
FINGERPRINTS MEET *DAUBERT*: THE MYTH OF FINGERPRINT “SCIENCE” IS REVEALED

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I. INTRODUCTION

For the past ninety years, law enforcement fingerprint examiners have been matching partial latent fingerprint fragments detected at crime scenes to inked fingerprints taken directly from suspects.¹ In many, if not most of these cases, the fingerprint identifications have been seen as dispositive of the defendant’s guilt. From the very outset, law enforcement has claimed that latent fingerprint identification is a science.² Over the years, this claim has achieved almost universal acceptance.³ Recently, however, some of the leading voices in the forensic science community have begun to question the scientific foundation of the fingerprint field and suggest that latent fingerprint identifications may not be nearly as reliable as people have long

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1. As discussed further below, the first American case in which latent fingerprint identification evidence was introduced was *People v. Jennings*, 96 N.E. 1077 (Ill. 1911). See *infra* text accompanying notes 47–50.

2. The claim of science was made, for example, in the first American fingerprint case, *People v. Jennings*, 96 N.E. 1077, 1083 (Ill. 1911). The claim is still being made today. For example, the FBI’s standard text in this area is entitled *The Science of Fingerprints*. FED. BUREAU OF INVESTIGATION, U.S. DEP’T OF JUSTICE, THE SCIENCE OF FINGERPRINTS (rev. ed. 1998). There is no factual explanation in that text, however, as to why fingerprint evidence is scientific, and only three pages of that text even concern the comparison and identification of latent fingerprints.

3. A survey, for example, of 978 jurors revealed that 93% of them believed that fingerprint identification is a science. Charles Illsley, *Juries, Fingerprints and the Expert Fingerprint Witness*, Presentation at the International Symposium on Latent Prints at the FBI Academy 16 (July 1987) (on file with author). Not coincidentally, 85% of those polled viewed fingerprints as the most reliable means of identification. *Id.*

assumed.⁴ Indeed, some commentators have even gone so far as to suggest that fingerprint experts are vulnerable to challenge pursuant to the Supreme Court's seminal decision⁵ in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*⁶ Defense attorneys have started to pick up on these suggestions. To date, there have been at least ten *Daubert* challenges filed in federal courts seeking to preclude fingerprint examiners from testifying.⁷ But, while these challenges have been the subject of much recent media attention,⁸ there has not yet been a comprehensive treatment of this issue in the academic literature. This Article constitutes a first attempt at filling that void.

4. See, e.g., Michael J. Saks, *Merlin and Solomon: Lessons from the Law's Formative Encounters with Forensic Identification Evidence*, 49 HASTINGS L.J. 1069, 1105-06 (1998) ("Although in principle fingerprint identification depends upon an objective, probabilistic inquiry, its practitioners use no probability models and have no probability data to use. They rely on intuition and assumptions that have not been tested rigorously . . ."); David Stoney, *Fingerprint Identifications*, in MODERN SCIENTIFIC EVIDENCE: THE LAW AND SCIENCE OF EXPERT TESTIMONY § 21-2.3.1, at 72 (David L. Faigman et al. eds., 1997) [hereinafter MODERN SCIENTIFIC EVIDENCE] (asserting that "there is no justification [for fingerprint identifications] based on conventional science: no theoretical model, statistics or an empirical validation process").

5. See, e.g., Saks, *supra* note 4, at 1106.

When and if a court agrees to revisit the admissibility of fingerprint identification evidence under *Daubert*, the *Daubert* approach—that courts may admit scientific evidence only if it meets contemporary standards of what constitutes science—is likely to meet its most demanding test: A vote to admit fingerprints is a rejection of conventional science as the criterion for admission. A vote for science is a vote to exclude fingerprint expert opinions.

Id. See also Malcolm Ritter, *Fingerprints Cast in Doubt by Some As Good Evidence*, L.A. TIMES, Apr. 11, 2001, at A19 (quoting David Faigman, a professor at Hastings College of Law, who stated that, "within the next year, if not within the next six months, some judge somewhere in the country will write an opinion excluding fingerprinting . . . It's inevitable. The research is just too thin to let it in.").

6. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).

7. The author of this article brought the first such challenge in the case of *United States v. Mitchell*, No. Crim. 96-407 (E.D. Pa. Feb. 2000) (denying the challenge without a written opinion following a five-day *Daubert* hearing). Other cases in which *Daubert* challenges were filed include: *United States v. Ramsey*, No. 01-005-05 (E.D. Pa. 2001); *United States v. Cheshier*, No. IP01-01-CR-01-T/F, 2001 U.S. Dist. LEXIS 22516 (S.D. Ind. 2001); *United States v. Joseph*, 2001 WL 515213 (E.D. La. May 14, 2001); *United States v. Ressam*, No. CR99-666C (W.D. Wash. 2001); *United States v. Martinez-Cintrón*, 136 F. Supp. 2d 17 (D. P.R. 2001); *United States v. Rogers*, No. CR-90-1BR (E.D. N.C. 2000); *United States v. Havvard*, 117 F. Supp. 2d 848 (S.D. Ind. 2000); *United States v. Obanion*, No. DKC-98-0442 (N.D. Md. 2000); *United States v. Alteme*, No. 99-8131 (S.D. Fla. 2000). See http://onin.com/fp/daubert_links.html for a fingerprint examiner's compilation and assessment of recent legal challenges to fingerprints.

8. See, e.g., Editorial, *Fingerprints in the Dock*, NEW SCIENTIST, June 16, 2001, at 3; *Fingerprints, the Touchstone of Forensic Science, Have Never Been Subjected to Proper Scientific Scrutiny*, ECONOMIST, Dec. 16, 2000, at 115; Andy Newman, *Fingerprinting's Reliability Draws Growing Court Challenges*, N.Y. TIMES, Apr. 7, 2001, at A8; Malcolm Ritter, *Fingerprints' Accuracy on Trial*, L.A. TIMES, Apr. 8, 2001, at A1 (printing AP story that was picked up by numerous papers and internet sites across the country).

Part II of this Article will examine the basics of latent fingerprint identification evidence. Part III explores the legal history of its acceptance. A brief discussion of the Supreme Court's decisions in *Daubert* and *Kumho Tire Co. v. Carmichael*⁹ will follow in Part IV, along with a thorough analysis in Part V as to how fingerprint evidence stands up under the test for admissibility set forth in those decisions. As this Article will demonstrate, fingerprint analysis fails each and every one of the Supreme Court's suggested criteria for admission. The myth that there is a "science of fingerprints" will thus be exposed for what it really is: an unfounded creation of law enforcement fingerprint examiners. Finally, Part VI examines some of the recent cases that have considered the admissibility of fingerprint evidence.

II. THE BASICS OF LATENT FINGERPRINT IDENTIFICATION EVIDENCE

Fingerprints are impressions of the ridged skin surface of the fingers and palm.¹⁰ Fingerprint identifications in criminal cases are typically made from small distorted fingerprint fragments detected at crime scenes. These fragments are commonly referred to as "latent fingerprints." The Department of Justice ("DOJ") has recently suggested that the average size of a latent fingerprint fragment is only one-fifth the size of a full fingerprint.¹¹ After a latent fragment is detected at a crime scene, it is then compared by a fingerprint examiner with inked or digitally scanned fingerprints taken directly from a suspect's fingers. An examiner makes an identification if he or she believes there is a sufficient number of common "ridge characteristics," both in terms of type and location, between the latent and inked print under comparison.¹² The ridge characteristics are

9. *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999).

10. Stoney, *supra* note 4, § 21-2.1.2, at 62.

11. This representation was made by a government expert on the basis of an experiment that was conducted on latent fingerprint fragments. The expert's testimony was presented in the case of *United States v. Mitchell*. See Record at 96, *United States v. Mitchell* (E.D. Pa. July 9, 1999) (No. 96-407) (testimony of Donald Ziesig). There are no published studies regarding the actual or average size of latent fingerprints.

12. FED. BUREAU OF INVESTIGATION, U.S. DEP'T OF JUSTICE, LAW ENFORCEMENT BULLETIN: AN ANALYSIS OF STANDARDS IN FINGERPRINT IDENTIFICATION 1 (June 1972) [hereinafter FBI, FINGERPRINT IDENTIFICATION]. Ridge characteristics are also referred to as "ridge details," "points of similarity" and "Galton details." SIMON A. COLE, SUSPECT IDENTITIES: A HISTORY OF FINGERPRINTING AND CRIMINAL IDENTIFICATION 79 (2001).

points along the ridge path where something dramatic occurs: For example, the ridge might come to an end or bifurcate into two ridges.¹³

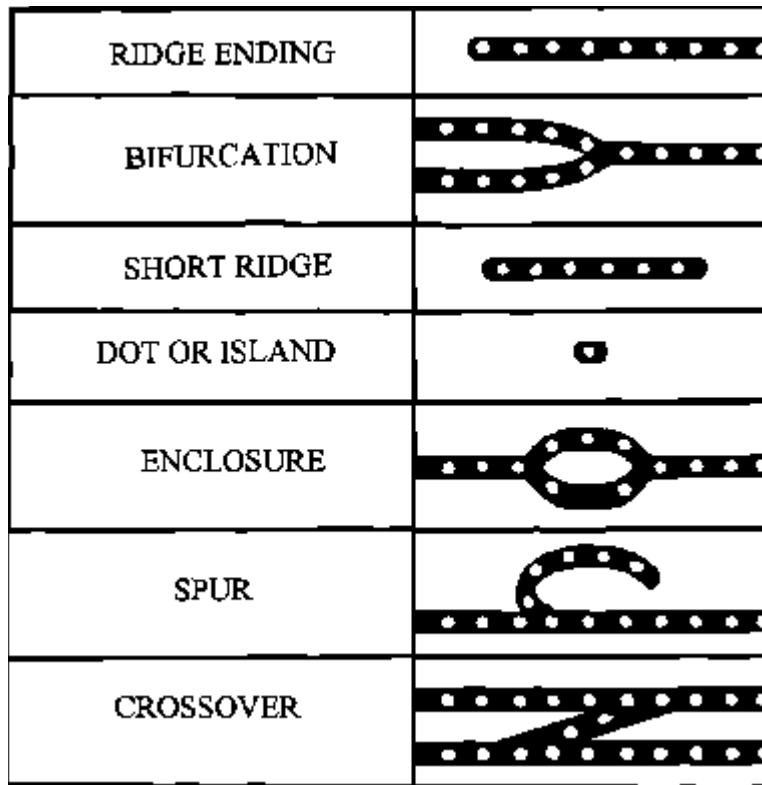
An average human fingerprint contains between seventy-five and 175 ridge characteristics.¹⁴ These ridge characteristics generally consist of a few different types, although there is no standard agreement among fingerprint examiners as to either the precise number or nomenclature of the different characteristics.¹⁵ The ridge characteristics most commonly referred to are: 1) islands, also referred to as dots, which are single independent ridge 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 a 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.¹⁶ Illustrations of these various characteristics are provided in the following box.

13. See DAVID R. ASHBAUGH, QUANTITATIVE-QUALITATIVE FRICTION RIDGE ANALYSIS: AN INTRODUCTION TO BASIC AND ADVANCED RIDGEOLOGY, 138–39, 141 (1999).

14. FBI, FINGERPRINT IDENTIFICATION, *supra* note 12, at 1.

15. See JAMES F. COWGER, FRICTION RIDGE SKIN: COMPARISON AND IDENTIFICATION OF FINGERPRINTS 143 (1983) (“The terms used to define and describe these characteristics vary markedly among writers in the field and differ even among examiners depending upon the organization in which they were trained.”); John Berry & David A. Stoney, *History and Development of Fingerprinting*, in ADVANCES IN FINGERPRINT TECHNOLOGY 2–3 (Henry C. Lee & Robert E. Gaensslen eds., 2d ed. 2001) (illustrating seven basic ridge characteristics, while acknowledging that “[s]ome authorities consider that only two types of characteristics are present”).

16. See ASHBAUGH, *supra* note 13, at 139–40; Berry & Stoney, *supra* note 15, at 2–3.



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While some occasional research has been conducted with respect to the relative frequencies with which these and other characteristics occur,¹⁷ no weighted measures of the characteristics have ever been adopted by fingerprint examiners on the basis of these studies. Research, moreover, has shown that different fingerprint examiners hold widely varying opinions regarding which characteristics appear most commonly.¹⁸

All prints, both inked and latent, are subject to various types of distortions and artifacts.¹⁹ The most common is pressure distortion, which

17. See, e.g., James W. Osterburg, *Fingerprint Probability Calculations Based on the Number of Individual Characteristics Present*, IDENTIFICATION NEWS, Oct. 1974, at 4, 7.

18. See James W. Osterburg, *An Inquiry into the Nature of Proof*, 9 J. FORENSIC SCI. 413, 425 (1964) (concluding that a fingerprint examiner's "subjective evaluation of the significance to be attached to a fingerprint characteristic is suspect").

19. David R. Ashbaugh, *The Premises of Friction Ridge Identification, Clarity and the Identification Process*, 44 J. FORENSIC IDENTIFICATION 499, 513 (1994).

occurs when the print is being deposited.²⁰ Other types of distortion can be caused by the shape of the surface on which the print has been deposited and by the media used to develop and lift the print.²¹ Significantly, distortion can cause a ridge characteristic to appear as something other than what it really is.²² For example, powder used to develop a latent print may cause a ridge ending to appear as a bifurcation.²³ No study has been conducted to determine the frequency with which such distortions occur.

Latent fingerprint fragments found at crime scenes are often very distorted.²⁴ Given the limited size of these latent prints, and given the amount of distortion that many latent prints suffer, fingerprint examiners often are in the position of making identifications on the basis of fifteen or fewer visible ridge characteristics.²⁵

As discussed in greater detail below,²⁶ there is considerable disagreement among fingerprint examiners as to how many common ridge characteristics should be found before an identification is made. Examiners historically have employed identification standards ranging from between eight and sixteen matching characteristics, or “points of similarity.”²⁷

20. *Id.*

21. See ASHBAUGH, *supra* note 13, at 114–23.

22. See *id.* at 121; David A. Stoney & John I. Thornton, *A Critical Analysis of Quantitative Fingerprint Individuality Models*, 31 J. FORENSIC SCI. 1187, 1193 (1986).

23. ASHBAUGH, *supra* note 13, at 120–21.

24. ANDRE MOENSSENS, JAMES E. STARRS, CAROL E. HENDERSON, & FRED E. INBAU, *SCIENTIFIC EVIDENCE IN CIVIL AND CRIMINAL CASES* § 8.08, at 514 (4th ed. 1995). “Many latent impressions developed at crime scenes are badly blurred or smudged, or consist of partially superimposed impressions of different fingers.” *Id.*

25. In the following published decisions, for example, identifications were made on less than fifteen points of similarity: *United States v. Durant*, 545 F.2d 823, 825 (2d Cir. 1976) (fourteen points); *Garrison v. Smith*, 413 F. Supp. 747, 761 (N.D. Miss. 1976) (twelve points); *Magwood v. State*, 494 So.2d 124, 145 (Ala. Crim. App. 1985) (eleven points); *Ramirez v. State*, 542 So.2d 352, 353 (Fla. 1989) (ten points); *People v. Alexander*, 571 N.E.2d 1075, 1078 (Ill. App. Ct. 1991) (eleven and fourteen points); *People v. Garlin*, 428 N.E.2d 697, 700 (Ill. App. Ct. 1981) (twelve points); *State v. Murdock*, 689 P.2d 814, 819 (Kan. 1984) (twelve points); *State v. Starks*, 471 So.2d 1029, 1032 (La. Ct. App. 1985) (twelve points); *People v. Jones*, 344 N.W.2d 46, 46 (Mich. Ct. App. 1983) (ten points); *State v. Jones*, 368 S.E.2d 844, 846 (N.C. 1988) (ten points); *State v. Cepec*, 1991 WL 57237, at *1 (Ohio Ct. App. 1991) (eleven points); *Commonwealth v. Ware*, 329 A.2d 258, 276 (Pa. 1974) (nine points); *Commonwealth v. Hunter*, 338 A.2d 623, 624 (Pa. Super. Ct. 1975) (fourteen points); *Commonwealth v. Walker*, 116 A.2d 230, 234 (Pa. Super. Ct. 1955) (four points); *State v. Awiis*, 1999 WL 391372, at *7 (Wash. Ct. App. 1999) (eight points). In the vast majority of published decisions involving fingerprint identifications, no mention is made as to how many points of similarity were identified.

26. See *infra* Part V.C.

27. See generally Christophe Champod, *Numerical Standards and “Probable” Identifications*, 45 J. FORENSIC IDENTIFICATION 136, 138 (1995) (setting forth numerical standards that are utilized in different countries).

Many examiners, however, including those at the FBI, currently 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 to the subjective judgment of the individual examiner.²⁸

It has been well documented that fingerprints from different people can share a limited number of ridge characteristics in common. Israeli fingerprint examiners, for example, have found fingerprints from two different people that contain seven matching ridge characteristics.²⁹ As these examiners candidly acknowledge, "an expert with many years of experience behind him" could make a false identification when comparing two such prints.³⁰ No scientific study has been performed that reasonably indicates the probabilities of fingerprints from different people having varying numbers of matching ridge characteristics.³¹

28. See FBI, FINGERPRINT IDENTIFICATION, *supra* note 12, at 6. Some latent print examiners look for additional identifying features beyond the basic ridge characteristics when comparing fingerprints, such as sweat pores and small edges on ridges. See ASHBAUGH, *supra* note 13, at 143. These features are sometimes referred to as third level details. *Id.* Level two detail is comprised of the traditional ridge characteristics such as those described above. See *infra* text accompanying notes 14–16. The first level of detail refers to the overall pattern design of the fingerprint, what is commonly referred to as loops, arches, or whorls. ASHBAUGH, *supra* note 13, at 137. There is considerable disagreement among fingerprint examiners as to the reliability of making identifications on the basis of third level detail. See COWGER, *supra* note 15, at 143 (Because "prints of friction skin are rarely so well recorded . . . comparison of pores or edges is only rarely practical"); FBI, FINGERPRINT IDENTIFICATION, *supra* note 12, at 3 ("Writers on fingerprints quite frequently mention the value of poroscopy in effecting identifications where only a few characteristics are present. FBI technicians know of no case in the United States in which pores have been used in the identification of fragmentary impressions."); John Thornton, Setting Standards in the Comparison and Identification, Presentation at the 84th Annual Training Conference of the California State Division of International Association for Identification 8 (May 9, 2000) (transcript available at <http://www.latent-prints.com/Thornton.htm>) ("Identifications based on level three detail have yet to be rigorously tested either in a scientific venue or in court."); Dusty Clark, What Is the Point, http://www.latent-prints.com/id_criteria_jdc.htm.

There is such a degree of variation of appearance in the third level detail due to pressure, distortion, over or under processing, foreign or excessive residue on the fingers, surface debris and surface irregularity, to name a few. The repeatability of the finite detail that is utilized in the comparison process has never been subjected to a definitive study to demonstrate that what is visible is actually a true third level detail or an anomaly.

Id.

29. Y. Mark & D. Attias, *What Is the Minimum Standard of Characteristics for Fingerprint Identification?*, 22 *Fingerprint Whorld* 148, 148 (Oct. 1996).

30. *Id.* at 150.

31. During the course of the past century, about a dozen or so fingerprint probability models have been proposed. See Stoney, *supra* note 4, § 21-2.3.1, at 72; Stoney & Thornton, *supra* note 22, at 1187. "None of these [models] even approaches theoretical adequacy, however, and none has been subjected to empirical validations." Stoney, *supra* note 4, § 21-2.3.1, at 72. Accordingly, "these models occupy no role in the routine professional practice of fingerprint examination." *Id.* (emphasis in original).

Lacking any such probability studies, latent print examiners do not offer opinions of identification in terms of probability. Indeed, latent print examiners are prohibited from doing so by the rules of their primary professional association, the International Association for Identification (“IAI”).³² Instead, latent print examiners make the claim of “absolute certainty” for their identifications.³³ In other words, examiners opine that the latent print at issue was made by a particular finger to the exclusion of all other fingers in the world.³⁴ But, fingerprint examiners themselves have recognized that such assertions of absolute certainty are inherently unscientific. For example, one leading law enforcement fingerprint examiner has noted:

[I]mposing 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. . . . [T]his categorical requirement of absolute

32. See *Resolution VII*, IDENTIFICATION NEWS (Int’l Ass’n for Identification, New Hartford, N.Y.), Aug. 1979, at 1 (resolving “that any member, officer or certified latent print examiner who provides oral or written reports, or gives testimony of possible, probable, or likely friction ridge identification shall be deemed to be engaged in [unbecoming] conduct . . . and charges may be brought”).

33. David L. Grieve, *Possession of Truth*, 46 J. FORENSIC IDENTIFICATION 521, 527–28 (1996). Examiners have historically been taught that they are testifying not to their opinions, but to scientific fact that cannot be properly contradicted. One writer, for example, asserts that:

The identification of a person by his finger prints or their impression . . . must not be confused with ‘palmistry’ that pretended art by which the charlatan and faker for a consideration pretends that he can foretell future events. Nor is it to be confounded with the operations of the Handwriting Expert, who is only able at the best to give AN OPINION as to the possibility of two writings having been made by the same person. It has no connection with the Bertillon System of identification, which depends upon measurements taken from certain members and portions of the human body, relying especially upon the length of certain bones.

Any or all of these methods are subject to error, and there is always an element of doubt in their findings that make their conclusions unreliable. . . . The finger print expert has only facts to consider; he reports simply what he finds. . . . If two prints are identical in every particular, they were made by the same person. If they are different, they were not made by the same person.

No matter how many finger print experts may be engaged in the labor of comparing two prints, their verdict *must* be the same.

A.A. Gribben, *How the Finger Print Expert Presents His Case in Court*, FINGERPRINT MAGAZINE, Aug. 1919, at 10, 11–12 (emphasis in original). Another text states:

The testimony of a finger print expert is not subject to contradiction by another finger print expert, for the reason . . . that the print is from the person; while in cases of testimony by handwriting experts there is always a possibility of contradiction, because the identification of handwriting is merely the opinion of a person who has made a study of detecting similarities in the formation of letters; and another expert, who is just as competent, might not agree with the conclusions of the first expert, thus giving cause for doubt.

FREDERICK KUHNE, *THE FINGER PRINT INSTRUCTOR*, at iv (1927). Examiners are still being taught the same lesson today. See, e.g., Robert J. Hazen & Clarence E. Phillips, *The Expert Fingerprint Witness*, in *ADVANCES IN FINGERPRINT TECHNOLOGY*, *supra* note 15, at 390 (“The fingerprint expert is unique among forensic specialists. Because fingerprint science is objective and exact, conclusions reached by fingerprint experts are absolute and final.”).

34. See ASHBAUGH, *supra* note 13, at 103.

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.³⁵

The notion that a latent fingerprint fragment can be identified to the exclusion of all other fingers in the world stems from the fingerprint field's basic premise that no two people in the world have the same fingerprints. But, as discussed further below, this is a premise that, though fervently subscribed to by all fingerprint examiners, has never been scientifically established.³⁶ Even assuming, moreover, that it is true that no two people in the world have the same fingerprint, this premise is logically flawed when it comes to the identification of latent fingerprint fragments. It simply does not follow from that premise that a fingerprint examiner can reliably make an identification from a small distorted fingerprint fragment that might reveal only a small number of ridge characteristics.³⁷ As discussed above, fingerprints from different people can have a limited number of characteristics that appear to match. Furthermore, fingerprint examiners in making their comparisons must rely on the "naked eye . . . along with their judgment to decide when two things are alike or different."³⁸ Thus, even if all fingerprints are in some sense unique, the undisputable reality remains that fingerprint examiners sometimes make

35. Grieve, *supra* note 33, at 527–28.

36. See *infra* text accompanying notes 107–119.

37. See COLE, *supra* note 12, at 260 (observing that "the contention that no two complete single fingerprint patterns are exactly alike did not address the issue fundamental to forensic identification: how great is the likelihood that a latent fingerprint impression might mistakenly be matched to the wrong source finger"); Saks, *supra* note 4, at 1090 (noting that "[e]ven if forensic 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"). David Stoney frames the issues in a recent publication:

The . . . premise [of] uniqueness . . . is also irrelevant. We are concerned with comparison of two printed reproductions of this skin surface. What amount of detail is reliably retained in a print? Can we recognize it? Can we accurately determine correspondence in this detail? How reliably can we form conclusions from the correspondence?

David A. Stoney, *Measurement of Fingerprint Individuality*, in ADVANCES IN FINGERPRINT TECHNOLOGY, *supra* note 15, at 331.

38. Saks, *supra* note 4, at 1087 n.85. See also Stoney, *supra* note 4, § 21-2.1.2(3)(c), at 65 ("In fingerprint comparison judgments of correspondence and the assessment of differences are wholly subjective: there are no objective criteria for determining when a difference may be explainable or not.").

false identifications.³⁹ Accordingly, the fundamental question in fingerprint analysis is one of reliability, not uniqueness.⁴⁰

III. HOW DID LATENT FINGERPRINT EVIDENCE INITIALLY COME TO BE ACCEPTED?

Law enforcement began to make use of fingerprints in the late 1890s as a means of connecting criminal offenders with their prior offenses.⁴¹ This was accomplished much the same way that it is today by taking a full set of inked fingerprints, a “ten print card,” from an individual upon his arrest, classifying that card, and then storing it, so that with each new arrest a search could be made to ascertain whether the arrestee had previously been arrested. The theory underlying this practice was that no two people in the world possessed identical sets of ten fingerprints.

After several years of utilizing complete sets of fingerprints in this manner, law enforcement made the significant leap of attempting to solve crimes on the basis of latent fingerprint fragments detected at crime scenes.⁴² At the time, this development was seriously questioned by one of the leading pioneers of fingerprint analysis, Henry Faulds.⁴³ As Faulds recognized, while it may be the case that no two people possess a matching full set of ten fingerprints, it does not follow that an identification can reliably be made from a single fingerprint fragment detected at a crime scene.⁴⁴ These concerns, however, fell upon deaf ears.⁴⁵

39. See *infra* note 152 and accompanying text.

40. Christophe Champod & Ian W. Evett, *A Probabilistic Approach to Fingerprint Evidence*, 51(2) J. FORENSIC IDENTIFICATION 101, 115 (2001) (noting that “the crux of the matter is not the individuality of the friction skin ridges but the ability of the examiner to recognize sufficient information for the disclosure of identity from a small distorted latent fingerprint fragment that may reveal only limited information in terms of quantity or quality”). The logical fallacy of the uniqueness premise can perhaps best be appreciated through a simple analogy. Let’s assume that everyone in the world has a unique face. No two people look exactly alike. Does it follow from that premise that eyewitnesses to crimes never make misidentifications? Of course not. It unfortunately happens quite frequently. And one of the reasons it happens is that eyewitnesses only get a partial look at the perpetrator of the crime. Likewise, a fingerprint examiner gets only a partial look at the fingerprint. The examiner only sees a distorted fingerprint fragment that on average is one-fifth the size of a full fingerprint. See *supra* note 11 and accompanying text.

41. Simon Cole, *What Counts for Identity? The Historical Origins of the Methodology of Latent Fingerprint Identification*, 12 SCI. CONTEXT 139, 151 (Spring 1999).

42. See COLE, *supra* note 12, at 168.

43. HENRY FAULDS, GUIDE TO FINGERPRINT IDENTIFICATION 5 (1905).

44. “Repeat patterns in single fingers are often found which come so near, the one to the other, that the least smudginess in the printing of them might easily veil important divergences in one or two lineations, with appalling results. I can hardly emphasize this point too strongly.” *Id.*

45. Cole, *supra* note 41, at 156.

As other legal commentators have recognized, the early latent fingerprint cases in this country are notable for the "meager judicial scrutiny" that was given to this new form of expertise.⁴⁶ Illinois, New Jersey, and New York were the first three states to address the admissibility of latent fingerprint identification evidence in 1911, 1914, and 1915, respectively.⁴⁷ In examining these first three cases, it is interesting to consider the rules of admissibility that were then being applied by courts when deciding whether expert testimony should be permitted.

In the Illinois case, *People v. Jennings*, the Supreme Court of Illinois wrote that "[e]xpert testimony is admissible when the subject-matter of the inquiry is of such a character that only persons of skill and experience in it are capable of forming a correct judgment as to any facts connected therewith."⁴⁸ Applying this rather loose standard, the court upheld the admissibility of the fingerprint examiner's testimony. The court found that "the classification of finger print impressions and their method of identification is a science requiring study . . . [which] does not come within the common experience of all men of common education in the ordinary walks of life."⁴⁹ However, while characterizing fingerprint identification as a science, the court never pointed to any scientific studies that had ever been conducted in the fingerprint field that would indicate that a fingerprint examiner can reliably make an identification from a latent fingerprint fragment found at a crime scene.⁵⁰

New Jersey and New York, the next two states to consider the issue, appeared to apply a slightly different rule of admissibility, one that can be characterized as "let it all in and let the jury figure out how much weight to give it." The New Jersey court, for example, in affirming the trial court's admission of the evidence, stated that "the weight of [the fingerprint examiners'] testimony and its importance as evidence in the case, [was] quite properly left to the jury to determine."⁵¹ Likewise, the New York Court of Appeals wrote:

46. MODERN SCIENTIFIC EVIDENCE, *supra* note 4, § 21-1.0, at 51.

47. *People v. Jennings*, 96 N.E. 1077 (Ill. 1911); *State v. Cerciello*, 90 A. 1112 (N.J. 1914); *People v. Roach*, 109 N.E. 618 (N.Y. 1915).

48. *Jennings*, 96 N.E. at 1082.

49. *Id.* at 1083.

50. As noted in *Modern Scientific Evidence*:

Nowhere in the opinion, however, does the court articulate the basis of the expertise it is evaluating, or discuss any scientific evidence in support of the expertise, or illuminate the technique's theoretical premises, or explain why one should believe that fingerprint examiners can do what they claim they have the ability to do.

MODERN SCIENTIFIC EVIDENCE, *supra* note 4, § 21-1.0, at 52-53.

51. *Cerciello*, 90 A. at 1114.

The evidence of the expert as to the identity of the finger prints of the defendant, with the blood marks found . . . upon the clapboards of the house, was a proper subject for the consideration of the jury. The weight to be given to this evidence was for the jury, not the court, to determine.”⁵²

As in *Jennings*, neither of these two appellate courts appeared to be concerned about the reliability of the fingerprint examiner’s opinion. To the contrary, the New York court explicitly stated, “[t]he fact that error may sometimes result in effecting identification by this means affords no reason for the exclusion of such evidence.”⁵³ In making this rather unsettling proclamation, the court never asked or answered the question of how often latent fingerprint identification error might be expected to occur.

Instead of analysis in these first three fingerprint opinions, what we have is an almost religious faith in the progress of “science.” The New Jersey court, for example, wrote:

In principle [a fingerprint’s] admission as legal evidence is based upon the theory that the evolution in practical affairs of life, whereby the progressive and scientific tendencies of the age are manifest in every other department of human endeavor, cannot be ignored in legal procedure, but that the law, in its efforts to enforce justice by demonstrating a fact in issue, will allow evidence of those scientific processes which are the work of educated and skillful men in their various departments, and apply them to the demonstration of a fact, leaving the weight and effect to be given to the effort and its results entirely to the consideration of the jury.⁵⁴

The fingerprint cases that followed in the wake of these first three decisions offered little in the way of additional analysis. Rather, they simply piggy-backed on what had already been decided; the judges apparently believed that if fingerprint evidence was good enough for these other states, then it must be good enough for their states as well. In the 1918 case of *McGarry v. State*,⁵⁵ for example, the Court of Criminal Appeals of Texas adopted verbatim the opinion of the Supreme Court of Illinois in *Jennings*.⁵⁶ Three years later, the Supreme Court of Arizona declared, without offering any analysis of its own, that it is “well settled . . . in this country” that latent fingerprint identification evidence is

52. *Roach*, 109 N.E. at 623.

53. *Id.*

54. *Cerciello*, 90 A. at 1114.

55. *McGarry v. State*, 200 S.W. 527 (Tex. Crim. App. 1918).

56. *See id.* at 528–30.

admissible.⁵⁷ A similar sentiment was expressed by the high court of Connecticut in 1927.⁵⁸ By the end of the 1930s, fingerprint identification evidence had explicitly been accepted by all but five states.⁵⁹ In not one of these opinions, however, did a court consider the essential question of the reliability of latent fingerprint identifications.

IV. THE LEGAL STANDARD TODAY—*DAUBERT* AND *KUMHO*

A. *DAUBERT V. MERRELL DOW PHARMACEUTICALS, INC.*⁶⁰

Considerable academic debate has surfaced about the meaning and impact of the Supreme Court's decision in *Daubert*.⁶¹ There is no question, however, that the *Daubert* decision requires far greater scrutiny of expert testimony than that provided in any of the early fingerprint cases discussed above.

The essence of the *Daubert* decision is that Federal Rule of Evidence 702⁶² requires trial judges to act as gatekeepers, excluding expert opinions that lack sufficient reliability.⁶³ Specifically addressing the issue of

57. Moon v. State, 198 P. 288, 290 (Ariz. 1921).

58. See State v. Chin Lung, 139 A. 91, 99 (Conn. 1927) (asserting that "[t]he utility of finger print evidence as a system of identification is universally admitted in this country").

59. MODERN SCIENTIFIC EVIDENCE, *supra* note 4, § 21-1.0, at 51 & n.9.

60. 509 U.S. 579 (1993).

61. Compare David L. Faigman, Elise Porter & Michael J. Saks, *Check Your Crystal Ball at the Courthouse Door, Please: Exploring the Past, Understanding the Present, and Worrying About the Future of Scientific Evidence*, 15 CARDOZO L. REV. 1799 (1994) (arguing that *Daubert* generally raises bar on admissibility), with Arvin Maskin, *The Impact of Daubert on the Admissibility of Scientific Evidence: The Supreme Court Catches Up With a Decade of Jurisprudence*, 15 CARDOZO L. REV. 1929 (1994) (claiming that *Daubert* should be viewed as making admission easier). See also D. Michael Risinger, *Navigating Expert Reliability: Are Criminal Standards of Certainty Being Left on the Dock*, 64 ALB. L. REV. 99 (2000) (analyzing *Daubert*'s impact on civil and criminal cases); Saks, *supra* note 4, at 1078 (contending that *Daubert* makes admission harder for an established technique that has a weak scientific foundation, while making admission easier for a new methodology that has not yet achieved general acceptance but is based on valid science).

62. At the time *Daubert* was decided, Federal Rule of Evidence 702 provided:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.

FED. R. EVID. 702 (amended 2000). The Rule has since been amended in response to the *Daubert* decision so as to make explicit in the Rule what the Supreme Court had found to be implicit. The amendment does this by adding a new clause after the final word "otherwise," which states: "if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods and (3) the witness has applied the principles and methods reliably to the facts of the case." *Id.*

63. See *Daubert*, 509 U.S. at 592–93.

“scientific” experts, the *Daubert* Court held that trial judges must determine at the outset whether the “reasoning or methodology underlying the [expert] testimony is scientifically valid.”⁶⁴ As the Court recognized, in cases involving expert testimony that is purportedly based upon scientific knowledge, “*evidentiary reliability* will be based upon *scientific validity*.”⁶⁵

The *Daubert* Court suggested five factors that trial courts may consider in determining whether proffered expert testimony is scientifically valid. The first and most essential of these factors is whether the “theory or technique . . . can be (and has been) tested.”⁶⁶ As the Court recognized, empirical testing is the primary criterion 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. [T]he statements constituting a scientific explanation must be capable of empirical test. [T]he criterion of the scientific status of a theory is its falsifiability, or refutability, or testability.⁶⁷

A second and closely related factor that the *Daubert* Court suggested should “ordinarily” be considered is the “known or potential rate of error” of the particular technique.⁶⁸ In this regard, the Court cited *United States v. Smith*,⁶⁹ in which the Seventh Circuit surveyed studies concerning the error rate of spectrographic voice identification techniques.

A third factor noted by the Court is the “existence and maintenance of standards controlling the technique’s operation.”⁷⁰ As an example, the Supreme Court cited the Second Circuit’s opinion in *United States v. Williams*,⁷¹ in which the Second Circuit observed that the “International

64. *Id.* The experts at issue in *Daubert* were opining upon the question of whether the drug Bendectin is a cause of birth defects. *See id.* at 583.

65. *Id.* at 590 n.9 (emphasis in original). In the realm of science the terms “reliability” and “validity” have two distinct meanings. *Id.* Reliability refers to the extent to which a particular technique or methodology produces consistent results from its practitioners when they are asked to perform the same task. *Id.* Validity, on the other hand, refers to the extent to which the technique or methodology produces accurate answers. *Id.* The Supreme Court in *Daubert* correctly tied the issue of evidentiary reliability to scientific validity. Consistent with the Supreme Court’s decision, the term “reliability” is used throughout this article synonymously with the term “validity.”

66. *Id.* at 593.

67. *Id.* (internal quotations and citations omitted) (alterations in original).

68. *Id.* at 594.

69. *United States v. Smith*, 869 F.2d 348, 353–54 (7th Cir. 1989).

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

71. *United States v. Williams*, 583 F.2d 1194 (2d Cir. 1978).

Association of Voice Identification . . . requires that ten matches be found before a positive identification can be made."⁷²

Fourth, the *Daubert* Court held that "general acceptance" can . . . have a bearing on the inquiry."⁷³ "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.'"⁷⁴ As the Court recognized, "[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."⁷⁵

Finally, the *Daubert* Court suggested that an additional factor that may be considered "is whether the theory or technique has been subjected to peer review and publication."⁷⁶ As the Court recognized, "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."⁷⁷ Accordingly, "[t]he fact of publication (or lack thereof) in a peer reviewed journal [is] a relevant, though not

72. *Id.* at 1198. While the Supreme Court did not address the issue, there would seem to be a critical distinction between an objective standard that has been derived from scientific testing, designed to establish a safe and reliable standard, and an objective standard that is nothing more than a guess as to what a safe standard might be. As discussed *infra* Part V.C, the point standards that latent fingerprint examiners have historically employed have been recognized recently by a noted fingerprint practitioner to be based on nothing more than "educated conjecture." ASHBAUGH, *supra* note 13, at 2.

73. *Daubert*, 509 U.S. at 594. Prior to *Daubert*, the "general acceptance" test of *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923), was the prevailing standard in the majority of the Federal Circuits. *Id.* at 584-85.

74. *Id.* at 594 (quoting *United States v. Downing*, 753 F.2d 1224, 1238 (3d Cir. 1985)).

75. *Id.* (quoting *Downing*, 753 F.2d at 1238). The critical issue for a court in looking at the factor of general acceptance is how to define the "relevant scientific community." If the community is defined narrowly so as to include only the practitioners of the technique or methodology that is in question, then, of course general acceptance will be found. Accordingly, some courts have recognized that when considering the factor of general acceptance it is necessary to look beyond the practitioners of the technique that is under assessment to a more mainstream scientific community. *See, e.g.*, *Williamson v. Reynolds*, 904 F. Supp. 1529, 1558 (E.D. Okla. 1995) ("Not 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."); *United States v. Starzeczyzel*, 880 F. Supp. 1027, 1038 (S.D.N.Y. 1995) (observing that forensic document examiners "certainly find 'general acceptance' within their own community, but this community is devoid of financially disinterested parties, such as academics").

76. *Daubert*, 509 U.S. at 593.

77. *Id.*

dispositive, consideration in assessing the scientific validity of a particular technique or methodology on which an opinion is premised.”⁷⁸

In providing the above factors, 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.⁷⁹ The Court also noted that the reliability requirement of Rule 702 not only applies to novel scientific techniques, but to “well-established propositions” as well.⁸⁰ Accordingly, in the wake of *Daubert*, courts have begun to reassess other longstanding forensic identification techniques, such as forensic document examination and hair analysis, utilizing the criteria set forth in the Supreme Court’s opinion.⁸¹

B. *KUMHO TIRE CO. v. CARMICHAEL*⁸²

In the aftermath of *Daubert*, the federal courts found themselves divided over the question of whether the *Daubert* criteria, as set forth above, should be applied to expert testimony of a nonscientific nature.⁸³ As noted above, Federal Rule of Evidence 702 also allows for expert testimony that is based upon “technical, or other specialized knowledge.”⁸⁴ The Supreme Court in *Kumho* resolved this question, holding as an initial

78. *Id.* at 594. Peer review and publication could hardly be a dispositive factor. All kinds of disciplines might have some form of peer reviewed publications, including, for example, astrology. No one would suggest, however, that the predictions of astrologers are either scientific or reliable, just because such “data” was published in a peer review journal. In short, peer review publication is not determinative of science or reliability.

79. *Id.*

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

81. See, e.g., *Williamson v. Reynolds*, 904 F. Supp. 1529, 1558 (E.D. Okla. 1995) (holding that hair analysis does not satisfy the *Daubert* criteria and that the admission of an expert hair analyst’s testimony was erroneous) Indeed, since the *Daubert* and *Kumho* decisions, there has been a startling transformation in the judicial treatment of handwriting experts. Handwriting analysis was accepted by the courts of this country as a valid forensic identification technique even before fingerprint evidence. See *Saks*, *supra* note 4, at 1095–1101. However, six different federal trial judges have now precluded prosecution handwriting experts from giving expert opinions of authorship. As these courts have recognized, handwriting analysis fails each and every one of the *Daubert* criteria. See *United States v. Saelee*, 162 F. Supp. 2d 1097 (D. Alaska 2001); *United States v. Fujii*, 152 F. Supp. 2d 939 (N.D. Ill. 2000); *United States v. Rutherford*, 104 F. Supp. 2d 1190, 1194 (D. Neb. 2000); *United States v. Santillan*, 1999 WL 1201765, at *5 (N.D. Cal. Dec. 3, 1999) (No. CR-96-40169 DLJ); *United States v. Hines*, 55 F. Supp. 2d 62, 70–71 (D. Mass. 1999); Pre-Trial Transcript at *35, *United States v. McVeigh*, 1997 WL 47724 (D. Colo. Feb. 5, 1997) (No. 96-CR-68). For an excellent recent analysis of the handwriting cases, see D. Michael Risinger, *Defining the “Task at Hand”: Non-Science Forensic Science After Kumho Tire Co. v. Carmichael*, 57 WASH. & LEE L. REV. 767 (2000).

82. 526 U.S. 137 (1999).

83. *Id.* at 145–47.

84. FED. R. EVID. 702. See also *supra* note 62.

matter, that a district court's "gatekeeping" obligation to ensure that expert testimony is sufficiently "reliable" applies to all experts, not merely scientists.⁸⁵ Moreover, the Court held that the *Daubert* factors may properly be considered by a trial court in assessing nonscientific expert testimony to the extent that any or all of those factors are pertinent to the particular case.⁸⁶

The Court provided some guidance in this regard by considering the particular facts of the case before it. At issue in *Kumho* was the proffered testimony of the plaintiff's expert in tire failure analysis.⁸⁷ The expert opined that the right rear tire of the plaintiff's minivan had blown out because of a defect in its design or manufacture.⁸⁸ The expert reached this conclusion on the basis of a visual inspection of the tire in which he looked for the presence of four physical signs that would indicate that the blow out was caused by "overdeflection," i.e., underinflating the tire or causing it to carry too much weight.⁸⁹ He testified that unless he saw two of the four signs he was looking for, he would conclude that overdeflection did not occur and that a manufacturing or design defect had instead caused the blow-out.⁹⁰ As both the trial court and the Supreme Court recognized, however, neither the plaintiff nor his expert provided any indication that other experts in the industry use this two-factor test.⁹¹ Nor could they point to any articles or papers that validate such an approach.⁹² Moreover, the plaintiff was unable to identify any criteria, beyond those that the Supreme Court pointed to in *Daubert*, that would militate in favor of admissibility.⁹³ The Supreme Court thus found that the district court did not abuse its discretion in excluding the expert's testimony.⁹⁴

Kumho is critical to the issue of fingerprint analysis because it means that prosecutors cannot avoid the burden of establishing the reliability of such expertise merely by recharacterizing it as "technical" or "specialized" knowledge rather than "scientific." A prosecutor must be able to demonstrate the reliability of latent fingerprint identification testimony

85. *Kumho Tire Co.*, 526 U.S. at 147.

86. *Id.* at 150-51 (emphasis added).

87. *Id.* at 142.

88. *Id.* at 143.

89. *Id.* at 144.

90. *Id.*

91. *Id.* at 157.

92. *Id.*

93. *Id.* at 158.

94. *Id.*

either by way of the *Daubert* factors or by some alternative criteria. As explained below, prosecutors will be hard pressed to make such a showing.

V. DAUBERT MEETS FINGERPRINTS

A. HAS THE METHOD OR TECHNIQUE BEEN TESTED?

While fingerprint examiners have long claimed the mantle of science so as to bolster the credibility of their profession, the reality is that the fingerprint community has never conducted any scientific testing to validate the premises upon which the field is based. The most fundamental premise of the fingerprint field, like that of all other forensic identification disciplines, is that fingerprint examiners can make reliable identifications from the type of small distorted latent fingerprint fragments that are typically detected at crime scenes.⁹⁵ Incredibly, there has been only one published study that even remotely addresses this issue. That study, an utter embarrassment to the fingerprint community, was done by two British researchers who were commissioned by Scotland Yard to review the sixteen point identification standard which, up until very recently, governed in both England and Wales.⁹⁶ As part of their review, the two researchers sent photographs of ten pairs of latent and inked fingerprints to fingerprint bureaus in England and Wales requesting that experts with ten or more years of experience undertake the ten comparisons independently of each other.⁹⁷ Nine of the pairs that were supplied were taken from past casework of Scotland Yard. Six of these pairs were properly identifiable to one another, while the other three were considered borderline cases. The tenth pair provided by the researchers consisted of two prints that were made by different fingers.⁹⁸ The participating examiners were asked to

95. As Simon Cole observes:

Forensic fingerprint identification . . . rests in part upon the . . . ambitious premise that no two *partial* prints are alike, or that fragmentary areas of papillary ridge detail of a certain size (exactly what size is unclear) can be matched to one and only one finger, to the exclusion of all other fingers in the world. Moreover, the impressions are often blurred, smudged, overlaid upon one another, and distorted by foreign matter. The detective must match this distorted crime scene print to an inked print, taken under pristine 'laboratory' conditions, to the exclusion of all other fingerprints in the world.

COLE, *supra* note 12, at 89 (emphasis in original).

96. See Ian W. Evett & R. L. Williams, *A Review of the Sixteen Point Fingerprint Standard in England and Wales*, 46 J. FORENSIC IDENTIFICATION 49 (1996). In April of 2000, England and Wales abandoned the sixteen-point standard that had governed there since the early 1900s. Identifications in these countries are now simply based on the examiner's judgment that there is a sufficient amount of corresponding ridge detail to justify an identification.

97. *Id.* at 58.

98. *Id.*

decide whether each of the pairs were identifiable and, if so, the number of corresponding points of similarity that could be seen.⁹⁹ Replies were received from 130 participants.¹⁰⁰ The variation in the responses was extraordinary. With respect to one of the pairs, for example, the number of points of comparison that the examiners reported ranged from ten to forty.¹⁰¹ As to another pair, the range was fourteen to fifty-six.¹⁰² There was also considerable disagreement as to whether identifications could properly be effectuated. On one of the pairs, 44% of the examiners found that an identification could be made, while 56% said that it could not.¹⁰³ As the researchers appropriately concluded from these results, "[t]he variation [in the responses] confirms the subjective nature of points of comparison."¹⁰⁴ "[E]xperts vary widely in their judgments of individual points."¹⁰⁵ The British experiment thus suggests that fingerprint analysis is not nearly as reliable as most people have assumed. As the study reveals, fingerprint examiners can reach extremely different conclusions regarding the same pairs of fingerprints, at least, that is, when they are unaware of the results that prior law enforcement examiners have reached.¹⁰⁶

In addition to the lack of basic reliability studies, no testing has been conducted to determine the probability of two different people having a number of fingerprint ridge characteristics in common.¹⁰⁷ This is in sharp contrast to the relatively new field of DNA analysis, where scientific testing has been done to calculate the probability of a coincidental match.¹⁰⁸ Commentators have recently recognized that the lack of testing in the fingerprint field is a critical problem. David Stoney, for example, a leading forensic science scholar, and a trained fingerprint analyst, has written:

99. *Id.* at 59.

100. *Id.*

101. *Id.* at 59 fig.2a.

102. *Id.* at 60 fig.2c.

103. *Id.* at 61.

104. *Id.*

105. *Id.* at 65. As these researchers also recognized, fingerprint examiners in the United States are recognized as being far more aggressive than their European counterparts in terms of making identifications on questionable fingerprints. *See id.* at 55, 65.

106. In everyday casework, a second examiner will examine the fingerprints at issue only if the first examiner has made an identification. As such, the second examiner necessarily knows the results of the first examiner's comparison. STONEY, *supra* note 4, § 21-2.1.2, at 65.

107. *See Saks, supra* note 4, at 1105-06 ("Although in principle fingerprint identification depends upon an objective, probabilistic inquiry, its practitioners use no probability models and have no probability data to use. They rely on intuition and assumptions that have not been tested rigorously, and they persist in treating identifications as absolute, not probabilistic.")

108. *See id.* at 1087-88.

[T]here is no justification [for fingerprint identifications] based on 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!

Much of the discussion of fingerprint practices in this and preceding sections may lead the critical reader to the question “Is there any *scientific* basis for an absolute identification?” It is important to realize that an *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.¹⁰⁹

The DOJ, in a stunning admission, has recently conceded that Stoney is indeed correct—that basic validation studies in the fingerprint field have never been conducted and that they now must be performed. This admission is in the form of a formal “Solicitation” for “Forensic Friction Ridge (Fingerprint) Examination Validation Studies,” which was issued by the DOJ’s research arm, the National Institute of Justice (“NIJ”), in March of 2000.¹¹⁰ The Solicitation was drafted by an NIJ Advisory Panel which included, in addition to Stoney, fingerprint examiners from the FBI, the United States Secret Service, and the United States Army.¹¹¹ As revealed by the NIJ’s internal documents, the DOJ decided to issue the Solicitation

109. Stoney, *supra* note 4, § 21-2.3.1, at 72. See also Stoney, *supra* note 37, at 330 (pointing out that “there have been no objective studies providing validation of [fingerprint analysis]”). Stoney, who holds a Ph.D. in forensic science from the University of California at Berkeley, did his doctoral dissertation on the subject of fingerprint individuality. That effort culminated in a published article in the *Journal of Forensic Science*. See Stoney & Thornton, *supra* note 22. Stoney is currently the Executive Director of the McCrone Research Institute, a not-for-profit teaching and research institution located in Chicago, Illinois. He was called as an expert witness for the defense in *United States v. Mitchell*. See *United States v. Mitchell*, No. Crim. 96-407 (E.D. Pa. Feb. 2000).

110. Solicitation, Nat’l Inst. of Justice, Forensic Friction Ridge (Fingerprint) Examination Validation Studies (Mar. 2000) (on file with author) [hereinafter Solicitation].

111. The Advisory Panel’s composition is revealed in documents, on file with author, that the NIJ provided in response to a Freedom of Information Act request made by the author.

shortly after the first *Daubert* challenge was filed contesting the admissibility of latent fingerprint identification evidence. The purpose of this Solicitation is nothing less than an attempt to provide fingerprint examiners with the necessary ammunition to survive *Daubert* challenges.¹¹²

The Solicitation explicitly recognizes that testing in the fingerprint field "needs" to be conducted in two basic areas.¹¹³ First, it calls for "[b]asic research to determine the scientific validity of *individuality in friction ridge* examination based on measurement of features, quantification, and statistical analysis."¹¹⁴ As the DOJ admits in this regard, "the theoretical basis for [fingerprint] individuality has had limited study and needs additional work to demonstrate the statistical basis for identifications."¹¹⁵

This is quite an admission. For the past ninety years, fingerprint examiners have been testifying in court that the basic premise of fingerprint identification evidence is the individuality of all fingerprints.¹¹⁶ Indeed, the notion of fingerprint individuality—that everyone has unique fingerprints—is deeply ingrained in our popular culture.¹¹⁷ Yet we now discover from the DOJ's Solicitation that fingerprint individuality has never in fact been scientifically established and that basic research in this

112. The purpose of the Solicitation can be clearly seen from some of the NIJ's internal documents that were provided to the author. See *supra* note 111. One of these documents, for example, is a memorandum written by the NIJ Senior Program Manager who administered the Solicitation's creation. The memorandum, which was submitted to the NIJ's Director, provides that the issuance of the Solicitation is especially "urgent" in light of, among other things, a "challenge to the admissibility of fingerprint evidence in a case in Philadelphia." Memorandum from Richard M. Rau, OST, Nat'l Inst. of Justice, to Jeremy Travis, Director, Nat'l Inst. of Justice (undated) (on file with author). In another document produced by the NIJ, a member of the NIJ's fingerprint Advisory Panel urges the NIJ to go forward with the Solicitation's release because "[i]t will not be long before more and more cases come up where fingerprint testimony will be challenged and, therefore, we need to provide the examiners with the necessary hard data on validation to counter challenges." E-mail from Antonio Cantu, Chemist, U.S. Secret Service, Forensic Services Division, to Richard Rau, Senior Program Manager, Nat'l Inst. of Justice (Feb. 16, 2000) (on file with author). Similarly, a letter from one of the other Advisory Panel members to a prospective researcher states that the "proposed NIJ research is at least partially related to the need for scientific validation to support the government's continued use of fingerprint identification as a valid legal means of positive identification." Letter from Edward R. German, Special Agent, U.S. Army Criminal Investigation Laboratory, to James Wayman, Researcher (June 17, 1999) (copy on file with author). On its face, moreover, the introduction section of the Solicitation specifically refers to the requirements of *Daubert* in explaining why the Solicitation has been created. See Solicitation, *supra* note 110, at 3.

113. Solicitation, *supra* note 110, at 3–4.

114. *Id.* at 4 (emphasis in original).

115. *Id.*

116. See, e.g., Ashbaugh, *supra* note 19, at 501–02.

117. See, e.g., MARK TWAIN, PUDD'NHEAD WILSON 134–35 (Simon & Schuster 1997) (1894).

area needs to be conducted. As discussed above, the premise of fingerprint individuality does not logically support the reliability of latent fingerprint identification evidence in the first place.¹¹⁸ Nevertheless, it is this premise that fingerprint examiners have chosen to rely upon all these years. Accordingly, the DOJ's admission that fingerprint individuality has not been scientifically validated is nothing short of remarkable.¹¹⁹

118. See *supra* text accompanying notes 37–40.

119. Fingerprint examiners typically declare that fingerprint individuality has been definitively established by the fact that no two fingerprints from different people have ever been found to match in all of the day-to-day case work that fingerprint examiners have conducted over the past 100 years. See, e.g., ASHBAUGH, *supra* note 13, at 85. But the problem with this argument is that no fingerprint examiner, in the course of his casework, has actually ever attempted to find fingerprints of different people that match. See Saks, *supra* note 4, at 1087–88 (pointing out that “with the exception of recent work involving biological markers, such as DNA typing, the various forensic identification sciences have not taken the trouble to collect data on populations of forensically relevant objects so that the probability of erroneous matches can be calculated”).

Consider, in this regard, what a fingerprint examiner actually does every day. An examiner takes a latent fingerprint fragment found at a crime scene and compares it to fingerprints taken directly from one or more suspects. The examiner either makes a match or doesn't and then moves on to the next case. An examiner never takes a fingerprint and manually compares it with hundreds or thousands of other fingerprints to see how much similarity he can find between prints of different people. A fingerprint examiner might protest that in cases where there are no suspects, fingerprint searches are now frequently done through an Automated Fingerprint Identification System (“AFIS”). The AFIS will compare the latent with the thousands and thousands of prints contained in its database. These AFIS searches, however, have not established the individuality of fingerprints. An AFIS is not able to make matches. MOENSSENS ET AL., *supra* note 24, § 8.06, at 509. Rather, it will generate a number of candidate prints for the human examiner to manually compare with the latent. *Id.* The AFIS will generate however many candidates it is programmed to produce, and the system will rank and score the candidates depending on how much similarity it was able to detect between the latent and the particular candidate. *Id.*

Approximately 30% of the time an AFIS will fail to generate the correct candidate fingerprint even if it is within the database. See *United States v. Pimentel*, No. 94 CR 0871, 1995 WL 745009, at *1 (E.D.N.Y. Nov. 30, 1995) (reporting testimony of a DEA fingerprint examiner that when a latent print is run through an AFIS, which has in its database a rolled print that was taken from the same finger that deposited the latent, there is only a 70% chance that the rolled print will be identified); Frank G. Woods, *Automated Fingerprint Identification Systems*, in *ADVANCES IN FINGERPRINT TECHNOLOGY*, *supra* note 15, at 238 (1994 ed.) (indicating that “[l]atent search accuracy rates range from 50% to greater than 80% depending on the quality of the print and the number of identifiable minutiae”). And in some instances, AFIS will generate the correct candidate, but will fail to rank that candidate in the first position. MOENSSENS ET AL., *supra* note 24, § 8.06, at 509 n.3. However, assume that in the typical case the AFIS will generate the correct candidate and will rank that fingerprint first, and the examiner, upon manually comparing that fingerprint with the latent, will make a match. At that point the examiner's job is done, and he or she will have no reason to compare the latent print with all of the other candidates produced by the AFIS to see how much similarity might exist with one of the other prints. That is why, despite all the casework that has been done over the years and all the AFIS searches that have ever been conducted, the federal government has recognized that the fingerprint field “needs . . . basic research to determine the scientific validity of [fingerprint] individuality.” Solicitation, *supra* note 110, at 3–4 (emphasis omitted).

The essential question, moreover, when studying fingerprint individuality, is not whether fingerprints are unique, but rather how unique they actually are. Any two items if studied closely

The second area of testing that the Solicitation calls for concerns the fundamental question of reliability. The DOJ recognizes that the fingerprint field "needs" to develop "standardized" procedures for comparing fingerprints and that these "[p]rocedures must [then] be tested statistically in order to demonstrate that following the stated procedures allows analysts to produce correct results with acceptable error rates."¹²⁰ As the DOJ candidly concedes, such testing "has not yet been done."¹²¹

The ramifications of this Solicitation are thus enormous. The DOJ has effectively admitted that latent fingerprint analysis fails the primary criterion of science and, by extension, the primary criterion for admissibility under *Daubert*: There has been no testing of the field's basic underlying premises.¹²²

enough might be found to have differences that make them unique even, for example, two paper cups manufactured on the same assembly line. If, however, an examiner comparing the two paper cups had only 20% of one of the cups to examine, the examiner might not be able to spot the difference between them. Likewise, a fingerprint examiner is usually working with a latent fingerprint fragment that is only one-fifth the size of a full fingerprint. Thus, the critical issue is not whether there might be two fingerprints that have all seventy-five to 200 ridge characteristics perfectly in common. Rather, the pivotal questions to be researched, as recognized in the DOJ Solicitation, are the likelihood of two different people having some number of common characteristics and the error rate of examiners when they attempt to make identifications from small distorted fragments. Such research will address two distinct types of errors that can be made: chance error and examiner error. Chance error occurs when the examiner correctly identifies a certain number of common characteristics but the two prints were made by different people who by random chance have similar fingerprints bearing that number of common characteristics. Examiner error, by contrast, is where the examiner made one or more erroneous determinations in evaluating the similarity of the prints.

120. Solicitation, *supra* note 110, at 3-4. The Solicitation does not indicate what an acceptable rate of error might be. Nor, for that matter, does the Supreme Court's opinion in *Daubert*.

121. *Id.*

122. Not surprisingly, the DOJ has attempted to downplay the significance of the Solicitation. On June 20, 2000, the government released a letter signed by the NIJ's Acting Director, Julie Samuals, addressed "To whom it may concern." Samuals, who was appointed to the post of Acting Director shortly after the Solicitation's release, writes:

What underlies this solicitation is a desire for more research to further confirm the already existing basis that permits fingerprints to be used as a means to individualize. NIJ wishes to note that it is accepted that fingerprints are unique to the individual. NIJ has no basis to believe that is not the case. Further, NIJ notes that, even given the success of the current procedures, such procedures should be periodically examined and research conducted to enhance their empirical foundation.

Letter from Julie Samuals, Acting Director, Nat'l Inst. of Justice (June 20, 2000) (on file with author).

In connection with a recent judicial proceeding, Samuals has acknowledged that she, in fact, has no knowledge of the fingerprint field and that this letter was issued at the request of the FBI. Record at 168, *United States v. Mitchell* (E.D. Pa. Feb. 2000) (No. 96-407) (testimony of Julie Samuals, Jan. 3, 2001). A close examination of the letter, moreover, reveals that, while it is cleverly written so as to attempt to reassure the reader that there is nothing amiss in the world of fingerprints, it actually is devoid of any real content. For example, it goes without saying that there is an "already existing basis" that permits fingerprints to be used as a means to individualize. What the NIJ does not comment on in this letter, however, is whether the "already existing basis" is scientifically sound or otherwise reliable.

In addition to releasing the Solicitation, the DOJ has also recently conducted some experiments for litigation purposes. These tests were conducted in connection with the case of *United States v. Mitchell*,¹²³ which presented the government with the first *Daubert* challenge to the admissibility of latent fingerprint identification evidence. As recognized by forensic science authority, Michael Saks, that the government in *Mitchell* was compelled to do fingerprint experiments “should terrify a court.”¹²⁴ “[W]hy couldn’t [the government] bring in the hundreds of studies that ought to exist to support their claims of the past century? Because few were ever done. Because they do not exist.”¹²⁵

At issue in *Mitchell* were two latent fingerprints that the government recovered from a getaway car.¹²⁶ The government claimed that these two prints were made by Mitchell’s left and right thumbs.¹²⁷ In response to Mitchell’s *Daubert* challenge, the government sent the two latent prints at

Likewise, Samuals, writing in the negative, states that the NIJ has no basis to believe that fingerprints are not unique to the individual. But, she does not state the converse—that the NIJ has any basis to believe that fingerprints are truly unique. And while the NIJ acknowledges the “success of current procedures,” the NIJ again does not suggest that those procedures are scientifically sound or otherwise reliable. The NIJ could not do so, when it has explicitly stated in the Solicitation that fingerprint procedures have never been standardized and validated so as to determine whether examiners can produce correct results with acceptable error rates.

A far more revealing document than the “To whom it may concern letter,” is a “Research Utilization Proposal” that was provided to Samuals’ predecessor as NIJ Director in connection with his review of the Solicitation. Under the heading entitled “What are the implications for further research and program development,” the document states “[t]here has been very little scientific study of the fingerprint examination process or the individuality of fingerprints. Hence, it is a nearly untouched research field.” NIJ Research Utilization Proposal (June 30, 1999) (on file with author). The Research Utilization Proposal was written by NIJ Senior Program Manager, Richard Rau, after a five hour meeting with the fingerprint Advisory Panel that he assembled. Record at 47, *United States v. Mitchell* (E.D. Pa. Feb. 2000) (No. 96-407) (testimony of Richard Rau, Jan. 3, 2001).

The evidence regarding the solicitation was produced not at the Mitchell *Daubert* hearing, but rather at a subsequent hearing on Mitchell’s motion for a new trial. The solicitation was published within weeks of Mitchell’s February 2000 conviction. Internal documents of the NIJ presently on file with the author (*see supra* notes 111–112) reveal that the Institute was ready to publish the Solicitation in September of 1999, but that at the FBI’s request, publication was delayed until after Mitchell’s trial. For example, a document entitled “Time Line of Fingerprint Related Meetings” states that on September 17, 1999, FBI Crime Lab Director “Donald Kerr asked and David Boyd [NIJ Deputy Director] agreed to withhold releasing the fingerprint Solicitation until after the Philadelphia trial had ended.” Mr. Mitchell’s motion for a new trial is still pending.

123. *United States v. Mitchell*, No. 96-407 (E.D. Pa. Feb. 2000).

124. Michael J. Saks, *Banishing Ipse Dixit: The Impact of Kumho Tire on Forensic Identification Science*, 57 WASH. & LEE L. REV. 879, 899 n.108 (2000).

125. *Id.*

126. Record at 75–76, *United States v. Mitchell* (E.D. Pa. Feb. 2000) (No. 96-407) (testimony of Stephen Meagher, Feb. 2, 2001).

127. *See generally* *United States v. Mitchell*, 145 F.3d 572, 575 (3d Cir. 1998) (discussing facts of case and granting new trial).

issue, along with Mitchell's ten print card, to fifty-three different law enforcement agencies, requesting those agencies to select "court qualified" examiners to compare the prints and to determine whether any identifications could be made.¹²⁸ In making this request, the government did not explicitly advise the agencies of the fact that the FBI had already determined that the latents could be matched to Mitchell's left and right thumbs.¹²⁹ The results of this experiment were eye-opening. Of the thirty-four agencies that responded, nine (27%) reported that they had not identified either one or both of the latent prints with any of the fingers on Mitchell's ten print card.¹³⁰ Thus, as with the Evett and Williams study discussed above,¹³¹ the FBI experiment further illustrates the subjectivity and unreliability of fingerprint analysis. The test reveals, once again, that fingerprint examiners can reach extremely different conclusions with respect to the same fingerprints, at least when they are unaware of the results that prior law enforcement examiners have reached.¹³²

128. Record at 114-17, *United States v. Mitchell* (E.D. Pa. Feb. 2000) (No. 96-407) (testimony of Stephen Meagher, Feb. 2, 2001).

129. The government did advise the agencies of the extreme importance of their cooperation. The cover letter accompanying the request provided in pertinent part:

The FBI needs your immediate help! The FBI laboratory is preparing for a Daubert hearing on the scientific basis for fingerprints as a means of identification. The Laboratory's Forensic Analysis Section Latent Print Unit, is coordinating this matter and supporting the Assistant United States Attorney in collecting data needed to establish this scientific basis and its universal acceptance.

The time sensitive nature of these requests cannot be expressed strongly enough, nor can the importance of your cooperation. The potential impact of the Federal court not being convinced of the scientific basis for fingerprints providing individuality has far-reaching and potentially negative ramifications to everyone in law enforcement. The FBI wishes to present the strongest data available in an effort to insure success in this legal matter and your cooperation is a key component in achieving this result.

Defense Exhibit 20, *United States v. Mitchell* (E.D. Pa. Feb. 2000) (No. 96-407) (letter from FBI to state law enforcement agencies).

130. See Record at 203-08, *United States v. Mitchell* (E.D. Pa. Feb. 2000) (No. 96-407) (testimony of Stephen Meagher, July 8, 1999).

131. See *supra* text accompanying notes 96-106.

132. The FBI was so unhappy with the results of this experiment that it sent the nine agencies in question a new response form and requested that the agencies fill it out and return it after reexamining the prints. This time, however, the FBI took nothing for granted. The FBI provided the agencies with the marked-up enlargements of the fingerprints displaying what the FBI apparently believed to be the common characteristics. The second letter read:

Thank you for responding to the referenced survey. Your input is greatly appreciated. All of the data received to date has been recorded and tabulated in summary form.

Survey B results indicate that your agency responded with the answer "No" with respect to one or both of the latent prints. For your convenience, I have included with this letter another set of the original photographs submitted to you with another blank survey form and a set of enlarged photographs of each latent print and an enlargement of areas from two of the fingerprints contained on the fingerprint card. These enlargements are contained within a clear plastic sleeve that is marked with red dots depicting specific fingerprint characteristics.

Please test your prior conclusions against these enlarged photographs with the marked characteristics. Please indicate the results on the enclosed survey form and return to me by

A second set of experiments submitted by the DOJ in the *Mitchell* case involved the FBI's Automated Fingerprint Identification System ("AFIS"), and was conducted by the FBI's AFIS provider, Lockheed Martin ("Lockheed").¹³³ The government sought through these experiments to establish the probability of two fingerprints being "identical."¹³⁴ Toward this end, the government utilized a database of 50,000 fingerprints extracted from the FBI's master file. The first experiment compared each fingerprint with *itself*, as well as with all of the other fingerprints in the database.¹³⁵ The second experiment utilized the same methodology, except that each fingerprint, prior to comparison, was converted into a simulated latent print by extracting the central 21.7% of the print. This central portion was then compared with the entire print from which it had been extracted.¹³⁶ The scores generated by AFIS from all of these comparisons were converted into "Z" scores and then probability measures.¹³⁷ Not surprisingly, whenever the AFIS compared a fingerprint image with *itself*, an extremely high score was generated.¹³⁸ Much lower scores were obtained when different fingerprint images were compared.¹³⁹ The conclusion that Lockheed derived from the first experiment was that the "probability of a non-mate rolled fingerprint being *identical* to any particular fingerprint is less than 1/10⁹⁷" (10⁹⁷ is one followed by ninety-

June 11, 1999. You only need to complete the bottom portion, the third part, of the survey form. Any written narrative description or response should be attached to the survey form.

I anticipate that this data must be made available to the defense counsel and the court prior to the Daubert Hearing proceedings. Therefore, please insure that your handling of this matter is done within the June 11, 1999 deadline. The Daubert Hearing is scheduled for July 7, 1999, and the trial is scheduled for September 13, 1999. If you have any questions, I can be reached at 202-324-6157.

Defense Exhibit 22, *United States v. Mitchell* (E.D. Pa. Feb. 2000) (No. 96-407) (letter from FBI to state law enforcement agencies).

Not surprisingly, the state law enforcement agencies responded by filling out their new response forms to indicate that identifications had been made.

133. See *supra* note 119 for a discussion of how AFIS operates.

134. Record at 69, *United States v. Mitchell* (E.D. Pa. Feb. 2000) (No. 96-407) (testimony of Donald Zeisig, July 9, 1999). See also Stoney, *supra* note 37, at 378-83 for a discussion of the FBI/Lockheed experiments.

135. Record at 81, *United States v. Mitchell* (E.D. Pa. Feb. 2000) (No. 96-407) (testimony of Donald Zeisig, July 9, 1999).

136. *Id.* at 95-96.

137. *Id.* at 82-83.

138. *Id.* at 82. The reason that there was some variation in the scores that were obtained when fingerprint images were each compared with themselves is because fingerprints have varying amounts of minutia. *Id.* at 82-83. The more minutia that the AFIS finds in common, the higher the score that it will generate. *Id.* Accordingly, a fingerprint that contains a great deal of minutia, when compared with itself by the AFIS, will generate an extremely high score. A fingerprint containing a smaller amount of minutia will also generate a very high score but not quite as high a score as the fingerprint that contains a greater amount of minutia.

139. *Id.* at 84.

seven zeros).¹⁴⁰ The conclusion from the second experiment was that "the probability of a minutia subset of a non-mate fingerprint being *identical* to a minutia subset of any particular fingerprint is less than $1/10^{27}$. . . for small numbers of minutia (in this case, small means four)," decreasing to less than $1/10^{97}$ for larger numbers of minutia.¹⁴¹ As an expert from Lockheed explained at the *Mitchell* hearing on the *Daubert* challenge, these various probabilities were simply taken from the lowest scores that the AFIS generated when comparing each fingerprint image with *itself*.¹⁴² Thus, the term "identical" was effectively defined by having the AFIS compare a fingerprint image with itself.

The fundamental problem with both of these AFIS experiments—and the reason undoubtedly that they have still yet to be published two years after they were conducted—is that when it comes to fingerprints, the concept of "identical" is meaningless. As the Lockheed expert acknowledged, even two inked fingerprints that are taken of the same finger will not be identical because of the various distortions that occur in the rolling process.¹⁴³ Indeed, this fact was unintentionally demonstrated by the experiments. Included in the 50,000 print database were multiple fingerprints that had been taken of the same fingers. (Apparently some individuals had been fingerprinted twice by the FBI).¹⁴⁴ Three different examples of this were found to exist in the database, though the Lockheed expert conceded that there could be others that were undetected.¹⁴⁵ Significantly, in each of these instances, the scores that were generated by the AFIS, when comparing two different fingerprints of the exact same finger, were significantly lower than the scores that were obtained when each fingerprint in the database was compared with itself.¹⁴⁶ In fact, in some instances, the scores generated from two fingerprints of the same finger were so low as to fall well within the range of scores that were generated when fingerprints of different fingers were compared.¹⁴⁷ Thus, there were some fingerprints of different fingers that the AFIS found to have greater similarity than fingerprints of the same finger. Accordingly, the expert from Lockheed acknowledged that if two people actually had

140. *Id.* at 84–85.

141. *Id.* at 97 (emphasis added).

142. *Id.* at 85.

143. *Id.* at 86–87. This same admission was made by another government expert who acknowledged that different fingerprints of the same finger will never be identical. *Id.* at 22 (testimony of Edward Raymond German, July 8, 1999).

144. *Id.* at 87 (testimony of Donald Ziesig, July 9, 1999).

145. *See id.* at 87–94.

146. *Id.* at 84.

147. *Id.* at 91–92.

fingers with identical fingerprint patterns, and rolled fingerprints of those fingers were compared by the AFIS, the score generated would in all likelihood be far less than the scores that Lockheed obtained when each fingerprint image was compared with itself.¹⁴⁸ In other words, two fingerprints of the same finger would not meet the definition of “identical” that Lockheed established through the methodology of comparing a fingerprint with itself.¹⁴⁹ The Lockheed tests thus ultimately established nothing in regard to the uniqueness of fingerprints.¹⁵⁰

148. *See id.* at 94–95.

149. *See id.* at 92, 94–95.

150. Even though the Lockheed tests have not been published, they have still come under withering criticism from researchers and fingerprint examiners who have examined them. Stoney, for example, has written that the experiments were “worthless for documenting the individuality of fingerprints” and that they were “extraordinarily flawed and highly misleading.” Stoney, *supra* note 37, at 381, 383 (“It was specifically designed to ‘prove the uniqueness’ of fingerprints in a *Daubert* hearing, and incorporates a profound ignorance of both forensic science and statistics. Perhaps the most remarkable aspect of these experiments is that they continue to be introduced in such hearings.”). Similarly, James Wayman, a biometrics researcher at San Jose State University has written:

The comparison of images to themselves lead [sic], of course, to extremely high scores [I]n life . . . no real comparison of two *different* images of the same finger will ever yield such a high score. By adopting, as the definition of [“identical”], the score obtained by comparison of identical images, the government very strongly biased any results in the *government’s* favor.

JAMES L. WAYMAN, NAT’L BIOMETRIC TEST CTR., SAN JOSE STATE UNIV., WHEN BAD SCIENCE LEADS TO GOOD LAW: THE DISTURBING IRONY OF THE *DAUBERT* HEARING IN THE CASE OF *U.S. V. BYRON C. MITCHELL*, http://www.engr.sjsu.edu/biometrics/publications_daubert.html (Feb. 2, 2000). *See also* CHAMPAUD & EVETT *supra* note 40 at 112 (“The FBI’s AFIS experiment so transcends reality that we are amazed that it was admitted into evidence.”). In addition, John Thornton, in a recent address to fingerprint examiners at an IAI conference, scoffed at the experiment’s conclusion that it is mathematically impossible for two fingerprints from different people to have even four points of similarity: “I suspect that a goodly number of us here have seen two fingerprints from two individuals that have agreed in just four characteristics.” Thornton, *supra* note 28.

What the FBI’s AFIS tests effectively demonstrate is why testing that is done for purposes of litigation, without being published or peer reviewed, has traditionally been regarded with considerable caution. *See, e.g.*, *United States v. Cuong*, 18 F.3d 1132, 1143 (4th Cir. 1994) (noting that “[r]eports specifically prepared for purposes of litigation are not, by definition, ‘of a type reasonably relied upon by experts in the particular field.’”); *Richardson v. Richardson-Merrell, Inc.*, 857 F.2d 823, 831 (D.C. Cir. 1988) (holding doctor’s testimony to be inadmissible because, among other reasons, the calculations that he relied upon had not been “published . . . nor offered . . . for peer review”); *Perry v. United States*, 755 F.2d 888, 892 (11th Cir. 1985) (rejecting expert’s testimony where the study upon which the expert relied had not been subjected to peer review). As the Lockheed expert’s lab notes from these experiments revealed, the very purpose of these experiments was to generate an extremely low probability of fingerprint duplication that could be readily displayed to the court:

Discussed with jimo a more user-friendly approach to analyzing the 50k vs 50k searches. We need a separability measurement that we can point to in a math book and say “here, this graph shows that N means that the probability is 99.999999M that there are no other fingerprints with the same minutia configuration.”

Defense Exhibit 54 at 17, *United States v. Mitchell* (E.D. Pa. Feb. 2000) (No. 96-407) (Lockheed Lab Notes). The Lab notes further reveal that as Lockheed conducted the experiments, it repeatedly provided the preliminary results to Steven Meagher, the FBI fingerprint examiner who arranged for the experiments, so as to make sure that the FBI was pleased with the data being produced and the manner

In sum, at the present time, the fingerprint field fails the first and most critical of the *Daubert* factors. The premises underlying the field have never been scientifically validated.

B. HAS AN ERROR RATE BEEN ESTABLISHED?

The answer to this question is plainly no. Because of the lack of testing, there are no established error rates for latent fingerprint examiners, another fact that the DOJ has explicitly conceded in the recently issued Solicitation.¹⁵¹ There can be no dispute, moreover, that latent fingerprint examiners do make misidentifications. There are numerous documented cases in which latent fingerprint examiners have made erroneous identifications that have led to the imprisonment of innocent people.¹⁵² What remains unknown, however, is the rate at which misidentifications take place. As commentators have recognized, "[i]t is difficult to glean information about cases of error because they rarely produce a public record, and the relevant organizations and agencies tend not to discuss them publicly."¹⁵³

Just how prevalent the problem of false identifications may actually be, however, can be seen, at least to some extent, in the poor performance of latent print examiners on proficiency exams. Such tests are typically taken by examiners for purposes of crime lab accreditation. While these

in which it was ultimately presented. *Id.* at 18 ("Jimo is to prepare sample of results that we can send to Steve M. for criticism. If these satisfy him, we will try to get the data needed to perform the remainder of the search."); *Id.* at 16 ("Passed these on to Steve Meagher (via phone call) as VERY preliminary results. He was DELIGHTED.") (emphasis in the original); *Id.* at 14 ("Generated preliminary text report for Steve Meagher. . . . Faxed to [him] at U.S. Attorney's Office . . .").

151. Solicitation, *supra* note 110, at 4 ("Procedures must be tested statistically in order to demonstrate that following the stated procedures allows analysts to produce correct results with acceptable error rates. This has not yet been done.").

152. See, e.g., *State v. Caldwell*, 322 N.W.2d 574, 580 (Minn. 1982) (reversing conviction due to erroneous identification made not only by prosecution's fingerprint expert, but by the defense retained expert as well); James E. Starrs, *More Saltimbancos on the Loose? Fingerprint Experts Caught in a Whorl of Error*, 12 SCI. SLEUTHING NEWSL. 1 (1998) (detailing several erroneous identifications discovered in North Carolina and Arizona); Stephen Grey, *Yard in Fingerprint Blunder*, TIMES (London), Apr. 6, 1997, at 6 (discussing erroneous fingerprint identification, which had been triple-checked by experts at Scotland Yard); Anne Barnard, *Convicted in Slaying, Man Wins Freedom*, PHILA. INQUIRER, Dec. 24, 1999, at B1 (reporting that defendant was set free after it was determined that three prosecution fingerprint experts had erred); Panorama: *Finger of Suspicion* (BBC television broadcast, July 8, 2001), http://news.bbc.co.uk/hi/english/static/audio_video/programmes/panorama/transcripts/transcript_08_07_01.txt (discussing cases of Shirley McKie and David Asbury where four Scottish fingerprint experts made erroneous identifications as well as several other cases of misidentification in the United Kingdom).

153. Simon A. Cole, *Witnessing Identification: Latent Fingerprinting Evidence and Expert Knowledge*, 28 SOC. STUDIES OF SCI. 687, 701 (1998).

exams do not constitute controlled scientific studies, they nevertheless do provide some indication of the proficiency, or lack thereof, of examiners throughout the United States. On these exams, latent fingerprint examiners typically are provided with several latent prints along with a number of “ten print” inked impressions for comparison. The 1995 exam is a useful starting point, because it was the first test authorized by the fingerprint examiners’ own professional association, the IAI.¹⁵⁴

The results of the 1995 exam were, in the words of a leading law enforcement examiner, both “alarming” and “chilling.”¹⁵⁵ Of the 156 examiners who participated, only sixty-eight (44%) were able to both correctly identify the five latent print impressions that should have been identified, and correctly note the two elimination latent prints that were not to be identified.¹⁵⁶ Even more significantly, thirty-four of these examiners (22%) made erroneous identifications on one or more of the questioned prints for a total of forty-eight misidentifications.¹⁵⁷ 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.¹⁵⁸ In addition, one of the two elimination latents was misidentified twenty-nine times.¹⁵⁹

These shockingly poor results, moreover, could not be blamed on the test. The 1995 proficiency exam was recognized by David Grieve, a leading law enforcement fingerprint examiner, as being “a more than satisfactory representation of real casework conditions.”¹⁶⁰ A “proficiency test composed of seven latents and four suspects was considered neither overly demanding nor unrealistic.”¹⁶¹ Accordingly, the fingerprint profession’s dreadful performance on this test has been, and continues to be, a matter of significant concern. As Grieve, the head of Forensic Sciences for the Illinois State Police, has written:

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

154. Grieve, *supra* note 33, at 523.

155. *Id.* at 524.

156. *Id.*

157. *Id.* at 524–25.

158. *Id.* at 524.

159. *Id.*

160. *Id.*

161. *Id.*

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.¹⁶²

Despite Grieve's call for "positive action," the poor results have continued unabated on the more recent proficiency exams. On the 1998 test, for example, only 58% of the participants were able to correctly identify all of the latents and recognize the two elimination latents as being unidentifiable.¹⁶³ Even more disturbing was that twenty-one erroneous identifications were made by fourteen out of the ninety-one participants.¹⁶⁴ On the 1997 exam, sixteen false identifications were made by thirteen different examiners.¹⁶⁵

The proficiency testing thus suggests that when the DOJ validation studies are ultimately conducted, there may well be a substantial rate of error for latent fingerprint examiners. In this regard, it should be kept in mind that it is the prosecutor who bears the burden of establishing the reliability of the expert evidence that he or she is seeking to admit.¹⁶⁶ Accordingly, when it comes to the *Daubert* factor of error rate, the prosecution cannot, at this point in time, satisfy its burden. As a district court has recognized in a case concerning handwriting analysis, "[c]ertainly an unknown error rate does not necessarily imply a large error rate[;] [h]owever if testing is possible, it must be conducted if forensic document examination is to carry the imprimatur of 'science.'"¹⁶⁷

162. *Id.* at 524–25.

163. COLLABORATIVE TESTING SERVICES, INC., FORENSIC TESTING PROGRAM: LATENT PRINTS EXAMINATION 2 (Rep. No. 9808) (1998) (on file with author).

164. *Id.*

165. COLLABORATIVE TESTING SERVICES, INC., FORENSIC TESTING PROGRAM: LATENT PRINTS EXAMINATION 2 (Rep. No. 9708) (1997) (on file with author). On the 1999 exam, nine participants made eleven misidentifications, a shockingly high number in light of the fact that the exam did not even include any elimination latents. Each of the twelve latents provided in the test could be correctly identified with one of the rolled impressions that were included. COLLABORATIVE TESTING SERVICES, INC., FORENSIC TESTING PROGRAM: LATENT PRINTS EXAMINATION 2 (Rep. No. 99-516) (1999) (on file with author).

166. *See, e.g.,* Kannankeril v. Terminex Intl., Inc., 128 F.3d 802, 807 (3d Cir. 1997) (requiring proponent of expert testimony to demonstrate by preponderance of the evidence that expert's opinion was based on methods and procedures of science).

167. *United States v. Starzeczyzel*, 880 F. Supp. 1027, 1037 (S.D.N.Y. 1995).

C. ARE THERE OBJECTIVE STANDARDS TO GOVERN THE TECHNIQUE'S OPERATION?

Latent fingerprint examiners in the United States currently operate in the absence of any uniform objective standards.¹⁶⁸ The absence of standards is most glaring with respect to the ultimate question of all fingerprint comparisons: What constitutes a sufficient basis for making a positive identification? The position of the FBI, as well as the IAI, is that no minimum number of corresponding points of identification is necessary for an identification.¹⁶⁹ Instead, the determination of whether there is a sufficient basis for an identification is left to the subjective judgment of the particular examiner. As one of the world's leading fingerprint practitioners, David Ashbaugh, has candidly acknowledged, a fingerprint examiner's opinion of identification is "very subjective."¹⁷⁰

While the official position of the FBI 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 standards that have been set by the agencies for which they work.¹⁷¹ In addition, while there is no uniform identification standard in the United

168. Stoney, *supra* note 37, at 329–30 (asserting that "[a]ny unbiased, intelligent assessment of fingerprint identification practices today reveals that there are, in reality, no standards").

169. See FBI, FINGERPRINT IDENTIFICATION, *supra* note 12, at 6; INT'L ASS'N FOR IDENTIFICATION, IAI STANDARDIZATION COMMITTEE REPORT 1 (1973). The IAI reached this determination after forming 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." *Id.* 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 minimum number of friction ridge characteristics which must be present in two impressions in order to establish positive identification." *Id.* at 2. 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. See Stoney, *supra* note 4, at 71 (stating that "[i]ndeed, the absence of valid scientific criteria for establishing a minimum number of minutiae has been the main reason that professionals have avoided accepting one"). The IAI effectively conceded as much when it strongly recommended in the Report that "a federally funded 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." INT'L ASS'N FOR IDENTIFICATION, *supra*, at 2. To date, however, no such research has been conducted, though it has now been called for again by the NIJ Solicitation.

170. Ashbaugh, *supra* note 19, at 511. Ashbaugh is a staff sergeant with the Royal Canadian Mounted Police. He has more than twenty-five years of experience as a fingerprint examiner and he was called by the government as an expert witness in connection with the *Daubert* challenge in *United States v. Mitchell*. *United States v. Mitchell* (E.D. Pa. Feb. 2000) (No. 96-407).

171. Cole, *supra* note 41, at 143.

States, many other countries have set such standards.¹⁷² Australia, for example, has a minimum standard of twelve matching ridge characteristics; France and Italy each have sixteen.¹⁷³ The obvious purpose of establishing such standards is to try to insure against erroneous identifications.¹⁷⁴

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.¹⁷⁵ While latent print examiners have somehow managed to maintain a united front in the courtroom, they have been at odds in the technical literature.¹⁷⁶ Ashbaugh, for example, has written that "[i]t is unacceptable to use the simplistic point philosophy in modern day forensic science."¹⁷⁷ As Ashbaugh has correctly recognized, the selection of any particular point standard is based not on scientifically conducted probability studies, but "through what can best be described as an educated conjecture."¹⁷⁸

The problem, however, is that while Ashbaugh is correct that all of the various point standards employed by fingerprint examiners over the past hundred years are scientifically invalid, neither Ashbaugh, nor any other member of the fingerprinting community, has advanced a scientifically sound alternative. Here, for example, is Ashbaugh's 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

172. ASHBAUGH, *supra* note 13, at 98. Brazil and Argentina require thirty matching characteristics.

173. Champod, *supra* note 27, at 138.

174. See generally K. Luff, *The 16-Point Standard*, 16 FINGERPRINT WORLD 73 (1990).

175. Cole, *supra* note 41, at 139. As recently recognized by John Thornton, there is a type of "professional schizophrenia" in the fingerprint profession, with some examiners counting points of similarity, some examiners disavowing points, and some examiners being "closet counters." Thornton, *supra* note 28.

176. Cole, *supra* note 41, at 145.

177. Ashbaugh, *supra* note 19, at 513.

178. ASHBAUGH, *supra* note 13, at 2. See also Ashbaugh, *supra* note 19, at 512 (stating that "[s]uperficial and unsubstantiated quips became the methodology of the point system").

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.¹⁷⁹

The utter meaninglessness of this explanation speaks for itself.¹⁸⁰ Ashbaugh's prior writings on this subject provide little in the way of additional insight. He has stated, for example, that while "[i]n some instances we may form an opinion on eight ridge characteristics[,] [i]n other instances we may require twelve or more to form the same opinion."¹⁸¹ Ashbaugh's explanation for this sliding scale is that some ridge characteristics are more unique than others.¹⁸² But, no weighted measures of the different characteristics have ever been adopted by the fingerprint community, and different examiners vary considerably in terms of their subjective beliefs as to the relative frequencies with which different characteristics appear.¹⁸³ Accordingly, as Ashbaugh has ultimately recognized, a particular examiner's determination of whether eight or twelve matching characteristics is sufficient in a particular case is entirely "subjective."¹⁸⁴

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.¹⁸⁵ As discussed above, fingerprint examiners

179. ASHBAUGH, *supra* note 13, at 103 (emphasis in original).

180. The emptiness of Ashbaugh's explanation has also been recognized by other fingerprint examiners.

The non-point counters refuse to put a number on the quantitative portion of their comparison analysis opting for the rhetorical response of "Show me the Print." There has to be something to measure and count if the comparison process includes "quantitative". If the analysts do not quantify their analysis then their opinion of identity is strictly subjective. A subjective analysis without quantification makes the identification process as reliable as astrology. If one does not quantify, is it an ID when a warm and fuzzy feeling overwhelms you? What happens if my warm and fuzzy feeling is different than yours?

Clark, *supra* note 28. See also Stoney, *supra* note 37, at 329 (observing that "we have an ill-defined, flexible, and explicitly subjective criterion for establishing a fingerprint identification"); Thornton, *supra* note 28 (calling upon fingerprint profession to develop an identification standard).

181. David Ashbaugh, *The Key to Fingerprint Identification*, 10 *Fingerprint Whorld* 93, 93 (1985).

182. See *id.* at 94-95.

183. Osterburg, *supra* note 18, at 425 (stating that "[c]learly subjective evaluation of the significance to be attached to a fingerprint characteristic is suspect").

184. ASHBAUGH, *supra* note 13, at 146.

185. Ashbaugh asserts that while a fingerprint examiner's ultimate opinion of identification is subjective, the examiner's comparison of fingerprints is purely "objective." Ashbaugh, *supra* note 19, at 511. Ashbaugh's testimony at a recent *Daubert* hearing, however, revealed otherwise. In

are not even in agreement as to what it is that they are looking for when comparing fingerprints. Examiners hold widely varying beliefs as to the number, nomenclature, and frequency of the standard ridge characteristics.¹⁸⁶ Some examiners, moreover, such as David Ashbaugh, do not limit their analysis to the traditional ridge characteristics, but instead rely heavily on what they refer to as third level detail, for example, sweat pores and ridge edges.¹⁸⁷ Other examiners, however, strongly question the reliability of identifications that are made on the basis of such detail. For example, John Thornton, a leading forensic science commentator and

demonstrating to the court how he conducts a comparison of two fingerprints, Ashbaugh unwittingly revealed the very subjective judgments that are made throughout the entire process:

So when I looked at the first ridge, that was acceptable. The second ridge, this area is a little different. And because there's no lateral pressure, I would have a concern. *This area here, I would accept the top—the top area I would accept.* The shape of this particular ridge feature, I feel even with less pressure you should be able to see that pointed aspect of that short ridge.

When I move on to this ridge, there's a dissimilarity here that will—in my opinion, would not end up being a difference. Dissimilarity to me is something you can accept, but when it looks like this, I believe that is now moved into the difference category.

Then, of course, the ridge ends here and that's *reasonably* in agreement.

.....

The next ridge comes down and has a dogleg. This ridge comes down and the dogleg is not as abrupt. And that again would concern me.

I feel that is bordering on disagreement. This particular short ridge in the unknown has a wide area at this end and then moves narrow, and this is pretty well straight all the way through.

I feel that this would be a disagreement because even with less pressure, things would get thinner on this ridge. You would still have that shape.

The next ridge in the unknown print—I apologize. I'm so used to looking at unknown on the left-hand side and this is backwards.

In the unknown print, this ridge runs straight through between two short ridges. This ridge makes a major dogleg and that is disagreement. That isn't acceptable.

This other short ridge, *it just doesn't seem to be the same length.* And where this ridge ends, a little bit farther down the ridge, where, if you look at—I'm sorry, this ridge ends a little farther up the ridge of the short ridge, if you draw a line straight across here to their relationship. And yet this one is down quite a bit farther.

If I moved to the next ridge across and followed it down, it has a dogleg again coming in nice and tight here. *I'm not sure I would accept that, but I likely would.*

The next ridge, the angle here is a little bit different than the angle here (indicating). *But, again, there's a great deal of pressure so I may even accept that as being in agreement.*

Record at 121–23, *United States v. Mitchell* (E.D. Pa. Feb. 2000) (No. 96-407) (testimony of David Ashbaugh, July 7, 1999) (emphasis added).

As Ashbaugh's demonstration plainly reveals, latent fingerprint examiners make subjective judgment calls throughout the entire comparison process as to whether various ridge features are in agreement or disagreement. Other writers also note the subjective nature of the comparison process:

Several decisions that are based mostly on experience must be made before comparing a latent print with an inked impression. Was the impression made by friction ridge skin? Is there color reversal in the image of the latent print? What area of friction skin made the impression? Is it possible to determine pattern type or ridge flow? Are there sufficient ridge characteristics present for comparison with an inked print?

Robert D. Olsen, Sr. & Henry C. Lee, *Identification of Latent Prints*, in *ADVANCES IN FINGERPRINT TECHNOLOGY*, *supra* note 15, at 50.

186. See generally Osterburg, *supra* note 18, at 425; COWGER, *supra* note 15, at 143.

187. See *supra* note 28.

trained fingerprint analyst, has recognized that “[i]dentifications based on level three detail have yet to be rigorously tested either in a scientific venue or in court.”¹⁸⁸ Thornton further states that he has not “ever seen a level 3 detail comparison of a latent fingerprint that didn’t require some level of rationalization.”¹⁸⁹ Similarly, fingerprint examiner Dusty Clark writes:

There is such a degree of variation of appearance in the 3rd level detail due to pressure, distortion, over or under processing, foreign or excessive residue on the fingers, surface debris and surface irregularity, to name a few. The repeatability of the finite detail that is utilized in the comparison process has never been subjected to a definitive study to demonstrate that what is visible is actually a true 3rd level detail or an anomaly.¹⁹⁰

The lack of standards in the fingerprint field can even be seen with respect to the one rule apparently agreed upon by fingerprint examiners, the so called “one dissimilarity doctrine.”¹⁹¹ Pursuant to this rule, if two fingerprints contain a single genuine dissimilarity, then the prints cannot be attributed to the same finger or individual.¹⁹² This doctrine is well recognized in the fingerprint community.¹⁹³ But, it is effectively ignored in practice. As Thornton has written, once a fingerprint examiner finds what he or she believes is a sufficient number of matching characteristics to make an identification, the examiner will then explain 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

188. Thornton, *supra* note 28.

189. *Id.*

190. Clark, *supra* note 28; The FBI has also previously questioned the viability of using 3rd level detail. See FBI, FINGERPRINT IDENTIFICATION, *supra* note 12, at 3 (“Writers on fingerprints quite frequently mention the value of poroscopy in effecting identifications where only a few characteristics are present. FBI technicians know of no case in the United States in which pores have been used in the identification of fragmentary impressions.”). See also COWGER, *supra* note 15, at 143 (stating that because “prints of friction skin are rarely so well recorded . . . comparison of pores or edges is only rarely practical”).

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

192. *Id.* at 89.

193. See, e.g., David Ashbaugh, *Defined Pattern, Overall Pattern, and Unique Pattern*, 42 J. FORENSIC IDENTIFICATION 503, 510 (1992).

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 fanciful explanation for the dissimilarity.¹⁹⁴

The absence of real standards in the fingerprint field also can be seen with respect to the issue of verification. Independent verification by another fingerprint examiner is considered an essential part of the identification process.¹⁹⁵ However, again, in real practice, fingerprint agencies sometimes "waive the verification requirement."¹⁹⁶

In response to recent *Daubert* challenges that have been lodged against fingerprint evidence, the DOJ has suggested that fingerprint examiners around the world all employ a standard methodology known as "ACE-V": analysis, comparison evaluation, and verification.¹⁹⁷ This so-called "methodology" is set forth in Ashbaugh's 1999 publication, *Quantitative-Qualitative Friction Ridge Analysis: An Introduction to Basic and Advanced Ridgeology*.¹⁹⁸ The problem, however, is that neither the DOJ, nor Ashbaugh, provide much in the way of guidance beyond the ACE-V acronym. How exactly is the "Analysis" and "Comparison" to be conducted? How are examiners supposed to make their judgments as to whether various characteristics are in agreement or disagreement or whether a characteristic is even genuine or is just the product of distortion?

194. Thornton, *supra* note 191, at 91.

195. See ASHBAUGH, *supra* note 13, at 148. As noted above, in the fingerprint field, verification is typically done by a second examiner from the same police agency who knows the result of the first examiner's identification. See *supra* note 106.

196. William Leo, *Identification Standards—The Quest for Excellence*, CAL. IDENTIFICATION DIGEST, Dec. 1995.

197. See, e.g., Government's Combined Response to Defendant Ramsey's Motion to Preclude the Introduction of Latent Fingerprint Identification Evidence and Motion in Limine to Admit Latent Print Evidence, at 10–11, filed in *United States v. Gary Ramsey*, Crim. No. 01-005-04 (E.D. Pa. 2001) [hereinafter Government's Combined Response].

198. See ASHBAUGH, *supra* note 13, at 173–74.

And, most fundamentally, how is an examiner to make his final "Evaluation" as to whether there is enough similarity to declare a match? The ACE-V "methodology" does not offer any assistance to an examiner who is grappling with these questions. Nor does it provide a court or a juror with any sort of standard by which the examiner's opinion can be evaluated.

Finally, the lack of standards in the fingerprint community extends to the training and experience requirements for latent print examiners. Put simply, no such requirements currently exist.¹⁹⁹ As one leading fingerprint commentator has recognized, "people are being hired directly into latent print units without so much as having looked at a single fingerprint image."²⁰⁰ Once hired, the training that examiners receive is typically minimal. Consider what another leading law enforcement fingerprint examiner has stated 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, 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 directed 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 trainee is ready.²⁰¹

Thus, as the above quoted practitioner has recognized, fingerprint examiners are not required to take any kind of objective test before they start giving their expert opinions in court. There is not even any type of licensing requirement in the field. The fingerprint professional association, the IAI, did start a certification program back in 1980. But approximately half the examiners that have taken the certification test have failed it.²⁰² And since certification is not required, many, if not most, of the examiners

199. Leo, *supra* note 196 (recognizing need for "minimum training and experience standards" for latent print examiners). Stoney, *supra* note 37, at 330 (recognizing that "[n]either the education of fingerprint examiners, nor the process of fingerprint comparison is standardized").

200. Pat Wertheim, *The Ability Equation*, 46 J. FORENSIC IDENTIFICATION 149, 152 (1996).

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

202. Newman, *supra* note 8 (observing that "while the International Association of Identification has a rigorous certifying test, about half the current or would-be examiners who take it fail, without apparent career consequences").

who failed the test are still practicing.²⁰³ Indeed, the vast majority of fingerprint examiners in this country are not certified.²⁰⁴

The obvious result of not having any training or experience requirements is deficient examiners. As stated by a leading law enforcement fingerprint examiner, "[t]he quality of work produced is directly proportional to the quality of training received."²⁰⁵ That examiner further acknowledged that it is "too well established" that there are "examiners performing identification functions who are not qualified and proficient."²⁰⁶ Moreover, the lack of training and standards has not only resulted in a plethora of deficient examiners, but dishonest ones as well. Pat Wertheim, a fingerprint examiner with more than twenty-five years of law enforcement experience, estimates that there have been "hundreds or even thousands" of cases of forged and fabricated latent prints.²⁰⁷

In sum, latent print examiners operate without the benefit of any objective standards to guide them in their comparisons. There also are no objective standards or minimum qualifications with respect to their hiring and training. Accordingly, another critical *Daubert* factor is unsatisfied.²⁰⁸

203. *Id.* (reporting "'There's very few employers who will terminate an employee for not passing the test,' said Ken Smith, the association's certification chairman").

204. *Id.* (further noting that "Mr. Smith added that most of the 5,000 examiners in the country have never taken the test").

205. Grieve, *supra* note 201, at 111.

206. David L. Grieve, *The Identification Process: Traditions in Training*, 40 J. FORENSIC IDENTIFICATION 195, 196 (1990). See also Robert D. Olsen, *Cult of the Mediocre*, 8 FINGERPRINT WHORL 48, 51 (1982) (recognizing that "[t]here is a definite need for us to strengthen our professional standards and rise above the cult of the mediocre").

207. Pat A. Wertheim, *Detection of Forged and Fabricated Latent Prints*, 44 J. FORENSIC IDENTIFICATION 652, 675 (1994) (stating that "[a] disturbing percentage of experienced examiners polled by the author described personal exposure to at least one of these cases during their careers").

208. Recognizing the critical absence of standards in the fingerprint field, the FBI has recently made some effort at filling the void. In 1995, the FBI formed a group of latent fingerprint examiners, which is currently titled, Scientific Working Group on Friction Ridge Analysis Study and Technology ("SWGFAST"). In 1997, SWGFAST issued proposed guidelines for minimum qualification training and quality assurance. See <http://www.swgfast.org> (last visited Jan. 28, 2001). At the present time, these guidelines continue to be merely suggested. They are not required in the field. See David Grieve, *The Identification Process: TWGFAST and the Search for Science*, <http://www.scafo.org/library/150501.html> (last visited Jan. 28, 2001). The SWGFAST guidelines also provide very little in the way of actual standards. The minimum qualifications and training guidelines, for example, do not require a college degree or any type of licensing or certification requirement. Likewise, the quality assurance guidelines do not propose any type of minimum identification standard, nor do they set forth a protocol as to how comparisons are to be conducted. Thus, as John Thornton recently stated during a presentation at the IAI's annual training conference, "SWGFAST knows a lot about fingerprints, but they don't know much about standards." Thornton, *supra* note 28.

D. HAS THE METHOD OR TECHNIQUE BEEN SUBJECTED TO PEER REVIEW
AND PUBLICATION?

Very little has been written regarding the comparison and identification of fingerprints, a fact recognized by those within the fingerprint community itself.²⁰⁹ While a technical journal does exist that is published on a bi-monthly basis, the *Journal of Forensic Identification*, an examination of this journal reveals that the vast majority of its articles concern the lifting and developing of latent fingerprints, rather than the process of comparison and identification.²¹⁰ There has been, moreover, very little in the way of analysis concerning the fundamental premises of the field.

The major texts in the field also provide little analysis of the comparison and identification of latent fingerprints. Take, for example, the FBI publication, *The Science of Fingerprints*.²¹¹ Only three pages of this 211-page text even concern the subject of latent fingerprint comparisons. The rest of the text is primarily concerned with classifying ten print patterns, recording ten print patterns, and the lifting of latent prints. As to the three pages that concern latent fingerprint comparisons, there is no discussion whatsoever about the fundamental premises that underlie latent print identifications or how such comparisons should be conducted.

Even when the premises of latent print identifications have been considered in the fingerprint literature, they have rarely been critically examined. A perfect example is the editorial *Nature Never Repeats Itself*, written by Alan McRoberts.²¹² In this editorial, McRoberts cites with approval the following statement which was originally made by Harris Wilder and Bert Wentworth in their 1916 text, *Personal Identification*:

209. See Olsen & Lee, *supra* note 185, at 44 (noting that “little written information exists regarding the methodologies and procedures for making a comparison of two prints”); Ashbaugh, *supra* note 193, at 508 (recognizing the “lack of published material available about the identification process.”); ASHBAUGH, *supra* note 13, at 4 (“It is difficult to comprehend that a complete scientific review of friction ridge identification has not taken place at some time during the last 100 years. A situation seems to have developed where this science grew by default.”). Ashbaugh’s book, *Quantitative-Qualitative Friction Ridge Analysis*, which was published in 1999, constitutes an attempt on his part to make up for the paucity of publications over the past 100 years. But as discussed above, Ashbaugh fails to offer any satisfactory explanation as to how comparisons and identifications are to be made. See *supra* notes 178–184 and accompanying text. And, as also discussed above, other fingerprint examiners have been very critical of Ashbaugh’s emphasis on third level detail. See *supra* note 28.

210. This can be seen for example, by a review of the Journal’s index. See <http://www.theiai.org/publications/index.html>.

211. See *supra* note 2.

212. Alan L. McRoberts, *Nature Never Repeats Itself*, PRINT, Sept.–Oct. 1996, at 1.

Finally, there is never the slightest doubt of the impossibility of the duplication of a finger print, or even of the small part of one, on the part of any one who has carefully studied the subject at first hand, whether finger-print 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.²¹³

It is probably statements such as these that have led David Ashbaugh to bemoan the "failure of the identification community to challenge or hold meaningful debate."²¹⁴ As Ashbaugh has acknowledged, the fingerprint community has been more akin to a religion than to a science:

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 destruction of the credibility of those supporting it.²¹⁵

This is the precise sense that one gets reading through much of the fingerprint literature. As a district court recently stated with respect to the field of handwriting analysis, 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."²¹⁶

213. *Id.*

214. ASHBAUGH, *supra* note 13, at 4. This same sentiment has been expressed by another leading law enforcement fingerprint examiner. See *supra* note 33 and accompanying text.

215. ASHBAUGH, *supra* note 13, at 4. A perfect illustration of the fear that fingerprint examiners seem to have when it comes to challenging fingerprint orthodoxy is contained in a one page article that appeared in *The Print* magazine back in 1991. See Tom Jones, *Inherited Characteristics In Fingerprints (or Theory of Relativity)*, <http://www.scafo.org/library/130101.html>. The examiner who wrote this article recounts his experience of finding fingerprints, on several occasions, from family members that were strikingly similar, so much so that on one of these occasions, the examiner nearly made a misidentification. As the author explains, the standard belief in the fingerprint field is that genetics impacts only the general pattern type of fingerprints and not the ridge characteristics that provide the basis for identifications. The examiner candidly reveals that for years he "kept [his] mouth shut [regarding the similar fingerprints that he had found] fearing ridicule from [his] peers." *Id.* It was only after being confronted with this phenomenon time and time again that the examiner finally decided to come public with his account. Not surprisingly, Jones's account has not generated any response in the fingerprint literature.

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

E. IS THERE A GENERAL CONSENSUS?

It can hardly be disputed, of course, that a consensus exists in the general public, as well as the judiciary, that latent fingerprint identifications are perfectly reliable. But the pertinent inquiry, for purposes of *Daubert*, is whether a general consensus has been reached by a “relevant scientific community.”²¹⁷ And, as has been recognized in several post-*Daubert* cases, in defining a relevant scientific community, it is necessary to look beyond the practitioners of the technique that is under assessment.²¹⁸

There has never been a scientific community, beyond fingerprint examiners, that has expressed a general acceptance of latent fingerprint identifications. To the contrary, mainstream scientists, by and large, have ignored the question of whether individuals can be reliably identified through small, distorted latent fingerprint impressions.²¹⁹ And the leading forensic science commentators that have examined the issue recently have found the fingerprint field to be scientifically deficient. Michael Saks, for example, an editor of one of the leading treatises in the field, *Modern Scientific Evidence: The Law and Science of Expert Testimony*, has written that “[a] vote to admit fingerprints is a rejection of conventional science as the criterion for admission.”²²⁰ Likewise, David Faigman, another editor of the same treatise, was recently quoted in the *Los Angeles Times* that he expects that a judge will exclude fingerprint evidence from a trial within the next year because “[t]he research is just too thin to let it in.”²²¹ Accordingly, fingerprint examiners cannot even properly satisfy the general acceptance prong of *Daubert*.

217. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 594 (1993) (citation omitted).

218. See *Williamson v. Reynolds*, 904 F. Supp. 1529, 1558 (E.D. Okla. 1995) (granting habeas petition upon finding erroneous admission of expert hair analyst and stating that “[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”); *Starzeczyzel*, 880 F. Supp. at 1038 (pointing out that forensic document examiners “certainly find ‘general acceptance’ within their own community, but this community is devoid of financially disinterested parties, such as academics”).

219. See Saks, *supra* note 4, at 1081; COLE, *supra* note 12, at 186 (stating that “[f]ingerprint evidence won acceptance without being subjected to the kind of organized skepticism and careful scrutiny that is supposed to be inflicted upon scientific and legal facts”).

220. Saks, *supra* note 4, at 1106.

221. See Ritter, *supra* note 8.

F. ARE THERE ANY NON-DAUBERT FACTORS THAT ESTABLISH THE RELIABILITY OF LATENT FINGERPRINT IDENTIFICATIONS?

As discussed above, the Supreme Court in *Kumho* made clear that, while a court may apply the *Daubert* factors in making its reliability determination, it is not required to do so.²²² A court may utilize whatever factors are pertinent in the particular case to assess the reliability of the proffered expert testimony. Accordingly, the government could properly argue for the admissibility of latent fingerprint evidence on the basis of factors that were not identified in *Daubert*. But, as in the recent handwriting cases,²²³ the government will be hard pressed to come up with any convincing alternative criteria. How, after all, can a court reasonably have confidence in a fingerprint examiner's identification that is based on certain points of similarity, when there has been no probability testing conducted so as to demonstrate that these same points of similarity could not also be found in any number of other fingerprints?²²⁴ Even more fundamentally, how can a judge believe in the reliability of an identification that is being made from a small distorted latent fingerprint fragment, when there has been no testing done to establish the error rate for such identifications, especially given the dreadful performance of fingerprint examiners on crime lab accreditation proficiency exams? As the Supreme Court recognized in *Daubert*, when the expertise that is at issue is based upon knowledge that is purportedly "scientific," then "evidentiary reliability will be based upon scientific validity."²²⁵ Plainly, there can be no scientific validity in the absence of scientific testing.

In responding to recent *Daubert* challenges, the government has argued that fingerprint identifications "have been tested empirically over a period of 100 years."²²⁶ What the government apparently means by this is that fingerprint identifications have a long history of being used in court. But the obvious reply to this argument is that there is simply no way of telling how many cases of error have gone undetected.²²⁷ There has been

222. See discussion *supra* Part IV.B.

223. See *supra* note 81.

224. Making this problem even worse is that fingerprint examiners, lacking any probability studies, express their opinions in terms of absolute certainty; that is, they identify a particular finger to the exclusion of all other fingerprints in the world. See *supra* notes 32–34 and accompanying text.

225. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 590 n.9 (1993) (emphasis in original).

226. See, e.g., Government's Combined Response, *supra* note 197, at 85.

227. As Saks observes:

The allusion to 'thousands of cases without error' obviously begs the question of validity. In actual disputed cases it rarely, if ever, is possible to tell whether the identification was correct

very little scrutiny of fingerprint evidence in the courtroom since it gained judicial acceptance in the early 1900s. From then on, virtually everyone, including most of the defense bar, simply assumed the reliability of the evidence. Perhaps the most striking illustration of this can be seen from the scandal in the New York State Police Office which involved some forty cases of fingerprint fraud over an eight-year period.²²⁸ It was subsequently determined that many of these cases of fraud were crude endeavors that would have been blatantly obvious to anyone trained in fingerprint identification.²²⁹ Yet in none of these cases did the defense even have the fingerprint evidence evaluated by an independent fingerprint examiner.²³⁰ The scandal thus effectively “revealed the extent of the trust extended to fingerprint examiners, how little defense attorneys scrutinize fingerprint evidence, and how rare is the retention of an expert by the defense.”²³¹

The government, in responding to recent *Daubert* challenges, has also argued that all that needs to be done at this point in time is for defendants to hire their own fingerprint experts who can then check the identifications made by the prosecution.²³² But to the extent that there are reliability problems inherent to fingerprint methodology itself, the retention of a defense expert might not do any good. Just as two polygraph examiners might reach the wrong conclusion about whether someone is telling the truth, because of deficiencies in the polygraph, so too might several fingerprint examiners make a false identification with respect to a

or not; that is why the issue was before the factfinder. This has been a major problem in validating many forensic techniques.

Saks, *supra* note 4, at 1102 n.169. Similarly, Simon Cole cautions:

Remember, a trial is not an experiment because you have no way of validating your results. If you falsely match a fingerprint, then the guy is convicted and goes to jail. Who's going to believe he's really innocent unless there's some extraordinary circumstance, like DNA comes along or someone else confesses? There's no way you would ever know.

Adrian Cho, *Opinion Interview*, NEW SCIENTIST, June 16, 2001, at 42 (interviewing Simon Cole).

228. COLE, *supra* note 12, at 274.

229. *Id.* at 280.

230. *Id.*

231. *Id.* Indeed, in their confessions, the troopers themselves acknowledged that they chose to fabricate fingerprint evidence because they knew it would go unquestioned. It should also be recognized in this regard that there is not a large pool of independent fingerprint examiners from which defense attorneys may choose. There are virtually no academic training grounds for fingerprint examiners. The vast majority of examiners are trained by, and work for, law enforcement. The independent examiners who do exist tend to be retired law enforcement examiners, who continue to strongly believe in the validity of fingerprint analysis. Moreover, as noted above, fingerprint examiners have been indoctrinated to believe that “[n]o matter how many finger print experts may be engaged in the labor of comparing two prints, their verdict must be the same.” Gribben, *supra* note 33, at 12. See also Hazen & Phillips, *supra* note 33, at 390 (“Because fingerprint science is objective and exact, conclusions reached by fingerprint experts are absolute and final.”).

232. See, e.g., Government's Combined Response, *supra* note 197, at 85.

particular fingerprint because of deficiencies in the standards and procedures of the fingerprint profession. Indeed, in one of the most famous cases of fingerprint error, the misidentification was made not only by the prosecution's expert, but by a defense-retained expert as well.²³³ The erroneous identification was discovered only upon the subsequent trial of the defendant's wife.²³⁴

This argument by the government also betrays a fundamental misunderstanding of Federal Rule of Evidence 702. Under that Rule, the proponent of expert testimony must be able to demonstrate the reliability of the expert's methodology or technique as applied to the particular case. A litigant cannot satisfy this test simply by pointing out that his adversary has the ability to retain the same type of expert to give a conflicting opinion. If that were the case then virtually any expert could gain admittance, even astrologers and psychics.²³⁵

In sum, the government will not be able to cite to any non-*Daubert* factors that support the reliability of latent fingerprint identification evidence.

VI. WHAT HAVE THE COURTS SAID?

As alluded to at the outset of this Article, a number of defense attorneys have already filed motions contesting the admissibility of latent fingerprint identification evidence.²³⁶ Thus far, there is no reported

233. *State v. Caldwell*, 322 N.W.2d 574, 580 (Minn. 1982).

234. *See id.* at 581.

235. The government's attempt to substitute "adversarial testing" for scientific testing has been summarily rejected in the recent cases concerning handwriting analysis. Handwriting analysis has been used by law enforcement as a forensic identification tool even longer than fingerprint evidence. *See Saks, supra* note 4, at 1094. Nevertheless, several district courts have reexamined the field recently in the wake of *Daubert* and *Kumho* and have precluded the government's handwriting experts from providing their opinions of authorship. *See United States v. Saelee*, 162 F. Supp. 2d 1097 (D. Alaska 2001); *United States v. Fujii*, 152 F. Supp. 2d 939 (N.D. Ill. 2000); *United States v. Rutherford*, 104 F. Supp. 2d 1190 (D. Neb. 2000); *United States v. Santillan*, 1999 WL 1201765 (N.D. Cal. Dec. 3, 1999) (No. CR-96-40169 DLJ); *United States v. Hines*, 55 F. Supp. 2d 62 (D. Mass. 1999); Pre-Trial Transcript, *United States v. McVeigh*, 1997 WL 47724 (D. Colo. Feb. 5, 1997) (No. 96-CR-68). As these courts have correctly recognized, it is not enough for the government to assert that the opinion of its handwriting examiner can be checked by some other handwriting examiner retained by the defense. Nor is it sufficient for the government simply to point to the fact that handwriting analysis has been accepted and utilized for many years. Rather, the courts have required the government to come forward with some proof that the opinions of handwriting examiners are reliable. The government has been unable to make such a showing.

236. *See supra* note 7.

decision granting such a motion.²³⁷ In several cases, however, trial judges have held, over the prosecutor's objection, that the defendant could present expert testimony at trial regarding the scientific bankruptcy of the field.²³⁸ Moreover, in a number of other cases where challenges were filed, prosecutors have sought to avoid litigation of this issue altogether, either by coming forward with a much improved plea offer, or by withdrawing the fingerprint evidence from the case.²³⁹ Accordingly, from the defense point of view, there have been some significant benefits from challenging fingerprint evidence.²⁴⁰

237. As this Article was being finalized for publication, a federal district court judge in the Eastern Dist. of Pennsylvania, ruled in a lengthy decision that fingerprint analysis fails the test of *Daubert*. *United States v. Llera-Plaza*, 179 F. Supp. 2d 492 (E.D. Pa. Jan. 7, 2002) (ruling that government's fingerprint expert could not testify that latent prints were a "match" to the defendant's rolled prints). Almost immediately, however, the judge granted the government's motion for rehearing and issued an equally lengthy decision, stating ultimately, "In short, I have changed my mind." *United States v. Llera-Plaza*, 2002 U.S. Dist. LEXIS 4032, at *71 (E.D. Pa. Mar. 13, 2002) (ruling that the government's latent print evidence was admissible). The two *Llera-Plaza* opinions will be discussed in a future article.

238. See, e.g., *United States v. Ramsey*, No. 01-005-05 (E.D. Pa. 2001) (the author served as Gary Ramsey's counsel); *United States v. Alteme*, No. 99-8131-CR (S.D. Fla. Apr. 7, 2000), <http://onin.com/fp/altemedaubert.pdf> (last visited Jan. 28, 2001); *State v. Rodriguez*, No. 41640 (Ariz. Super. Ct. Apr. 24–May 7, 2000), http://onin.com/fp/daubert_links2.html#CASE2; *State v. Nawi*, No. 176527, http://onin.com/fp/daubert_links2.html#CASE2 (Cal. Super. Ct. Oct. 10, 2000); *State v. McGee*, No. 99-CR-277 (Ga. Super. Ct. Oct. 27, 2000), http://onin.com/fp/daubert_links2.html#CASE2 (last visited Jan. 28, 2001). The defense attorneys in each of these cases have advised the author that the trial judges ruled that the defense could call an expert at trial regarding the scientific status or lack thereof of fingerprint evidence.

239. Several defense attorneys have reported to the author that, after filing a *Daubert* challenge to the admissibility of the prosecution's fingerprint evidence, the prosecution came forward with a much improved plea offer. Andy Newman of the *New York Times* gave an account of one such case:

Last year, in a burglary case in Montgomery County, Md., where fingerprints were the only evidence, prosecutors offered a 6-year plea agreement on theft charges, rather than the 10 years the defendant was facing for burglary, after the public defender challenged the admissibility of fingerprinting. "We decided that rather than go through the trouble of doing the motion we would agree to a plea," the prosecutor, Michael Banks, said.

Newman, *supra* note 8. Further, in a second case where the author filed a *Daubert* challenge, the prosecutor, after taking the full seventy-five days allotted by the district court to respond, advised the district court that the government had decided not to offer the fingerprint evidence at trial. *United States v. Choi*, No. 96-118 (E.D. Pa. 2000) (prosecution's letter to the court on file with author).

240. Another extremely successful outcome, from the defense point of view, occurred in *People v. Morris*, No. 1938293 (Cal. Super. Ct. Nov. 29, 2000). The defense attorney in that case, rather than filing a motion to exclude the fingerprint examiner's testimony, subjected the examiner to a withering cross-examination at a preliminary hearing that was held by the court to determine whether the prosecution had sufficient evidence to proceed to trial. Reporter's Transcript of Proceedings at 26–61, *Morris*, (No. 1938293) (Preliminary Hearing Nov. 9–13, 2000). After hearing the examiner's testimony, the court dismissed the case. Reporter's Transcript of Proceedings at 78–80, *Morris*, (No. 1938293) (Preliminary Hearing Nov. 29, 2000). The defendant in *Morris* was charged with burglary. The only pieces of evidence against him were three latent fingerprints that were found on a vase in the victim's home. *Id.* at 41 (testimony of fingerprint examiner Susan Bachman). The fingerprint examiner testified at the preliminary hearing that she matched the three latent prints to three fingerprints taken

The courts that have denied the recent *Daubert* challenges have provided very little in the way of analysis to support their decisions.²⁴¹ A notable exception is the opinion that was issued in *United States v. Havvard*.²⁴² The opinion, however, betrays a fundamental misunderstanding of the *Daubert* decision. For example, with respect to *Daubert*'s first and most essential criteria, testing, the *Havvard* court writes that "the methods of latent fingerprint identification . . . have been tested for roughly 100 years . . . in adversarial proceedings with the highest possible stakes—liberty and sometimes life."²⁴³ But as discussed above, there has in fact been virtually no adversarial testing of fingerprint evidence over the years, since everyone has simply assumed its accuracy.²⁴⁴ Even more fundamentally, though, adversarial testing in the courtroom is a far cry from the type of scientific validity testing that the Supreme Court discussed in *Daubert*. In real life criminal cases, rarely is there any way ultimately to know whether the fingerprint examiner was correct or not, since no one actually observed the latent print being deposited.²⁴⁵ Scientific validation studies of the field, by contrast, would utilize latent prints from known sources. Examiners could then be tested to determine the frequency with which they are able to make identifications and exclusions correctly.

The *Havvard* court goes even further astray with its discussion of "error rate." Turning *Daubert* on its head, the court writes that "[t]he defense has presented no evidence of error rates, or even of any errors."²⁴⁶ Contrary to the district court's reasoning, however, it is the proponent of the expert testimony that bears the burden of establishing the reliability of the proffered expertise.²⁴⁷ Accordingly, it is not up to the defense to establish a high error rate; it is the prosecution's burden to demonstrate that the rate is low. The court goes on to declare that "the error rate with latent

from the defendant. *Id.* The defense counsel then proceeded to cross-examine the examiner at length regarding, among other things, the lack of testing that has been done in the fingerprint field and the failure of the profession to develop any objective standards. *Id.* at 44–71. At the conclusion of the hearing, the judge stated that he was "not inclined to accept the opinion of the expert for the reasons that [defense counsel] cited." *Id.* at 80. As the judge correctly recognized, the examiner's opinion was "completely insufficient." *Id.* at 81.

241. Only two courts have published opinions on the issue. See *United States v. Martinez-Cintron*, 136 F. Supp. 2d 17 (D.P.R. 2001); *United States v. Havvard*, 117 F. Supp. 2d 848 (S.D. Ind. 2000). But see *supra* note 237.

242. *Havvard*, 117 F. Supp. 2d 848.

243. *Id.* at 854.

244. See *supra* notes 226–231 and accompanying text.

245. See *supra* note 227.

246. *Havvard*, 117 F. Supp. 2d at 854.

247. See *supra* note 170 and accompanying text.

print identification is vanishingly small when it is subject to fair adversarial testing and challenge.”²⁴⁸ The court, however, provides no support for this proclamation. Apparently, the parties did not alert the court to the NIJ’s Solicitation for fingerprint validation studies, which explicitly acknowledges that error rates have never been determined in the fingerprint field.

As to the *Daubert* factor of “standards for controlling the technique,” the *Havvard* court writes, without further explanation, that “[t]here are such standards through professional training, peer review, criticism, and presentation of conflicting evidence.”²⁴⁹ Tellingly, the court provides no specifics as to what standards actually exist with respect to “training” or “peer review” or “criticism.” And the court fails to explain how any of this constitutes a standard that controls the technique’s operation. As the court acknowledges elsewhere in its opinion, there is in fact no agreed upon standard in the field for making an identification.²⁵⁰

Finally, as to the factor of publication and peer review, the *Havvard* court declares that this “factor does not fit well with fingerprint identification because it is a field that has developed primarily for forensic purposes.”²⁵¹ It is hard to understand what the court means by this. Does the court really mean to suggest that a technique that is designed for use when the “highest stakes possible”²⁵² are involved should not be published and subjected to the review and criticism of the scientific community? Certainly there is no external impediment that prevents those in law enforcement from publishing their techniques. In any event, the *Havvard* court declares that “the purpose of the publication factor is easily satisfied here . . . because latent fingerprint identification has been subject to adversarial testing for roughly 100 years.”²⁵³ But again, there has in fact been very little in the way of adversarial testing, and what has taken place certainly does not substitute for the review of the scientific community.²⁵⁴

248. *Havvard*, 117 F. Supp. 2d at 854.

249. *Id.*

250. *See id.* at 855.

251. *Id.* at 854.

252. *Id.*

253. *Id.*

254. As this Article was being finalized, the *Havvard* decision was affirmed by the Seventh Circuit. *United States v. Havvard*, 260 F.3d 597 (7th Cir. 2001). The Seventh Circuit found that the district court did not err in denying the defendant’s motion on the record that had been presented. As the Seventh Circuit observed, the defendant presented no evidence to the district court in support of his motion. *Id.* at 599. On appeal, the defendant attempted to raise the DOJ fingerprint Solicitation and the 1995 proficiency test discussed above at *supra* text accompanying notes 110–142. *Havvard*, 260 F.3d

In the end, *Havvard* suggests two things. First, that many judges are going to be extremely resistant to the notion that fingerprint examiners do not qualify for admission under *Daubert*. Second, that judges are going to have a very hard time rationalizing their decisions. This is not meant to suggest, however, that the exclusion of fingerprint evidence is an impossible dream for defense attorneys. In fact, a judge has already taken this step. It happened some ten years ago when a United States District Court Judge in Los Angeles took it upon himself to take a close look at the field.²⁵⁵

In *United States v. Parks*,²⁵⁶ the defense did not file a motion to exclude the prosecution's fingerprint evidence. Rather, the court took up the issue sua sponte when the fingerprint examiner, who was called by the prosecution, testified that she employed an eight point identification standard.²⁵⁷ The judge found the examiner's testimony disturbing because of the variability in point standards that he had heard from examiners over the years, all of which had required more than eight points of similarity:

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 it 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, "I 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 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.

at 600. The Seventh Circuit, however, refused to consider this evidence since it had not been presented to the district court. *Id.*

255. Partial Transcript of Proceedings, *United States v. Parks*, No. CR-91-358-JSL (C.D. Cal. Dec. 10, 1991) (on file with author).

256. *Parks* (No. CR-91-358-JSL).

257. Partial Transcript of Proceedings at 538, *Parks* (No. CR-91-358-JSL) (testimony of Diana Castro, Dec. 10, 1991); The examiner testified that the three latent prints she identified from the crime scene each had between ten and twelve points of similarity with the known prints of the defendant. *Id.* at 544-45.

And, as it happens, you also have fewer than anybody that's ever testified before me; that makes me very uncomfortable.²⁵⁸

The judge then questioned the examiner as to what the fingerprint treatises stated with respect to a minimum point standard.²⁵⁹ When the examiner was unable to respond, the court correctly recognized that if no studies have been conducted to develop a standard, "then this is not a science and there are no experts in it."²⁶⁰

In response to the court's concerns, the government called the examiner's supervisor to testify regarding the "standard in the industry."²⁶¹ The supervisor's testimony, however, only succeeded in further revealing the unreliability of the evidence. He disclosed to the court 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 possibly employs a twelve- or fifteen-point rule and that "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 of points for a comparison and make."²⁶² The supervisor further revealed, in a response to a direct question from the court, that there is no "literature" regarding this issue and that he is unaware of why there is no uniform rule.²⁶³

After hearing the supervisor's testimony, the district court was only more convinced that the fingerprint evidence should be excluded. To try to "resuscitate" the evidence, the government called yet a third fingerprint examiner, Steven Kasarsky, a board certified member of the IAI and an employee of the United States Postal Inspection Service.²⁶⁴ The court specifically questioned Kasarsky as to where the "science" is to support fingerprint identifications.²⁶⁵ Kasarsky, however, could not provide a satisfactory response.

258. *Id.* at 551–53 (statement of the court, Dec. 11, 1991).

259. Specifically the judge stated:

I want to know what the accepted level is generally. If all of the treatises of all of the work done in this area says 10 is fine, that's fine; then 8 isn't fine. If it says 8 is fine, that's different. I don't know why I never heard 8 before if that's true.

Id. at 555.

260. *Id.* at 556.

261. *Id.* (statement of the prosecutor, Dec. 11, 1991).

262. *Id.* at 559–61 (testimony of Darnell Carter, Dec. 11, 1991). The Court understandably responded: "That's the most incredible thing I've ever heard of." *Id.*

263. *Id.* at 561.

264. *Id.* at 567–68, 596 (testimony of Stephen Kasarsky, Dec. 11, 1991).

265. *See id.* at 576–92.

Like the two examiners who had appeared before him, Kasarsky testified that "everyone in our field basically has independent standards."²⁶⁶ Kasarsky also acknowledged that misidentifications in the field had occurred,²⁶⁷ and, in response to a question from the court, he admitted that no published studies regarding false identifications had ever been done.²⁶⁸ Kasarsky further admitted that he knew of instances where prints from two different people have had ten matching characteristics and that he personally compared prints from different individuals possessing six points of similarity.²⁶⁹ While Kasarsky testified that he was able to observe a dissimilarity between the prints with six points of similarity, which convinced him that 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.²⁷⁰ 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 very dangerous territory.

The Witness: Yes, Your Honor, because if you can't see the area that might have the dissimilarity, one can only *guess*.²⁷¹

After hearing Kasarsky's testimony, the district court ruled that it would not admit the government's fingerprint evidence. Here is some of what the district court had to say regarding 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 saw it before."

Where is the standard, where is the study, where is the statistical base that's been studied? . . .

. . . .

266. *Id.* at 584.

267. *Id.* at 568-69.

268. *Id.* at 569.

269. *Id.* at 599-600.

270. *Id.* at 600, 602.

271. *Id.* at 602 (emphasis added).

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 as 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.²⁷²

Unites States v. Parks thus stands as a compelling example that a judge can be convinced to exclude latent fingerprint identification evidence. 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. As other commentators have recently predicted, it is only a matter of time before another judge reaches the same conclusion.

272. *Id.* at 587, 591–92, 606–07.

VII. CONCLUSION

Having considered the various indicators of reliability set forth by the Supreme Court in *Daubert*, it is evident that at the present time, latent fingerprint identifications do not constitute reliable evidence. Indeed, the picture that has emerged from this analysis is a disturbing one. It is a picture of poorly trained law enforcement fingerprint examiners making extremely subjective determinations without the benefit of any uniform standards, and in the absence of any testing to validate the fundamental premises upon which the field is based. As two former FBI fingerprint examiners have recently acknowledged, "[a] fingerprint expert is a salesperson selling the identification to the jury."²⁷³ For the past ninety years, a big part of the examiner's sales pitch has been the claim that fingerprint identification is an "exact" science and that the examiner's identification is therefore "absolute and final."²⁷⁴ Like many other sales claims, however, the claim of fingerprint science does not stand up under scrutiny. The so-called "science of fingerprints" is nothing but an unfounded myth.

273. Hazen & Phillips, *supra* note 33, at 393.

274. *Id.* at 390.

