; and Assistant Counsel, Amalgamated Clothing Workers. He has been Dean of both the Yale Law School (1965-70) and the University of Pennsylvania Law School (1975-78).

Government counsel and defense counsel will, in closing arguments, be free to argue to the jury that, on the basis of the jury's observation of a particular latent print and a particular rolled print, the jury may find the existence, or the nonexistence, of a match between the prints.¹¹

The government's attorneys, astonished and nonplused by the ruling, quickly moved for a reconsideration of the judge's order. They warned that "prosecutorial effectiveness, both in the case at bar and in other cases in which fingerprint identification could be expected to play a significant role, would be seriously compromised by the preclusion of opinion testimony at the 'evaluation' stage 'that a particular latent print is in fact the print of a particular person.'"¹² Sixty-five days later, despite the fact he had found fingerprint comparison evidence to lack scientific reliability, Judge Pollak reversed himself and reissued his opinion, granting the government's request.¹³ In a lengthy *mea culpa*, Judge Pollak resorted to a review of English history for precedent and his personal observations of the government's fingerprint expert for authority:

I have concluded that arrangements which, subject to careful trial court oversight, are felt to be sufficiently reliable in England, ought likewise to be found sufficiently reliable in the federal courts of the United States, subject to similar measures of trial court oversight. In short, I have changed my mind. "Wisdom too often never comes, and so"—as Justice Frankfurter admonished himself and every judge—"one ought not to reject it merely because it comes late."

....

At the upcoming trial, the presentation of expert fingerprint testimony by the government, and the presentation of countering expert fingerprint testimony by any of the defendants . . . will be

11. *Llera Plaza*, 188 F. Supp. 2d at 552 (emphasis added) (involving three defendants who were charged with operating a multimillion-dollar drug ring linked to four homicides).

12. *Id.* at 552-53.

13. *Id.* at 576.

subject to the court's oversight prior to presentation of such testimony before the jury, with a view to insuring that any proposed expert witness possesses the appropriate expert qualifications and that fingerprints offered in evidence will be of a quality arguably susceptible of responsible analysis, comparison and evaluation.¹⁴

Judge Pollak explained his self-reversal as the result of changing the focus of his inquiry from the status of the fingerprinting system used by the FBI as a *scientific* discipline to its status as a *technical* discipline.¹⁵ By adjusting his focus, he was merely modifying "the angle of doctrinal vision," and his strict application of the test for scientific reliability was more flexible under the *Kumho Tire* application to a "technical expert" than it might have been under *Daubert*.¹⁶ Judge Pollak reasoned that his adjusted vision (some might say result-oriented vision) was the result of his newfound knowledge that British law courts are comfortable with the manner in which their judges supervise fingerprint comparison evidence.¹⁷ Judge Pollak explained that he now felt comfortable with fingerprint comparison evidence.¹⁸ He reversed his previous opinion and vacated his previous order.¹⁹

The first round bell has now sounded and those who would adamantly assert the scientific nature of fingerprint evidence and their opponents are regrouping for round two. The government has drawn a proverbial line in the sand and rightly so. For decades, the

14. *Id.*

15. *Id.* at 562.

16. *Llera Plaza*, 188 F. Supp. 2d at 562. In *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993), the U.S. Supreme Court clarified both the standards federal judges should use and the role they should play in deciding whether expert evidence is to be admitted into a case. Instead of deferring to the appropriate expert community or to the jury, judges were directed to examine the method or reasoning underlying such evidence themselves and to act as "gatekeepers" in admitting only reliable and relevant material. In *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999), the Court explained that the trial court's gatekeeping function with regard to the reliability of expert testimony applied not only to scientific testimony, but to all expert testimony. In so doing the Court held that the trial also apply other factors better suited for the particular case before it.

17. *Llera Plaza*, 188 F. Supp. 2d at 575.

18. *Id.* at 575-76.

19. *Id.* at 576.

government has touted the infallibility of state expert opinions about fingerprint comparisons but now serious questions are arising not only about the infallibility of the fingerprint expert's abilities, but the entire science of fingerprint analysis.

Litigation will continue, notwithstanding the almost vitriolic nature with which the government experts in this field have attacked those who would question the scientific reliability of fingerprint evidence. No other expert is allowed to state conclusively that a known object is an *absolute match* to an unknown object. Not even the scientifically touted DNA testing allows experts to make such absolute assertions. The question now becomes whether the courts will subject fingerprint evidence to scientific reliability tests or allow it to continue in the manner of mythically invoked incantations from soothsayers.

This article examines the scientific reliability of fingerprint evidence and its implications for the criminal defense practitioner. Part I provides an overview of the history of fingerprint analysis and the present controversy about fingerprint comparison evidence. Parts II, III, and IV explore whether fingerprint analysis and the accompanying comparisons can meet the required tests for scientific reliability. The remaining sections demonstrate that the underlying premises currently used to justify fingerprint identification have questionable scientific validity and fail the test elucidated by the United States Supreme Court for the admission of scientific evidence.

I. PRIMER ON FINGERPRINTS²⁰A. *History and Fingerprints*

The human physiological feature commonly called fingerprints had been recognized for centuries in China and India before Europeans “invented” it in the late nineteenth century and disseminated the Anglo-American system of fingerprint identification.²¹

In the late 1800s, Dr. Louis Adolph Bertillon, a physician and anthropologist, formulated the Bertillonage system, which classified physical measurements and cataloged those measurements to identify individuals.²² Bertillon, who started his career as a clerk in a Paris police precinct, developed an identification system that categorized a person into one of three main categories based upon head size and measurements of certain other body parts. Bertillon hypothesized eleven unchanging measurements of human anatomy with the statistical probability that two people share combinations of them

20. This material has been prepared as a result of a Brief Supporting the Exclusion of Fingerprint Evidence filed in the Superior Court of Carroll County, Georgia, in the case of *Georgia v. Jeffrey McGee*, No. 99-CR-277 (Oct. 2000). One of the authors (MM) was lead trial counsel on this case. The evidentiary hearing held in this case included the cross examination of Federal Agent Meagher, various members of the Georgia Criminal Laboratory, and the direct examination of Drs. David Stoney and Jeffrey Kovac. Although the trial judge refused to exclude the State’s proposed fingerprint evidence, he did grant a request that all of the expert testimony presented by the defense be presented to the jurors during the trial of the case. Shortly after this ruling, the district attorney approached the defendant and accepted a negotiated plea earlier proposed by the defendant. The motion and accompanying brief filed in that case relied, in substantial part, on research conducted by attorney Michael Burt of San Francisco, California and Robert Epstein, Assistant Federal Defender for the United States District Court for the Eastern District of Pennsylvania. Burt’s excellent presentation at the NAACP’s Legal Defense Fund Seminar at Airlie, Virginia first brought this topic to the attention of many defenders including this author. The brief filed in the *McGee* case was also enhanced by the work of Pamela Blume Leonard, Chief Investigator for the Multi-County Public Defender Office, and briefs prepared by Robert Epstein, Leigh M. Skipper, *et al.* in the case of *United States v. Mitchell*, 199 F. Supp. 2d 262 (E.D. Pa. 2002). Additionally, much of the material contained herein is derived from the hearing transcripts in the case of *United States v. Parks*, No. CR-91-358 JSL (C.D. Cal. 1991). We want to thank Betsy Clink, Fellowship Attorney with the Multi-County Public Defender Office and Pamela Blume Leonard for their work in assisting in the editing of this paper. Their critical eyes and writing skills have been invaluable. At the time of publication, the superior court opinion and transcripts in *McGee* and the district court opinion and transcripts in *Parks* were unavailable for citation purposes.

21. Simon Cole, *What Counts for Identity? The Historical Origins of the Methodology of Latent Fingerprint Identification*, 12 SCI. IN CONTEXT 139, 147 (1999) [hereinafter Cole, *What Counts*].

22. See Cole, *What Counts*, *supra* note 21, at 150; see also PATRICK J. KIGER, DEAD INVENTORS’ CORNER (Discovery Communications, Inc. 1998), available at <http://www.discovery.com/stories/deadinventors/deadinventors.html>.

being one in 286, 435, or 456. Many police departments around the world adopted Bertillon's system and maintained identification cards on convicted criminals containing the various measurements of their body parts. Bertillon's system first began to lose favor when authorities found that two prisoners at Leavenworth Prison in the United States possessed the same Bertillon measurements.²³ Other similar discoveries doomed Bertillon's system, previously believed to be infallible, to the dust bin of discredited identification methods.

Another anthropometrist,²⁴ Francis Galton, published a book titled *Fingerprints* in 1892, the first of its kind. In this book, Galton classified fingerprints according to their triangular configurations.²⁵ Later, Sir Edward Richard Henry, who developed what is widely known today as the Henry System of Classification, adapted this method of classification.²⁶

B. Fingerprint Characteristics

An average human fingerprint contains between 75 and 175 ridge characteristics.²⁷ Fingerprint examiners do not have a standard agreement as to either the precise number or nomenclature of the different characteristics.²⁸ "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."²⁹

The ridge characteristics most commonly referred to are: (1) islands, also referred to as dots, which are single independent ridge

23. PATRICK J. KIGER, DEAD INVENTORS' CORNER (Discovery Communications, Inc. 1998), available at <http://www.discovery.com/stories/deadinventors/deadinventors.html>.

24. Anthropometry involves determining a person's body composition and body type. An anthropometrist is a scientist who gathers information on the size of the human body and its components.

25. FRANCIS GALTON, FINGER PRINTS 68 (MacMillan & Company 1892).

26. COLIN BEAVAN, FINGERPRINTS: THE ORIGINS OF CRIME DETECTION AND THE MURDER CASE THAT LAUNCHED FORENSIC SCIENCE 13 (Hyperion Press 2001).

27. *An Analysis of Standards in Fingerprint Identification*, FBI L. ENFORCEMENT BULL., June 1972, at 1 [hereinafter *Analysis of Standards*].

28. JAMES F. COWGER, FRICTION RIDGE SKIN: COMPARISON AND IDENTIFICATION OF FINGERPRINTS 143 (Elsevier 1983).

29. *Id.*

units; (2) short ridges, in which both ends of the ridge are readily observable; (3) ridge endings, where a ridge comes to an abrupt end; (4) bifurcations, in which the ridge forks into two; (5) enclosures, which are formed by two bifurcations that face each other; (6) spurs, where the ridge divides and one branch comes to an end; and (7) crossovers, in which a short ridge crosses from one ridge to the next.³⁰

While some occasional research has been done with respect to the relative frequencies with which these and other characteristics occur, fingerprint examiners have never used the studies to adopt weighted measures of the characteristics. Moreover, research shows that different fingerprint examiners hold widely varying opinions regarding which characteristics appear most commonly. As one scientist wrote in the 1960s, "Clearly subjective evaluation of the significance to be attached to a fingerprint characteristic is suspect."³¹

C. Fingerprint Comparisons

Latent print examiners make identifications when they find a certain number of ridge characteristics to be in common, both in terms of type and location, on the two prints that they are comparing.³² Latent print examiners do not agree as to how many common characteristics should be found before an identification is made. Some examiners believe that there should be no minimum standard whatsoever and that the determination of whether there is a sufficient basis for an identification should be left entirely to the subjective judgment of the individual examiner.

Latent print identifications have fundamental problems. All prints,³³ both inked and latent, are subject to various types of

30. See John Berry, *The History and Development of Fingerprinting*, in *ADVANCES IN FINGERPRINT TECHNOLOGY 2* (Henry C. Lee & R.E. Gaensslen eds., 1994).

31. See James W. Osterburg, *An Inquiry Into the Nature of Proof*, 9 *J. FORENSIC SCI.* 413, 425 (1964).

32. *Analysis of Standards*, *supra* note 27.

33. Skin on the surface of hands and fingers (and other parts of the human body) is rough or corrugated, consisting of raised portions that are commonly called ridges. Also present on the fingers are very minute sweat pores, which are constantly exuding perspiration. This perspiration adheres to the outlines of the ridges on the fingers. At times, these impressions will be visible, and other times the

distortions and artifacts.³⁴

A latent fingerprint is the reproduction of the friction ridges of the finger in perspiration or oily matter on an object which it has touched. . . . When an object is touched, an outline in moisture corresponding to these ridges may be left. . . . An inked fingerprint is the reproduction of the friction ridges of the finger in black printer's ink on a suitable contrasting background, such as a white fingerprint card.³⁵

Significantly, distortion can cause a ridge characteristic to appear as something other than what it really is.³⁶ The most common type is pressure distortion, which occurs when the print is deposited.³⁷ The shape of the surface on which the print has been deposited and the mediums used to develop and lift the print can cause other types of distortion. For example, powder used to lift a latent print may cause a ridge ending to appear as a bifurcation.³⁸

Another fundamental problem is that different people can indeed share a limited number of fingerprint ridge characteristics in common, a fact that is well documented. The literature on this particular aspect of fingerprint analysis discusses studies showing that fingerprints from two different people contained seven matching ridge characteristics.³⁹ During testimony in a pre-trial hearing challenging the admission of fingerprint comparison evidence, one government expert admitted that he knew of instances where prints from two different people had as many as ten matching

impressions will be invisible or "latent." These invisible or "latent" prints must be developed by the application of powders or chemicals, or by electronic means. See generally GARY W. JONES, COURTROOM TESTIMONY FOR THE FINGERPRINT EXPERT (Staggs Publ'g 1999).

34. David Ashbaugh, *The Premises of Friction Ridge Identification, Clarity, and the Identification Process*, 44 J. FORENSIC IDENTIFICATION 499, 513 (1999) [hereinafter Ashbaugh, *Premises*].

35. JONES, *supra* note 33, at 14.

36. *Id.* at 82; David A. Stoney & John I. Thornton, *A Critical Analysis of Quantitative Fingerprint Individuality Models*, 31 J. FORENSIC SCI. 1187, 1198 (1986).

37. DAVID R. ASHBAUGH, QUANTITATIVE-QUALITATIVE FRICTION RIDGE ANALYSIS: AN INTRODUCTION TO BASIC AND ADVANCED RIDGEOLOGY 125 (CRC Press 1999) [hereinafter ASHBAUGH, FRICTION RIDGE ANALYSIS].

38. ASHBAUGH, FRICTION RIDGE ANALYSIS, *supra* note 37, at 127.

39. See, Y. Mark and D. Attias, *What Is the Minimum Standard for Characteristics for Fingerprint Identification*, FINGERPRINT WHORLD 148 (1996).

characteristics.⁴⁰

In spite of these and other significant general flaws, proponents of fingerprint identification claim two fundamental premises to support its use. First, they assert that two or more people cannot possibly share the same basic ridge characteristics.⁴¹ Second, they maintain that fingerprint examiners can reliably assert absolute identification from small latent print fragments despite the unknown degree of distortion and variability from which all latent prints suffer.

Several very significant points must be considered in making a determination whether fingerprint evidence can be admissible in the prosecution of a criminal case: (1) No one has tested either of the two fundamental premises that underlie the so-called science of fingerprint identification. The failure to test these theories has been repeatedly recognized by various scientific commentators. (2) There is no known error rate for latent fingerprint examiners. (3) Fingerprint examiners do not possess uniform standards to guide them in their comparisons. To the contrary, fingerprint examiners substantially disagree as to how many points of comparison are necessary to make an identification, ranging from four to thirty-six. Many examiners now take the position that no objective standard is needed at all. David Ashbaugh, the leading government proponent of fingerprint identification, has admitted that a fingerprint examiner's "opinion of individualization or identification is subjective."⁴² (4) There is no general consensus that fingerprint examiners can reliably make identifications on the basis of a certain number of matching characteristics. Many other countries have statutory requirements of twelve to sixteen points of comparison before fingerprint evidence is sufficiently reliable to warrant admission at a criminal trial. (5) The professional literature of the fingerprint community confirms the scientific bankruptcy of the field. Once again, Ashbaugh has acknowledged that "[i]t is difficult to comprehend that a complete scientific review of friction ridge identification has not taken place at

40. *United States v. Parks*, No. CR-91-358 JSL (C.D. Cal. 1991). At the time of publication the district court opinion and transcripts were unavailable for citation purposes.

41. *See, e.g.*, JONES, *supra* note 33, at 15.

42. ASHBAUGH, FRICTION RIDGE ANALYSIS, *supra* note 37, at 103.

some time during the last 100 years. A situation seems to have developed where this science grew by default.”⁴³ (6) Latent fingerprint identifications are analogous to other techniques such as handwriting analysis and hair comparisons that federal courts, in the wake of *Daubert*, have found to be scientifically unreliable.⁴⁴ (7) Latent fingerprint identifications do not have any non-judicial applications. The use of fingerprints has been “under the control of the police community rather than the scientific community” and latent prints are used by law enforcement solely as a “tool for solving crime.”⁴⁵ (8) Courts have already recognized the unreliability of latent fingerprint identifications. In the only known fingerprint case prior to *United States v. Llera Plaza*, in which a federal trial court has performed the type of analysis that is mandated by *Daubert*, *Frye*, or some hybrid test used by state courts, the district court in *United States v. Parks* excluded the government’s fingerprint identification evidence by finding no scientific basis for the latent print examiner’s opinion of identification.⁴⁶ In excluding the evidence, the district court recognized among other things the lack of testing that has been done in the field, the failure of latent fingerprint examiners to employ uniform objective standards, and the minimal training that latent print examiners typically receive.

No objective history points to fingerprint identification techniques as anything more than the subjective and unguided opinion of a technician whose livelihood rests upon the perpetuation of the use of fingerprint identification as a “science.”⁴⁷ Indeed, the same reports upon which Judge Pollack relied in readjusting his vision indicated that the British fingerprint examiners were abandoning the numeric

43. ASHBAUGH, FRICTION RIDGE ANALYSIS, *supra* note 37, at 4.

44. *See United States v. Starzecpyzel*, 880 F. Supp. 1027, 1038 (S.D.N.Y. 1995); *Williamson v. Reynolds*, 904 F. Supp. 1529, 1558 (E.D. Okla. 1995).

45. ASHBAUGH, FRICTION RIDGE ANALYSIS, *supra* note 37, at 4.

46. *United States v. Llera Plaza*, 188 F. Supp. 2d 549 (E.D. Pa. 2002); *United States v. Parks*, No. Cr-91-358 JSL (C.D. Cal. 1991). At the time of publication the district court opinion and transcripts in *Parks* were unavailable for citation purposes.

47. *See Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 141 (1999). “This case requires us to decide how *Daubert* applies to the testimony of engineers and other experts who are not scientists. We conclude that *Daubert*’s general holding—setting forth the trial judge’s general ‘gatekeeping’ obligation—applies not only to testimony based on ‘scientific knowledge,’ but also to testimony based on ‘technical’ and ‘other specialized’ knowledge.” *Id.*

“point counting” of similar characteristics exactly because the comparison is nothing more than the subjective opinion of the examiner.

II. WHAT IS THIS THING WE CALL SCIENCE?

A. *Science and Ethics*

In his testimony during a pre-trial hearing on the admissibility of fingerprint comparison evidence, Dr. Jeffrey D. Kovac, a Fellow at the Center for Applied and Professional Ethics at the University of Tennessee, testified that science is separated from other human endeavors by its “universality, commonality, disinterestedness, and organized skepticism.”⁴⁸ Kovac has written:

Science is fundamentally an open process. Scientific results are always conditional, and scientific investigations usually raise as many questions as they answer [S]cience is largely a gift economy where exchanges of ideas, methodologies, and results aim to initiate and maintain interactions. Law, on the other hand, is fundamentally a closed process. It is designed to resolve disputes. In litigation, one side must win. In negotiations, the goal is to come to a mutually satisfactory resolution among competing parties. In contrast to science, law is much more of a commodity economy in which the goal is to establish—ideally, mutually beneficial—conclusions of interactions. Further, legal proceedings are usually based on unique and complicated fact situations which may involve more than one scientific discipline or subdiscipline. The kinds of professional judgments expected of scientists in the courtroom or other legal proceedings are often very different from those made in the day-to-day practice

48. Transcript of Pre-trial Proceedings, State of Georgia v. Jeffrey McGee, No. 99-CR-277 (Super. Ct. of Carroll County, Ga. Oct. 2000), [hereinafter McGee Transcript]. One of the authors (MM) was lead trial counsel on this case. Dr. Kovac is Professor of Chemistry and a Fellow at the Center for Applied and Professional Ethics at the University of Tennessee. At the time of publication the transcript was unavailable for citation purposes.

of research.⁴⁹

B. *The Law of Nature*

As noted by the Georgia Supreme Court in *Carr v. State*,⁵⁰ before scientific evidence can be presented in some courts of law, the proponent must show that the opinion testimony is based upon a procedure or theory that is accurate and reliable and that “has been established with verifiable certainty, or that [the procedure] rests upon the laws of nature.”⁵¹ In *Harper v. State*,⁵² the Georgia Supreme Court held:

It is proper for the trial judge to decide whether the procedure or technique in question has reached a scientific stage of verifiable certainty, or in the words of Professor Irving Younger, whether the procedure “rests upon the laws of nature.” The trial court may make this determination from evidence presented to it at trial by the parties; in this regard expert testimony may be of value. Or the trial court may base its determination on exhibits, treatises or the rationale of cases in other jurisdictions. *The significant point is that the trial court makes this determination based on the evidence available to him rather than by simply calculating the consensus in the scientific community.* Once a procedure has been recognized in a substantial number of courts, a trial court may judicially notice, without receiving evidence, that the procedure has been established with verifiable certainty, or that it rests upon the laws of nature.⁵³

Justice Hunstein of the Georgia Supreme Court noted in her special concurring opinion in *Chester v. State*: “It behooves this Court ‘not to perpetuate error or to allow our reasoning or conscience

49. Jeffrey D. Kovac, *Science, Law, and the Ethics of Expertise*, 67 TENN. L. REV. 397, 404 (Winter 2000).

50. 482 S.E.2d 314, 318 (Ga. 1997).

51. *Id.* (citing *Harper v. State*, 292 S.E.2d 389, 395 (Ga. 1982)).

52. 292 S.E.2d 389 (Ga. 1982).

53. *Id.* at 395-96 (footnote omitted, citations omitted, emphasis added).

to decay or to turn deaf ears to new light and new life.”⁵⁴ Fingerprint evidence has been admitted, albeit without substantive challenge to the underlying scientific basis of such evidence. However, continued admission is not proper if evidence showing the scientific basis cannot be reliably verified and does not rest upon the laws of nature. The issue is not *when* practitioners and courts deemed a technique scientific, but *whether* the technique is, in fact, based on scientific principles. The requirement that scientific opinion testimony be based upon a procedure or technique that has reached a scientific stage of verifiable certainty cannot be satisfied by relying on the supposition that because other courts have accepted this evidence, it must be proper. The first question is whether the technique or procedure can be scientifically verified or rests upon the laws of nature, and only then do we ask the secondary question as to what weight should be given to testimony concerning an ostensible fingerprint identification.

A scientific procedure may be reliable for some purposes and not for others. For example, many procedures have been used in non-forensic, non-judicial settings, but have been found unacceptable when used for forensic purposes.⁵⁵ Polygraphs are one example. The procedures used in polygraphs (monitoring heart rate, blood pressure, galvanic skin response) have a number of accepted applications in physiological research and medicine. However, it does not follow that lie-detection procedures that use these “accepted” methods are necessarily reliable for courtroom use.⁵⁶

There is simply no “lie detector,” machine or human. The first recorded lie detector test was in ancient India where a suspect was required to enter a darkened room and touch the tail of a donkey. If the donkey brayed when his tail was touched the suspect was declared guilty, otherwise he was released. Modern

54. *Chester v. State*, 471 S.E.2d 836 (Ga. 1996), *special concurring opinion reported at* 473 S.E.2d 759, 760 (Ga. 1996).

55. *See State v. Chambers*, 239 S.E. 2d 324, 327 (Ga. 1977).

56. *See Famber v. State*, 213 S.E.2d 525 (Ga. Ct. App. 1975) (“[W]e have concluded and so rule that the results of a polygraph test are not only inadmissible but also have no probative value.”).

science has substituted a metal electronic box for the donkey but the results remain just as haphazard and inconclusive.⁵⁷

The results are not admissible for purposes of a criminal prosecution.

Hypnosis is another example. The use of hypnosis is well accepted for psychological research and psychotherapy, but testimony derived from hypnosis is not admissible in the courts of Georgia.⁵⁸

Prosecutors often argue that the use of fingerprint identification is reliable because it has been accepted in the scientific community. However, this “scientific community” is limited to law enforcement agencies. The argument, at best, is syllogistic, i.e., “it is verifiable because we use it.” Use by police agencies makes the process of identification by fingerprint comparison scientifically verifiable no more than the use in India of the lie detector tests involving the tail of a donkey! Certainly, the widespread use of the polygraph machine by private industry does not make the process scientifically reliable.⁵⁹

Science seeks to understand phenomena by observing and correlating available factual information. Our understanding of science is therefore based upon and limited by available factual information. In science, fact-based explanations are called “hypotheses.” Theories may be good, bad, or indifferent. It all

57. *State v. Chambers*, 239 S.E.2d 324, 327 (Ga. 1977) (Jordan, J., dissenting).

58. *See Walraven v. State*, 336 S.E.2d 798, 802 (Ga. 1985) “[W]e held that ‘the reliability of hypnosis has not been established and statements made while the witness was in a trance are inadmissible.’” *Id.* (quoting *Emmett v. State*, 205 S.E.2d 231 (Ga. 1974)).

59. *See Mary Perea, Associated Press Article*, Sept. 17, 1999:

So-called lie-detector tests can be thrown off by heart problems, prescription medication and even aging, according to Sandia National Laboratories scientists who oppose federal plans to use the polygraph as a security measure. U.S. Department of Energy Security Czar Gen. Eugene Habiger was confronted Thursday by about 50 scientists who attacked the DOE proposal as unscientific. “All cardiovascular diseases have effects on polygraph tests,” said Allan Zelicoff, a Sandia physicist. Medical problems such as HIV, asthma or heart disease could influence the outcome of a polygraph examination, Zelicoff said. The polygraph measures central nervous system responses and skin conditions, he said, and both are influenced by various medical factors. Drugs used to treat high blood pressure and heart disease may alter polygraph results. “There’s insufficient research to show these illnesses and drugs cannot produce false positives on a polygraph,” Zelicoff said.

Id.

depends on the accuracy and amount of the factual information available and how these facts are logically interpreted. Although identification by fingerprint comparison may be a scientific hypothesis, it is not a valid, proven scientifically reliable theory, and the courts of law should not recognize it as such.

C. Judges as Gatekeepers

According to *Daubert*, courts are required to act as gatekeepers for scientific evidence.⁶⁰ The court must first determine whether fingerprint identification is a science. Then, if it can be supported as a science, the court must determine whether the procedures used by experts practicing this science have reached the stage of scientific verifiability. The defense attorney bears the responsibility of assuring that the court applies these evidentiary rules in all cases in which the state seeks to present evidence under the imprimatur of science. Novel scientific procedures and junk science must be kept from the courtroom, and the gatekeeping function of the judge alone is not sufficient to prevent this from happening.⁶¹ The defense attorney has the duty, responsibility, and challenge of making sure the gatekeeper sees the evidence in full light.

III. SCIENCE AND THE LAW

A. Laws of Man and the Law of Nature

The tension between the law of man and the law of nature has existed for legal eons. In 1758, William Blackstone, in his *Commentaries on the Laws of England*, wrote:

This law of nature, being co-equal with mankind and dictated by God Himself, is of course superior in obligation to any other. It is binding over all the globe in all countries, and at all times: no human laws are of any validity, if contrary to this; and such of

60. *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993). See discussion of *Daubert*, *supra* note 16.

61. *Daubert*, 509 U.S. at 589.

them as are valid derive all their force, and all their authority, mediately or immediately, from this original.⁶²

Since the inception of the common law and its derivatives, courts have had to deal with conflicts between the development of scientific theories and hypotheses and the application of legal principles and evidentiary rules. At the heart of this centuries-old conflict lies the question of the definitive limit of science and how to define and apply truly scientific concepts to legal questions.

The term *science* is defined as: 1. The systematic observation of natural events and conditions in order to discover facts about them and to formulate laws and principles based on these facts. 2. The organized body of knowledge that is derived from such observations and that can be verified or tested by further investigation. 3. Any specific branch of this general body of knowledge, such as biology, physics, geology, or astronomy. (From the Latin word meaning knowledge).⁶³

Science can be defined as the use of the scientific method, which is a well-defined procedure of gaining knowledge about natural events and conditions. The scientific method is based on empirical observation and relies on objectivity, precision, and verifiability.⁶⁴ The method requires that knowledge be gained or obtained in an unbiased manner, that it relate only to observable facts or experiences, and that the knowledge gained or obtained must be replicable, that is, observable in the same manner by different individuals. Thus, knowledge gained through the use of the scientific method differs from other forms of knowledge such as deduction or rationalism.⁶⁵

The benchmark of knowledge gained and theories developed through the scientific method is replication. For example, gravity is a theory based upon empirical observation. Similar objects will fall to

62. WILLIAM BLACKSTONE, COMMENTARIES ON THE LAWS OF ENGLAND, Vol. 1, at 41 (William Carey Jones ed., Bancroft-Whitney Co. 1916).

63. See ACADEMIC PRESS DICTIONARY OF SCIENCE AND TECHNOLOGY (Harcourt 1996).

64. See *United States v. Starzecpyzel*, 880 F. Supp. 1027, 1030 (S.D.N.Y. 1995).

65. For example, the ancient Greek philosophers and thinkers deduced that blood controls thinking.

the earth in a similar manner. The process of reporting the fact that similar objects fall to the earth in a similar manner can be replicated each time the event happens. Therefore, the scientific method is based on objective events described precisely so that the events can be observed again and again under similar circumstances. These scientifically-based observations become theories or an explanation of facts or observations that can be tested, replicated, and proven. The foundation of the scientific method rests upon the concepts of replication and predictability.⁶⁶

The noted scientific philosopher Karl Popper emphasized that if an explanation cannot be adequately tested, it is not scientific.⁶⁷ Conversely, according to Popper, a concept must be testable, that is, falsifiable, to qualify as science. Any kind of explanation will not do; it must be amenable to a testing process. If it survives testing, it may qualify as a science.⁶⁸

For example, it can be stated as a scientific theory that a magnet attracts iron. To test the falsifiability of that theory, it can be proposed that objects of only a certain color, and not necessarily a magnet, attract iron. If a red magnet were found to work, we could further test the notion by using a wooden block of the same color as the magnet and thus disprove the color theory. Therefore, the scientific statement that a magnet attracts iron cannot be falsified.

Popper, in his book *The Logic of Scientific Discovery*, is emphatic about the matter of falsification: "But I shall certainly admit a system as empirical or scientific only if it is capable of being *tested* by experience. These considerations suggest that not the *verifiability* but the *falsifiability* of a system is to be taken as a criterion of

66. See *Starzecpyzel*, 880 F. Supp. 1027. As British physicist William Thomson, Lord Kelvin, observed in 1883:

When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind: it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science.

William Thomson, Lord Kelvin, *Popular Lectures and Addresses*, available at <http://www.chemistrycoach.com/measurement.htm>.

67. See *Starzecpyzel*, 880 F. Supp. at 1040.

68. SIR KARL POPPER, *THE LOGIC OF SCIENTIFIC DISCOVERY* 47 (Harper & Row 1956).

demarcation.”⁶⁹

The idea that a genuine scientific theory must have the consistency that gives it predictive value and the potential for falsification is analogous to the demand for forensic reliability in the criminal justice system.⁷⁰ This demand for reliability is an issue of constitutional importance. The Confrontation Clause of the Sixth Amendment to the United States Constitution as well as Article I, Section I, Paragraph XIV of the Constitution of the State of Georgia and similar provisions under most state constitutions ensure the reliability of evidence against a defendant by subjecting it to rigorous testing in an adversarial proceeding.⁷¹

In the pre-trial hearings held in the case of *State of Georgia v. Jeffrey McGee*, the state’s fingerprint examiners testified that the peer review of their findings consisted of having a supervisor look over the forms filled out by the examiner to insure that “proper procedures” were followed. These same fingerprint examiners admitted that their office did not use blind testing of individual examiner’s work products.⁷² Thus, all the examiners assured was that the paperwork was in order, not that the underlying test was reliable.

IV. THE DAUBERT TEST

A. Legal Tests for Admissibility

In *Frye v. United States*,⁷³ the defendant took a lie detector test and, at his trial, offered the scientist who conducted the test as an expert witness to testify regarding the results.⁷⁴ The government

69. *Id.* at 40 (emphasis in original).

70. See Michael J. Saks, *Merlin and Solomon: Lessons from the Law’s Formative Encounters with Forensic Identification Science*, 49 *Hastings L.J.* 1069, 1090-91 (1998).

71. See *Maryland v. Craig*, 497 U.S. 836, 845 (1990); *Hubbard v. State*, 429 S.E.2d 123, 124 (Ga. Ct. App. 1993).

72. McGee Transcript, *supra* note 48 (testimony of Lou Cuente, Georgia Bureau of Investigation Crime Lab employee).

73. 293 F. 1013 (D.C. Cir. 1923); see also Paul C. Giannelli, *The Admissibility of Novel Scientific Evidence: Frye v. United States, A Half-Century Later*, 80 *COLUM. L. REV.* 1197 (1980).

74. *Frye*, 293 F. 1013. In this case, the test referred to was the systolic blood pressure deception test. The theory at that time was that blood pressure is influenced by change in the emotions of the witness and that rises in the systolic blood pressure are brought about by nervous impulses sent to the

objected to the admission of the testimony about the results of the lie detector test. The trial judge sustained the objection and refused to allow the jury to hear the testimony. Upon appeal the appellate court held:

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. We think the systolic blood pressure deception test has not yet gained such standing and scientific recognition among physiological and psychological authorities as would justify the courts in admitting expert testimony deduced from the discovery, development, and experiments thus far made.⁷⁵

The *Frye* test⁷⁶ became the legal standard used by courts throughout the United States to determine scientific reliability and admissibility issues until the more recent decision by the United States Supreme Court in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*⁷⁷ In *Daubert*, the Supreme Court held that federal trial courts, when faced with a proffer of expert scientific testimony, must determine at the outset whether the “reasoning or methodology underlying the testimony is scientifically valid.”⁷⁸ The Court

sympathetic branch of the autonomic nervous system. *Id.*

75. *Frye*, 293 F. at 1014.

76. The *Frye* test, or as it is sometimes described, the general acceptance test, involved the admissibility of scientific evidence. It provided that such evidence would be admissible only after the thing from which the deduction was made had been sufficiently established to have gained general acceptance in the particular field in which it belongs.

77. 509 U.S. 579 (1993). In *Daubert*, the United States Supreme Court discarded the “general acceptance” test set forth in *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923), on the ground that *Frye* had been supplanted by the Federal Rules of Evidence. The Court specifically recognized that Rule 702, not the general acceptance test, provides the governing standard when a litigant offers expert scientific testimony. *Daubert*, 509 U.S. at 587-88.

78. *Id.* at 592-93.

recognized that “in a case involving scientific evidence, *evidentiary reliability* will be based upon *scientific validity*.”⁷⁹ This standard applies both to “‘novel’ scientific techniques” and to “well established propositions.”⁸⁰

The *Daubert* Court suggested five factors that trial courts may consider in determining whether proffered expert testimony is scientifically valid. The first factor is whether the “theory or technique . . . can be (and has been) tested.”⁸¹ As the Court noted, empirical testing is the primary criteria of science:

Scientific methodology today is based on generating hypotheses and testing them to see if they can be falsified; indeed, this methodology is what distinguishes science from other fields of human inquiry. . . . The statements constituting a scientific explanation must be capable of empirical tests. . . . The criterion of the scientific status of a theory is its falsifiability, or refutability, or testability.⁸²

A second closely related factor that the *Daubert* Court suggested should ordinarily be considered is the “known or potential rate of error” of the particular technique.⁸³ In this regard, the Court cited the Seventh Circuit’s decision in *United States v. Smith*,⁸⁴ in which the court surveyed studies concerning the error rate of spectrographic voice identification techniques.⁸⁵

A third factor pointed to by the *Daubert* Court is the “existence and maintenance of standards controlling the technique’s operation.”⁸⁶ As an example, the Supreme Court cited the Second Circuit’s opinion in *United States v. Williams*,⁸⁷ in which the Second Circuit observed that the “International Association of Voice

79. *Id.* at 590 n.9.

80. *Id.* at 592 n.11.

81. *Id.* at 593.

82. *Id.* at 593 (internal quotations and citations omitted).

83. *Id.* at 594.

84. 869 F.2d 348 (7th Cir. 1989).

85. *Id.* at 353-54.

86. *Daubert*, 509 U.S. at 594.

87. 583 F.2d 1194 (2d Cir. 1978).

Identification . . . requires that ten matches be found before a positive identification can be made.”⁸⁸

A fourth factor described by the Court in *Daubert* was that general acceptance by the scientific community “can . . . have a bearing on the inquiry. A ‘reliability assessment does not require, although it does permit, explicit identification of a relevant scientific community and an express determination of a particular degree of acceptance within that community.’”⁸⁹ The Court acknowledged, “[w]idespread acceptance can be an important factor in ruling particular evidence admissible, and ‘a known technique which has been able to attract only minimal support within the community,’ . . . may properly be viewed with skepticism.”⁹⁰

Finally, the *Daubert* Court pointed out that an additional factor to be considered was “whether the theory or technique has been subjected to peer review and publication.”⁹¹ The Court recognized that “submission to the scrutiny of the scientific community is a component of ‘good science,’ in part because it increases the likelihood that substantive flaws in methodology will be detected.”⁹² Accordingly, publication in a peer-review journal is “a relevant, though not dispositive, consideration in assessing the scientific validity of a particular technique or methodology on which an opinion is premised.”⁹³

In providing these guidelines, the Supreme Court emphasized that the inquiry under Federal Rule of Evidence 702 is a flexible one and that, as such, additional factors may be considered.⁹⁴ Several additional factors have been suggested by the Third Circuit, including:

- (1) the relationship of the technique to the methods which have been established to be reliable;

88. 583 F.2d 1194, 1198 (2d Cir. 1978).

89. *Daubert*, 509 U.S. at 594 (quoting *United States v. Downing*, 753 F.2d 1224, 1242 (3rd Cir. 1985)).

90. *Id.* at 594 (quoting *Downing*, 753 F.2d at 1238)).

91. *Id.* at 593.

92. *Id.*

93. *Id.* at 594.

94. *See id.* at 587-88.

- (2) the qualifications of the expert witness testifying based on the methodology; and
- (3) the non-judicial uses to which the method has been put.⁹⁵

The lack of reliability of fingerprint comparison evidence should also exclude the evidence pursuant to Federal Rule of Evidence 403. Rule 403 requires the exclusion of any evidence, even relevant evidence, "if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues or misleading the jury"⁹⁶

In summary, the *Daubert* test involves at least five criteria: (1) whether the theory or technique can or has been tested; (2) whether the theory or technique has been subjected to peer-review; (3) whether there is a known or potentially known error rate; (4) whether the proponents of such theory or technique maintain standards controlling the operation of the theory; and (5) whether the theory or technique has attracted widespread acceptance within a relevant scientific community.⁹⁷

V. FINGERPRINTS: A FAILED SCIENCE?

The use of fingerprint identification evidence *fails* the most basic criteria of science: the premises underlying identification have not been tested to determine if they can be falsified. As noted previously, two fundamental premises underlie latent print identification. First, that it is impossible for two or more people to have prints showing a limited number of ridge characteristics in common. Second, that latent fingerprint examiners can reliably make identifications from small distorted latent fingerprint fragments that reveal only a limited number of basic ridge characteristics.

Forensic experts have repeatedly recognized that the premises underlying fingerprint identification have not been empirically

95. *United States v. Downing*, 753 F.2d 1224, 1238-39 (3rd Cir. 1985); *see also In re Paoli R.R. Yard PCB Litg.*, 35 F.3d 717, 742 n.8 (3rd Cir. 1994) (listing factors deemed important by *Daubert*).

96. FED. R. EVID. 403.

97. *Daubert*, 509 U.S. at 593-94.

validated.⁹⁸ “Although in principle fingerprint identification depends upon an objective, probabilistic inquiry, its practioners use no probability models and have no probability data to use. They rely on intuitions and assumptions that have not been tested rigorously . . .

„99

Even commentators within the fingerprint identification community have recognized the lack of appropriate and required testing. David Stoney, a leading scholar and fingerprint practitioner, has written:

[T]here is no justification [for fingerprint identifications] based upon conventional science: no theoretical model, statistics or an empirical validation process.

Efforts to assess the individuality of DNA blood typing make an excellent contrast. There has been intense debate over which statistical models are to be applied, and how one should quantify increasingly rare events. To many, the absence of adequate statistical modeling, or the controversy regarding calculations, brings the admissibility of the evidence into question. Woe to fingerprint practice were such criteria applied! As noted earlier, about a dozen models for quantification of fingerprint individuality have been proposed. None of these even approaches theoretical adequacy, however, and none has been subjected to empirical validation. . . . Indeed, inasmuch as a statistical method would suggest qualified (non-absolute) opinions, the models are rejected on principle by the fingerprint profession.

. . . .

Much of the discussion of fingerprint practices . . . may lead the critical reader to the question “Is there any *scientific* basis for an absolute identification?” It is important to realize that an

98. See Saks, *supra* note 70, at 1106.

99. See Saks, *supra* note 70, at 1105-06 (citation omitted); see also Margaret A. Berger, *Procedural Paradigms For Applying the Daubert Test*, 78 MINN. L. REV. 1345 (1994). “Considerable forensic evidence [such as fingerprinting] made its way into the courtroom without empirical validation of the underlying theory and/or its particular application.” *Id.* at 1354.

absolute identification is an opinion, rather than a conclusion based on scientific research. The *functionally equivalent* scientific conclusion (as seen in some DNA evidence) would be based on calculations showing that the probability of two different patterns being indistinguishably alike is so small that it asymptotes with zero The scientific conclusion, however, must be based on tested probability models. These simply do not exist for fingerprint pattern comparisons.¹⁰⁰

The International Association for Identification (IAI) issued a report in 1973 that also reflects the lack of testing in the fingerprint identification field.¹⁰¹ The IAI had previously formed a Standardization Committee for the purpose of determining “the minimum number of friction ridge characteristics which must be present in two impressions in order to establish positive identification.”¹⁰² After three years of examining the issue, however, the Committee was unable to provide a minimum number. Instead, the IAI issued a report declaring that “no valid basis exists for requiring a predetermined number of friction ridge characteristics which must be present in two impressions in order to establish positive identification.”¹⁰³ Of course, the reason that the IAI did not have a valid basis to set a minimum number was that no scientific testing as to this issue had ever been performed.¹⁰⁴ “Indeed, the *absence* of valid scientific criteria for establishing a minimum number of minutiae has been the main reason that professionals have avoided accepting one.”¹⁰⁵ The IAI effectively conceded as much when it strongly recommended in the report that “a federally funded

100. David A. Stoney, *The Scientific Basis of Expert Testimony on Fingerprint Identification*, in MODERN SCIENTIFIC EVIDENCE: THE LAW AND SCIENCE OF EXPERT TESTIMONY § 21-2.3.1 at 72 (David L. Faigman et al. eds., West 1997) (emphasis in original) [hereinafter Stoney, *Fingerprint Identification*].

101. International Association for Identification, IAI Standardization Committee Report (1973) [hereinafter IAI Committee Report]. At the time of publication, this report was not available for citation purposes. See http://www.latent-prints.com/iai_standardization_committee.htm for a discussion of the report.

102. *Id.*

103. *Id.*

104. See Stoney, *Fingerprint Identification*, *supra* note 100, at 71.

105. *Id.* (emphasis in original).

in depth study should be conducted, in order to establish comprehensive statistics concerning the frequency, type and location of ridge characteristics in a significantly large database of fingerprint impressions.”¹⁰⁶ To date, however, no such research has been conducted. Therefore, it must be said that some failures exist in fingerprint comparisons today.

The lack of empirical testing in the field of fingerprints is devastating to the claim that latent fingerprint identifications are scientifically based. “Scientific methodology today is based on generating hypotheses and testing them to see if they can be falsified; indeed, this methodology is what distinguishes science from other fields of human inquiry.”¹⁰⁷ Moreover, the lack of testing prevents latent fingerprint comparisons from having true evidentiary significance. Due to the lack of testing, a latent fingerprint technician cannot, with consistent scientific accuracy and verifiable reliability, correctly determine whether the ridge characteristics are in common in the two prints under comparison. Given the existence of those matching characteristics, the examiner has no verifiable basis to give an opinion of the probability that the two prints were actually made by the same finger. Instead, the latent examiner can provide only a *subjective opinion* that a sufficient basis to make a positive identification exists. In the analogous area of DNA researchers have recognized the necessity of being able to provide statistically sound probabilities.¹⁰⁸ The statistical calculation step is the pivotal element of DNA analysis; the evidence means nothing without a determination of the statistical significance of a match of DNA patterns.¹⁰⁹ Fingerprint analysis does not meet this prerequisite.

A. *Erroneous Findings*

The obvious failure of the so-called science of fingerprint identification to achieve empirical validation makes the lack of an

106. IAI Committee Report, *supra* note 101.

107. *Daubert*, 509 U.S. at 593 (internal quotations and citations omitted).

108. See *People v. Wallace*, 14 Cal. App. 4th 654, 661 n.3 (1993) (stating that without valid statistics, DNA evidence is “meaningless”); *People v. Barney*, 8 Cal. App. 4th 798, 802 (1992).

109. See *Barney*, 8 Cal. App. 4th at 805.

established error rate for latent print comparisons unsurprising.¹¹⁰ The lack of an established error rate certainly does not mean that errors do not occur.¹¹¹ In fact, many cases of erroneous fingerprint identifications have been documented.¹¹² One such case is reported in *State v. Caldwell*.¹¹³ The prosecution's fingerprint expert in *Caldwell*, a board-certified member of the IAI with more than fourteen years of experience, testified that a particular latent print at issue in the case had been made by the defendant's right thumb.¹¹⁴ The examiner based his opinion on eleven points of similarity that he had charted. A second fingerprint expert, also a board-certified member of the IAI, confirmed the first examiner's finding after being consulted by the defense. After the defendant's conviction for murder, however, further inquiry definitively established that both of these certified fingerprint experts had erred.¹¹⁵ The court therefore reversed defendant's conviction.

Another erroneous fingerprint identification recently occurred in England.¹¹⁶ In that case, two latent prints that had been recovered from a burglary crime scene were each found to have at least sixteen points in common with two of the defendant's inked prints. Pursuant to standard Scotland Yard procedures, fingerprint examiners had triple-checked these identifications prior to the defendant's arrest. After the defendant had spent several months in jail, however, the identifications were found to be erroneous.¹¹⁷

That erroneous identifications do occur despite the number of points of similarity thought to have been found is beyond dispute. "It is true that some overly zealous North American examiners have given testimony concerning false identifications when they believed the identifications were valid."¹¹⁸ Simon Cole, in his latest book

110. *See id.* at 811.

111. *See* James E. Starrs, *A Miscue in Fingerprint Identification: Causes and Concerns*, 12 J. POLICE SCI. & ADMIN. 287 (1984).

112. *See id.*

113. 322 N.W.2d 574 (Minn. 1982). *See also* Starrs, *supra* note 111.

114. Starrs, *supra* note 111, at 288.

115. *Caldwell*, 322 N.W.2d at 586.

116. *See* Stephen Gray, *Yard in Fingerprint Blunder*, TIMES (LONDON), Apr. 6, 1997, at 6.

117. *Id.*

118. David L. Grieve, *Reflections on Quality Standards*, 16 FINGERPRINT WHORL 108, 110 (Apr.

Suspect Identities: A History of Fingerprint and Criminal Identification, reports that when outside testing of fingerprint laboratories was attempted, “[o]nly 44 percent of the tested examiners scored perfectly. Six of the 156 examiners reported false negatives—that is, they failed to identify matching prints.”¹¹⁹

On these exams, practicing latent print technicians are typically provided with several latent prints along with a number of “ten print” inked impressions with which to compare them. Beginning in 1995, the provider of the test, Collaborative Testing Service, began to include as part of the test one or two “elimination” latent prints made by an individual whose inked impressions had not been furnished. The results of the 1995 exam were, in the words of commentator David Grieve, both “alarming” and “chilling.”¹²⁰ Of the 156 examiners who participated, only 68 (44%) were able to both correctly identify the five latent print impressions that were supposed to be identified and correctly note the two elimination latent prints that were not to be identified.¹²¹ Even more significantly, 34 of these examiners (22%) made erroneous identifications on one or more of the questioned prints for a total of 48 misidentifications.¹²² Erroneous identifications occurred on all seven latent prints that were provided, including thirteen errors made on the five latent prints that could be correctly identified to the supplied suspects.¹²³ In addition, the group of practicing fingerprint technicians misidentified one of the two elimination latent prints 29 times.¹²⁴

These shockingly poor results, moreover, could not be blamed on the test. The 1995 proficiency exam was recognized as being “a

1990). Grieve is employed by the Illinois State Police, Division of Forensic Services. He has worked as a latent fingerprint examiner for more than thirty years. He also is the editor of the leading journal for fingerprint practitioners, the *Journal of Forensic Identification*, which is published by the International Association of Identification.

119. SIMON COLE, *SUSPECT IDENTITIES: A HISTORY OF FINGERPRINT AND CRIMINAL IDENTIFICATIONS* 281 (Harvard University Press 2001) [hereinafter COLE, *SUSPECT IDENTITIES*].

120. David L. Grieve, *Possession of Truth*, 46 *J. FORENSIC IDENTIFICATION* 521, 524 (1996); see discussion, *supra* note 118.

121. Grieve, *supra* note 120.

122. *Id.*

123. *Id.*

124. *Id.*

more than satisfactory representation of real casework conditions.”¹²⁵ Representatives of the International Association of Identification designed, assembled, and reviewed the test. A “proficiency test composed of seven latents and four suspects was considered neither overly demanding or unrealistic.”¹²⁶ Accordingly, the dreadful results are a matter of significant concern.

Reaction to the results of the CTS 1995 Latent Print Proficiency Test within the forensic science community has ranged from shock to disbelief. Errors of this magnitude within a discipline singularly admired and respected for its touted absolute certainty as an identification process have produced chilling and mind-numbing realities. Thirty-four participants, an incredible 22% of those involved, *substituted presumed but false certainty for truth*. By any measure, this represents a profile of practice that is unacceptable and thus demands positive action by the entire community.¹²⁷

The poor results have continued unabated on more recent proficiency exams. On the 1998 test, for example, only 58% of the participants correctly identified all of the latents and recognized the two elimination latents as being unidentifiable.¹²⁸ Even more disturbing was the fact that twenty-one erroneous identifications were made by fourteen different participants.¹²⁹

Certainly practitioner error is relevant under *Harper* and *Daubert*. Courts have looked at studies of examiner error rate in determining whether proffered “scientific” evidence is reliable.¹³⁰ The Seventh Circuit’s decision in *Smith* was, as noted above, cited with approval by the United States Supreme Court in *Daubert*.¹³¹

125. *See id.* at 524-25.

126. *Id.*

127. *Id.*

128. Collaborative Testing Services, Inc., *Forensic Testing Program: Latent Prints Examination*, Report No. 9808, at 2 (1998).

129. *Id.*

130. *See, e.g.,* United States v. Smith, 869 F.2d 348, 353-54 (7th Cir. 1989) (considering studies of “actual cases examined by trained voice examiners” in deciding admissibility).

131. *See Daubert*, 509 U.S. at 594; *see also* Saks, *supra* note 70, at 1090 (“Even if forensic

Although no controlled studies have determined an error rate, the proficiency testing done in the field suggests that the rate is in fact substantial. In this regard, one must remember that the prosecution bears the burden of establishing the scientific reliability of the expert evidence it seeks to admit.¹³² “Certainly an unknown error rate does not necessarily imply a large error rate. However, if testing is possible, it must be conducted if forensic document examination is to carry the imprimatur of ‘science.’”¹³³

Without known error rates, the government fails to meet its burden and the admission of fingerprint evidence certainly does not meet the test required by *Daubert*. At the very heart of verifiable certainty is a known error rate against which comparisons can be made. The essence of statistical probabilities demands that error rates be established and considered by a court before granting the court’s approval of fingerprint identification as science.

In addition to failing to provide a known error rate, the testimony of fingerprint experts also lacks scientific studies upon which predictions of probabilities can be made. Lacking any such probability studies, latent print technicians do not offer opinions of identification in terms of probability. Indeed, the rules of their primary professional association, the IAI, actually prohibit latent print examiners from doing so. Instead of testifying regarding probabilities, latent print examiners make the claim of “absolute certainty” for their identifications. Examiners provide an opinion to the factfinder that the latent print at issue was made by a particular finger to the exclusion of all others in the world! Such assertions of absolute certainty, however, are inherently unscientific. One leading law enforcement fingerprint examiner has stated:

metaphysicians were right, that no two of anything are alike, for fact finders in earthly cases, the problem is to assess the risk of error whatever its source, be that in the basic theory or in the error rates associated with human examiners or their apparatus.”)

132. *See, e.g.,* Kannankeril v. Terminex Int’l, Inc., 128 F.2d 802, 806 (3d Cir. 1997) (requiring proponent of expert testimony to demonstrate by preponderance of evidence that expert’s opinion was based on methods and procedures of science).

133. *See* U.S. v. Starzecpyzel, 880 F.Supp. 1027, 1037 (S.D.N.Y. 1995).

Imposing deductive conclusions of absolute certainty upon the results of an essentially inductive process is a futile attempt to force the square peg into the round hole. This categorical requirement of absolute certainty has no particular scientific principle but has evolved from a practice shaped more from allegiance to dogma than a foundation in science. Once begun, the assumption of absolute certainty as the only possible conclusion has been maintained by a system of societal indoctrination, not reason, and has achieved such a ritualistic sanctity that even mild suggestions that its premise should be re-examined are instantly regarded as acts of blasphemy. *Whatever this may be, it is not science.*¹³⁴

VI. LACK OF OBJECTIVE STANDARDS AND FINGERPRINT COMPARISONS

Latent fingerprint examiners in the United States are currently operating in the absence of any uniform objective standards.¹³⁵ The absence of standards is most glaring with respect to the ultimate question that should be asked of all fingerprint comparisons: what constitutes a sufficient basis to make a positive identification? The official position of the IAI since 1973 is that no minimum number of corresponding points of identification is required for an identification.¹³⁶ Instead, the IAI leaves the determination of a sufficient basis for an identification entirely to the subjective judgment of the particular examiner.¹³⁷ While the official position of the IAI is that there is no basis for a minimum point requirement, many fingerprint examiners in the United States continue to employ either their own informal point standards or those that have been set by the agencies for whom they work.¹³⁸

134. Grieve, *supra* note 120, at 527-28 (emphasis added).

135. Cole, *What Counts*, *supra* note 21, at 141-43.

136. *Id.* at 143.

137. *Id.*

138. *See id.*

A. *Numeric Standards Versus Non-Numeric Standards*

Though the United States has no uniform identification standard, many other countries have, in fact, set such standards based on a minimum number of points of comparison.¹³⁹ Italy, for example, retains the minimum standard of seventeen matching points before a comparison can be made, and both France and Australia require twelve points.¹⁴⁰ Thirty is the minimum number required for a “match” in Argentina and Brazil.¹⁴¹ England and Wales have only recently abandoned their longstanding adherence to a minimum standard, and Scotland has followed their lead.¹⁴² The report issued by the Scottish Criminal Record Office notes:

6.8.1. The use of a minimum number of points or characteristics in coincident sequence and agreement with no points of dissimilarity has been used in Scotland since fingerprint evidence became routinely used in the first half of the last century. Originally 12 characteristics in sequence and agreement was the accepted standard. The present 16 point standard was introduced to Great Britain in 1924 following the publication of photographs which purported to show two fingerprints from different people with 16 common characteristics

. . . .

6.8.2. In 1953, following reviews of the differing practices throughout Great Britain, the Home Office agreed that a minimum of sixteen points should be the standard for a single print. This has remained the position until the present day although in some cases courts have accepted evidence of fingerprint identification where a lower number of points have been found.

139. ASHBAUGH, *FRICTION RIDGE ANALYSIS*, *supra* note 37.

140. Christophe Champod, *Numerical Standards and “Probable” Identifications*, 45 J. FORENSIC IDENTIFICATION 136, 138 (1995).

141. PAUL GIANNELLI & EDWARD IMWINKELRIED, 1 SCIENTIFIC EVIDENCE § 16-7(A), at 768 (3rd ed. 1999).

142. SCOTTISH CRIMINAL RECORDS OFFICE, FINGERPRINT BUREAU: PRIMARY INSPECTION § 6.8.6 (2000).

6.8.3. The practice in other countries varies from no specific number required to a fixed number which is usually lower than 16.

....

6.8.4. *There is no strict scientific basis for the use of a numeric standard as the identification rests with the expert's opinion.* This is recognized in an increasing number of countries where a non-numeric standard is applied, including England and Wales where active steps are taking place to progress the introduction of a non-numeric standard.¹⁴³

The reason for the movement away from a non-numeric standard embraces the increasing realization that examiners have committed errors in reliance on the numeric standard. "The hearing [in *United States v. Mitchell*]¹⁴⁴ served notice to the fingerprint community that point counting was vulnerable to attack on scientific grounds."¹⁴⁵ On January 1, 2001, England abandoned its adherence to a sixteen-point minimum standard.¹⁴⁶ As Dr. David Stoney testified in the *McGee* hearing in Georgia, "when a latent fingerprint examiner compares latent prints with known prints, he or she is using [his or her] subjective observations and [is] not relying on objective standards."¹⁴⁷ The primary purpose of establishing such standards is to insure against erroneous identifications.¹⁴⁸

As commentators have recognized, the question of whether there should be a minimum point standard for latent print identifications has bitterly divided the fingerprint community.¹⁴⁹ While latent print examiners have somehow managed to maintain a united front in the courtroom, they have been at odds in the technical literature.¹⁵⁰ Ashbaugh, for example, has written that use of the simplistic point

143. *Id.* (emphasis added).

144. *United States v. Mitchell*, No.96-407-CR (E.D. Pa. 1999).

145. COLE, SUSPECT IDENTITIES, *supra* note 119, at 286.

146. *Id.*

147. *McGee* Transcript, *supra* note 48 (testimony of Dr. David Stoney).

148. K. Luff, *The 16-Point Standard*, 16 FINGERPRINT WHORL 73 (Jan. 1990).

149. *See* Cole, *What Counts*, *supra* note 21, at 140-41.

150. *Id.* at 144.

philosophy in modern-day forensic science is unacceptable and has stated that “superficial and unsubstantiated quips became the methodology of the point system.”¹⁵¹ Cole writes that one of the effects of *Daubert* may be that the fingerprint profession will decide to abandon point counting because such a process clearly would not satisfy demands that the profession articulate a scientific foundation for the process.¹⁵²

The problem persists, however, because no other member of the fingerprinting community has advanced a scientifically sound alternative. Yet the point system, as employed by fingerprint examiners over the past hundred years, remains scientifically invalid. Ashbaugh provides the following explanation as to how a latent print examiner, in the absence of a minimum point standard, is supposed to know when a sufficient basis exists to make an identification:

A frequently asked question is, “How much is enough?” The opinion of individualization or identification is subjective. It is an opinion formed by the friction ridge identification specialist based on the friction ridge formations found in agreement during comparison. The validity of the opinion is coupled with an ability to defend that position, and both are founded in one’s personal knowledge, ability and experience.

. . . .

How much is enough? Finding adequate friction ridge formations in sequence, that one knows are specific details of the friction skin, and *in the opinion* of the friction ridge identification specialist that there is sufficient uniqueness within those details to eliminate all other possible donors in the world, is considered enough. At that point individualization has occurred and the print has been identified. The identification was established by the agreement of friction ridge formations in sequence having sufficient uniqueness to individualize.¹⁵³

151. Ashbaugh, *Premises*, *supra* note 34.

152. COLE, SUSPECT IDENTITIES, *supra* note 119, at 285-86.

153. ASHBAUGH, FRICTION RIDGE ANALYSIS, *supra* note 37, at 103 (emphasis in original).

Ashbaugh's prior writings on this subject provide little in the way of additional insight. He has stated, for example, that "[i]n some instances we may form an opinion on eight ridge characteristics," but in other cases, "we may require twelve or more to form the same opinion."¹⁵⁴ Ashbaugh's explanation for this sliding scale is that some ridge characteristics are more unique than others.¹⁵⁵ However, fingerprint examiners have never adopted any weighted measures of the different characteristics. Therefore, as Ashbaugh has recognized, the particular examiner's determination of whether eight or twelve matching characteristics are sufficient in a particular case is entirely subjective.¹⁵⁶ Without objective professional standards, courts are without sufficient basis to judge the validity, admissibility, and worthiness of fingerprint identification testimony.

The lack of uniform standards for latent print comparisons extends well beyond the question of what ultimate standard should apply for a positive identification. Objective standards are lacking throughout the entire comparison process. Even the seemingly simple determination of how to count points of similarity lacks an objective standard. When examiners find themselves struggling to reach a certain point criteria, they often engage in a practice known as "pushing the mark."¹⁵⁷ Pursuant to practice, they count a single characteristic such as a short ridge not as one point but rather as two separate ridge endings to bolster the technician's point count.

The lack of objective standards in fingerprint comparison also arises with respect to the inconsistent use of the one-dissimilarity doctrine.¹⁵⁸ According to this doctrine, if two fingerprints under comparison contain a single genuine dissimilarity, "the prints cannot be attributed to the same finger or individual."¹⁵⁹ This doctrine is well recognized by fingerprint examiners and has been endorsed in

154. David Ashbaugh, *The Key to Fingerprint Identification*, 10 FINGERPRINT WHORLD 93 (Apr. 1985).

155. *Id.* at 94-95.

156. *Id.* at 96.

157. Dale Clegg, *A Standard Comparison*, 24 FINGERPRINT WHORLD 99, 101 (July 1998).

158. See John I. Thornton, *The One-Dissimilarity Doctrine in Fingerprint Identification*, 306 INT'L CRIM. POLICE REV. 89 (Jan. 1977).

159. *Id.* at 89.

the writings of the experts usually employed by prosecutors.¹⁶⁰ Examiners, however, have effectively ignored the doctrine in practice.¹⁶¹ Despite the one-dissimilarity rule, one noted scholar in this field, Dr. John I. Thornton, has written that, when a fingerprint examiner finds what he or she believes is a sufficient number of matching characteristics to make an identification, the examiner then explains away any observed dissimilarity as being a product of distortion or artifact:

Faced with an instance of many matching characteristics and one point of disagreement, the tendency on the part of the examiner is to rationalize away the dissimilarity on the basis of improper inking, uneven pressure resulting in the compression of a ridge, a dirty finger, a disease state, scarring, or super-imposition of the impression. How can he do otherwise? If he admits that he does not know the cause of the disagreement then he must immediately conclude that the impressions are not of the same digit in order to accommodate the one-dissimilarity doctrine. The fault here is that the nature of the impression may not suggest *which* of these factors, if any, is at play. The expert is then in an embarrassing position of having to speculate as to what caused the dissimilarity, and often the speculation is without any particular foundation.

....

The practical implication of this is that the one-dissimilarity doctrine will have to be ignored. It is, in fact, ignored anyway by virtue of the fact that fingerprint examiners will not refrain from effecting an identification when numerous matching characteristics are observed despite a point of disagreement. Actually, the one-dissimilarity doctrine has been treated rather shabbily. The fingerprint examiner adheres to it only until faced with an aberration, then discards it and conjures up some

160. See, e.g., David Ashbaugh, *Defined Pattern, Overall Pattern and Unique Pattern*, 42 J. FORENSIC IDENTIFICATION 505, 510 (1992) [hereinafter Ashbaugh, *Defined Pattern*].

161. See *id.*

fanciful explanation for the dissimilarity.¹⁶²

The issue of verification further illustrates the absence of real fingerprint comparison standards. Independent verification is an essential part of the identification process, but in practice, fingerprint examiners sometimes “waive the verification requirement.”¹⁶³ Moreover, some examiners will simply go from one supervisor to another until they obtain the desired verification. Even more insidious is the practice in many state crime laboratories of only making an administrative review of the examiner’s findings with no attempt to verify or even review the actual fingerprints being compared. An article published by Pat Wertheim candidly recounts his experience as a fingerprint technician, when he would shop for a supervisor to obtain the positive verification that he believed was warranted.¹⁶⁴

Finally, the lack of standards in fingerprint comparison extends to the training and experience requirements for latent print examiners. In many forensic laboratories, no such requirements currently exist.¹⁶⁵ “[P]eople are being hired directly into latent print units without so much as having looked at a single fingerprint image.”¹⁶⁶ Once hired, the training that examiners receive is typically minimal. Even in those laboratories where attempts to institute some training standards are made, the efforts have not overcome the basic deficiencies in the techniques and procedures used in fingerprint identification. Consider what one prosecution expert has said on the subject of training:

The harsh reality is that latent print training as a structured, organized course of study is scarce. Traditionally, fingerprint training has centered around a type of apprenticeship, tutelage,

162. Thornton, *supra* note 158.

163. William Leo, *Identification Standards - The Quest for Excellence*, CAL. IDENTIFICATION DIGEST (Dec. 1995).

164. Pat Wertheim, *The Ability Equation*, 46 J. FORENSIC IDENTIFICATION 149 (1996).

165. See Leo, *supra* note 163 (recognizing the need for “minimum training and experience standards” for latent print examiners).

166. Wertheim, *supra* note 164, at 152.

or on-the-job training, in its best form, and essentially a type of self study, in its worst. Many training programs are the “look and learn” variety, and aside from some basic classroom instruction in pattern interpretation and classification methods, are often impromptu sessions dictated more by the schedule and duties of the trainer than the needs of the student. Such apprenticeship is most often expressed in terms of duration, not in specific goals and objectives, and often end with a subjective assessment that the trainer [sic] is ready.¹⁶⁷

B. Falsification of Findings

The direct result of this poor training is deficient examiners. “The quality of work produced is directly proportional to the quality of training received.”¹⁶⁸ Moreover, the lack of training and standards has not only resulted in a plethora of deficient examiners, but dishonest ones as well. Pat Wertheim, an expert regularly employed by prosecutors, estimates that there have been “hundreds and even thousands” of cases of forged and fabricated latent prints.¹⁶⁹ In 1995, a police officer was convicted of planting false fingerprint evidence in an armed robbery case.¹⁷⁰ Testimony showed that the police officer had used a defendant’s inked fingerprints previously taken by police and retained on a fingerprint card, duplicated them onto another card, and labeled the second card as fingerprints taken from a crime scene. The police officer, an eleven-year police veteran, was sentenced to three years in prison. His defense attorney told the jury that his client was “overworked, stressed out, and emotionally

167. David L. Grieve, *The Identification Process: The Quest for Quality*, 40 J. FORENSIC IDENTIFICATION 109, 110-11 (1990).

168. *Id.*; see also David L. Grieve, *The Identification Process: Traditions in Training*, 40 J. FORENSIC IDENTIFICATION 195, 196 (1990) (stating that there are “examiners performing identification functions who are not qualified and proficient . . . unfortunately has been too well established”); Robert D. Olsen, *Cult of the Mediocre*, 8 FINGERPRINT WHORLD 51 (Oct. 1982) (“There is a definite need for us to strengthen our professional standards and rise above the cult of the mediocre.”).

169. Pat Wertheim, *Detection of Forged and Fabricated Latent Prints*, 44 J. FORENSIC IDENTIFICATION 653, 675 (1994) (“A disturbing percentage of experienced examiners polled by the author described personal exposure to at least one of these cases during their careers.”).

170. Ben Schmitt, *Man Sues Garden City Police Over Planted Prints*, SAVANNAH MORNING NEWS, Jan. 17, 1998, at 12A, available at <http://www.savannahnow.com/stories/061898/LOCgreensuit.html>.

distraught [and that] sometimes good people do bad things.”¹⁷¹ A New York State fingerprint expert confessed to falsifying fingerprint evidence at seventeen different criminal cases.¹⁷² “A four-year investigation revealed widespread fingerprint fabrication by New York state troopers in approximately forty cases and resulted in the conviction of five state troopers.”¹⁷³

Barry Scheck, Peter Neufeld, and Jim Dwyer write about a case in Orange County, California:

[A] police officer photocopied fingerprint cards from suspects and then pressed the wet photocopy of the prints onto blank “lift” cards from armed robbers. Another time [the same police officer] took a fingerprint card from a suspect, placed it under a Baggie that had been filled with drugs, photographed it, and cropped out the outlines of the card.¹⁷⁴

In summary, latent print examiners operate without the benefit of any objective standards to guide them in their comparisons. Nor do any objective standards or minimum qualifications exist with respect to their hiring and training. Most experts in this area will agree that fingerprints are unique and permanent. The relevant question is not whether entire fingerprints are unique and permanent, but whether there is a general consensus that fingerprint examiners can make reliable identifications on the basis of only a limited number of basic ridge characteristics. The answer to that question is plainly no. There is no consensus.

Moreover, in this country, no relevant scientific community, beyond fingerprint examiners themselves, generally accepts the reliability of latent fingerprint identifications. As courts have recognized, when reviewing a purportedly scientific endeavor, the court must look beyond the practitioners of the technique under assessment. For example, in regard to hair comparison, courts have

171. *Id.*

172. Andre A. Moenssens, *Novel Scientific Evidence in Criminal Cases: Some Words of Caution*, 84 J. CRIM. L. & CRIMINOLOGY 1, (1993).

173. COLE, SUSPECT IDENTITIES, *supra* note 119, at 274.

174. BARRY SCHECK, ET AL., ACTUAL INNOCENCE (Doubleday 2000).

noted, “[n]ot even the ‘general acceptance’ standard is met, since any general acceptance seems to be among hair experts who are generally technicians testifying for the prosecution, not scientists who can objectively evaluate such evidence.”¹⁷⁵ “[Forensic Document Examiners] certainly find ‘general acceptance’ within their own community, but this community is devoid of financially disinterested parties, such as academics.”¹⁷⁶ 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.¹⁷⁷

VII. LACK OF SCIENTIFICALLY BASED LITERATURE REGARDING FINGERPRINT COMPARISONS

The fundamental premises underlying latent fingerprint identifications have not been critically examined in the technical literature of fingerprint examiners. “It is difficult to comprehend that a complete scientific review of friction ridge identification has not taken place at sometime during the last one hundred years. A *situation seems to have developed where this science grew through default.*”¹⁷⁸

When the premises of latent print identification have been considered in the technical literature, they have not been critically examined. A perfect example is the article *Nature Never Repeats Itself*, written by Alan McRoberts.¹⁷⁹ In this article, McRoberts cites with approval the following statement originally made by Wilder and

175. *Williamson v. Reynolds*, 904 F. Supp. 1529, 1558 (E.D. Okla. 1995).

176. *United States v. Starzeczyzel*, 880 F. Supp. 1027, 1038 (S.D.N.Y. 1995).

177. See DAVID L. FAIGMAN ET AL., MODERN SCIENTIFIC EVIDENCE: THE LAW AND SCIENCE OF EXPERT TESTIMONY § 21-1.0, at 55 (West 1997) (“[B]y conventional scientific standards, any serious search for evidence of the validity of fingerprint identification is likely to be disappointing.”); Stoney, *Fingerprint Identification*, *supra* note 100, at 72. (“[T]here is no justification [for fingerprint identifications] based on conventional science: no theoretical model, statistics or an empirical validation process.”); Saks, *supra* note 70, at 1106 (“A vote to admit fingerprints is a rejection of conventional science as a criterion for admission.”).

178. ASHBAUGH, FRICTION RIDGE ANALYSIS, *supra* note 37, at 4 (emphasis added).

179. Alan McRoberts, *Nature Never Repeats Itself*, 12(5) THE PRINT, at 1-3 (Sept./Oct. 1996), available at <http://www.scafo.org/library/120501.htm>.

Wentworth in their 1916 text, *Personal Identification*:

Finally, there is never the slightest doubt of the impossibility of the duplication of a fingerprint, or even of the small part of one, on the part of anyone who has carefully studied the subject at first hand, whether fingerprint expert or anatomist: the only doubters are those who have never taken the trouble to look for themselves, and who argue from the basis of their own prejudices and preconceived opinions.¹⁸⁰

Probably statements such as these have led even such prosecution experts as David Ashbaugh to bemoan the “failure of the identification community to challenge or hold meaningful debate.”¹⁸¹ Ashbaugh explains:

In the past the friction ridge identification science has been akin to a divine following. Challenges were considered heresy and challengers frequently were accused of chipping at the foundation of the science unnecessarily. This cultish demeanor was fostered by a general deficiency of scientific knowledge, understanding and self confidence within the ranks of identification specialists. A pervading fear developed in which any negative aspect voiced that did not support the concept of an exact and infallible science could lead to its destruction and the credibility of those supporting it.¹⁸²

In summary, the literature of latent fingerprint examiners “fails to meet the expectations of the *Daubert* court—that a competitive, unbiased community of practitioners and academics would generate increasingly valid science.”¹⁸³

180. HARRIS HAWTHORNE WILDER & BERT WENTWORTH, *PERSONAL IDENTIFICATION* (Gorham Press 1918).

181. ASHBAUGH, *FRICTION RIDGE ANALYSIS*, *supra* note 37, at 4.

182. *Id.*

183. *United States v. Starzecpyzel*, 880 F. Supp. 1027, 1038 (S.D.N.Y. 1995).

VIII. OTHER FAILED IDENTIFICATION "SCIENCES"

Latent fingerprint comparisons are analogous to three other long-standing forensic identification techniques that, in the wake of *Daubert*, courts have found to be scientifically deficient: handwriting analysis, hair comparisons, and voice print analysis.¹⁸⁴ The courts have not had a sterling record with regard to determining what is and is not science.

A. *Voice Print Analysis*

Several trial courts were rather quick to validate voice print identification as a reliable science only to be contradicted by the National Academy of Sciences, which disputed studies relied upon by courts to validate voice print analysis.¹⁸⁵

B. *Handwriting Analysis*

Handwriting analysis has likewise proven to be unreliable. The fundamental premises of handwriting analyses are that no two people write alike and that forensic document examiners can reliably determine authorship of a particular document by comparing the document with known samples. As with fingerprints, these premises have not been tested, nor has an error rate for forensic document examiners been established. As the court in *Starzeczyzel* recognized, while "an unknown rate does not necessarily imply a large error rate . . . if testing is possible, it must be conducted if forensic document examination is to carry the imprimatur of 'science.'"¹⁸⁶ The parallel between the handwriting and fingerprint fields extends to the issue of objective standards. Like fingerprint examiners, forensic document examiners do not have any established criteria to govern their

184. See *United States v. Williams*, 583 F.2d 1194, 1196 (2d Cir. 1978) (finding that a pretrial hearing established spectrographic voice analysis admissible as identification evidence), *cert. denied*, 439 U.S. 1117 (1979); *Starzeczyzel*, 880 F. Supp. at 1028-50; *Williamson v. Reynolds*, 904 F. Supp. 1529, 1554-59 (E.D. Okla. 1995).

185. Paul C. Giannelli, *The Admissibility of Novel Scientific Evidence: Frye v. United States, A Half-Century Later*, 80 COLUM. L. REV. 1197, 1213 (1980); see also Moenssens, *supra* note 172, at 1-2.

186. *Starzeczyzel*, 880 F. Supp. at 1037.

analyses. Also, like the fingerprint community, forensic document examiners have not subjected themselves to “critical self-examination.”¹⁸⁷ For these various reasons, the district court in *Starzeczyel* concluded that “forensic document examination, despite the existence of a certification program, professional journals and other trappings of science, cannot, after *Daubert*, be regarded as ‘scientific . . . knowledge.’”¹⁸⁸

C. Hair Sample Analysis

Likewise, hair analysis lacks scientific basis. Similar to the process of latent print examination, hair analysts look for a number of matching characteristics when making hair comparisons.¹⁸⁹ Hair analysts then state whether the unknown hair, when viewed under a microscope, is consistent with the known hair.¹⁹⁰ As with fingerprints, there has been a “scarcity of scientific studies regarding the reliability of hair comparison testing.”¹⁹¹ And, like fingerprint comparison, “there is no research to indicate with any certainty the probabilities that two hair samples are from the same individual . . .”¹⁹² Accordingly, as with fingerprints, “the evaluation of hair evidence remains subjective, the weight the examiner gives to the presence or absence of a particular characteristic depends upon the examiner’s subjective opinion.”¹⁹³ Given these various considerations, the U.S. District Court Judge in *Williamson* concluded that the court had been “unsuccessful in its attempts to locate *any* indication that expert hair comparison testimony meets *any* of the requirements of *Daubert*.”¹⁹⁴ Barry Scheck and his co-authors write that the judge’s skepticism about the reliability of hair comparison evidence was vindicated in 1999 when mitochondrial

187. *See id.* at 1038.

188. *Id.*

189. *Williamson v. Reynolds*, 904 F. Supp. 1529, 1553 (E.D. Okla. 1995) (“Hett [] testified that there are approximately 25 characteristics used in hair comparisons.”).

190. *Id.*

191. *Id.* at 1556.

192. *Id.* at 1558.

193. *Id.* at 1556.

194. *Id.* at 1558.

DNA tests proved that the hair experts in the *Williamson* case “were even worse than anyone suspected.”¹⁹⁵ DNA testing was conducted on all seventeen hairs that had been retrieved from the crime scene and that had been “matched” to Williamson and his co-defendant. The DNA testing revealed that all seventeen hairs were misidentified—not one single hair came from Williamson or the co-defendant.¹⁹⁶

IX. NON-JUDICIAL USE OF FINGERPRINT COMPARISONS

There have been no non-judicial applications of latent fingerprint comparisons. As David Ashbaugh has recognized, the use of fingerprints has been “under the control of the police community rather than the scientific community” and latent prints are used by law enforcement as a “tool for solving crime.”¹⁹⁷

The picture that has emerged from the analysis of fingerprint comparison evidence is a very disturbing one. It is a picture of poorly trained law enforcement fingerprint examiners making extremely subjective determinations in the absence of any uniform standards and in the absence of any testing to validate the fundamental premises upon which the technique rests. Therefore, it should hardly be surprising that forensic science commentators have concluded that a “vote for science is a vote to exclude fingerprint expert opinions.”¹⁹⁸

X. SCIENCE, FINGERPRINTS, AND VERIFIABLE CERTAINTY

In the one case involving a challenge to fingerprint comparison evidence prior to *United States v. Llera Plaza*,¹⁹⁹ in which a federal court performed the type of analysis now mandated by *Daubert*, the court excluded the prosecution’s fingerprint identification evidence. In *United States v. Parks*,²⁰⁰ the Court excluded the proffered

195. SCHECK, ET AL., *supra* note 174.

196. *Id.* at 165.

197. ASHBAUGH, FRICTION RIDGE ANALYSIS, *supra* note 37, at 4.

198. Saks, *supra* note 70, at 1106.

199. 188 F. Supp. 2d 549 (E.D. Pa. 2002).

200. No. CR-91-358 JSL (C.D. Cal. 1991).

evidence after finding the latent print examiner's opinion of identification had no scientific basis.²⁰¹ The District Court in *Parks* reached its determination after hearing from three different fingerprint experts produced by the government in an effort to have the evidence admitted. The testimony of those government experts, however, virtually confirmed every argument set forth by the defense in opposition to the use of such expert testimony.

One of the prosecution's experts testified that her minimum standard for an identification of fingerprints is only eight points of similarity. This expert acknowledged that her standard was on the "low side" and that other examiners require ten or twelve points, or even more. The expert further acknowledged that no empirical studies had ever determined if two people might have the same fingerprint.²⁰²

The district court in *Parks* found the testimony of this expert to be disturbing because all the latent print examiners that had previously testified before the court had testified to higher minimum-point thresholds. The court stated:

This business of having a sliding scale—and this is a very high risk business, because I've had a lot of fingerprinting testimony, and it's been from the same group of people by and large, and my impression, correct me if you can—that it slides up and down, that if you have only 10 points, you're comfortable with 8, if you have 12, you're comfortable with 10, if you have 50, you're comfortable with 20.

. . . .

I've had them say that when they had 20 and 25, and say, "wouldn't be comfortable with less than 10," and they've thrown out some that were less than 10. Whether they were less than 8, I don't know. Suddenly I find that you come—being I think

201. *United States v. Parks*, No. CR-91-358 JSL (C.D. Cal. 1991). Citations also refer to the pages of the transcript of the hearing held on the motion. The three experts for the prosecution were Diana Castro, Freddie Underwood, and Michael Ames. Additional testimony was given by Darnell Carter and Stephen Kasarsky. At the time of publication, the district court opinion and transcripts in *Parks* were unavailable for citation purposes.

202. *Id.* at 541.

probably the most junior that's ever testified before me that I've ever permitted to testify as an expert—you are comfortable with fewer than anybody that has ever testified before me before, and as it happens, you also have fewer than anybody that's ever testified before me; that makes me very uncomfortable.²⁰³

The court then questioned the government regarding the minimum point standard required by experts writing in treatises about fingerprint identification.²⁰⁴ The Court was incredulous over the testimony that no such studies had been performed. With no studies, the court found, “then this is not a science and there are no experts in it.”²⁰⁵ In response to the court's concerns, the government called the expert's supervisor to testify regarding the standard in the industry. The supervisor's testimony, however, only succeeded in further revealing the unreliability of the evidence. He disclosed that, while the Los Angeles Police Department has a ten-point standard, which can slide down to eight with a supervisor's approval, the Los Angeles Sheriff's Department employs a twelve- to fifteen-point rule, and “if there was a survey taken, you would probably get a different number from every department that has a fingerprint section as to their lowest number for a comparison.”²⁰⁶ The supervisor further revealed, in a response to a direct question from the court, that no “literature” addresses this issue and that he was unaware why no uniform rule exists.²⁰⁷

After hearing this testimony, the District Court was only more convinced that the fingerprint evidence should be excluded. In an attempt to “resuscitate” the evidence, the government called yet a third fingerprint expert, Steven Kasarsky, a board-certified member of the IAI and an employee of the United States Postal Inspection Service.²⁰⁸ The court specifically questioned Kasarsky regarding the

203. *Id.* at 551-53.

204. *Id.* at 555.

205. *Id.*

206. *Id.* at 559-61.

207. *Id.* at 561.

208. *Id.* at 561, 567-68, 596.

“science” supporting fingerprint identifications.²⁰⁹ Kasarsky, however, could not provide a satisfactory response.

Kasarsky testified that “everyone in our field basically has independent standards.”²¹⁰ In response to a question from the court, Kasarsky acknowledged that misidentifications in the field had occurred, and he further acknowledged that no published studies regarding false identifications had ever been conducted. Kasarsky testified that he knew of instances where prints from two different people have had ten matching characteristics and that he personally had compared prints from different individuals possessing six points of similarity.²¹¹ Though Kasarsky testified that he was able to observe a dissimilarity between these prints that convinced him they had been made by two different people, he admitted that on other occasions a dissimilarity might go unseen given the partial nature of most latent prints. Accordingly, Kasarsky conceded that latent print examiners are in “dangerous territory” when making identifications on the basis of only eight points of similarity:

The Court: Unless you have a very clear full print, you can't rule out a dissimilarity someplace on it that you didn't have, and if you have only five or six, or seven or eight, you're in dangerous territory.

The Witness: Yes, Your Honor, because if you can't see the area that might have the dissimilarity, *one can only guess.*²¹²

After hearing Kasarsky's testimony, the District Court ruled that he would not admit the government's fingerprint evidence and commented on the scientific bankruptcy of the field:

You don't have any standards. As far as I can tell, you have no standard. It's just an *ipse dixit*. “This is unique, this is very unusual?” “How do you know it's unusual?” “Because I never

209. *Id.* at 576-92.

210. *Id.* at 584.

211. *Id.* at 599-600.

212. *Id.* at 600, 602 (emphasis added).

saw it before.” Where is the standard, where is the study, where is the statistical base that [has] been studied?

....

I have discovered . . . that there are very limited objective standards, and that the training in this area, if it exists, other than “I’ve done this for a long time and I’m teaching you what I know,” is almost nonexistent.

....

People that have done it teach each other. So far as I’ve heard from you, and so far I’ve heard from anybody, those kinds of studies that would turn this into a *bona fide* science simply haven’t been done.

....

The information is there, it could be done, but it hasn’t been done. There has been no study about how far qualified experts with existing prints could look at them and make a mistake on which kinds of things. That’s something that can be done. Those prints exist. It wouldn’t be hard for those studies to be made.

....

This thing could be turned into a science, but it isn’t now, not from what you’ve said, and not from what she said, and not from what her supervisor said.

....

Now I have heard a lot of conversation about what it takes to become an expert in this field, and I will say, based on what I’ve heard today, the expertise is fragile as any group that I’ve ever heard hold themselves out as experts.

....

The basis for calling themselves experts seems to me to be very fragile. The basic premise that they don’t need expertise, that fingerprints don’t change, doctors told them that. The other premise that they are unique is, I think, a matter of genetics, and also a matter not of fingerprint specialists. Those are givens in the expertise.

. . . .

The expertise that they have said that they possess, to say this is unique, I can't find, as I said, a common thread of analysis. It may be there, but I haven't heard it.²¹³

Having conducted a searching inquiry for the "science" of fingerprints, the District Court in *Parks* properly determined that no such science exists and that the government's fingerprint evidence did not possess sufficient reliability to warrant admission.

XI. THE CONSTITUTIONAL RIGHT TO A FAIR TRIAL AND FINGERPRINT COMPARISON EVIDENCE

Courts have consistently held that relevant evidence should be excluded if the probative value of the evidence is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury.²¹⁴ "Expert testimony, like any other testimony, may be excluded if, compared to its probative worth, it would create a substantial danger of undue prejudice or confusion."²¹⁵ The Georgia Court of Appeals reversed a trial judge's admission of expert testimony and held that "[a]ny probative value of the testimony was substantially outweighed by the danger of unfair prejudice. . . . In light of the unequivocal nature of the [expert witnesses'] conclusions, there was a real danger that the jurors perceived the expert's testimony as infallible."²¹⁶ As both state and federal courts have long recognized, expert testimony is extremely powerful and thus subject to extreme abuse. With regard to scientific experts, "jurors may be awed by an 'aura of special reliability and trustworthiness' which may cause undue prejudice, confuse the issues or mislead the jury."²¹⁷

213. *Id.* at 587, 591-92, 606-607.

214. *See, e.g.,* *United States v. Schmidt*, 711 F.2d 595, 599 (5th Cir. 1983).

215. *Id.*; *see also* *Adams v. State*, 499 S.E.2d 105 (Ga. Ct. App. 1998).

216. *Adams*, 499 S.E.2d at 111-12.

217. *Williamson v. Reynolds*, 904 F. Supp. 1529, 1557 (E.D. Okla. 1995) (quoting *United States v. Amaral*, 488 F.2d 1148, 1152 (9th Cir. 1973)); *see* *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579, 595 (1993) ("Expert evidence can be both powerful and quite misleading because of the difficulty of evaluating it."); *United States v. Starzecpyzel*, 880 F. Supp. 1027, 1048 (S.D.N.Y. 1995) ("[W]ith

The risk of undue prejudice and confusion is especially great when it comes to latent fingerprint identifications because it has been uncritically accepted by the American legal system for the past eighty years. As a result, the general public has come to firmly believe that fingerprint identifications are scientifically based and that they are invariably accurate. In a recent study of jurors' attitudes toward fingerprint evidence, 93% of the 978 jurors questioned expressed the view that fingerprint identification is a science, and 85% ranked fingerprints as the most reliable means of identifying a person.²¹⁸ As noted previously, however, these commonly held views are completely unwarranted. Latent fingerprint identifications are not scientifically supported and there are substantial questions regarding their reliability.

While realistically the probative value of the prosecution's fingerprint evidence is low, the danger of undue prejudice is extremely high given the likelihood that the jury will give the evidence considerably more weight than it deserves. The state's fingerprint evidence, therefore, should be excluded not only under the rules of evidence, but also because its probative value is outweighed by the unfair prejudicial value that such evidence presents.²¹⁹

A. Challenging Fingerprint Evidence in the Courtroom

Notwithstanding the asserted reliance upon the efficacy of the British system of oversight, attorneys representing the criminally-charged person must be vigilant in challenging the use and admissibility of fingerprint comparison evidence. On a practical note, counsel must develop a legal arsenal sufficient not only to

regard to scientific experts, a major rationale for *Frye*, and now *Daubert*, is that scientific testimony may carry an 'aura of infallibility.'" (quoting CHARLES T. MCCORMICK ET AL., MCCORMICK ON EVIDENCE § 203, at 608-09 (3rd ed. 1984)); see also John W. Strong, *Language and Logic in Expert Testimony: Limiting Expert Testimony by Restrictions of Function, Reliability and Form*, 71 OR. L. REV. 349, 361 n.81 (1992) ("There is virtual unanimity among courts and commentators that evidence perceived by jurors to be 'scientific' in nature will have particularly persuasive effect.").

218. Charles Illsley, *Juries Fingerprints and the Expert Fingerprint Witness*, presented at the International Symposium on Latent Prints (FBI Academy, Quantico, Virginia, July 1987).

219. See *Williamson*, 904 F. Supp. at 1558 (finding that the probative value of hair comparison evidence was substantially outweighed by its prejudicial effect).

invoke the gatekeeping role of the court, but also to develop a record upon which the appellate courts can make legitimate decisions.

The proper challenge to the use of fingerprint comparison evidence will not only involve challenging the “science” of fingerprint comparison. Attorneys must prepare and assert challenges to the qualifications of prosecution witnesses as well as the protocols by which they perform their duties. Courts usually strictly construe, against the defendant in a criminal prosecution, statutes and case law involving disputed evidentiary matters outside of the constitutional protections found in the Fourth and Fifth Amendments.

As a general proposition, if the government is using fingerprint comparison evidence for any purpose, counsel for the defendant must be prepared to assess and evaluate that evidence. To do this, counsel must be conversant with the terminology of fingerprint comparison methods and techniques. Counsel should develop a working library on this subject and keep that library updated with the most recent academic and professional literature.

Counsel must be prepared to fight for the discovery of all reports, field notes, bench notes, experiments and tests conducted by the government’s witnesses regarding the lifting of prints at the scene of the crime and the processing of the latent and known prints for comparison purposes. Counsel should request discovery of the procedures used in each individual case for the preservation and maintenance of prints, photographs, and tape lifts. Attorneys should demand access to activity logs of all those persons connected with the processing and analysis of the prints, including internal notes and memoranda between the technicians and their supervisors.

Discovery of all internal laboratory protocols relating to the lifting and processing of latent fingerprints will enable counsel to prepare his or her challenge. Counsel should demand any records of evaluations and supervised visits of all accrediting authorities related to the particular forensic laboratory that performed the processing and analysis of the prints. The defense attorney should make detailed checks of the background and training history of all government witnesses involved in the case. Counsel should not forget to include

in these checks all of the state actors, including crime-scene technicians, first-responding police officers, and paramedics. Defense counsel should be sure to obtain copies of certificates, diplomas, or other memorializations of classes and training sessions attended by witnesses. Counsel should make a name search in all of the cases in the specific jurisdictions in which the government witnesses have worked. Counsel should find and review any court transcripts of previous testimony given by a particular witness. The Internet and various list servers available to defense attorneys have made this process much easier than in the past.

Once counsel has made a thorough review of all the evidence available and an investigation into the background of the government's witnesses, he or she should file a pre-trial motion in limine seeking an order preventing particular witnesses from testifying as experts because of their lack of qualifications, training, or experience. A request for a pre-trial evidentiary hearing should accompany the motion.

If counsel is unsuccessful in excluding the testimony of particular government witnesses, he or she should file another motion in limine seeking an order preventing the prospective witnesses from giving testimony beyond their expertise. Quite frequently police officers and crime laboratory technicians will offer gratuitous testimony that is far beyond even their often marginal qualifications. The motion should also urge the court to prevent expert nomenclature from being applied to these witnesses.

Defense counsel should obtain funds (from the court if the criminally-charged person is indigent) to retain the services of independent experts who can review the evidence and assist counsel in preparing for the cross-examination of the government's witnesses. Counsel also needs funds to retain the services of experts to assist in the challenge to the admissibility of the government's evidence. Federal courts have consistently affirmed an accused person's right to have funds to secure the services of expert witnesses when the government's case against the defendant depends almost entirely upon

the testimony of one or two experts.²²⁰ Counsel should use every opportunity to challenge the underlying theories of fingerprint comparison evidence and the alleged expertise of those government witnesses who come into court to testify without satisfying the law's demand that such evidence first pass the test of scientific reliability.

CONCLUSION

The techniques relied upon by so-called experts in the field of fingerprint analysis are not scientifically reliable. There are no empirical test results, no known error rates, no peer review, and no standards governing the procedures. The techniques cannot be replicated and cannot be verified scientifically.

Judged by the standard of forensic application, the use of friction ridge characteristics to identify with absolute certainty a partial latent print certainly does not involve precise calculations in a way that preserves the constitutional presumption of a defendant's innocence. On the contrary, it *presumes* the fingerprint examiner's ability to determine the defendant's guilt with absolute certainty, even though, by the fingerprint profession's own admission, "this science grew by default."²²¹ A "science" which has proceeded by default in the absence of scientific knowledge and testing is the antithesis of a forensically reliable procedure as that term is used within our system of justice. By admitting fingerprint comparison evidence, courts are promoting and encouraging the government's substitution of "presumed but false certainty for truth."²²²

220. See, e.g., *Bradford v. United States*, 413 F.2d 467, 474 (5th Cir. 1969) ("It was therefore necessary, if [the defendant] was to combat this evidence, that he have the assistance of other handwriting and fingerprint experts."). Other circuits have used a similar approach. See *United States v. Durant*, 545 F.2d 823, 827-28 (2d Cir. 1976), for a case where the court reversed a conviction for the district court's refusal to appoint a fingerprint expert. The government's case, other than fingerprint evidence, consisted of the testimony of two accomplices who presumably were easily impeachable. In finding that the defendant should have been permitted the services of an expert, the court stated that it must be the policy of the courts to equalize the imbalance between the government and an indigent defendant. *Id.*; see also *United States v. Bass*, 477 F.2d 723, 725 (9th Cir. 1973).

221. ASHBAUGH, FRICTION RIDGE ANALYSIS, *supra* note 37, at 4.

222. Robert Epstein, *Fingerprints Meet Daubert: The Myth of Fingerprint "Science" is Revealed*, 75 S. CAL. L. REV. 605, 635 (2002) (citing David L. Grieve, *Possession of Truth*, 46 J. FORENSIC IDENTIFICATION 521, 524-25).

The proponent of the introduction of scientific evidence carries the burden of proof on such issues as reliability and trustworthiness. Rule 702 of the Federal Rules of Evidence provides that scientific testimonial evidence can only be admitted if it is “the product of reliable principles and methods.”²²³ The burden of establishing that reliability is clearly upon the proponents of fingerprint comparison evidence. If a court allows the admission of scientific evidence concerning fingerprint comparisons without clearly requiring that the proponent’s burden of proof be met, the court then denies the defendant his or her constitutional right to a fair trial.

Fingerprints can serve as an identifying characteristic, and new technology such as digitally enhanced photographs and expanded computer technology can assist in the development of fingerprint comparison techniques. However, the process is presently incomplete and imperfect and not worthy of admission in courts of law. As Peter Neufeld and Barry Scheck recently noted in an opinion editorial in the *New York Times*:

Forensic science has rarely been subjected to the kind of scrutiny and independent verification applied to other fields of applied and medical science. Instead, analysts testifying in courts about fingerprint analysis, bite marks, handwriting comparisons and the like have often argued that in their field the courtroom itself provided the test.²²⁴

Fingerprint comparison evidence should not be pawned off in the courtroom as a “science” until the methodology and the process have been thoroughly subjected to the rigors of scrutiny in the scientific community. The present state of training of fingerprint examiners and the lack of an ability to verify the results of fingerprint analysis can lead to grave errors that may result in the unconstitutional loss of liberty and lives.

223. FED. R. EVID. 702.

224. Peter Neufeld & Barry Scheck, *Will Fingerprinting Stand Up in Court?* N.Y. TIMES, Mar. 9, 2002, at A-15.

As noted by Professor Paul S. Milich:

We accept science in the courtroom because we have confidence in the methods and respect for the achievements of science. The law gives science a special status in the courtroom, one denied to astrologers, mystics, and others who practice alternative modes of knowledge . . . The law, in short, places great faith in scientific knowledge; the same kind of faith each of us shows when we step into an airplane or drive across a long bridge with little fear or doubt. Our faith in science is qualified by the recognition that there is a difference between established or proven science and scientific work that is still under review. Few of us would volunteer to be the first to fly in an airplane or cross a bridge that was so “experimental” that experts still were debating whether it would work.²²⁵

The criminal defense lawyer must ensure that fingerprint comparison evidence is used in a criminal prosecution only when it is the result of scientifically reliable analysis by a true expert and not the conjuring of a courtroom Merlin.

225. Paul S. Milich, *Controversial Science in the Courtroom: Daubert and the Law's Hubris*, 43 EMORY L.J. 913, 914-15 (1994).