

IN THE DISTRICT COURT OF THE UNITED STATES
FOR THE NORTHERN DISTRICT OF ALABAMA
SOUTHERN DIVISION

UNITED STATES OF AMERICA,)
Plaintiff,)
vs.) CR-00-N-0422-S
ERIC ROBERT RUDOLPH,)
Defendant.)

**AFFIDAVIT OF SIMON COLE IN SUPPORT OF MOTION TO EXCLUDE
TESTIMONY OF FORENSIC FINGERPRINT EXAMINER AND REQUEST FOR A
DAUBERT HEARING**

I, SIMON A. COLE, PH.D., swear and affirm as follows:

I. QUALIFICATIONS

1. I hold a Ph.D. in Science and Technology Studies from Cornell University. I am an Assistant Professor of Criminology, Law & Society at the University of California, Irvine. See Attachment A (Curriculum Vita).
2. Science and Technology Studies is an interdisciplinary field drawing on faculty and courses in sociology, history, politics, and philosophy of science and technology. The field of Science and Technology Studies uses the tools of the humanities and social sciences to study and understand what science and technology are, how scientists produce knowledge, and how engineers and others produce technological systems and artifacts. The question of what counts as science and what does not is naturally a central question in the field of Science and Technology Studies.
3. In the fall of 1993, I was employed as a Research Assistant on a National Science

Foundation Grant, entitled DNA Fingerprinting: Law and Science in Criminal Proceedings. In this capacity, I decided to investigate historically how forensic fingerprint identification had become such a trusted form of evidence. I continued this research after the term of my Assistantship had expired. Eventually the project expanded to encompass a comprehensive history and sociology of criminal identification techniques beginning with photography and leading up to DNA typing. The principal focus of my study was fingerprint identification. In 1998 and 1999, I published two peer reviewed journal articles in journals in the field of Science and Technology Studies about the findings of my research on forensic fingerprint identification.¹ These articles attempted to answer historically the problem posed at the beginning of the study: how forensic fingerprint identification became such a trusted form of evidence.

4. In 1998, Cornell University granted me a Ph.D. in Science and Technology Studies. In partial fulfillment of the requirements for this degree, I submitted my dissertation, *Manufacturing Identity: A History of Criminal Identification Techniques from Photography through Fingerprinting*. The dissertation covered the history of fingerprinting up to World War II. At this time, I combined and substantially revised the above materials into a comprehensive book manuscript that covered both record-keeping and forensic applications of fingerprint identification and ran from photography up to DNA typing. After a process of peer review, further revisions, and editing, this manuscript was published in 2001 as Suspect Identities: A

¹ "Witnessing Identification: Latent Fingerprint Evidence and Expert Knowledge," *Social Studies of Science* 28 (1998), 687-712; "What Counts for Identity? The Historical Origins of the Methodology of Latent Fingerprint Identification," *Science in Context* 12 (1999), 139-172.

History of Fingerprinting and Criminal Identification by Harvard University Press. To my knowledge, this book is the first comprehensive scholarly monograph on the history of fingerprinting or criminal identification. On October 17, 2003, Suspect Identities was awarded the Rachel Carson Award for a book length work of social or political relevance in the area of social studies of science and technology by the Society for Social Studies of Science. Since publication of my book, I continue to monitor and write about developments in this area of science.²

II. LIMITATIONS OF FORENSIC FINGERPRINT EVIDENCE

A. History

5. In the course of my completed and ongoing research, I have come to the following conclusions:

6. Forensic fingerprint identification was initially accepted by American courts without subjecting it to the kind of scrutiny that would be required of novel scientific or technical evidence today. Courts accepted the arguments of prosecutors and fingerprint examiners testifying as expert witnesses that fingerprint identification was (1) generally accepted, (2) science, and (3) reliable. Courts also accepted the claim that there were no two fingerprints in the world exactly alike. None of these claims were subjected to adequate scrutiny from either a scientific or a legal standpoint.

7. Courts, prosecutors, defense attorneys, fingerprint examiners, indeed everyone involved, accepted the faulty logic that if there are no two fingerprints exactly alike in all the

² See, Simon Cole, *Grandfathering Evidence: Fingerprint Admissibility Rulings from Jennings to Illegible Plaza and Back Again*, 41 Am. Crim. L. Rev. 1189 (2004).

world, then the method of forensic fingerprint identification must be reliable. This logic is now understood to be fallacious.³

8. Judicial acceptance, indeed, became an important source in legitimating forensic fingerprint evidence. That is, people outside the legal system believed that fingerprinting was scientific and reliable because courts said it was so.

B. THE DOUBTS AND UNCERTAINTIES REGARDING THE RELIABILITY OF FINGERPRINT EVIDENCE

9. The reliability - or accuracy or validity⁴ - of fingerprint evidence is simply not known. The reliability of fingerprint evidence is a simple question: how often does forensic fingerprint analysis yield correct and incorrect results. Answering this question is less simple; in actual casework, there is usually no way of determining the ultimate correctness of the fingerprint evidence - or of the verdict. While some might wish to infer an accuracy rate from the number of exposed cases of wrongful conviction by fingerprint evidence divided by the number of cases in which fingerprint evidence has been deployed (a figure which is not known), extreme caution would have to be exercised in such an undertaking. The reason for this is that fingerprint evidence is treated as so powerful that we must assume that wrongful convictions based on fingerprint evidence are exposed at a very low rate.

³ Christophe C. Champod and Ian W. Evett, "A Probabilistic Approach to Fingerprint Evidence," Journal of Forensic Identification 51 (2001), 101-122.

⁴ I am here using the vernacular meaning of reliability as essentially synonymous with "accuracy," rather than the technical meaning in which "reliability" refers to the ability of a process to produce consistent answers, regardless of their ultimate correctness, while "accuracy" refers to the ability of the process to produce correct answers. I assume that courts generally mean "accuracy" when they say "reliability," since a court's focus would likely be on the accuracy, not the reliability, of evidence.

10. One may attempt to estimate accuracy through simulations - mock cases, in which the true origin of the print is known - but questions may always be raised about the extent to which simulations measure the accuracy of actual casework.

11. To date, there has been no good attempt to measure the accuracy of forensic fingerprint analysis. The best one can do is try to treat a series of proficiency tests conducted in the United States as simulations⁵, but this is problematic for a number of reasons. First, note that the fingerprint community and the test-maker both staunchly oppose and, indeed, seek to prohibit treating these proficiency tests as representative of the accuracy of forensic fingerprint identification in actual casework.⁶ Second, these tests were distributed and returned by mail and thus completed under uncontrolled, untimed conditions and possibly by committee. Third, the difficulty of the tests relative to casework is unknown. Fourth, it is generally believed that technicians of all types overperform on proficiency tests. Nonetheless, it should be noted that the "false positive" (that is, examiners say fingerprints come from a common source when in fact

⁵ Joseph L. Peterson and Penelope N. Markham, "Crime Laboratory Proficiency Testing Results, 1978-1991, II: Resolving Questions of Common Origin," *Journal of Forensic Sciences* 40 (1995), 1009-1029. Collaborative Testing Services, Latent Prints Examination, Report Nos. 9508, 9608, 9708, 9808, 99-516, 01-516, 02-516, 02-517, 03-516, 03-517, 03-518, 04-516, 04-517, 04-518 (1995-2004), summaries or complete reports on file with the author, reports from 2001-2004 available at http://www.collaborativetesting.com/forensics/forensics_reports.html, last accessed December 16, 2004.

⁶ Each Collaborative Testing Service report contains the following disclaimer:
Since it is the laboratory's option how the samples are to be used (e.g. training exercise, known or blind proficiency testing, research and development of new techniques), the results compiled in the summary report are not intended to be an overview of the quality of work performed in the profession and cannot be interpreted as such.

they do not) error rate on these proficiency tests is not trivial. Lastly, even if proficiency tests could be used to measure error rates, a sufficient sample size would be necessary because low failure rates on a small number of samples do not necessarily imply a low error rate.⁷

12. We are left with only two possible conclusions: (1) the inaccuracy of forensic fingerprint identification is significant, or (2) the inaccuracy of forensic fingerprint identification is unknown.

13. It may be difficult to believe that no attempt to measure the accuracy of forensic fingerprint identification has yet been made. However, the argument has been made in the scientific literature since at least 1997⁸ and in American legal proceedings since 1999⁹, and no one has yet produced a contravening example. The situation becomes more understandable, however, when one realizes that courts have admitted fingerprint evidence for around a century now without demanding evidence of its reliability.

14. It is often thought that reliability of forensic fingerprint identification is vouched for by the "fact" that no two fingerprints are exactly alike. The claim that there are no two fingerprints exactly alike in the world has never been proven, nor could it be. It has been inferred from the failure of criminal identification bureaus to find two exactly identical fingerprints

⁷ Jonathan J. Koehler, *On Conveying the Probative Value of DNA Evidence: Frequencies, Likelihood Ratios, and Error Rates*, 67 U. COLO. L. REV. 859, 874-75 (1996)

⁸ David A. Stoney, "Fingerprint Identification: Scientific Status," Modern Scientific Evidence: The Law and Science of Expert Testimony, eds. David L. Faigman, David H. Kaye, Michael J. Saks and Joseph Sanders, 1st ed., vol. 2 (St. Paul: West, 1997).

⁹ *United States v. Mitchell*, Cr. No. 96-407 (E.D. Pa. 1999)

emanating from different fingers. It should be noted (and it was noted by a critic as early as 1905)¹⁰ that the systems of fingerprint filing used by criminal identification bureaus are not designed to look for identical fingerprints from two different individuals.

15. The claim that there are no two fingerprint exactly alike in the world has also been supported by reference to the "law of nature" or by general assertions that "nature never repeats itself" or that "an object is identical only to itself" or by analogies with other natural objects like snowflakes.¹¹

16. It should be noted that even were it to be established, or accepted, that there are no two fingerprints exactly alike in the world, there still might be, and undoubtedly are, friction ridge patterns on two different fingers that are very similar. No empirical studies have been conducted to determine how similar fingerprint patterns from two different fingers might be. Thus, there has been no measurement of the underlying variability of human fingerprint patterns.

Attempts to answer the above question through statistical modeling have been found by statisticians to be inadequate.¹²

¹⁰ Henry Faulds, Guide to Finger-Print Identification (Hanley: Wood Mitchell, 1905).

¹¹ As pointed out by Dr. John Thornton in "The General Assumptions and Rationale of Forensic Identification", Ch. 20, in David L. Faigman, David H. Kaye, Michael J. Saks, and Joseph Sanders (eds.), Modern Scientific Evidence: The Law and Science of Expert Testimony 2nd ed. Vol. 3. (St. Paul: West, 2002), 156-157, such assertions, even if true, "cannot be substituted for a systematic and thorough investigation of a physical evidence category." With respect to the snowflake analogy, Thornton also points out that "(i)ndeed, snowflakes that are indistinguishably alike have been reported", *Id.* at 156 n. 3, citing N.C. Knight, "No Two Alike ?" 69 Bull. Am. Meteorological Soc'Y 496 (1988)(finding "apparent contradiction of the long -accepted truism that no two snowflakes are alike.")

¹² David A. Stoney and John I. Thornton, "A Critical Analysis of Quantitative Fingerprint Individuality Models," *Journal of Forensic Sciences* 31 (1986), 1187-1216;

However, even if it were possible to prove that there are no two fingerprint exactly alike in all the world - and let me state that I do not doubt this myself, though I am no more capable of proving it than anyone else - it would be almost entirely irrelevant to the question of how accurate is forensic fingerprint evidence.

In short, the fingerprint discipline has made no attempt to measure its own reliability.

C. STANDARDS

17. The fingerprint community has failed to devise an adequate standard for what constitutes a fingerprint "match." It is well understood that similarities in location, type, and orientation of what are called "ridge characteristics" lead fingerprint examiners to conclude that a "latent" (that is, from a crime scene) print and an inked print from a known source come from the same finger. What is not understood is how many of these similarities, or how much similarity, is necessary to warrant this conclusion. It should be noted that this conclusion does not have a probability attached to it. It is, therefore, presented as an unqualified opinion.

18. For much of this century, fingerprint examiners used "point standards" to vouch for fingerprint matches. Many countries, including most of the continental European nations, still use these standards.¹³ As established in the case of *United States v. Mitchell*, as recently as 1999 many examiners in the United States also still used point standards.¹⁴

19. An alternative viewpoint, first espoused by North Americans, was that there should

David A. Stoney, "Measurement of Fingerprint Individuality" in Advances in Fingerprint Technology 327 (Lee and Gaenslen eds., 2001).

¹³ "European Fingerprint Standards," Fingerprint Whorld 28.107 (2002).

¹⁴ *United States v. Mitchell*, Cr. No. 96-407 (1999)

not be a point standard. Instead, it should be up to the examiner in each individual case to decide whether sufficient matching detail is present to warrant the conclusion that the anatomical entity that created the known print is the only anatomical entity in the universe capable of creating the unknown print.

20. Many American law enforcement agencies, including the FBI and, to my knowledge, the ATF, do not use a point standard.¹⁵ The standard for how much matching ridge detail is sufficient to warrant a conclusion of identification is the judgment of the examiner based on training and experience. This is not a standard.

21. We may, therefore, conclude (1) that there is no clearly articulated standard for what constitutes a fingerprint match, and (2) the standard, whatever it is, is not uniform, either across the United States, nor around the world. There is substantial disagreement between examiners and jurisdictions over what constitutes a fingerprint match.

22. In addition, the process of forensic fingerprint identification fails to meet the peer review and publication standards. The published literature on fingerprinting is overwhelmingly

¹⁵ According to the ATF's Laboratory Services, Methods of Analysis: Fingerprint Examination (June 2003), Policy and Procedure Guideline 5.2, Criteria for Identification

After a latent print has been examined for friction ridge detail and has been determined to be "suitable for comparison", it may be compared with known fingerprints or palm prints.

Latent print and known print identifications will be made by the comparison of friction ridge detail. Identifications are established as the results of the comparison of friction ridge impressions containing sufficient quality (clarity) and quantity of friction ridge detail in agreement to establish individuality. Identification occurs when a latent print examiner, trained to competency, determines that the friction ridge impressions originated from the same source, to the exclusion of all others.

about how to classify sets of ten inked fingerprints, how to chemically process and otherwise "develop" (that is, make visible) latent fingerprints, and how friction ridges are formed during embryonic development. These topics are of marginal relevance to the method of forensic fingerprint identification. There are exceptions to this paucity of literature, but they have not been adequately peer reviewed and do not constitute a scientific discourse.¹⁶

23. I testified to the above points, among others, in a pre-trial "Daubert" hearing in *United States v. Mitchell*. At the conclusion of this hearing I was under the impression that I was precluded from testifying at trial. On appeal, the United States Court of Appeals, Third Circuit, ruled that I and other defense experts "were undoubtedly qualified to offer...expert opinions" and that we were not in fact precluded from challenging the specific identifications made of Mitchell's prints or from challenging the reliability of latent fingerprint identification in general, including discussion that the discipline lacked an error rate and thus the government expert witnesses' testimony was unreliable. However, the Court upheld the exclusion of any defense testimony concerning the definitional question of whether latent fingerprint evidence was a science. *United States v. Mitchell*, 365 F. 3d 215, 246-252 (3rd Cir. 2004). The Court also ruled that on the record before it the district court did not abuse its discretion in holding the

¹⁶ See, for example, David R. Ashbaugh, Quantitative-Qualitative Friction Ridge Analysis: An Introduction to Basic and Advanced Ridgeology (Boca Raton, Fla.: CRC Press, 1999). But see, Dr. John Thornton, Setting Standards In The Comparison and Identification 84th Annual Training Conference of the Calif. State Div. of IAI, May 9, 2000, <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....In his book, Asbaugh takes pains to develop the basis of ridgeology. And I think he does a commendable job of doing so, but it's an argument. You may think it's a good argument. But it's still an argument and argument is not proof.")

government's fingerprint evidence admissible, but that "this case does not announce a categorical rule that latent fingerprint evidence is admissible in this Circuit..." (Id. at 246).

III. RECENT DEVELOPMENTS REGARDING FINGERPRINTING

24. Since the publication of my book and my testimony in *Mitchell*, further information has come to light that strengthens, rather than weakens, my conviction in the above conclusions. This information includes the following:

25. Other disinterested (that is, not having an interest in the perpetuation of the belief that forensic fingerprint identification is a reliable and scientific technique) scholars and scientists have looked at the evidence and come to conclusions consistent with mine. Lyn and Ralph Norman Haber, distinguished experimental psychologists, have examined the literature on forensic fingerprint identification and come to the conclusion that its accuracy has not been adequately measured.¹⁷ Ralph Haber has testified to this opinion under oath in *United States v. Llera Plaza*. Dr. David Stoney and Professor James Starrs have come to the same conclusion and

¹⁷ Lyn Haber and Ralph Norman Haber, "The Accuracy of Fingerprint Evidence," paper presented at the Annual Convention of the Psychonomics Society (Orlando, Fla., 2001). See also, Lyn Haber & Ralph Norman Haber, *Error Rates for Human Latent Fingerprint Examiners*, in Automatic Fingerprint Recognition Systems 339, 358 (Nalini K. Ratha & Ruud Bolle eds., 2004) ("Our careful search of all of the professional research literature turned up not a single experiment on examiner accuracy, either when comparing latent prints to AFIS outputs or when comparing latent prints to ten-prints. Such data simply do not exist, even though examiners have testified in court about their infallible accuracy in making fingerprint comparisons for almost 100 years."); Sharath Pankanti et al., *On the Individuality of Fingerprints*, 24 IEEE Transactions on Pattern Analysis & Machine Intelligence 1010, 1010-11 (2002) ("The notion of fingerprint individuality has been widely accepted based on a manual inspection (by experts) of millions of fingerprints. However, the underlying scientific basis of fingerprint individuality has not been rigorously studied or tested.").

have so testified under oath in *United States v. Mitchell*.¹⁸ Other legal scholars who have also reached this conclusion are Professors Michael Saks and Professor Jennifer Mnookin.¹⁹ A recent editorial in the prestigious magazine *Science* also noted that fingerprinting's "reliability is unverified either by statistical models on fingerprint variation or by consistent data on error rates."²⁰

26. A leading legal treatise on scientific evidence by leading legal scholars on scientific evidence has argued strongly that forensic fingerprint evidence has not been adequately tested and that it does not meet the U.S. Supreme Court's requirements for scientific or technical evidence, as laid down in *Daubert* and its progeny.²¹

¹⁸ Dr. David Stoney, *Fingerprint Identification: Scientific Status*, in 3 Modern Scientific Evidence: The Law and Science of Expert Testimony § 27-2.1.2 at 378 (David L. Faigman et al. eds., 2002) ("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."). See also, § 27-2.1.2 at 379 ("The process of fingerprint examination and comparison has recently been articulated by Ashbaugh and his terminology has gained some acceptance within the forensic community."); § 27-2.1.2 at 381 ("From a statistical viewpoint, the scientific foundation for fingerprint individuality is incredibly weak"); Id. at § 27-2.3.1 at 388 ("[T]here is no justification [for fingerprint identifications] based on conventional science: no theoretical model, statistics or an empirical validation process.").

¹⁹ Michael Saks, "Merlin and Solomon: Lessons from the Law's Formative Encounters with Forensic Identification Science," Hastings Law Journal 49 (1998), 1069; *idem.*, "Reliability Standards: Too High, Too Low, or Just Right? The Legal and Scientific Evaluation of Forensic Science (Especially Fingerprint Expert Testimony)," Seton Hall Law Review 33 (2003), 1167; Jennifer L. Mnookin, "Fingerprint Evidence in an Age of DNA Profiling," Brooklyn Law Review 67 (2001), 13; *idem.*, "Fingerprints: Not a Gold Standard," Issues in Science and Technology 20 (2003), 47.

²⁰ Donald Kennedy, "Forensic Science: Oxymoron?" Science 302 (2003), 1625.

²¹ David L. Faigman, David H. Kaye, Michael J. Saks & Joseph Sanders, 3 Modern Scientific Evidence: The Law and Science of Expert Testimony, *Fingerprint Identification: Legal Issues* § 27-1.0 at 347(2002 ed.) ("(S)urprisingly little conventional

27. Two highly credentialed, doctoral-level forensic scientists from the Forensic Science Service in Britain published an article, arguing that the current methodology of forensic fingerprint identification was not scientific.²²

28. A study offered in evidence by the FBI in *Mitchell*, heavily relied upon in *Plaza*, and that continues to be presented at scientific meetings by the FBI, purporting to demonstrate the underlying variability of human fingerprint patterns, has been soundly criticized in the literature as poorly designed, as offering conclusions not warranted by the data, and as being valueless.²³ Indeed, in *United States v. Mitchell*, 365 F. 3d 215, 238 (3rd Cir. 2004), the court concluded that the study did not advance the government's case, saying "(s)ince the 50/50 experiment did not adequately model real world conditions, we cannot say that it significantly supports the government's position."

29. For these reasons, forensic fingerprint identification is not generally accepted in the

science exists to support the claims of the fingerprint examination community....Today, a thoughtful and scientifically literate proponent of expert fingerprint identification testimony, compelled by a thoughtful and scientifically literate opponent to demonstrate the validity of fingerprint identification claims in front of a thoughtful and scientifically literate judge, would face a number of serious difficulties"). See also, See e.g., David L. Faigman, *Is Science Different for Lawyers?* Science 2002 July 19; 297: 339-340 ("But the most basic work has yet to be done. The other forensic sciences, including bite-mark analysis, handwriting identification, firearms analysis, and so on, are similarly amenable to test. Unfortunately, like fingerprints, most have not been seriously tested.")

²² Champod and Evett (see note 2).

²³ James L. Wayman, "When Bad Science Leads to Good Law: The Disturbing Irony of the Daubert Hearing in the Case of U.S. v. Byron C. Mitchell," *Biometrics in Human Services User Group Newsletter* 4 (Jan. 2000); Champod and Evett (see note 2); Haber and Haber (see note 8); Faigman et al. (see note 9); Pankanti (see note 17); David H. Kaye, "Questioning a Courtroom Proof of the Uniqueness of Fingerprints," *International Statistical Review* 71 (2003), 521.

relevant scientific community. While forensic fingerprint identification is universally accepted by practicing fingerprint examiners, the relevant scientific community must be construed more broadly, to include knowledgeable experts whose livelihoods do not - and never did - depend on the perception of fingerprint identification as reliable and scientific. Such a community would include forensic scientists from other specialties, scientists and general, and perhaps historians and sociologists of science.

30. A federal judge wrote a sixty-page opinion in which he concluded that forensic fingerprint identification failed the *Daubert* requirements of testing, peer review, and standard and error rate. *United States v. Llera Plaza*, 179 F. Supp. 2d 492 (E.D. Pa. Jan. 7, 2002) (excluding, in part, expert testimony comparing fingerprints), vacated, 188 F. Supp. 2d 549, 576(E.D. Pa. Mar. 13, 2002) . Leading evidence scholars, including Professor Edward Imwinkelried, Professor Paul Giannelli, Professor David Faigman, Professor D. H. Kaye Professor Elizabeth Phillips Marsh, and Professor Jennifer Mnookin, praised the opinion as better reasoned than previous opinions ruling that fingerprint evidence met these criteria.²⁴ In fact, the only law professor who criticized

²⁴ See e.g., David L. Faigman, David H. Kaye, Michael J. Saks & Joseph Sanders, 3 Modern Scientific Evidence: The Law and Science of Expert Testimony, *Fingerprint Identification: Legal Issues* § 27-1.2.11(2002 ed.) (“A Short-lived Exception to the Usual Evasions”); Paul C. Giannelli, Fingerprints Challenged!, 17-SPG Crim. Just. 33 (“Judge Pollak’s analysis of [Daubert] factors is what makes *Plaza I* such a compelling case and he did not change his interpretation of *Daubert* in *Plaza II*, only its application.”); D.H. Kaye, *The Nonsense of Fingerprinting: United States v. Llera-Plaza*, 21 QLR 1073 (2003) (“Ultimately, the argument for admitting fingerprint identification that Judge Pollak found persuasive reduces to the following claim of the fingerprint community: We are well trained to offer opinions about the identity of individuals, and we have been doing it for over a century without anyone proving that we make many mistakes. As *Llera-Plaza I* so clearly reveals, this does not satisfy *Daubert*. And *Llera-Plaza II* does not hold otherwise. Instead, it holds that FBI examiners can give identification opinions without any effort to validate their claims to skill and knowledge by testing the accuracy of their judgments in a scientific experiment.”); Printing Errors, THE ECONOMIST, Jan.

the decision, to my knowledge, was Professor André Moenssens, a former fingerprint examiner.²⁵

Although this opinion was vacated, the revised opinion still held that forensic fingerprint evidence is not science. It further held, as I do, that forensic fingerprint identification failed to meet the testing and peer review criteria of *Daubert*.²⁶

31. In *Plaza II*, testimony was elicited at the pre-trial *Daubert* hearing that indicated that the FBI's internal proficiency tests were laughably easy to pass and not designed to test for the possibility of false positives (errors falsely incriminating a suspect) but rather for the possibility of false negatives (errors falsely excluding a suspect). The court in *Plaza II* was persuaded by the testimony of Allan Bayle, a former Scotland Yard fingerprint examiner, that the FBI's newly revealed proficiency tests "presented little challenge." 188 F. Supp. 2d at 565. The court concluded, "the FBI examiners got very high proficiency grades, but the tests they took did not."

(Id.)

19, 2002, at 66, 68 (Professors Marsh and Mnookin "called [the Llera Plaza] ruling 'exceptionally well-reasoned'"); Seth Stern, A Harder Day in Court for Fingerprint, Writing Experts, CHRISTIAN SCI. MONITOR, Jan. 16, 2002, at 2 (Professor Saks says "Courts are forcing forensic science to become a science"); Mike Weiss, U.S. Judge Challenges 'Science' of Fingerprints, S.F. CHRON., Feb. 24, 2002, at A1 (Professor Imwinkelried "hailed [Judge] Pollak's decision"). See also, Tara Marie La Morte, *Sleeping Gatekeepers: United States v. Llera Plaza and the Unreliability of Forensic Fingerprinting Evidence Under Daubert*, 14 Alb. L.J. Sci. & Tech. 171, 201(2003)(“Th[e] [first] decision represents a reasonable accommodation between the criminal justice system's reliance on this type of forensic evidence and the fact that such evidence has blatant shortcomings, which cannot continue to be abused at the risk of convicting defendants who are, in fact, innocent.”)

²⁵ Andre A. Moenssens, *Fingerprint Identification: A Valid, Reliable "Forensic Science"?*, 18-SUM Crim. Just. 30 (2003)

²⁶ See also, *United States v. Crisp*, 324 F.3d 261 at 273-274 (4th Cir. 2003)(dissenting opinion of Judge Michael)(fingerprint evidence fails the *Daubert* test)

32. A central underpinning of both *Plaza* and *Mitchell* was, in the words of the court in *Plaza*, that “(i)t has been open to defense counsel to present examples of erroneous identifications attributable to FBI examiners, and no such examples have been forthcoming.” 188 F. Supp. 2d at 565-66. See also, *United States v. Mitchell*, 365 F. 3d at 238-241. However, on May 24, 2004, approximately one month after *Mitchell* was decided, the FBI issued the following press statement:²⁷

After the March terrorist attacks on commuter trains in Madrid, digital images of partial latent fingerprints obtained from plastic bags that contained detonator caps were submitted by Spanish authorities to the FBI for analysis. The submitted images were searched through the Integrated Automated Fingerprint Identification System (IAFIS). An IAFIS search compares an unknown print to a database of millions of known prints. The result of an IAFIS search produces a short list of potential matches. A trained fingerprint examiner then takes the short list of possible matches and performs an examination to determine whether the unknown print matches a known print in the database.

Using standard protocols and methodologies, FBI fingerprint examiners determined that the latent fingerprint was of value for identification purposes. This print was subsequently linked to Brandon Mayfield. That association was independently analyzed and the results were confirmed by an outside experienced fingerprint expert.

Soon after the submitted fingerprint was associated with Mr. Mayfield, Spanish authorities alerted the FBI to additional information that cast doubt on our findings. As a result, the FBI sent two fingerprint examiners to Madrid, who compared the image the FBI had been provided to the image the Spanish authorities had.

Upon review it was determined that the FBI identification was based on an image of substandard quality, which was particularly problematic because of the remarkable number of points of similarity between Mr. Mayfield's prints and the print details in the images submitted to the FBI.

The FBI's Latent Fingerprint Unit will be reviewing its current practices and will give consideration to adopting new guidelines for all examiners receiving latent print images when the original evidence is not included.

The FBI also plans to ask an international panel of fingerprint experts to review our examination in this case.

²⁷ Statement on Brandon Mayfield Case, May 24, 2004,
<http://www.fbi.gov/pressrel/pressrel04/mayfield052404.htm>, accessed Dec 16, 2004.

The FBI apologizes to Mr. Mayfield and his family for the hardships that this matter has caused.

33. *Plaza II* and *Mitchell* explicitly limited itself to the FBI and was highly contingent on the court's impression of the competence, proficiency, and training standards of FBI fingerprint examiners. The opinion, therefore, begs for continued scrutiny, in a proceeding like a pre-trial hearing, of the competence, proficiency as demonstrated by tests, and training standards of fingerprint examiners from other agencies seeking to offer evidence of fingerprint matches.

IV. THE SUMMARY OF TESTIMONY OF EXPERT WITNESS LARRY HANKERSON

34. The summary of ATF agent Larry Hankerson is not unusual for fingerprint testimony, but it illustrates some of the limitations I have discussed above. For example, the summary states that "Mr. Hankerson will testify that ... he determined that the friction ridges in question bore sufficient quality and quantity of detail to individualize them. Had the fingerprints lacked sufficient quality and quantity of detail, the examination would have ended at this stage." In response to defendant's request for clarification of this sentence, the government has stated (doc. 348, p.16),

The defense ...argues that the United States has not provided the defense with what "objective standard" Mr. Hankerson used to reach his conclusions that certain latent prints were made by the defendant. The United States must point out that there is no "cookbook" used in the analysis or examination of fingerprints or latent prints. There is no "numerical standard" as referred to by the defense."

But this poses the crucial question: if there is no numerical or objective standard of measurement, how many characteristics found in the same relative position do you need to warrant the extraordinarily strong conclusion that the prints must have been made by the same finger, and by no other finger in the world? Mr. Hankerson does not have an answer to this

question and neither, as explained above, does the fingerprint profession. Notice that the entire summary hinges upon what is meant by the term "sufficient"; this term is never defined, either by Mr. Hankerson or by the professional literature. Moreover, any assertion of "sufficient quality and quantity of detail" by Mr. Hankerson is essentially untestable, especially in the present case where I have been informed that government counsel has represented to the Court that Mr. Hankerson made no contemporaneous notes or other documentation of the specific details being compared.²⁸

35. Mr. Hankerson's summary also illustrates the confusion between the individuality of friction ridge skin itself and the accuracy of fingerprint analysis. The summary states:

Mr. Hankerson will testify that fingerprint and/or palm print identification is based on two premises:

Permanence: fingerprints (friction ridges) are formed prior to birth and remain unchanged until death

and
Uniqueness: no two fingerprints made by two different fingers have ever (sic) found to be the same.

These two premises, even if true, address the wrong question. The relevant question for a finder of fact is not whether some other person has finger and palm prints identical to Mr. Rudolph's. Instead, the relevant question is whether there are individuals with small areas of friction ridge skin that are similar enough to small areas of friction ridge skin on Mr. Rudolph's finger or palm that a latent print examiner might erroneously conclude that a print left by another person was made by Mr. Rudolph. The answer to this is certainly, "yes," in that we know that, in other cases, fingerprints have been erroneously attributed to persons who turned out not to be the

²⁸ The ATF's Laboratory Services, Methods of Analysis: Fingerprint Examination (June 2003), Policy and Procedure Guideline 5.2 provides:

Recorded observations shall consist of: A complete written description that will include photographs, sketches, diagrams, video, photocopy, and/or other visual aides used to document the identification.

That is a clear standard. However, it was not followed in this case.

donors.²⁹ But the question remains, what is the probability of this occurring and under different kinds of circumstances. No attempt has been made to answer this question.

None of this has anything whatsoever to do with the question of whether Mr. Rudolph's friction ridge skin is unique - it surely is. But areas of it may be unique and yet very similar to areas of many other persons' friction ridge skin. The fact of uniqueness, does not lead to the conclusion that Mr. Hankerson's fingerprint testimony is reliable.

36. Finally, I note that Mr. Hankerson's conclusion is both non-probabilistic and extraordinarily strong:

Mr. Hankerson will testify that the only possible conclusions that can be made from the comparison of two different fingerprints are: (1) both fingerprints were made by the same finger; (2) the fingerprints were not made by the same finger; or (3) there is insufficient detail or clarity in one or both fingerprints to reach a conclusion.³⁰

(Summary, p. 4)

There is no attempt made - nor is there ever in standard fingerprint practice - to quantify either the frequency with which fingerprint examiners are correct in their conclusion, the

²⁹ To list only the ones that occurred this year: the Brandon Mayfield case. FBI, Statement on Brandon Mayfield Case, May 24, 2004, <http://www.fbi.gov/pressrel/pressrel04/mayfield052404.htm>, accessed Dec 16, 2004. And, the Stephan Cowans case. Simon A. Cole, Fingerprints Not Infallible, National Law Journal, Feb. 23, 2004, at 22.

³⁰ Indeed, fingerprint examiners' professional code prohibits them from testifying with any lesser degree of certainty. See, International Association for Identification, Resolution VII, 29 IDENTIFICATION NEWS 1 (Aug. 1979) ("[A]ny 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 conduct unbecoming such member, officer, or certified latent print examiner."); International Association for Identification, Resolution V, 30 IDENTIFICATION NEWS 3 (Aug. 1980) (amending the resolution to allow for such testimony, with qualifications, under threat of court sanction).

confidence level properly to be attached to the analyst's conclusion, or the frequency with which the identifying features of the print appear in the population. This is in marked contrast to forensic DNA evidence, which is associated with a "random match probability" which estimates the frequency of the identifying features in the population.

37. So strong a conclusion as that offered by Mr. Hankerson—"the defendant made the latent prints" (Summary, p. 7)-- is simply not warranted by what is known about either the variability of human friction ridges or the accuracy of forensic fingerprint identification.

I hereby swear and affirm the foregoing to be true and correct, under penalties of perjury. If called as a witness, I could and would testify to the matters set forth herein.

DATE

SIMON A. COLE