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.	)	

MOTION TO EXCLUDE TESTIMONY OF FORENSIC FINGERPRINT EXAMINER AND REQUEST FOR A DAUBERT HEARING

Introduction

COMES NOW Defendant, ERIC ROBERT RUDOLPH, by and through undersigned counsel, and files this Motion to exclude the testimony of Larry Hankerson and any other forensic fingerprint examiner the government intends to call as a witness in this case. Defendant asks for a hearing on this Motion. At the conclusion of that hearing, Defendant asks the Court to apply the principles from *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S.Ct. 2786, 125 L.Ed.2d 469 (1993)(hereinafter *Daubert*) and the 2000 amendments to Rule 702 of the Federal Rules of Evidence, and to exclude all testimony from this witness.

In order to demonstrate that the Court should grant a hearing and exclude this testimony, Defendant will briefly outline the discovery provided by the government on this issue. Next, Mr. Rudolph will review the seminal cases of *Daubert* and *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 119 S.Ct. 1167, 143 L.Ed.2d 238 (1999), as well as the 2000 amendments to Rule 702,

which supplement but clearly go beyond these decisions. Third, Defendant will review the recent cases in this area following *Daubert*, *Kumho Tire,* and the amendments to Rule 702. The vast majority of these decisions hold, without employing the "exacting" and "rigorous" *Daubert* analysis now mandated by *United States v. Frazier,* 387 F. 3d 1244, 1260 (11th Cir. 2004), that forensic fingerprint examinations are admissible.

But in a very recent and comprehensive review of the issue, the Court of Appeal for the Third Circuit acknowledged the legitimacy of many of the arguments raised below. *United States v. Mitchell*, 365 F.3d 215 (3rd Cir. 2004). Although the court ruled that testimony from an FBI fingerprint examiner was admissible on the record made at the *Daubert* hearing in that case in 1999, the court also concluded that "this case does not announce a categorical rule that latent fingerprint identification is admissible in this Circuit...", and that "district courts will generally act within their discretion in excluding testimony of recalcitrant witnesses-those who will not discuss on cross-examination things like error rates or the relative subjectivity or objectivity of their methods." (Id. at 245-246. The implications of this decision are therefore discussed in some detail, especially since there is no binding post-*Daubert* precedent on the issue in the Eleventh Circuit. Finally, Mr. Rudolph will review some of the most recent research in this area, as outlined in the attached Affidavit and Expert Witness Summary of Dr. Simon Cole (attached hereto as Exhibit A)(hereafter, "Cole Dec."), and the Affidavit and Expert Witness Summary of James Starrs (attached hereto as Exhibit B)(hereafter "Starr Dec.), and set forth additional grounds for exclusions of the testimony under Rules 403 and 702.

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I. The Proposed Testimony Concerning Comparison of Known and Questioned Partial Latent Prints in this Case.

On February 23, 2004, the government filed a pleading entitled "Summary of Testimony of Expert Witness Larry Hankerson." In this pleading, the government contends that it should be allowed to call Mr. Hankerson as an "expert" witness in the field of forensic fingerprint examination. Mr. Hankerson is employed as a latent fingerprint examiner at the Bureau of Alcohol, Tobacco and Firearms Forensic Science Laboratory in Atlanta, Georgia.

In this pleading, the government states that Mr. Hankerson proposes to testify that latent fingerprint comparisons are based on the premises of "(1) Permanence: fingerprints (friction ridges) are formed prior to birth and remain unchanged until decomposition after death, and (2)Uniqueness: no two fingerprints made by two different fingers have ever (sic) found to be the same." Summary, p. 2.

The government fails to include any support for these contentions. In fact, as Dr. Simon Cole, one of the leading scholars in this area of scientific evidence, points out in the affidavit and expert witness summary attached hereto as Exhibit A:

> "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 donors.[1] But the question remains, what is

[1] 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 Infalliable*, National Law Journal, Feb. 23, 2004, at 22.

> the probability of this occurring and under different kinds of circumstances. No attempt has been made to answer this question."

(Cole Dec., p. 18-19, para. 35). And as James Starrs, another leading scholar, notes in the affidavit and expert witness summary attached hereto as Exhibit B, "In other words, the present process of fingerprint comparison and analysis, is not predicated on a sound and adequate scientific basis for purposes of individualization to one person from a fragmentary latent print to the exclusion of all other persons in the world." (Starrs Dec., p. 5, para. 21). See also, *United States v. Mitchell*, 365 F.3d at 220 ("Criminals generally do not leave behind full fingerprints on clean, flat surfaces. Rather, they leave fragments that are often distorted or marred by artifacts); *Mitchell*, 365 F.3d at 225 ("analysis of full-rolled prints [is] not particularly germane to the question of the identification of latent partial prints").

The prosecution wants Mr. Hankerson to testify further that the methodology used in his fingerprint comparison involves four phases: (1) analysis; (2) comparison; (3) evaluation; and (4) verification (ACE-V).(Summary, p. 2-3).[2]

The prosecution also vaguely asserts that "Mr. Hankerson will testify that... he determined that the friction ridges in question bore sufficient quality and quantity of detail to

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[2] The flaws in this particular methodology are discussed below in some detail. It is similar, but significantly different from the methodology used by the FBI in the *Mitchell* case, where the court stated that "[w]hile this [methodology] has the advantage of allowing an examiner to find a match in situations where an examiner using a strict point-based standard would not find one, this flexibility comes at the price of substituting a degree of subjectivity for an objective numerical standard." 365 F. 3d at 222. In fact, however, the court notes that the FBI expert employed a fourteen point count standard: "In this case, Agent Meagher identified fourteen points of Level 2 detail (and unspecified supporting Level 3 detail, which we leave aside for simplicity) that matched Mitchell's right thumbprint to the latent print taken from the gearshift knob. Thus, for purposes of this particular identification, "sufficient quantity and quality of detail" really means "fourteen points of Level 2 detail." (Id. at 237 n. 17). As the government admits, no such numerical standard was used in this case.

individualize them", and that "[h]ad the fingerprints lacked sufficient quality and quantity of detail, the examination would have ended at this stage." (Summary, p. 3). 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 ceratin 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.[3]

As Dr. Cole points out,

> "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 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

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[3] The defense has further and repeatedly moved for documentation of the precise points of comparison relied upon by Hankerson to make each of his identifications. See, *United States v. Robinson*, 44 F. Supp. 2d 1345 (N.D. Ga. 1997)(excluding fingerprint testimony for failure to comply with such a request). In response, the government has informed defense counsel and the magistrate that Hankerson made no contemporaneous documentation of his points of comparison, and that if he was asked or forced to do so now, the selected points would not necessarily be the same points relied upon at the time the examinations were conducted . At a status conference held on December 15, 2004, the government was ordered to produce such points of comparison. The government also promised to produce external laboratory audits. Defendant therefore reserves the right to supplement this motion upon production of the requested discovery.

> contemporaneous notes or other documentation of the specific details being compared."

(Cole Dec., p. 17-18, para. 34). See also, Starrs Dec., p. 7, para. 32 ("It is critical to the scientific process that both the original examination and any subsequent verifications be documented via contemporaneously taken notes which are retained for later independent review."); Cf., *United States v. Mitchell*, 365 F.3d 215 (3rd Cir. 2004) ("the FBI's reliance on an unspecified, subjective, sliding-scale mix of 'quantity and quality of detail' makes meaningful testing elusive, for it is difficult to design an experiment to test a hypothesis with unspecified parameters."

The government further says that Mr. Hankerson will testify that "friction ridges" generally flow from one side of the hand or finger to the other and, "therefore have certain unique characteristics, minutiae, or points of comparison." (Summary, p. 3) The government does not explain why having ridge characteristics flow from one side of the hand or finger to the other is in any way connected with the asserted uniqueness of "friction ridges." The government also says that the comparison process "involves looking for the finer details of the print such as shapes and widths of ridges, pore structure, edges of the ridges, scars, incipient ridges and other features considered to be unique to the pint." (Id. at 4). Again, no documentation of any "friction ridge" points of comparison, or of any of the other named features has been forthcoming, and the government provides nothing to back up the claim of uniqueness. As Professor Starrs points out,

> "The subjectivity of the evaluation extends not only to the number of points of comparison that are deemed necessary needed to make a 'match,' but even to the question of what the points of comparison are and the weight to be attributed to them. For instance, bifurcations, ending ridges, and dots (short ridges) are very common elements of a fingerprint pattern and are generally utilized. Other, rarer types of points of comparison include bridges, trifurcations, and spurs, as well as interpapillary lines and ridge dimensions (termed ridgeology) and pore variations (classed as poroscopy), which are not identified and used

generally, let alone uniformly."

(*Starrs Dec.*, p. 6-7, para. 28).

The government also contends that Mr. Hankerson will testify that the during the last phase of his examination, verification, the fingerprints were examined by a second examiner. During this phase, "the second examiner performs the examination using the same approach outlined above and conducts his or her examination completely independent of Mr. Hankerson's examination with no knowledge of the features Mr. Hankerson used to make his identification." This second examination is "performed to verify conclusions, not to verify the individualizing features used by the first examiner." (Summary, p. 4) As with Mr. Hankerson's conclusions, no documentation exists as to the precise points of comparison being relied upon by the reviewer. On October 5, 2004, the government indicated in response to a request for such documentation that "[t]he BATFE and experts who conducted technical review do not maintain case jackets, work papers or bench notes of that review process." (Doc. 348, p. 11). However, on December 7, 2004, the government produced eleven Case File review forms, all signed by Andrew McIntrye, who is alleged to be the technical reviewer for Mr. Hankerson's work.(BH-ABL-006054-006078). None of these eleven forms relate to the four reports listed in the Summary that relate to Mr. Rudolph. All the forms have check boxes, one of which reads, "[w]as data properly interpreted, and are the conclusions fully supported by the data ?" McIntrye has checked this box "yes" on all eleven forms, although nowhere is the basis for his conclusions documented. Another part of the form reads, "[a]re all graphs, charts, photographs an/or photocopies used to support conclusions in the case jacket ?" (Id.) This form is also checked "yes" on all eleven forms, although the government now represents that Hankerson never produced any

documentation used to support conclusions. The Summary clearly implies that no identification is reported unless the reviewer independently agrees with the person being reviewed. However, in at least six of eleven forms the review forms were signed a day or even days after Hankerson filed his report.

The government also states that Hankerson wants to 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." (Summary, p. 4). The Summary goes on to say that based on the methodology outlined above, Mr. Hankerson is prepared to say, based on a comparison with Mr. Rudolph's known prints[4], that he made various latent fingerprints allegedly relevant to this case. (Id. at 7-9). Dr. Cole comments on this aspect of the proposed testimony as follows:

> "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 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."

(Cole Dec., p. 20, para. 36).

Dr. Cole concludes: "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

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[4] The defense has been informed that for some of the comparisons, Mr. Hankerson used a copy of Mr. Rudolph's military fingerprints, not the original. It was the use of such copies that recently led multiple FBI agents to misidentify Brandon Mayfield in the Madrid bombing case. (Cole Dec. p. 16-17, para. 32).

about either the variability of human friction ridges or the accuracy of forensic fingerprint identification." (Id.)

II. The Major Changes Within the past Decade Concerning the Admissibility of "Expert" Testimony

As Mr. Rudolph indicates in other motions, when purported science or technical expert evidence is imported from the crime laboratory into the courtroom the leap from one context to another must be carefully analyzed. *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999); *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993). As the Supreme Court most recently declared, " Since *Daubert* . . . parties relying on expert evidence have had notice of *the exacting standards of reliability* such evidence must meet." *Weisgram v. Marley Co. et al* 528 U.S. 440,455, 120 S. Ct. 1011, 1021, 145 L.Ed.2d 958 (2000) (emphasis added). See also, *United States v. Frazier,* 387 F. 3d 1244, 1260 (11th Cir. 2004) ("This function 'inherently require[s] the trial court to conduct an exacting analysis' of the foundations of expert testimony to ensure they meet the standards for admissibility under Rule 702.") (en banc). "The importance of *Daubert's* gatekeeping function cannot be overstated." (387 F. 3d at 1260).

Up until 1993, the test for admitting "expert" witnesses in a federal trial was whether the expert's analysis was "generally accepted" in the scientific community. In *Daubert*, the Supreme Court held that the passage of the Federal Rules of Evidence surpassed the "general acceptance" test. *Daubert* held that under the Federal Rules, the judge has to act as a "gatekeeper", and must decide if certain testimony is not only relevant, but also reliable. The Court pointed out a non-exhaustive list of five factors that could help with this inquiry: (1) whether the technique or theory can be and has been tested, (2) whether the theory or technique had been subjected to peer

review and publication, (3) the known or potential rate of error of the particular scientific technique, (4) the existence and maintenance of standards controlling the technique's operation, and (5) whether the technique is generally accepted in the scientific community.

After *Daubert*, questions arose over whether these guidelines applied to witnesses whose testimony was based not on scientific principles, but instead was grounded on expertise, skill, knowledge or education. In *Kumho Tire*, the Court concluded that the general holding from Daubert-setting forth the trial judge's general "gatekeeping" function-applies not only to testimony based in "scientific" knowledge, but also to testimony based on "technical" or "other specialized" knowledge. "Thus 'technical knowledge,' under which heading the discipline of latent fingerprint examination and identification seems to fall, is generally subject to the same considerations as 'scientific' expertise." *United States v. Mitchell*, 365 F.3d at 234.

Daubert and *Kumho Tire* resulted in changes to the expert witness rules. Now, under Rule 702,

> "a witness qualified as an expert by knowledge, skill, experience, training, or education may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case."

The current version of Rule 702 went into effect in 2000. As recently emphasized in *United States v. Frazier,* 387 F. 3d 1244, 1260 (11th Cir. 2004), in determining the admissibility of expert testimony under Rule 702, a trial court must engage in "a rigorous three-part inquiry"

and must consider whether:

> "(1) the expert is qualified to testify competently regarding the matters he

> intends to address; (2) the methodology by which the expert reaches his conclusions is sufficiently reliable as determined by the sort of inquiry mandated in *Daubert*; and (3) the testimony assists the trier of fact, through the application of scientific, technical, or specialized expertise, to understand the evidence or to determine a fact in issue."

In addition, the court must ensure that the specific requirements of the 2000 amendments of Rule 702 are satisfied: "(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." (emphasis added). "Indeed, the Committee Note to the 2000 Amendments of Rule 702 expressly says that '[i]f the witness is relying solely or primarily on experience, then the witness must explain how that experience leads to the conclusion reached, why that experience is a sufficient basis for the opinion, and how that experience is reliably applied to the facts. The trial court's gatekeeping function requires more than simply 'taking the expert's word for it.' " *United States v. Frazier,* 387 F. 3d at 1261.

This "newly-expanded rule goes further than *Kumho* to 'provide [ ] some general standards that the trial court *must* use to assess the reliability and helpfulness of proffered expert testimony.'" *Rudd v. General Motors Corp.*, 127 F.Supp.2d 1330, 1336 (M.D.Ala. 2001) (emphasis in original).

> "While the inquiry into 'reliable principles and methods' has been a familiar feature of admissibility analysis under *Daubert*, the new Rule 702 appears to require a trial judge to make an evaluation that delves more into the facts than was recommended in *Daubert*, including as the rule does an inquiry into the sufficiency of the testimony's basis ("the testimony is based upon sufficient facts or data") and an inquiry into the application of a methodology to the facts ("the witness has applied the principles and methods reliably to the facts of the case")....
> Neither of these two latter questions that are now mandatory under the new rule--the inquiries into the sufficiency of the testimony's basis and the reliability of the methodology's application--were expressly part of the formal admissibility analysis under *Daubert.*"

(Id. at 1336).

As will be set out below, after *Kumho Tire* and the recent changes to Rule 702, a growing number of researchers and some courts have called into serious question whether forensic fingerprint examiners can now be allowed to testify as "experts".

III. Some Background Onthe Fingerprint Controversy

With two important exceptions to be discussed below, the admissibility of expert testimony based upon fingerprint evidence to prove identity is well established in every jurisdiction of the United States. See generally, 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* § 27-1.1 at 350(2002 ed.), Exhibit 1[5]). Less well known is the advent of judicial acceptance of the technique during the 1920s. " This evidentiary development was characterized by meager judicial scrutiny combined with rapid spread of acceptance among numerous jurisdictions. That swiftness is somewhat surprising considering that fingerprint identification presented the courts with a claim that was still novel (infinite and absolute individualization) in a remarkably strong form (infallibility). And rapid considering the recent shortcomings of anthropometry, the first child of scientific attempts at individualization, which had made essentially the same claims." Id. at p. 350.[6]

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[5] With the exception of Exhibits A and B, all exhibits in support of this motion are contained on a CD-ROM filed as an attachment to the motion. Hard copies of everything contained on the CD are also provided, except for voluminous transcripts.

[6] Anthropometry, or bertillonage, developed in the early 1880's by Alphonse Bertillion, a clerk in the Paris prefecture of police, relied on the measurements of 11 different physical features of prisoners to determine if they had prior arrests in spite of their giving aliases to the police. This supposedly "infallible" system was abandoned in the United States in the early 1900s when it was discovered that some prisoners, contrary to the theory, had indistinguishable

Illustrative of this "meager judicial scrutiny" is the pre-*Daubert* case of *United States v. Piccinonna*, 885 F. 2d 1529, 1531 n. 5 (11th Cir. 1989), where the court, in the course of considering the admissibility of the polygraph, cites a dissenting state court opinion for the proposition that the "*Frye* standard has generally not been relied upon for the admission of evidence such as fingerprints, ballistics, intoxication tests, and X-rays." But as the court put it in *United States v. Horn*, 185 F. Supp 530, 554(D. Md. 2002) in ruling to exclude long accepted intoxication tests:

> Following the *Kumho Tire* decision and the December 2000 changes to Rule 702, a detailed analysis of the factual sufficiency and reliability of the methodology underlying expert testimony is required for all scientific, technical or specialized evidence, not just "novel scientific" evidence. This has required, at times, a reexamination of the admissibility of evidence that long has been admitted under the *Frye* test, which may result in exclusion of evidence that for years routinely has been admitted. *See, e.g., United States v. Llera Plaza,* 179 F.Supp.2d 523 (E.D.Pa.2002) (excluding aspects of evidence of latent fingerprint identification evidence on the basis of *Daubert/Kumho Tire* and Rule 702 analysis). As lawyers and courts become fully aware of the relatively recent additional requirements of *Kumho Tire* and revised Rule 702, this process of reexamination can be expected to continue. It may mean, in a very real sense, that "everything old is new again" with respect to some scientific and technical evidentiary matters long considered settled. Alarmists may see this as undesirable, envisioning courtrooms populated by mad scientists in white lab coats and overzealous judges in black robes, busily undoing established precedent. The more probable outcome is that judges, lawyers and expert witnesses will have to learn to be comfortable refocusing their thinking about the building blocks of

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anthropometric measurements. (Id. at p. 350 n. 2.)

A similar phenomenon may be developing with respect to the "infallible" science of DNA testing.See, Mismatch Calls DNA Tests Into Question, USA TODAY, February 8, 2000, p. 1("Great Britian's national DNA database, the world's largest crime-solving computer system, has mistakenly matched an innocent man to a burglary-a one-in-37 million possibility that American experts call 'mind-blowing'"). Another "mind blowing" event was the recent misidentification of falsely accused Madrid bombing suspect Brandon Mayfield whose fingerprints were erroneously matched to a latent print by multiple FBI fingerprint specialists. (Cole Dec., p. 16; 19[discussing a second case of fingerprint misidentification in 2004])

> what truly makes evidence that is beyond the knowledge and experience of lay persons useful to them in resolving disputes. The beneficiaries of this new approach will be the jurors that have to decide increasingly complex cases. *Daubert, Kumho Tire,* and now Rule 702 have given us our marching orders, and it is up to the participants in the litigation process to get in step.

Like intoxication tests, handwriting analysis, and many other recently challenged forensic methodologies, the unproven assumption that the fingerprint process is reliable can no longer be sustained post-*Daubert* and post-*Frazier*. Forensic scientists, and even fingerprint experts themselves, are now calling into question the fundamental scientific premises upon which fingerprint evidence is based. In these circumstances, "everything old is new again."

As Dr. Cole ably points out in the attached affidavit and expert witness summary (pp. 18-19), the question here is not the uniqueness and permanence of entire fingerprint patterns, consisting of hundreds of distinct ridge characteristics. Rather, the question is far more specific: Is there a scientific basis for a fingerprint examiner to make an identification, of absolute certainty, from a small distorted latent fingerprint fragment, revealing only a small number of basic ridge characteristics which are not even counted and quantified under the holistic approach used by Mr. Hankerson ? See, *United States v. Mitchell,* 365 F. 3d at 238 ("the issue for *Daubert* purposes is the testing of the hypothesis that positive identification be made from *actual latent fingerprints* containing sufficient detail.") (emphasis in original). See also, Paul Giannelli and Edward Imwinkelried, 1 Scientific Evidence (3d. ed. 2001 Supp)§ 16-9(D), p. 113, Exhibit 2 ("The issue is not whether persons have distinctive fingerprints. Rather, the question is the reliability of findings of matches given the size and clarity of the latent print found. Even if persons have unique fingerprints, the process of determining matches may be unreliable.").

There are two fundamental premises that underlie such an identification: First, that two

or more people cannot possibly share this number of basic ridge characteristics in common; and second, that fingerprint examiners can reliably assert absolute identity from small latent print fragments despite the unknown degree of distortion and variability from which all latent prints suffer. With the issue properly framed, it is readily evident that the People cannot demonstrate the various indicia of scientific reliability set forth in the cases cited above.

First, there has been never been any testing conducted to establish the reliability of identifications which are made from small distorted latent fingerprint fragments. Nor has there been any testing performed to establish the probability of different people having a number of fingerprint ridge characteristics in common. The National Institute of Justice has conceded that this type of reliability and probability testing has never been performed, and even more significantly, that it needs to be conducted. The Department, in March of 2000, issued a "Solicitation" calling for such testing, and the Department has offered a $500,000 grant toward that end. See, National Institute of Justice, *Solicitation: Forensic Friction Ridge (Fingerprint Examination Validation Studies* (March 2000), Exhibit 3). See also, Cole Dec. at p. 7 ("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."); Compare, *United States v. Mitchell*, 365 F.3d at 238 ("In sum, if directed, specific actual testing were the requirement of *Daubert*, we might be hesitant to find this factor weighing in favor of the government" but "implicit testing is equally forceful") with *United States v. Frazier,* 387 F. 3d at 1261 ("it remains a basic foundation for admissibility that '(p)roposed [expert] testimony must be supported by appropriate validation–i.e., 'good grounds,' based on what is known ").

Second, given that reliability testing has yet to be performed, there are no known error rates for latent fingerprint examiners. See also, Cole Dec. at p. 5 ("To date, there has been no good attempt to measure the accuracy of forensic fingerprint analysis."); Starrs Dec. at 6 (same). See also, 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.") (Exhibit 71); 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.") (Exhibit 69). There is, however, substantial reason to suspect that once the necessary scientific testing is conducted the error rates generated will indeed be significant. Many real life examples of false identifications exist and there has been a shockingly high rate of misidentifications on latent print examiner proficiency exams (See, *infra* at p. 48). Any claim that the error rate is "zero" is patently absurd in light of the fact that " both here and abroad there have been alarming disclosures of errors by fingerprint examiners."Paul Giannelli and Edward Imwinkelried, 1 Scientific Evidence (3d. Ed 1999)§ 16-1, p. 740-741, Exhibit 2.

Third, fingerprint examiners do not possess uniform objective standards to guide them in

their comparisons. To the contrary, there is complete disagreement among fingerprint examiners as to how many points of comparison are necessary to make an identification, and many examiners, including those of the FBI and the ATF, now take the position that there should be no objective standard at all. As a leading law enforcement fingerprint examiner has candidly conceded, a fingerprint examiner's opinion of identification is "very subjective." David Ashbaugh, Premises of Friction Ridge Identification, Clarity and the Identification Process, 44 J. OF FORENSIC IDENTIFICATION 499, 511 (1994) (hereinafter Ashbaugh, Premises), Exhibit 4. See also, 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), Exhibit 1("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."); David Ashbaugh, Quantitative-Qualitative Friction Ridge Analysis: An Introduction to Basic and Advanced Ridgeology, 103 (1999) [hereinafter Ashbaugh, Basic and Advanced Ridgeology]("The opinion of individualization or identification is subjective."), Exhibit 5.[7] See, *United States v. Mitchell*, 365 F.3d at 241

[7] Dr. David Stoney has a Ph.D. in Forensic Science from the University of California, Berkeley, where he worked on the statistical modeling of fingerprint identifications. He then worked for six years as a fingerprint examiner at the Institute of Forensic Sciences in Oakland, California before joining the faculty of the University of Illinois at Chicago. After serving as Director of Forensic Sciences for eight years he left to become Director of the McCrone Research Institute in Chicago, a not-for-profit corporation dedicated to teaching and research in microscopy and microscopic analysis.

David Asbaugh is a Canadian law enforcement officer who has built his career on practicing, teaching, and writing about the art of "ridgeology", the fingerprint examination technique used by Jacob Holmes in this case. In his book Basic and Advanced Ridgeology Asbaugh admits that he invented the pseudo-scientific term "ridgeology" out of whole cloth: "The term *ridgeology* was coined by the author in an article published in 1983. The rationale was

("...procedural standards (such as ACE-V) and terminological standards (such as the naming conventions for Galton points).... are insubstantial in comparison to the elaborate and exhaustively refined standards found in many scientific and technical disciplines. As such, we find that this factor does not favor admitting the evidence.")

Fourth, there is no relevant scientific community, beyond fingerprint examiners themselves, that have displayed any kind of general acceptance for the proposition that reliable identifications can be made from small distorted latent fingerprint fragments. (Cole Dec. at p. 11-

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that a new word would draw rapid attention to new ideas, new ideas that involved a more scientific approach required to meet the needs of the floating threshold protocol laid out by the Standardization Committee. While most *-ology* words tend to drop the *e*, here the *e* was intentionally left in place to attract more attention and initiate debate." (Id. at 8).

As explained by Asbaugh, the essence of ridgeology is a "holistic" or "floating threshold" approach to fingerprint comparison which looks at three levels of detail in a print: Level I (class characteristics such as loops whorls, and arches), Level II (traditional "Galton" ridge characteristics such as bifurcations, ridge endings, enclosures, etc), and Level III (pores and ridge shapes). Asbaugh coined another pseudo-scientific term for the method of comparison used by ridgeologists, "ACE-V" (Analysis, Comparison, Evaluation, and Verification). The gist of ACE-V is that the examiner, contrary to traditional methods of fingerprint examination practiced for decades in England and other countries, does not use a minimum number of Level II details as the basis for an identification ("point counting"), but rather takes into account all levels of detail and then reaches a wholly subjective conclusion as to identification. The emergence of the "ridgeologists" has caused the fingerprint community to be divided into two camps, the "ridgeologists" and the "point counters". The ridgeologists maintain websites (e.g. **http://onin.com/fp/**; **http://www.clpex.com/mainframes.htm**) pointing out the evils and unscientific nature of point counting and cataloging "problem idents" where point counters have made erroneous identifications based on as many as 16 level II points of similarities. The point counters, lead by California Department of Justice fingerprint examiner Dusty Clark, have their own website (**http://www.latent-prints.com/**) in which they deride ridgeology as no reliable than astrology. See, Dusty Clark, *What Is the Point* ?, Exhibit 6, **http://www.latent-prints.com /id_criteria_jdc.htm** ("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 that yours?").

14). While fingerprint evidence has been utilized for many years, there has never been any support shown for it by a more mainstream scientific community. To the contrary, numerous scientists and forensic science commentators have now come to recognize that the field is scientifically bankrupt. See e.g., Donald Kennedy, "Forensic Science: Oxymoron?" Science 302 (2003), 1625("fingerprinting's "reliability is unverfied either by statistical models on fingerprint variation or by consistent data on error rates."); 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.") (Exhibit 70); 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 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 thoughtful and scientifically literate judge, would face a number of serious difficulties"); Stoney, *Fingerprint Identification: Scientific Status*, in 3 Modern Scientific Evidence: The Law and Science of Expert Testimony (2002 ed.) § 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."). Simon Coles, Suspect Identities: A History of Fingerprinting and

Criminal Identification (Harvard University Press, 2001) p. 5("[L]ongstanding fissures in the reliability of fingerprint identification have become visible cracks."); Michael J. Saks, *Merlin and Solomon: Lessons from the Law's Formative Encounters With Forensic Identification Science*, 49 HASTINGS L.J. 1069, 1106 (1998), Exhibit 7 ("A vote to admit fingerprints is a rejection of conventional science as a criterion for admission."),

More specifically, there is no general consensus that fingerprint identifications can reliably be made using the wholly subjective "ridgeology" technique used in this case. There is currently no general acceptance within the fingerprint community itself of the art of ridgeology. See, Stoney, *Fingerprint Identification: Scientific Status*, in 3 Modern Scientific Evidence: The Law and Science of Expert Testimony § 27-2.1.2 at 379 (David L. Faigman et al. eds., 2002) ("The process of fingerprint examination and comparison has recently been articulated by Ashbaugh and his terminology has gained some acceptance within the forensic community.") (emphasis added). There is not even general consensus within a relevant scientific community that fingerprint examiners can reliably make identifications on the basis of only twelve matching characteristics. "There is no consensus on the number of points necessary for an identification. In the United States, one often hears that eight or ten points are 'ordinarily' required. Some local police departments generally require 12 points. In England, many examiners use 16 points as a rule of thumb. In France, the required number used most often is 24 while the number is 30 in Argentenia and Brazil." Paul Giannelli and Edward Imwinkelried, 1 Scientific Evidence (3d. Ed 1999)§ 16-7(A), p. 768.

In England, a 16 point standard was adopted after it was discovered that prints from two different individuals shared from 10 to 16 points of similarity. I. W. Evett and R.L. Williams, *A*

Review of the Sixteen Point Fingerprint Standard in England and Wales, (1996) 12(1) The Print 1,4, **http://www.scafo.org/library/120101.html** [8], Exhibit 8 ("Experts [in Britian] appeared to have a particularly poor regard for the fingerprint profession in the USA where there is no national standard. Cases of wrongful identification which had been made by small bureaus in the USA were cited as being symptomatic of a poor system and the dominant view was that such unfortunate events would not have occurred had there been a 16 points standard in operation"). Even matches that are based on 16 points of comparison and that have been verified by a second or third analyst have been shown to be in error. See, James E. Starrs, Judicial Control Over Scientific Supermen: Fingerprint Experts and Others Who Exceed The Bounds, (1999) 35 CRIM. L. BULL. 234, 243-246, Exhibit 9 (describing two cases in England in 1991 and 1997 in which misidentifications were made despite the fact that the British examiners insist on 16 points for an identification and triple check fingerprint identifications) (hereinafter "Scientific Supermen"); Paul Giannelli and Edward Imwinkelried, 1 Scientific Evidence (3d. Ed 1999)§ 16-1, p. 740-741 (discussing same cases) ("Fingerprint identification is not as infallible as many laypersons assume it to be.").[9] See also, "Problem Idents", **http://onin.com/fp/**, Exhibit 10 (documenting several cases of erroneous identifications based on 16 points of similarity).

It appears that as of June, 2001 England has abandoned its reliance on a 16 point

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[8] The Print is the official publication of the Southern California Association of Fingerprint Officers.

[9] Professor Starrs' use of the term "Scientific Supermen" is used derisively to refer to a tendency on the part of police fingerprint technicians to testify to feats beyond the capacity of mere mortals.

standard. See generally, *United States v. Plaza* 188 F.Supp. 2d. 549, 569-70 (E.D.Pa. 2002). However, the "holistic," "no minimum number of points" standard adopted in place of the 16 point standard is also not generally accepted among impartial scientists and, because of its subjectivity, it is even more likely to lead to false identifications, as the Mayfield case illustrated shortly after the Mitchell appeal was decided. See also, Stoney, *Fingerprint Identification: Scientific Status*, in 3 Modern Scientific Evidence: The Law and Science of Expert Testimony §§ 27-2.3.1, at 386-387, 390 (David L. Faigman et al. eds., 2002) ("Most recently some leading practitioners have denounced and denied the practice of counting minutiae entirely. This view is founded in the fear that if one merely counts minutiae one will be distracted from properly comparing all aspects of the print. Stating the deficiencies of minutiae point counts, however, does not bring one closer to having a suitable replacement measure."). As the court put it in *United States v. Mitchell*, 365 F.3d at 241:

> The FBI maintains that its flexibility to consider a mixture of Level 2 and Level 3 detail in making identifications renders its method superior to and more flexible than the minimum-points standards used in some states and various foreign jurisdictions. The tradeoff, though, is that the FBI's method lacks a significant yardstick of standard-based objectivity. In contrast, with a minimum-point standard there is at least some agreement about what constitutes a Galton point and what does not.Some standards do remain: There are procedural standards (such as ACE-V) and terminological standards (such as the naming conventions for Galton points). But these are insubstantial in comparison to the elaborate and exhaustively refined standards found in many scientific and technical disciplines. As such, we find that this factor does not favor admitting the evidence.

Fifth, the scientific deficiencies of the field are further demonstrated by the fingerprint community's own professional literature. As the leading proponent of the "holistic" approach to fingerprint identification admits, "it is difficult to comprehend that a complete scientific review

of friction ridge identification has not taken place during the last one hundred years[;] a situation seems to have developed where this science grew through default." David Ashbaugh, Quantitative - Qualitative Friction Ridge Analysis: An Introduction to Basic and Advanced Ridgeology, at 47; See also, National Institute of Justice, *Solicitation: Forensic Friction Ridge (Fingerprint Examination Validation Studies* (March 2000), Exhibit 3 ("The participants in the [National Institute of Justice Fingerprint Research Advisory Panel] included practicing latent print examiners, researchers, and senior administrators from Federal, State, and private forensic science laboratories. They reached a consensus that the field needs...basic research to determine the scientific validity of individuality in friction ridge examination.")

The current void in the scientific literature is not filled by Ashbaugh's book or any other source that purports to validate the "holistic" approach of fingerprint identification by invocation of pseudo-scientific labels such as "ridgeology," ACE-V, and "level three detail." As respected University of California forensic scientist Dr. John Thornton points out, " 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." 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., Exhibit 11. See also, Simon Cole, *Grandfathering Evidence: Fingerprint Admissibility Rulings from Jennings to Ilera Plaza and Back Again*, 41 AM. CRIM. L. REV. 1189, 1207-1208 (2004) ((critiquing AVE-V) (Exhibit 72); *Reply to R. Knowles, The New (Non-Numerical Fingerprint Evidence Standard–It Is Pointless ?*,

SCIENCE & JUSTICE 2000;40(2):120 (Exhibit 67) (critiquing AVE-V) (Exhibit 67).

Sixth, latent fingerprint identifications are analogous to other techniques, such as handwriting analysis, hair comparisons, toolmark comparisons, and even in particular cases, DNA analysis, that courts, in the wake of a new skepticism toward junk science , have now found to be scientifically unreliable and hence inadmissible.

Citing *Daubert* or *Kumho Tire*, several recent federal cases have held that some traditionally accepted techniques, such as handwriting comparison (*United States v. Saelee*, 162 F.Supp.2d 1097 (D. Alaska 2001);*United States v. Fuji*, 152 F.Supp.2d 939 (N.D. Ill. 2000);*United States v. Rutherford*, 104 F.Supp.2d 1190 (D. Neb. 2000); *United States v. Hines* (D. Mass. 1999) 55 Supp. 62;*United States v. Santillan* (N.D. Cal. 1999) ,1999 WL 1201765; *United States v. McVeigh*, 1997 WL 47724 (D.Colo. 1997); *United States v. Starzecpyzel* (S.D.N.Y. 1995) 880 F. Supp. 1027, 1038), and hair comparison (See *Williamson v. Reynolds* (E.D. Okla. 1995) 904 F. Supp. 1529, 1558, rev'd on other grounds (10th Cir. 1997) 110 F. 3d 1523), are no longer supported by current scientific research.

As these cases illustrate, the fact that an allegedly scientific procedure has been accepted by courts in the past does not insulate that procedure from challenge based on advances in scientific thinking. Northern California Federal District Court Judge Lowell Jensen put the matter bluntly: "The government is correct in their assertion that pre-*Daubert*/*Kumho*/ Ninth Circuit precedent supports the admissibility of (handwriting) testimony; however, the world has changed. The Court believes that ... a past history of admissibility does not relieve this Court of the responsibility of now conducting *Daubert*/*Kumho* analysis as to this proffered expert testimony." *United States v. Santillan* (N.D. Cal. 1999) ,1999 WL 1201765 at p. 4. See also,

United States v. Horn , supra; *Government of the Virgin Islands v. Jacobs*, 2001 WL 1735083, p. 1,4 (D.Virgin Islands 2001)("Although the government had notice that the hearing would be to determine the admissibility of the fingerprint evidence under *Daubert,* it did not present any evidence or even produce the proffered expert witness for examination by the defendant or the court. ... Under these circumstances, the trial court was virtually compelled by default to reject the government's fingerprint identification opinion as unreliable, and thus inadmissible, under *Daubert* and *Kumho Tire.* In doing so, the trial court did not abuse its discretion, and the evidence was properly excluded."); *United States v. Havvard* 117 F. Supp. 2d 848, 851 (S.D. Ind. 2000) ("The government proposed that the court essentially take judicial notice of the reliability of latent print identification and leave any further challenges to cross-examination. ... In the wake of *Daubert*, however, experts in a number of different fields have faced fresh challenges as to whether their opinions are sufficiently reliable to admit into evidence. ... Although a trial court has some degree of discretion in determining *how* to evaluate the reliability of expert testimony, it is clear that the court has no discretion as to *whether* to evaluate reliability. ... This court therefore held an evidentiary hearing and has considered the issue in some detail."); *United States v. Hines* (D. Mass. 1999) 55 F.Supp. 62, 67("The Court is plainly inviting a reexamination even of 'generally accepted' venerable, technical fields.").

In *Rameriz v. State*, 810 So. 2d. 836 (2001) the Florida Supreme Court recently reversed a capital murder conviction for the third time because of the trial court's erroneous admission under the *Frye* standard of a toolmark examiner's opinion that the defendant's knife caused the fatal injury to the exclusion of all other knives in the world. In reaching this result, the Court applied many of the same reliability factors utilized in the *Daubert* opinion and placed particular

emphasis on the fact that "the final deduction is in the eyes of the beholder, i.e., the identification is a match because the witness says it is a match." Id. at 846. Echoing many of the criticisms recently leveled against fingerprint examiners, the Court held that the expert's subjective testing procedure " possesses none of the hallmarks of acceptability that apply in the relevant scientific community to this type of evidence. This is particularly true in light of the extraordinarily precise claims of identification that Hart makes under his testing procedure--i.e., he claims that a 'match' made pursuant to his method is made with absolute certainty. Such certainty, which exceeds even that of DNA testing, warrants careful scrutiny in a criminal--indeed, a capital--proceeding." Id. at 849. More broadly, the court proclaimed that:

> In sum, Hart's knife mark identification procedure--at this point in time--cannot be said to carry the imprimatur of science. The procedure is a classic example of the kind of novel "scientific" evidence that *Frye* was intended to banish--i.e., a subjective, untested, unverifiable identification procedure that purports to be infallible. The potential for error or fabrication in this procedure is inestimable. In order to preserve the integrity of the criminal justice system in Florida, particularly in the face of rising nationwide criticism of forensic evidence in general, our state courts--both trial and appellate--must apply the *Frye* test in a prudent manner to cull scientific fiction and junk science from fact. Any doubt as to admissibility under *Frye* should be resolved in a manner that minimizes the chance of a wrongful conviction, especially in a capital case.

Id. at 853

And in an analogy even closer to the context of fingerprints, the Washington Court of Appeals has reversed an aggravated murder conviction because the state did not establish that latent earprint identification was generally accepted in the forensic science community, as required for admissibility under the *Frye* test. *State v. Kunze* (1999) 97 Wash.App. 832, 988 P.2d 977. See also, *State v. Jones* (2001) 343 S.C. 562, 574, 541 S.E.2d 813 ("In our opinion, it is premature to accept that there exists a science of 'barefoot insole impressions.' ... We find,

therefore, that the trial judge erred in permitting expert testimony purporting to demonstrate that 'barefoot insole impression' testing revealed [defendant's] foot to be consistent with the impression made by the primary wearer of the ... [crime scene] boot."); *State v. Berry* (2001) 143 N.C. App. 187, 546 S.E. 2d 545 (same) (foot impression testimony excluded in part because there was no " use of visual aids before the jury so that the jury is not asked to sacrifice its independence by accepting [the] scientific hypotheses on faith."). All of these cases, as well as a number of others discussed below, warrant a new look at the reliability and general acceptance of latent print identification testimony.

Seventh, partial latent fingerprint identifications do not have any non-judicial applications. As Ashbaugh puts it, " The failure of the identification community to challenge or hold meaningful debate can also be partly attributable to the fact that the friction ridge identification science has been basically under the control of the police community rather than the scientific community. In the eyes of many police administrators, friction ridge identification is a tool of solving crime, a technical function, as opposed to a forensic science."Ashbaugh, Basic and Advanced Ridgeology, supra, at 4. When scientists other then police latent fingerprint technicians have looked into the reliability of using computer-scanned complete fingerprints for the purpose of computer security systems in the emerging science of biometrics, they have found that fingerprinting is not reliable enough to use as a stand-alone identification technique. (See, infra at p. 28)

In addition to these various factors, the lack of scientific reliability of the government's fingerprint evidence has been most dramatically demonstrated by a test that the F.B.I. recently performed specifically for the purpose of defeating a *Daubert* challenge to the admissibility of

fingerprint evidence in *United States v. Mitchell,* 365 F. 3d at 223-225.[10] In an apparent effort to demonstrate that different fingerprint examiners will, at least, be able to reach the same conclusion when they are presented with the same data, the government provided the two latent prints at issue in that case, along with Mr. Mitchell's inked prints, to 53 different law enforcement agencies. Contrary to the government's expectations, however, 23% of the responding agencies found that there was an insufficient basis to make an identification with respect to one of the two latents and 17% found an insufficient basis as to the other. The government's experiment thus perfectly illustrates how subjective latent print identifications really are and how unreliable their results can be.

Finally, the unreliability of latent fingerprint identifications has already been judicially recognized in two federal decisions. In the first known fingerprint case in which a federal trial court has performed the type of analysis that is now mandated by *Daubert*, the district court excluded the government's fingerprint identification evidence, finding that there was no scientific basis for the latent print examiner's opinion of identification. *United States v. Parks*

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[10] Following an extensive evidentiary hearing, the district court denied the *Daubert* challenge in *Mitchell* and as indicated above this ruling was upheld on appeal. Following this ruling in *Mitchell*, the record in that case was used by federal district court Judge Louis Pollak as the basis for his February 7, 2002 decision to exclude the testimony of F.B.I. fingerprint experts under *Daubert.* See, *United States v. Plaza* (E.D. Pa. 2002) 179 F.Supp. 492. However, after considering further evidence upon the government's motion for reconsideration, the court reversed itself on March 13, 2002, finding that "[o]n further reflection, I disagree with myself." 188 F. Supp. 2d 549, 569. Defendant's challenge in the present case is grounded in part on defense testimony elicited in both *Mitchell* and the *Plaza* reconsideration hearing, as well as testimony and the court's ruling in *United States v. Park* (C.D. Cal. 1991)(No. CR-91-358-JSL). The entire *Mitchell* record is included on the attached CD-ROM as Exhibits 12-16. The entire *Plaza* hearing record is included as Exhibits 17-19. The *Park* record and ruling is included as Exhibits 20-21.

(C.D. Cal. 1991) (No. CR-91-358-JSL) . The district court in *Parks* reached its determination after hearing from three different fingerprint experts produced by the government in an effort to have the evidence admitted. In excluding the evidence, the district court recognized, among other things, the lack of testing that has been done in the field, the failure of latent fingerprint examiners to employ uniform objective standards, and the minimal training that latent print examiners typically receive.

More recently, in *Government of the Virgin Islands v. Jacobs*, 2001 WL 1735083, (D.Virgin Islands 2001), although the government had notice that a hearing would be held to determine the admissibility of the fingerprint evidence under *Daubert,* it did not present any evidence or even produce the proffered expert witness for examination by the defendant or the court. ... The appellate court held that "[u]nder these circumstances, the trial court was virtually compelled by default to reject the government's fingerprint identification opinion as unreliable, and thus inadmissible, under *Daubert* and *Kumho Tire.* In doing so, the trial court did not abuse its discretion, and the evidence was properly excluded." Id. at 4.

Accordingly, for all of the foregoing reasons, Mr. Rudolph requests that this Court preclude the government from introducing its fingerprint identification evidence at his upcoming trial.

IV. Fingerprint Fundamentals

The job of a latent fingerprint examiner is to compare latent fingerprint fragments found at crime scenes with rolled fingerprints taken directly from a suspect's fingers. An examiner makes an identification if he or she finds what the examiner believes is a sufficient number of common ridge characteristics, both in terms of type and location, between the latent and rolled

print under comparison. Federal Bureau of Investigation, *An Analysis of Standards in Fingerprint Identification*, FBI L. Enforcement Bull., June 1972, at 1 (Exhibit 22) [hereinafter FBI, *Fingerprint Identification*]. As discussed further below, there is considerable disagreement among latent fingerprint examiners as to how many common characteristics should be found before an identification is made. Examiners historically have employed identification standards ranging from between 8 and 16 matching characteristics. Christophe Champod, *Numerical Standards and "Probable" Identifications*, 45 J. OF FORENSIC IDENTIFICATION 136, 138 (1995) (Exhibit 23). However, many examiners, including those of 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 entirely to the subjective judgment of the individual examiner.

An average human fingerprint contains between 75 and 175 ridge characteristics. FBI, *Fingerprint Identification* at 1. 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. James F. Cowger, Friction Ridge Skin: Comparison and Identification of Fingerprints at 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."). 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 the ridge forks into two; 5) enclosures, which are formed by two bifurcations that face each

other; 6) spurs, where the ridge divides and one branch comes to an end; 7) cross-overs, in which a short ridge crosses from one ridge to the next; and, 8) trifurcations, in which two bifurcations develop next to each other on the same ridge. John Berry, *The History and Development of Fingerprinting, in* Advances in Fingerprint Technology at 2 (Henry C. Lee & R. E. Gaensslen eds., 1994); Ashbaugh, Basic and Advanced Ridgeology, supra, at 138-143.

While some occasional research has been done with respect to the relative frequencies with which these and other characteristics occur, no weighted measures of the characteristics have ever been adopted by fingerprint examiners on the basis of these studies. As stated in Stoney, *Fingerprint Identification: Scientific Status*, in 3 Modern Scientific Evidence: The Law and Science of Expert Testimony § 27-2.1.2 at 381 (David L. Faigman et al. eds., 2002):

> From a statistical viewpoint, the scientific foundation for fingerprint individuality is incredibly weak. Beginning with Galton, and extending most recently to Champod and to Meagher, Budowle and Zeisig there have been a dozen or so statistical models proposed. These vary considerably in their complexity, but in general there is much speculation and little data. Champod's recent work is the exception, bringing forth the first realistic means to *predict* frequencies of occurrence of specific combinations of ridge minutiae. Scientifically, the next step would be to access the accuracy of the predictions. No such work currently is being done. Champod's work does support *rejection* of simple minutiae counts as a realistic summary of fingerprint individuality. This is because the specific portion of the finger that the print comes from and the specific nature of each minutiae have a highly significant effect on the observed frequencies of occurrence.

Champod himself agrees with this assessment and has stated most recently that "[b]y recognizing that the identification process is probabilistic and intuitive by nature, it becomes clear that categorical conclusions can hardly be scientifically supported. Even in a field such as fingerprint identification, categorical conclusions are difficult to sustain from a scientific point of view." Christophe Champod, Ian Evett, and Beniot Kuchler, *Earmarks as Evidence: A Critical*

Review, 46 J. FORENSIC SCIENCE (2001) 1275, 1276, Exhibit 24. Research, moreover, has shown that different fingerprint examiners hold widely varying opinions regarding which characteristics appear most commonly. James W. Osterburg, An Inquiry Into the Nature of Proof, 9 J. of Forensic Sci. 413, 425 (1964), ("Clearly, subjective evaluation of the significance to be attached to a fingerprint characteristic is suspect.").

All prints, both inked and latent, are subject to various types of distortions and artifacts. David Ashbaugh, *The Premises of Friction Ridge Identification, Clarity, and the Identification Process*, 44 J. of Forensic Identification 499, 513 (1994), Exhibit 4. The most common type being pressure distortion which occurs when the print is being deposited. Id. Other types of distortion can be caused by the condition or shape of the surface on which the print has been deposited and by the mediums used to develop and lift the print. Ashbaugh, Basic and Advanced Ridgeology, supra, at 114-128. Significantly, distortion can cause a ridge characteristic to appear as something other than what it really is, a point agreed to by Jacob Holmes in this case. Id. at 109; David A. Stoney & John I. Thornton, *A Critical Analysis of Quantitative Fingerprint Individuality Models*, 31 J. OF FORENSIC SCI. 1187, 1193 (1986), Exhibit 26 . For example, "media such as ninhydrin tend to break a ridge into a series of units. The catalysts of ninhydrin, amino acids, are usually found around the pores and are frequently absent on the areas of the friction ridge between the pores. An understanding of this is very important when ascertaining which breaks constitute ridge endings and which breaks are simply a signature of the developing medium." Ashbaugh, Basic and Advanced Ridgeology, supra, at 121. There have been no studies done to determine the frequency with which such distortions occur, especially as it relates to cases such as the present one where several chemical development mediums were used.

Just as significant for the present case are distortions caused by the small size of a partial latent print or impediments to the visualization of that fragment, such as the cancellation markings present in this case. Although Agent Holmes testified that "size ... is not relevant to us" (PHT 503) Asbaugh confirms that " [a] prerequisite to carrying out an analysis of a complex print is the ability to examine the friction ridge formations in detail. An inherent problem encountered during the analysis is the size of the friction ridge formations." Ashbaugh, Basic and Advanced Ridgeology, *supra*, at 110. See also, Stoney, *Fingerprint Identification: Scientific Status*, in 3 Modern Scientific Evidence: The Law and Science of Expert Testimony § 27-2.3.1 at 386 (David L. Faigman et al. eds., 2002) ("As the are of the finger represente or the clarity of the print diminishes ... there necessarily comes a point where absolute identification is no longer justified on ... subjective grounds."); William Leo, Distortion Versus Dissimilarity in Friction Skin Identification, 15(2) The Print 1 (March/April 1999), Exhibit 27("Distortion ... is commonly found in both latent and exemplar prints that have the same origin. Examples of distortion can be noted when occurring from any of the following conditions - overlaid prints, pressure reversals, background interference, slippage, or from any circumstance that would change or misrepresent the appearance or shape of one or both prints that are being compared."). There have been no studies done to determine the frequency with which such distortions occur or how they can be accounted for so as to prevent a misidentification. And in this case, the government admits in the Summary at page 6 that "Mr. Hankerson will testify that pressure distortion may become a problem in the successful identification of a latent print when too much pressure is applied," and that he will also testify that "the environment plays a key role in latent print identification [because] [t]emperature, humidity, and handling may affect the latent print

from the time it is deposited until the timeit is developed."

_____It has been well documented that different people can share a limited number of fingerprint ridge characteristics in common. See, Y. Mark and D. Attias, *What Is the Minimum Standard for Characteristics for Fingerprint Identification* (1996) Fingerprint Whorld 148, Exhibit 28 ("In October 1995, while working with the AFIS and comparing a latent taken from a crime scene with a list of possible suspects, we found a comparison which had seven identical characteristics. Assuming that the fingerprint from the crime scene was only a partial print and it contained only the specific area of the seven points, one cannot rule out the idea that not only a junior examiner, but an expert with many years of experience behind him could arrive at a mistaken identity,); James Osterburg, *The Crime Laboratory : Case Studies of Scientific Criminal Investigation* (1967), Exhibit 29 (documenting a case where two individual shared ten points of similarity.); Ene-Malle Lauritis, *Some Fingerprints Lie*, National Legal Aid Defender Association, The Legal Aid Briefcase, October 1968, p.129, Exhibit 30 (Describing a case where the latent and known prints shared 14 points of similarity and three dissimilarities); J. Edgar Hoover, *Hoover Responds to "Some Fingerprints Lie"*, The Legal Aid Briefcase, June 1969, p.221, exhibit 31(not disputing the 3 dissimilarities in the same case, Hoover declares *ipse dixit* that "[a]ny two fingerprints possessing as many as fourteen identical ridge characteristics...would contain no dissimilar ridge characteristics"). See also, *United States v. Parks* (C.D. Cal. 1991) (No. CR-91-358-JSL), discussed infra at p. 72 76 (Steven Kasarsky, a board certified member of the IAI and an employee of the United States Postal Inspection Service, testified that cases have occurred in which there were ten points of similarity and one point of dissimilarity); *People v. John Davenport*, S. F. Muni Ct. No. 198530, Preliminary Hearing Transcript, August 30, 1978,

p. 30, Exhibit 32 (San Francisco Police Department fingerprint expert Michael Byrne testified that " I [have] seen a case one time that had nine points; however, it had a dissimilarity."). As indicated above, other cases have been documented in which different individuals have shared ten and even 16 points of similarity. There have been no scientific studies performed that can reasonably serve to predict the probability of such events occurring.

Lacking any such probability studies, latent print examiners do not offer opinions of identification in terms of probability. Indeed, latent print examiners are actually prohibited from doing so by the rules of their primary professional association, the International Association of Identification (IAI) and by the F.B.I.'s Scientific Working Group on Friction Ridge Analysis, Study, and Technology (hereinafter SWGFAST).[11] Instead, latent print examiners make the claim of "absolute certainty" for their identifications. Examiners provide an opinion that the latent print at issue was made by a particular finger to the exclusion of all other fingerprints in the world. Such assertions of absolute certainty, however, are inherently unscientific. Here is what one government expert has had to say on this issue:

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[11] In 1995 the FBI hosted a group of latent print examiners to discuss development of consensus standards which would preserve and improve the quality of service provided by the latent print community nationwide. The Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST) was formed and since then, SWGFAST expanded to 32 individuals representing 25 federal, state and local law enforcement agencies and crime laboratories, and developed a limited set of basic draft guidelines for hiring, training and quality assurance. The Quality Assurance Guidelines, considered by SWGFAST to be the minimum necessary to perform consistent quality examinations, provide in Section 2.1.5 that "*[f]riction ridge identifications are absolute conclusions. Probable, possible, or likely identification conclusions are outside of the acceptable limits of the science of friction ridge identification*." SWGFAST Quality Assurance Guidelines (Dec. 1997), **http://www.onin.com/twgfast/twgfast.html**, Exhibit 33.

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

David Grieve, Possession of Truth, 46 J. OF FORENSIC IDENTIFICATION 521, 527-28 (1996), Exhibit 34 . See also, Stoney, *Fingerprint Identification: Scientific Status*, in 3 Modern Scientific Evidence: The Law and Science of Expert Testimony § 27-2.3.1 at 385 (David L. Faigman et al. eds., 2002), Exhibit 1("The criteria for absolute identification in fingerprint work are subjective and ill-defined. They are the product of probabilistic intuitions widely shared among fingerprint examiners, not of scientific research."); Christophe Champod, Ian Evett, and Beniot Kuchler, *Earmarks as Evidence: A Critical Review*, 46 J. FORENSIC SCIENCE (2001) 1275, 1276, Exhibit 24 ("By recognizing that the identification process is probabilistic and intuitive by nature, it becomes clear that categorical conclusions can hardly be scientifically supported. Even in a field such as fingerprint identification, categorical conclusions are difficult to sustain from a scientific point of view.")

In this case, Agent Hankerson proposes to testify that Mr. Rudolph "made" certain latent prints recovered from various objects and locations. He did not use the traditional method of counting points and neither he nor his alleged reviewers made any contemporaneous notes or other documentation of the basis of his comparisons. His only articulated basis for the "holistic"

approach that he utilized is the vague statement 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." (Summary, p. 3). Dr. Cole correctly points out 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." The form of this opinion is indistinguishable from that recently excluded in *United States v. Frazier*, 387 F. 3d at 1264 where the Eleventh Circuit found that the district court did not abuse its discretion in finding the absence of "a sufficiently verifiable, quantitative basis" for an expert's opinion, stating:

> While the expert's statement that the recovery of hair or seminal fluid "would be expected" expresses an intrinsically probabilistic or quantitative idea, the probability it expresses is unclear, imprecise and ill-defined. And the basis for that probabilistic opinion is left unstated.

Similarly in the *Rameriz v. State* 810 So.2d. 836 (Fla. 2001), where a toolmark examiner's "absolute" opinion was excluded under *Frye*,

> A "match" under his method is declared if there is "sufficient similarity" in the ... marks ... to eliminate the possibility of coincidence. This determination is entirely subjective and is based on the technician's training and experience; there is no minimum number of matching striations or percentage of agreement or other objective criteria that are used in this method. No photographs are made of the (match presumably)... because lay persons and those not trained in this procedure would be unable to understand the comparison process; similarly, no notes are made describing the basis for identification. Once a match is declared under his theory, no other (prints) are examined because an identification under this method purportedly eliminates all other (prints) in the world as possible sources of the wound. Under (Holmes') method of identification, a team of expert technicians trained by him would be virtually impossible to challenge notwithstanding the fact that his procedure is untested and yet to be accepted by the relevant scientific community. There is no objective criteria that must be met, there are no photographs, no comparisons of methodology to review, and the final deduction is in the eyes of the beholder, i.e., the identification is a match because the witness

says it is a match.

Id. at 846

No less than in Florida, such a subjective and unchallengeable opinion cannot withstand the rigors of *Frazier* in the Eleventh Circuit. Hankerson's methodology "possesses none of the hallmarks of acceptability that apply in the relevant scientific community to this type of evidence. This is particularly true in light of the extraordinarily precise claims of identification that (Hankerson) makes under his testing procedure - i.e., he claims that a 'match' made pursuant to his method is made with absolute certainty. Such certainty, which exceeds even that of DNA testing, warrants careful scrutiny in a criminal--indeed, a capital--proceeding." *Rameriz v. State* 810 So.2d. at 848. See also, *Wolf v. Ramsey*, 253 F.Supp.2d 1323 (N.D. Ga. 2003) (excluding document examner's opinion of absolute certainty)

The newly invented method of "ridgeology" which Hankerson employed in this case is not yet generally accepted by any relevant scientific community. As indicated supra at n. 3, the creator of this method, David Asbaugh, posits in his book Basic and Advanced Ridgeology that an identification can be made only after looking at "first level detail"(class characteristics), "second level detail" (specific friction ridge paths, e.g. ridge dot, bifurcation, etc.), and "third level detail" (small shapes on the ridge, the relative location of pores, and the small details contained in accidental damage to the friction ridges). *Id*. at 136-144. In Ashbaugh's mind, it is the presence of "third level detail" which allows the fingerprint profession to abandon an objective standard based on a minimum number of points of similarity of "second level detail." *Id*. at p. 143.

However, the pseudo-scientific names used by Ashbaugh and others should not obscure

the fact that because "prints of friction skin are rarely well recorded ... comparison of pore or edges is only rarely practical." Cowger, supra, at 143. See *also, An Analysis of Standards in Fingerprint Identification*, FBI Law Enforcement Bulletin, June 1972, p. 7 ("FBI technicians know of no case in the United States in which pores have been used in the identification of fragmentary impressions. To the contrary, our observations on pores have shown that they are not reliably present and that they can be obliterated or altered by pressure, fingerprint ink, or developing meia."). Dusty Clark, one of the California Department of Justice's most experienced latent fingerprint examiners, has this to say about the scientific reliability of "poroscopy" and "ridgeology:"

> When making an identification comparison between a known and unknown impression, Latent Print Analysts rely on friction ridge characteristics in concurrence between the two impressions. Those that do not quantify (count points) rely on third level detail (edgeoscopy, poroscopy, and ridge shapes) to make an analysis, comparison, and evaluation. These analysts state that the comparison is a qualitative and quantitative process.
>
> The qualitative process that is applied depends on the validity of what is seen to the examiner. 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.
>
> The problem that occurs is when third level detail is not present, it becomes solely a quantitative process of Galton 2nd level detail. 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 that yours?...

> When discussing this issue at the 1999 Calif. Div. IAI Seminar, the audience of approximately 120 persons was asked to raise their hand if ever in their career that they had to rely on that one 3rd level detail to make the identification. Not one single hand was raised!
>
> That brings me to the topic of this article regarding the abandonment of counting points and relying on Ridgeology for individualization. Ridgeology hasn't been scientifically proven to be repeatable, and it's application is not standardized.

Dusty Clark, What's The Point (Dec. 1999), http://www.latent-prints.com/id_criteria_jdc.htm, Exhibit 6.

V. The Court Should Look Beyond the Forensic Fingerprint Community for Evidence of General Acceptance.

The result in *Mitchell* turned in part on the court's assessment that "fingerprint evidence is generally accepted within the forensic identification community." 365 F. 3d at 241. The defendant respectfully suggests that the court erred in construing the relevant scientific community so narrowly. The general acceptance factor of *Daubert* cannot be met by showing that promoters and practitioners of the method accept it to be reliable. The test is not whether a method is accepted by those who have a personal or professional stake in its acceptance, but rather, whether it is "accepted as reliable by the larger scientific community in which it originated." *People v. John W.* 185 Cal. App.. 3d 801, 805 (1986); *People v. Shirley* 31 Cal.3d 18, 54 (1982).

Courts have also recognized that promoters and practitioners of a particular method "may be too closely identified with the endorsement of [the technique] to assess fairly and impartially the

nature and extent of any opposing scientific views." *People v. Kelly* 17 Cal.3d 24, 38 (1976). Thus, when applying the *Daubert* standard, the court must look to experts who are "'impartial,' that is, not so personally invested in establishing the technique's acceptance that he might not be objective about disagreements within the relevant scientific community." *People v. Brown* 40 Cal.3d 512, 530 (1985) ; accord, *People v. Venegas* 18 Cal.4th 47, 77 (1998) (" FBI Agent Lynch, though vigorously defending the merits of the FBI's RFLP analytical procedures she had followed in this case, did not purport to be qualified, as a molecular biologist or otherwise, to testify on questions of general scientific acceptance of the validity of those procedures.") In this regard, the court should bear in mind that employees of forensic labs "have a clear pecuniary interest in the acceptance of (forensic) evidence by the courts. The success of their employers and the stability of their own employment depends upon continued use of (forensic) testing." Dan L. Bark, *DNA Identification: Possibilities and Pitfalls Revisited*, 31 Jurimetrics J. 53, 79-80.

As the Florida Supreme Court ruled in *Rameriz v. State* 810 So.2d. At 851, citing *Kelly* and numerous other cases, "in applying *Frye* general scientific recognition may not be established without the testimony of disinterested and impartial experts and disinterested scientists whose livelihoods are not intimately connected with the new technique. California and (other) courts have reached a like conclusion that independent and impartial proof of general scientific acceptability is required over and above those whose livelihood is intimately connected with the new technique." See also, *Williamson v. Reynolds*, 904 F.Supp. 1529, 1558 (E.D. Okl. 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. Starzecpyzel*, 880 F.

Supp. 1027, 1038 (S.D.N.Y. 1995) ("[Forensic Document Examiners] certainly find general acceptance within their own community, but this community is devoid of financially disinterested parties, such as academics.").

In this case, "[t]he scientific knowledge supporting ridgeology has been extracted from various related sciences such as embryology, genetics, and anatomy." Ashbaugh, Basic and Advanced Ridgeology, supra, at 8. In addition, as discussed below, the fields of statistics and general forensic science are also implicated. At a minimum, it should be shown that these disciplines generally accept the reliability of making absolute identifications from a partial latent print on the basis of ridgeology. Compare, *United States v. Plaza* 179 F. Supp. 2d 492 (E.D. Pa. 2001) ("Even those who stand at the top of the fingerprint identification field-people like David Asbaugh and Stephen Meagher-tend to be skilled professionals who have learned their craft on the job and without any concomitant advanced academic training. It would be a misnomer to call fingerprint examiners a 'scientific community' in the Daubert sense.") (excluding ridgeology testimony) with *United States v. Plaza*, 188 F. Supp. 2d. 549 ("I conclude that the fingerprint community's 'general acceptance' of ACE-V should not be discounted because fingerprint specialists - like accountants, vocational experts, accident-reconstruction experts, appraisers of land or of art, experts in tire failure analysis, or others - have 'technical, or other specialized knowledge,' rather than 'scientific ... knowledge' (*id.*), and hence are not members of what *Daubert* termed a 'scientific community.') (admitting the same testimony).

VI. Neither Acceptance of Fingerprint Evidence for Nonforensic Scientific Purposes Nor Widespread Law Enforcement Use of Fingerprinting for Classification and Other Nonevidentiary Purposes Establishes That Fingerprint Analysis of a Partial Latent Print Is Reliable or Generally Accepted for Courtroom Use

A scientific technique may be reliable for some purposes and not for others. Indeed, many techniques that have proven reliable for certain purposes in non-forensic settings have been found unacceptable when used for forensic purposes. Polygraphs are one example. The techniques used in polygraphs (monitoring heart rate, blood pressure, galvanic skin response) have a number of accepted applications in physiological research and medicine. It does not follow, however, that lie detection procedures which use these "accepted" procedures are necessarily reliable for courtroom use. *See*, *United States v. Scheffer* (1998) 523 U.S. 303, 118 S.Ct 1261, 1266 n. 8. Hypnosis is another example. The use of hypnosis is well accepted for a number of purposes in psychological research and in psychotherapy. But many courts have held that the use of hypnosis for refreshing witnesses' memories is not generally accepted.

It is anticipated that the government will make the argument that the identification of a partial latent print based on ridgeology or based on "approximately" twelve points of identity must necessarily be accepted in the scientific community because the identification technician employs procedures that are used and accepted elsewhere in law enforcement and science for other purposes. For example, the FBI Identification Division has been classifying and analysing fingerpint cards for purposes of identification since 1924. See, Federal Bureau of Investigation, The Science of Fingerprints: Classification and Uses (1979) p.1, Exhibit 35. Also, computer scientists in the field of biometrics are beginning to study and use fingerprints for the purpose of establishing security systems for access to computers or other uses. See, United States Government, The Biometric Consortium, **http://www.biometrics.org/.** The argument is syllogistic, *viz*: fingerprint analysis is accepted; the FBI fingerprint technicians uses fingerprint analysis; therefore the FBI's fingerprint analysis in all its variations and applications is generally

accepted.

The problem with this argument is that it fails to recognize the difficulties that may arise from the transfer of technology from one application to another. An anology to DNA evidence will illustrate this point. As explained in *United States v. Mitchell*, 365 F. 3d at 215:

> Latent fingerprint identification works from fingerprints that are partial and subject to distortions. All the nonjudicial uses listed above either use full-rolled prints, or avoid the difficulties introduced by distortion-or both. Both differences are critical, as Mitchell's experts testified and as the government's experts acknowledged: It is significantly easier to match one clean full-rolled print to another than it is to match a somewhat distorted latent fragment to a full-rolled print.

The FBI has found that in order to identify criminals from a ten finger fingerprint card, "it is essential that standard fingerprint cards and other forms used by the FBI be utilized. Fingerprints must be clear and distinct and complete name and descriptive data required on the form should be furnished in all instances." The Science of Fingerprints: Classification and Uses (1979) p.1. In biometrics,a clear fingerprint image is generated, usually by a high resolution digital camera behind a Plexiglas plate where the users presents their finger. Adrian Dysart, Biometrics (Winter 1998), **http://www.monkey.org/~adysart/598/**, Exhibit 36. Even with this high-tech method of collecting the print, it is generally recognized that "fingerprint verification systems are subject to a mimicry attack ...[that] can be avoid[ed only] by having thermal sensors detect subcutaneous blood vessels and reject the sample if none are found." *Id*. More significantly, it is generally recognized that "biometrics are not reliable enough on their own to act as identifiers, but in conjunction with other, more traditional forms of access control, such as passphrases and PINs, they provide a considerable layer of security." See also, *Let Your Fingers Do the Logging In*, NETWORK COMPUTING, Issue 910, June 1, 1998 ("Unfortunately, some of the

lowest-cost systems are simply gadgets and too gimmicky for consideration in the enterprise. In our review of fingerprint recognition devices in this issue, we found much of the current crop too insecure and unreliable for practical enterprise wide deployment.")**http://www.techweb.com/se/directlink.cgi?NWC19980601S002**, Exhibit 37.

For reasons already discussed, a person who deposits a latent print at a crime scene often leaves a partial, unclear print in unknown environmental conditions, and the person obviously does not leave behind subcutaneous blood vessels, passphrases, or PINs.

Moreover, even as to forensic use of a particular method, courts have explicitly rejected "widespread use" by law enforcement as a surrogate for a searching inquiry into whether impartial scientists accept a particular technique. In *People v. Leahy* (1994) 8 Cal. 4th 587, 605-606, the California Supreme Court stated unambiguously :

> The People observe that HGN testing has been used by law enforcement agencies for more than 30 years.... In determining whether a scientific technique is "new" for *Kelly* purposes, long-standing use by police officers seems less significant a factor than repeated use, study, testing and confirmation by scientists or trained technicians...To hold that a scientific technique could become immune from *Kelly* scrutiny merely by reason of long- standing and persistent use by law enforcement outside the laboratory or the courtroom, seems unjustified.

The United States Supreme Court agrees: "Respondent argues that because the Government--and in particular the Department of Defense - routinely uses polygraph testing, the Government must consider polygraphs reliable. Governmental use of polygraph tests, however, is primarily in the field of personnel screening, and to a lesser extent as a tool in criminal and intelligence investigations, but not as evidence at trials. ... Such limited, out of court uses of polygraph techniques obviously differ in character from, and carry less severe consequences than, the use of polygraphs as evidence in a criminal trial. They do not establish the reliability of polygraphs as

trial evidence, and they do not invalidate reliability as a valid concern supporting Rule 707's categorical ban." *United States v. Scheffer* (1998) 523 U.S. 303, 118 S.C. 1261, 1266 n. 8.

VI. The Subjective and Arbitrary Technique Used in this Case to Identify Partial Latent Prints with Absolute Certainty Does Not Survive Scrutiny under Daubert or Rule 702

A. Introduction: The Need For Reliability

The use of friction ridge characteristics to identify with absolute certainty a partial latent print *presumes* the fingerprint examiner's ability to determine the suspect's guilt with absolute certainty, even though, by the fingerprint profession's own admission, "[a] situation seems to have developed where this science grew by default." Ashbaugh, Basic and Advanced Ridgeology, supra, at 8. Frighteningly, Asburgh describes a close-minded profession where

> In the past the friction ridge identification science has been akin to a divine calling. 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 knowledege, understanding, and self-confidence within the ranks of idenification specialists. A pervading fear developed in which any negative aspect voiced that did not support the concept of an xact and infallible science could lead to its destruction and the destruction of the credibility of those supporting it. ...
>
> This attitude has been reinforced by the friction ridge identification itself. The role of the scenes of crime officer is continually emphasized in literature. Over the last few years most advancements that have taken place within the science are related to how friction ridge prints are developed, stored, or searched by computers. As a result, most available funding is allotted to furthering those developments. Little, if anything, has been reported on the importance and need for scientific knowledge, understanding the evaluative identification process, or

> the training necessary to be able to analyze, compare, and evaluate friction ridge prints. Apparently, it is assumed that anyone has the ability to compare friction ridge prints and form an unbiased opinion of individualization.

(Ashbaugh, Basic and Advanced Ridgeology, supra, at 4-5.)

A "science" which has proceeded by default in the absence of scientific knowledge and testing is the antithesis of a forensically reliable procedure as that term is used in *Daubert, Frazier,* and *Rule 702.*

B. The Lack Of Scientific Reliability As Measured By the Daubert Factors

1. The Failure to Test the Fundamental Hypothesis Upon Which Latent Print Identifications Are Based

The proffered fingerprint identification evidence in this case fails the most basic criteria of science: The premises underlying the identification have not been tested to determine if they can be falsified. As discussed above, there are two fundamental premises to a latent print identification of the type at issue here: First, that it is impossible for two or more people to have prints showing a limited number of ridge characteristics in common such as the "approximately" twelve characteristics identified by the fingerprint examiner in the case at bar, and second, that latent fingerprint examiners can reliably make identifications from a small distorted latent fingerprint fragment that reveals only a limited number of basic class ridge characteristics.

That these premises have not been empirically validated has, in the wake of Daubert, been repeatedly recognized by forensic science experts. See, National Institute of Justice, *Solicitation: Forensic Friction Ridge (Fingerprint Examination Validation Studies* (March 2000), Exhibit 3 ("The participants in the [National Institute of Justice Fingerprint Research

Advisory Panel] included practicing latent print examiners, researchers, and senior administrators from Federal, State, and private forensic science laboratories. They reached a consensus that the field needs ... basic research to determine the scientific validity of individuality in friction ridge examination...."); United States Department of Justice, *Forensic Sciences: Review of Status and Needs* (1999), p. 29, Exhibit 38 ("How can examiners prove that each individual has unique fingerprints? There are certainly statistical models that support this contention. Friction ridge print evidence has historically been 'understood' to hold individuality based on empirical studies of millions of prints. However, the theoretical basis for this individuality has had limited study and needs a great deal more work to demonstrate that physiological/developmental coding occurs for friction ridge detail, or that this detail is purely an accidental process of fetal development. Studies to date suggest more than an accidental basis for the development of print detail, but more work is needed."); Paul Giannelli and Edward Imwinkelried, 1 Scientific Evidence (3d. Ed 1999)§ 16-9, p. 784 ("The criteria used by examiners are 'the product of probabilistic intuitions widely shared among fingerprint examiners, not of forensic research.'".); Michael J. Saks, Merlin and Solomon: Lessons from the Law's Formative Encounters With Forensic Identification Science, 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 intuitions and assumptions that have not been tested rigorously."); Margaret A. Berger, Procedural Paradigms For Applying the Daubert Test, 78 MINN. L. REV. 1345, 1353 (1994), Exhibit 39 ("Considerable forensic evidence [such as fingerprinting] made its way into the courtroom without empirical validation of the underlying theory and/or its particular application.").

The lack of testing has also been recognized by those within the fingerprint community. Dr. David Stoney, a leading scholar and fingerprint practitioner, has written:

> 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!
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> As noted earlier, about a dozen models for quantification of fingerprint individuality have been proposed. None of these even approaches theoretical adequacy, however, and none has been subjected to empirical validation. . . . . Indeed, inasmuch as a statistical method would suggest qualified (non-absolute) opinions, the models are rejected on principle by the fingerprint profession.
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> * * *
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> Much of the discussion of fingerprint practice 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.
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> * * *

For the reasons discussed, we can set aside the experience and asserted infallibility of fingerprint examination practices as a foundation for reliability. What about mor specific, objective validation studies of the (subjective) fingerprint practices? Although such tests are feasible, they have not been conducted. Stoney, *Fingerprint Identification: Scientific Status*, in 3 Modern Scientific Evidence: The Law and Science of Expert Testimony §§ 27-2.3.1, at 386-387,

390 (David L. Faigman et al. eds., 2002).

The lack of testing in the fingerprint field also is reflected in an official report that the International Association for Identification ("IAI") issued in 1973. The IAI had three years earlier formed a "Standardization Committee" for the purpose of determining "the minimum number of friction ridge characteristics which must be present in two impressions in order to establish positive identification." International Association for Identification, IAI Standardization Committee Report 1 (1973). 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, at 38671) ("The limitations of a minutiae count have long been recognized and, over the last few decades, the traditional use of a specified threshold number of minutiae has been rejected on the grounds that there is no scientific basis for this practice."). 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. To date, however, no such research has been conducted.

Perhaps the strongest proof regarding the lack of testing comes from the Department of Justice ("DOJ") itself. In March of 2000, the National Institute of Justice, a division of the DOJ, issued a solicitation for fingerprint validation studies to be conducted. (Ex. 3). Toward that end,

the DOJ is offering a $500,000 grant to the person or entity who is ultimately awarded the bid. (Ex. 3 at 7). The DOJ's solicitation, which specifically acknowledges the requirements of the Supreme Court's decision in Daubert, calls for testing in two fundamental areas. First, "[b]asic research to determine the scientific validity of individuality in friction ridge examination based on measurement of features, quantification and statistical analysis." Id. at 4. As the DOJ candidly admits in this regard, "[T]he theoretical basis for ... individuality has had limited study and needs additional work to demonstrate the statistical basis for identifications." Id. Second, the DOJ Solicitation also calls for the development of standard procedures for fingerprint comparisons and for the testing of those procedures once they are adopted. Id. With respect to this latter testing, the Solicitation provides that "[p]rocedures must be tested statistically in order to demonstrate that following the stated procedures allows analysts to produce correct results with acceptable error rates." *Id*. (emphasis added). As the DOJ concedes, such testing "has not yet been done." *Id*. (emphasis added).

The ramifications of the DOJ Solicitation are thus enormous. The Department has effectively admitted that latent fingerprint analysis fails the primary criteria of science and, by extension, the primary criteria for admissibility under Daubert; there has been no testing of the field's fundamental underlying premises. No testing to determine the likelihood of different people having a number of ridge characteristics in common, and no testing to assess the reliability of an identification that is being made from a small distorted latent fingerprint fragment.

Additional strong proof regarding the lack of empirical testing comes directly from the government's submission in *United States v. Mitchell, supra*. Despite having had months to

prepare this submission, and despite having consulted with numerous fingerprint "experts" from around the world, the government was unable to point to any relevant scientific testing concerning either of the two fundamental premises upon which the fingerprint identification in this case is based. Instead, the government referred only to certain embryology studies that have traced the fetal development of fingerprints and to certain "twin" studies which have demonstrated that twins possess different fingerprints. Government's Combined Report To The Court And Motions In Limine Concerning Fingerprint Evidence (hereinafter Gov't Mem.) at 15-16, 18-19, **http://www.usao-edpa.com/daubert.html**. These studies, however, demonstrate, at most, that fingerprints are subject to random development in the embryo and that the individual ridge characteristics are not genetically controlled; they do not address the fundamental premises at issue here - the likelihood that prints from different people may show a limited number of ridge characteristics in common, and the ability of latent print examiners to make accurate identifications from small distorted latent fingerprint fragments.

The government also pointed in its memorandum to certain theoretical statistical claims that have been made with respect to the probability of two different people having entire fingerprint patterns in common. (See Gov't Mem. at 21.) (citing Francis Galton, Fingerprints 110 (1892) and Bert Wentworth, Personal Identification 318-20 (1932)). These theoretical models, however, have been severely criticized and, more importantly, they have never been empirically tested. See Stoney, supra, at 381, 387. ("As noted earlier, about a dozen models for quantification of fingerprint individuality have been proposed[;] none of these even approaches theoretical adequacy, however, and none has been subjected to empirical validation."). See also Stoney & Thorton, supra; I. W. Evett and R.L. Williams, *A Review of the Sixteen Point*

Fingerprint Standard in England and Wales, (1996) 12(1) The Print 1,6, http://www.scafo.org/library/120101.html, Exhibit 8 ("It is tempting to believe that the problem of deciding on a numerical standard for identification can be solved by statistical models.. . However, it is recognized by all that such arguments are overly simplistic."). Accordingly, the "models [referred to by the government] occupy no role in the ... professional practice of fingerprint examination." Stoney, supra at 387 ("Indeed, inasmuch as a statistical method would suggest qualified (non-absolute) opinions, the models are rejected on principle by the fingerprint profession.").[12]

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[12] The inadequacies of the models referred to by the government are readily evident. For example Mr. Wentworth states:

> There is, however, in all of these problems involving chance, an important factor which in our present lack of precise knowledge we have to assume; and that is the exact, or even approximate, percentage of occurrences of the different details. ... We find in the fingerprint in question a fork, opening downward. ... We have no definite data for knowing the percentage of occurrence of this detail ... but the variability of the ridges and their detail is so great that we may be warranted in asserting that it is small.

Bert Wentworth & Harris H. Wilder, Personal Identification (2d ed. 1932) at 318.

Another problem concerns the lack of empirical proof that the ridge details are statistically independent of one another. Two scientists studying this problem in the field of biometrics have pointed out that

> "[t]he underlying assumption made (in the statistical models) is that the content of each cell is a random variable which is independent of all other cells. The implication is that any configuration of the same set of features has the same probability of occurrence meaning, for instance, that a tightly clustered pack of minutiae is just as likely as the same set of minutiae geing distributed uniformly over the print. Although the (model) gives meaningful results, empirically the independence assumption is not valid because some configerations of Galton features are much less likely than others."

That the theoretical statistical models referred to by the government in *Mitchell* provide no scientific basis for latent finger print identifications can also be seen from the writing of the government's own expert David Ashbaugh. In his new book on the subject of fingerprints, Mr. Ashbaugh does not even refer to any of these theoretical models, though one of Mr. Ashbaugh's stated goals in writing the book is to "address the scientific ... basis of the identification process." Ashbaugh, Basic and Advanced Ridgeology, supra at 8-9.[13] Moreover, Mr. Ashbaugh acknowledges that there is currently no basis to provide opinions of probability with respect to fingerprints. Id. at 147 ("The so-called probability identifications of friction ridge prints is extremely dangerous, especially in the hands of the unknowing ... Extensive study is necessary before this type of probability opinion could be expressed with some degree of confidence and consistency."). Asbaugh's own theory of uniqueness based on "poroscopy" has been disproved by biometric scientists. See, A.R.Roddy and J.D. Stosz, *Fingerprint Features- Statistical Analysis and System Performance Estimates*, from The Proceedings of the Institute of Electrical and Electronics Engineering, Sept. 1997, Vol. 85, No. 9, pp., 18, 25, **http://www.biometrics.org/ REPORTS/IEEE_pre.pdf** , Exhibit 41. ("Ashbaugh ... contends that pore pods occur regularly, but the position of the pore within the pod is a random variable. In addition, he assumes independence between pores... [T]he underlying assumption of independence makes

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A.R.Roddy and J.D. Stosz, *Fingerprint Features- Statistical Analysis and System Performance Estimates*, from The Proceedings of the Institute of Electrical and Electronics Engineering, Sept. 1997, Vol. 85, No. 9, **http://www.biometrics.org/REPORTS/IEEE_pre.pdf**.

[13] Mr. Ashbaugh, like the government, points to the embryology studies as providing a scientific basis for fingerprint identifications. Ashbaugh, Basic and Advanced Ridgeology, supra at 8, 38-54. Like the government, though, Mr. Ashbaugh fails to explain how these studies relate to the fundamental premises that underlie latent fingerprint identifications.

uniqueness calculations possible. In reality, though, the independence assumption is not accurate. There appears to be a definite influence on a pore's position depending on the relative positions of the neighboring pores. If the independence assumption is not valid, then the assumption that all possible configurations of N pores are equally likely is also not valid.").

The lack of empirical testing that has been done in the field of fingerprints is devastating to any claim that latent fingerprint identifications are scientifically based or generally accepted as reliable. See *Daubert*, 509 U.S. at 593, 113 S.Ct. at 2796 ("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.") (internal quotations and citations omitted); *People v. Soto*, 21 Cal. 4th at 540 (The debate regarding the effect of population substructuring on RFLP calculations was only resolved empirically by "extensive literature in peer reviewed journals."). The lack of testing, moreover, deprives latent fingerprint comparisons from having true evidentiary significance. Because of the lack of testing, a latent fingerprint examiner can, at best, correctly determine that a certain number of ridge characteristics are in common in the two prints under comparison; the examiner, however, has no basis to opine what the probability is, given the existence of these matching characteristics, that the two prints were actually made by the same finger. Instead, as discussed further below, the latent print examiner can provide only a subjective opinion that there is a sufficient basis to make a positive identification.

The necessity of being able to provide statistically sound probabilities has been recognized in the analogous area of DNA. See, *People v. Venegas*, 18 Cal.4th at 82 ("A determination that the DNA profile of an evidentiary sample matches the profile of a suspect

establishes that the two profiles are consistent, but the determination would be of little significance if the evidentiary profile also matched that of many or most other human beings. The evidentiary weight of the match with the suspect is therefore inversely dependent upon the statistical probability of a similar match with the profile of a person drawn at random from the relevant population.); *People v. Wallace* (1993) 14 Cal. App. 4th 651, 661 n.3 (stating that without valid statistics DNA evidence is "meaningless"); *People v. Barney* (1992) 8 Cal. App. 4th 798, 802 ("The statistical calculation step is the pivotal element of DNA analysis, for the evidence means nothing without a determination of the statistical significance of a match of DNA patterns."); (1991) *People v. Axell*, 235 Cal. App. 3d 836, 866 ("We find that ... a match between two DNA samples means little without data on probability").[14] As forensic scientist Dr. John Thornton has noted, "DNA analysts seemed to have embraced the premise that they had best be very careful with their statistics, because, if they aren't, their work will be rejected. If this paradigm becomes the standard, then many other evidence categories, where statistical underpinnings have yet to be developed, are in deep trouble." John Thornton, *The General Assumptions and Rationale Of Forensic Identification*, in 3 Modern Scientific Evidence: The Law and Science of Expert Testimony § 24-9.2.1, p. 175 (D. Faigman, ed. 2002), Exhibit 42.

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[14] As the British physicist William Thomson, Lord Kelvin, observed in 1883:

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

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

2. The First Premise Of The Government's Fingerprint Identification Evidence Not Only Has Not Been Tested, It Has Been Proven False.

The first major premise of the government's fingerprint identification evidence - that it is impossible for fingerprints from two or more people to have as many as ten basic ridge characteristics in common - has not only not been scientifically tested, it has been proven false by anecdotal evidence. As noted above, cases have been documented in which different individuals have shared ten and even 16 points of similarity. In England, a 16 point standard was adopted after it was discovered that prints from two different individuals shared from ten to 16 points of similarity. I. W. Evett and R.L. Williams, *A Review of the Sixteen Point Fingerprint Standard in England and Wales*, (1996) 12(1) The Print 1,4, **http://www.scafo.org/library/120101.html** [15]. Even matches that are based on 16 points of comparison and that have been verified by a second or third analyst have been shown to be in error. See, James E. Starrs, Judicial Control Over Scientific Supermen: Fingerprint Experts and Others Who Exceed The Bounds, (1999) 35 CRIM. L. BULL. 234, 243-246 (describing two cases in England in 1991 and 1997 in which misidentifications were made despite the fact that the British examiners insist on 16 points for an identification and triple check fingerprint identifications); Paul Giannelli and Edward

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[15] Prints from two different individuals were originally determined to have 16 points of similarity by New Zealand experts, but "(w)hen the illustration was examined at New Scotland Yard, it was concluded that six of the points were not close enough to be considered similarities but the remaining 10 were." *Id*. at 2. Evett and Williams now claim that certain of the points of similarity are fabricated, but if this is true, then one can only question how two preeminent organizations missed what Evett and Williams call "patent" fabrications. *Id*. p. 9. Moreover, the authors point out that "[d]uring meetings with U.K. fingerprint officers the team heard, in support of the 16 point standard, anecdotes-often second hand-of how experts had seen more than 8 points of comparison in prints from different individuals." *Id*. at 9. In any case, the Evett and Williams study was done before two documented cases of 16 points of comparison were discovered in 1991 and 1997.

Imwinkelried, 1 Scientific Evidence (3d. Ed 1999)§ 16-1, p. 740-741(discussing same cases). As Giannelli and Imwinkelread conclude, "(f)ingerprint identification is not as infallible as many laypersons (and experts) assume it to be." *Id.*

Unfortunately, however, findings such as these have not been taken into consideration in determining criteria for the identification of fingerprints in the United States. As discussed further below, there is currently no minimum standard for latent fingerprint identifications in this country, and, as can be seen from the testimony of Agent Holmes each examiner is free to arbitrarily set his or her own minimum threshold and then to declare with absolute certainty that the latent and known print came from the same source. Most telling in this regard is Evett and William's observation that "[e]xperts [in Britain] appeared to have a particularly poor regard for the fingerprint profession in the USA where there is no national standard. Cases of wrongful identification which had been made by small bureaus in the USA were cited as being symptomatic of a poor system and the dominant view was that such unfortunate events would not have occurred had there been a 16 points standard in operation" *A Review of the Sixteen Point Fingerprint Standard* at 4. The potential for error is thus significant, especially given that distortion or even fabrication can cause ridge characteristics from two different prints to appear the same, when in reality they are not.

3. The Testing Conducted by the FBI in United States v. Mitchell for the Purposes of Litigation Fails To Demonstrate Scientific Reliability

Recognizing the lack of testing and scientific research that has been done by the fingerprint community during the last 100 years, the government in *United States v. Mitchell* desperately attempted to make up for this deficiency. The government's rushed efforts,

however, have been far from successful.

As discussed above, one test the government conducted was to send the two latent prints at issue in Mitchell's case, along with Mr. Mitchell's inked prints, to 53 different law enforcement agencies. The government requested that the agencies select "court qualified" examiners to compare the prints and to determine whether any identifications could be made. . This experiment is, in fact, relevant to the second fundamental premise at issue in this case - whether latent print examiners can reliably make identifications from small latent print fragments - as it indicates whether different examiners can, at least, be expected to reach the same conclusions when they are presented with the same data.

The results of this test, however, constitute an unmitigated disaster from the government's perspective, as can be seen from the fact that the test is nowhere mentioned in the government's first memorandum to the Court. While the results of the test can be found in the Mitchell government exhibit 6-4, this exhibit does not reveal that the prints utilized in the test are the very prints at issue in *Mitchell.* The reason for this omission is clear. Of the 35 agencies that responded to the government's request, eight (23%) reported that no identification could be made with respect to one of the two latents and six (17%) reported that no identification could be made as to the other. See, Memorandum Of Law In Support Of Mr. Mitchell's Motion To Exclude The Government's Fingerprint Identification Evidence, p. 21(hereinafter "Memorandum In Support") **http://www.onin.com/fp/fphome.html**. The test thus dramatically reveals how subjective latent print comparisons actually are and how unreliable their results can be.

The government can hardly contend in this regard that the participating agencies did not appreciate the extreme importance of the comparisons that they were being asked to perform.

The government's cover letter to the agencies provided:

> 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 mater and your cooperation is a key component in achieving this result.

Exhibit 43.

The government also cannot attribute the results of this test to the fact that the fingerprint comparisons were performed by inexperienced examiners. Consistent with the urgency of the government's cover letter, each of the state law enforcement agencies that did not find a sufficient basis to make an identification selected extremely experienced examiners to make the comparisons. As set forth in the Memorandum In Support at p. 21, the range of experience for this group of examiners is between 10 and 30 years, with the average amount of experience being 20 years. In addition, virtually all of these examiners are board certified members of the IAI, the highest distinction that a latent print examiner can achieve. *Id*. Accordingly, that this particular group of examiners did not find a sufficient basis to make an identification on either one or both of the latent prints at issue in this case is devastating to the government's claim of scientific reliability. See also, I. W. Evett and R.L. Williams, *A Review of the Sixteen Point Fingerprint*

Standard in England and Wales, (1996) 12(1) The Print 1, 7 ("Statistical analysis [of an extensive collaborative study] did not suggest any association between the number of [correct] identifications made by an expert and his/length of experience.").

Apparently recognizing just what this test really means to its case against Mr. Mitchell, the government next took the remarkable step of attempting to eradicate the test results. The government asked each of the agencies that did not make an identification to retake the test, but this time the government provided the agencies with the answers that the government believed to be correct. Along with a new response form, the government sent each of these agencies enlargements of the prints at issue displaying what the government apparently believed were the common characteristics. The government's cover letter to the state agencies provided in pertinent part:

> 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 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.

Memorandum in Support at 22.

It is hardly surprising, given the magnitude of what was at stake here, that all of the state agencies at issue, with the exception of one, Missouri, responded to the government's tactics by recanting and by filling out the new response forms so as to indicate that positive identifications have now been made. The government, in turn, revised its report of the test (Government Exhibit 6-4) so as to indicate that, except for Missouri, only positive identifications were returned by the participating agencies. Memorandum in Support at 23 (The government's newly revised exhibit 6-4 is provided as Defense Exhibit 23). This revised exhibit, moreover, provides no indication that these state agencies ever returned anything other than positive identifications. By letter to the Court dated June 17, 1999, the government then provided this revised exhibit to the Court, instructing the Court to "substitute[]" the exhibit for the one the government previously provided in its exhibit book. (Memorandum In Support at p. 23). In this fashion, the government attempted, like a magician, to make the original results of its experiment vanish into thin air.

The government's considerable efforts in this regard, however, have only succeeded in highlighting the importance of the original test. The study as originally conducted by the government was a relatively fair experiment as to whether different examiners would at least be able to reach the same conclusion when given the same prints to compare, and the test had special significance given the government's decision to use the very prints at issue in *Mitchell*. The original unbiased results of the test speak volumes for themselves. That the government has

subsequently been able to convince more than 20% of the participating examiners to change their answers only serves to demonstrate the desperate straits that the government found itself in and the lengths to which the government will go in order to have its fingerprint evidence admitted. As a noted fingerprint examiner has aptly recognized, an examiner's conclusion that a latent print is unidentifiable must be considered "irrevocable," as nothing is more "pitiful" than an examiner's subsequent attempt to change that conclusion:

> Of course, the crucial aspect is the initial determination to render the latents as unsuitable for identification purposes...this must be a ruthless decision, and it must be irrevocable. There is no more pitiful sight in fingerprint work than to see an expert who has decided that a mark is useless, then seeking to resuscitate the latent to compare with a firm suspect.

John Berry, Useless Information, 8 Fingerprint Whorld 43 (Oct. 1982) .

In addition to the above discussed test, the government in *Mitchell* also conducted experiments on its automated fingerprint identification system ("AFIS"). On the basis of these tests, the government made certain statistical claims with respect to the probability of two people having identical fingerprints or identical "minutia subsets" of fingerprints. The utter fallacy of these statistical claims, as well as the serious methodological flaws that undermine these experiments, became clear at the Daubert hearing, the transcripts of which the Court has been provided.

Moreover, given that the tests in *Mitchell* were conducted solely for purposes of litigation and have not been published or subjected to peer review, they do not constitute the type of data or facts that an expert in the fingerprint field would reasonably rely upon, and, as such,

the tests should not even be considered by this Court. *United States v. Tran Trong Cuong*, 18 F.3d 1132, 1143 (4th Cir. 1994) ("reports 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) (doctor's testimony held inadmissable because, among other things, 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) (expert's testimony rejected where the study upon which the expert relied had not been published or subjected to peer review).

Moreover, there is a particularly good reason why in the instant case the government's AFIS experiments in *Mitchell* should be published and subjected to peer review before they are given consideration by a court of law. The government in *Mitchell* attempted to utilize AFIS as it has never been utilized before. No previous attempts have ever been made to determine fingerprint probabilities from an AFIS system. To the contrary, such systems have been designed for an entirely different purpose - to generate a number of fingerprint candidates which a human fingerprint examiner can then manually compare with the latent print under consideration. The extreme complexity of what the government has attempted to do in *Mitchell* can readily be seen from the pleadings and transcripts in the case. The following is an excerpt from the description of the first experiment.

> Each comparison was performed by two totally different software packages, developed in two different countries by two different contractors using independent teams of fingerprint and software experts. The results of both comparisons were mathematically "fused" using software developed by a third contractor.
>
> * * *

> The two "matcher" programs calculate a measure of similarity between the minutia patterns of two fingerprints. In both cases, the scores of an identical mate fingerprint is normalized to 1.0 (or 100%). The statistical fusion program combines the two scores by analyzing the most similar 500 (out of 50,000) minutiae patterns. The fusion operation discards 49,500 very dissimilar minutia patters before calculating the fusion statistics. As in the case of the "matcher" programs, the fused similarity measure calculated by the fusion program is normalized to 1.0 (or 100%).

Memorandum In Support at 26.

Obviously, there are many valid questions regarding the software systems and methodology that the "teams of fingerprint and software experts" utilized to conduct these extremely complicated and novel experiments. As courts have recognized, however, the proper forum for such questioning, at least as an initial matter, is through publication and peer review, not the courtroom. See *United States v. Brown*, 557 F.2d 541, 556 (D.C. Cir. 1977) (holding that novel hair analysis technique should not have been admitted and stating that "[a] courtroom is not a research laboratory"); *Richardson*, 857 F.2d at 831. Peer review is especially important here given that the government in *Mitchell* refused to even provide the defense with access to the software packages that were used to run the experiments. Memorandum In Support at p. 27.

Finally, the government's novel AFIS experiments also need to be subjected to peer review and publication before they are accepted in a court of law because the statistical conclusions that the government generated defy reality. The government, for example, asserted, on the basis of its AFIS experiments, that the probability of two people even having four identical ridge characteristics in common "is less than one chance in 10 to the 27th power." Gov't Mem at 23. Yet, as discussed above, the fingerprint literature contains examples of people having 10 to 16 ridge characteristics in common. Moreover, as one fingerprint expert has

recently acknowledged in explaining why an identification would never be made on the basis of four or five matching points, a "million people" could possess those four or five points of similarity. *Commonwealth v. Daidone*, 684 A.2d 179, 188 (Pa. Super. 1996). See also, Stoney, Fingerprint Identification, supra, § 27-2.1.2 at 379 (" A correspondence of four minutiae may well be found upon diligent, extended effort when comparing the full set of prints of one individual with those from another person."). Accordingly, there is clearly something amiss with respect to the government's novel efforts to create astronomical statistical probabilities from its AFIS system.

The danger of relying upon internal testing that has not been published and subjected to the critical review of the scientific community has been specifically demonstrated with respect to the government's "50K by 50K" AFIS study. The government came forward with this study in the Spring of 1999 shortly before the commencement of the Mitchell *Daubert* hearing. It is now nearly three years later and the experiment still has yet to be published, despite the government's representations to Judge Joyner that it would be submitted for publication. Test. Budowle, Tr. March 20, 2001, at 111. Despite the failure of the FBI to publish the study, several researchers have now examined it, and their intense criticisms of the study have very recently been published. For example, forensic scientists Christopher Champod and Ian Evett have written that the FBI's AFIS experiment "so transcends reality that we are amazed that it was admitted into evidence." Christopher Champod & Ian W. Evett, A Probabilistic Approach to Fingerprint Evidence, 51 J. FORENSIC IDENTIFICATION 101, 115 (2001). Similarly, Dr. David Stoney has written that the experiments were "worthless for documenting the individuality of fingerprints" and that they were "extraordinarily flawed and highly misleading." David Stoney, Advances in

Fingerprint Technology, at 381, 383 (2d Ed. 2001) ("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.") While Dr. Stoney's criticisms were of course presented at the Mitchell *Daubert* hearing, what is new is that those criticisms have now been published in a leading fingerprint text, and that they have been corroborated by the only other researchers who have published on this issue. The government meanwhile either has not submitted the study for publication or their efforts in this regard have proven unsuccessful.

In sum, the AFIS testing that the government conducted in *Mitchell* for purposes of litigation would not reasonably be relied upon by an expert in the fingerprint field and it should therefore not be relied upon by this Court.

4. There is No Established Error Rate for Latent Print Comparisons, But It Is Clear That Many Errors Do Occur

Given that fingerprint validation studies have not yet been performed, it is not surprising that there are no established error rates for latent fingerprint identifications. Indeed, the failure of the fingerprint community to establish error rates has also been explicitly conceded in the DOJ Solicitation. (Ex. 3 at 4). Accordingly, the government is unable to satisfy this critical *Daubert* factor as well.

Moreover, there is in fact substantial reason to suspect that when the DOJ validation studies are ultimately conducted, the error rates that are established will be significant. Any claim that the error rate is "zero" is patently absurd in light of the fact that "both here and abroad there have been alarming disclosures of errors by fingerprint examiners." Paul Giannelli and

Edward Imwinkelried, 1 Scientific Evidence (3d. Ed 1999)§ 16-1, p. 740-741 (describing two cases in England in 1991 and 1997 in which misidentifications were made despite the fact that the British examiners insist on 16 points for an identification and triple check fingerprint identifications.); James E. Starrs, Judicial Control Over Scientific Supermen: Fingerprint Experts and Others Who Exceed The Bounds, (1999) 35 CRIM. L. BULL. 234, 243-246 (describing the same two cases, as well as a case in New York and two in North Carolina); James E. Starrs, A Miscue in Fingerprint Identification: Causes and Concerns, 12 J. OF POLICE SCI. & ADMIN. 287 (1984). Exhibit 44.

One such case is reported in *State v. Caldwell*, 322 N.W.2d 574 (Minn. 1982). The prosecution's fingerprint expert in *Caldwell*, a board certified member of the IAI with more than 14 years of experience, testified that a particular latent print at issue in the case had been made by the defendant's right thumb. Starrs, A Miscue in Fingerprint Identification supra, at 288. The examiner based his opinion on 11 points of similarity that he had charted. *Id*. A second fingerprint expert, also a board certified member of the IAI, confirmed the first examiner's finding, after being consulted by the defense. *Id*. However, following the defendant's conviction for murder, it was definitively established that both of these certified fingerprint experts had erred and the defendant's conviction was reversed. *Caldwell*, 322 N.W. 2d at 585.

Another erroneous fingerprint identification recently occurred in Pennsylvania in the case of *Commonwealth v. Richard Jackson*. See Mary Anne Janco, Murder Case is Formally Dropped: Richard Jackson's Fingerprints Did Not Match Those Found at the Scene, Philadelphia Inquirer, B1 (Mar. 8, 2000), exhibit 45. Mr. Jackson was convicted of murder on the basis of an erroneous fingerprint identification made by three different prosecution fingerprint

experts. It was only after Jackson had been incarcerated for two years that it was ultimately determined that the fingerprint examiners had erred.

A third recent case of fingerprint error occurred in England. See Stephen Gray, Yard in Fingerprint Blunder, Times (London), April 1997, at 6. (Ex. 46). In that case, two latent fingerprints which had been recovered from a burglary crime scene were each found to have at least sixteen points in common with two of the defendant's inked prints. These identifications, pursuant to standard Scotland Yard procedures, had been triple checked prior to the defendant's arrest. After the defendant had spent several months in jail, however, the identifications were found to be erroneous. See Starrs, Scientific Supermen at 244-245. [16]

Professor Starrs also describes how the same tragedy had happened before in England. In 1991, Neville Lee had been arrested for the rape of an eleven year old girl because his fingerprints matched with 16 points of comparison to those of the offender. The fingerprint error was discovered only when another man confessed to the crime. *Id*. at 245.

The FBI's admission of a serious misidentification in the Mayfield case, a misidentification confirmed by several agents, speaks for itself. (See, Exhibit 73; Cole Dec. at p. 16).

Accordingly, it is beyond dispute that "[r]egardless of its verbal trappings the science of fingerprint identifications is in no sense infallible, or flawless." Starrs, Scientific Supermen at

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[16] For other documented cases of false identifications, see James E. Starrs, More Saltimbancos on the Loose? -- Fingerprint Experts Caught in a Whorl of Error, 12 Sci. Sleuthing Newsl. 1 (Winter 1998) (detailing several erroneous identifications discovered in North Carolina and Arizona); see also, Dale Clegg, A Standard Comparison, 24 Fingerprint Whorld 99, 101 (July 1998) ("I am personally aware of wrong identifications having occurred under both 'non numeric' and '16 point' approaches to fingerprint identification.").

243. The government's own expert in *Mitchell* has acknowledged as much. See David L. Grieve, Reflections on Quality Standards, 16 Fingerprint Whorld 108, 110 (April 1990), Exhibit 47 ("It is true that some overly zealous North American examiners have given testimony concerning false identifications when they believed the identifications were valid."). What remains unknown, however, is the rate at which misidentifications take place. As commentators have recognized, "It 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." Simon A. Cole, Witnessing Identification: Latent Fingerprinting Evidence and Expert Knowledge, 28 SOCIAL STUDIES IN SCIENCE 687, 701 (Oct.-Dec. 1998) Exhibit 48 . Moreover, as discussed above, there have been no controlled studies conducted so as to determine an error rate for latent print examiners. "Unfortunately, although there is extensive collective experience among casework examiners, there has been no systematic study such as that described above." Stoney, Fingerprint Identification, supra, § 21-2.1.2 at 66.

Just how prevalent the problem of false identifications may actually be, however, can be seen, at least to some extent, from the astonishingly poor performance of latent print examiners on crime lab accreditation proficiency exams. On these exams, latent print examiners are typically provided with several latent prints along with a number of "ten print" inked impressions to compare them with. Commencing in 1995, the provider of the test, Collaborative Testing Service, began to include as part of the test one or two "elimination" latent prints made by an individual whose inked impressions had not been furnished.

The results of the 1995 exam were, in the words of the government's expert in *Mitchell*, both "alarming" and "chilling." Grieve, Possession of Truth, 46 J. FORENSIC IDENT. 521, 524.

Exhibit 34. Of the 156 examiners who participated, only 68 (44%) were able to both correctly identify the five latent print impressions that were supposed to be identified and correctly note the two elimination latent prints that were not to be identified. Even more significantly, 34 of these examiners (22%) made erroneous identifications on one or more of the questioned prints for a total of 48 misidentifications. *Id*. Erroneous identifications occurred on all seven latent prints that were provided, including 13 errors made on the five latent prints that could be correctly identified to the supplied suspects. *Id*. In addition, one of the two elimination latents was misidentified 29 times. *Id*.

"The results of the 1995 proficiency study ... raise serious questions about the trustworthiness of fingerprint analysis." Paul Giannelli and Edward Imwinkelried, 1 Scientific Evidence (3d. Ed 1999)§ 16-9(E), p. 784. These shockingly poor results could not be blamed on the test. In fact, as Professors Giannelli and Imwinkelried point out, "An especially troubling aspect of the test was that it was not blind, since the participating examiners were surely on notice that they were being tested and such notice should have put them on their guard to do their very best." *Id*. at p. 741 n. 18. The 1995 proficiency exam was recognized as being "a more than satisfactory representation of real casework conditions." Grieve, Possession of Truth, *supra*, at 524 . The test was designed assembled and reviewed by representatives of the International Association of Identification. *Id*. As Mr. Grieve correctly observed, a "proficiency test composed of seven latents and four suspects was considered neither overly demanding or unrealistic." *Id*. Accordingly, the dreadful results are a matter of significant concern. As Mr. Grieve 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 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.

Grieve, Possession of Truth, *supra*, at 524-25 (Ex. 34 at 524-25).

Despite Mr. Grieve's call for "positive action," the poor results have continued unabated on the more recent proficiency exams. Six misidentifications were made on the 1996 exam with only 16 % of the 191 laboratories reporting correct results on all aspects of the test. Collaborative Testing Services, Inc., Report No. 9608, Forensic Testing Program: Latent Prints Examination 2 (1996), Exhibit 49. On the 1997 exam, 16 false identifications were made by 13 participants and only 61 % of the participating agencies reported correct reults on all aspects of the test . Collaborative Testing Services, Inc., Report No. 9708, Forensic Testing Program: Latent Prints Examination 2 (1997), Exhibit 50. On the 1998 test, only 58% of the participants were able to correctly identify all of the latents and to recognize the two elimination latents as being unidentifiable. Even more disturbing was the fact that 21 erroneous identifications were made by 14 different participants. Collaborative Testing Services, Inc., Report No. 9808, Forensic Testing Program: Latent Prints Examination 2 (1998), Exhibit 51. On the 1999 test, only 61 % were able to correctly identify all the latents and there were 11 erroneous identifications. Collaborative Testing Services, Inc., Report No. 99-516, Forensic Testing Program: Latent Prints Examination 2 (1999), Exhibit 52.

Having failed to address any of these proficiency tests in advancing its claim of a zero

error rate, the government in *Mitchell* took the remarkable position that "practitioner error is not relevant to the validity of the science and methodology under Daubert." Government's Response to the Defendant's Motion to Compel the Government to Produce Written Summaries for All the Experts That It Intends to Call at the Daubert Hearing at 3 n.3. The government, however, failed to explain why practitioner error is irrelevant under *Daubert.* Nor did the government explain how an error rate for a particular technique may be assessed other than through its real-life practitioners. Not surprisingly, courts have looked at studies of examiner error rate in determining whether proffered "scientific" evidence is reliable. See, *e.g.*, *United States v. Smith*, 869 F.2d 348, 353-54 (7th Cir. 1989) (studies of "actual cases examined by trained voice examiners" considered by court in deciding admissibility). The Seventh Circuit's decision in *Smith* was, as noted above, cited with approval by the Supreme Court in *Daubert.* See Daubert, 509 U.S. at 594, 113 S. Ct. at 2797; *People v. Leahy* (1994) 8 Cal. 4th 587, 609 (to be qualified as a *Kelly* expert on an HGN test, witness must have "some understanding of the processes by which alcohol ingestion produces nystagmus, how strong the correlation is, how other possible causes might be masked, *what margin of error has been shown in statistical surveys*, and a host of other relevant factors"); See also Saks, supra, at 1090 ("Even 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."); John Thornton, *The General Assumptions and Rationale Of Forensic Identification*, in 3 Modern Scientific Evidence: The Law and Science of Expert Testimony § 24-6.3, p. 166 (" Proficiency testing is a means by which [reliability, validity, precision, and accuracy] can be measured. ... Proficiency testing [is] the most

appropriate means for the identification of sources of error."). Accordingly, the argument that practitioner error rates are irrelevant is without merit.

As in *Mitchell*, the government in *United States v. Plaza* (E.D. Pa. 2001) 179 F. Supp. 2d 492, again raised the argument that practitioner error was irrelevant and that the "methodology error" was zero. The Court emphatically rejected this distinction and held that "it is this court's view that the error rate of principle legal consequence is that which relates to 'practitioner error'" *Id.* at 511. The court adhered to this view on rehearing and rejected the government's attempt to show that the FBI's internal proficiency tests showed low practitioner error. See, *United States v. Plaza* (E.D. Pa. 2001), 181 F. Supp. 2d. at 565 ("On the record made before me, the FBI examiners got very high proficiency grades, but the tests they took did not. The defense witnesses succeeded in raising real questions about the adequacy of the proficiency tests taken annually by certified FBI fingerprint examiners.").

In sum, any claim of a zero error rate is plainly at odds with reality. While no controlled studies have been done to determine an error rate, it would appear from the proficiency testing done in the field that the rate is in fact substantial. In this regard, it must be remembered that under *Kelly* it is the government's burden to establish the scientific reliability and general acceptance of the expert evidence that it seeks to admit. With respect to the error rate factor, the government plainly cannot meet that burden. See *United States v. Starzecpyzel*, 880 F. Supp. 1027, 1037 (S.D.N.Y. 1995) ("Certainly, 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.'").

5. There Are No Objective Standards to Govern Latent Fingerprint

Comparisons

Latent fingerprint examiners in the United States are currently operating in the absence of any uniform objective standards. The absence of standards is most glaring with respect to the ultimate question of all fingerprint comparisons: What constitutes a sufficient basis to make a positive identification? As discussed above, the official position of the IAI since 1973 is that no minimum number of corresponding points of identification are required for an identification. The SWGFAST Quality Assurance Guidelines of the FBI are in agreement. According to the Introduction to the Guidelines, "There is no scientific basis for requiring that a minimum number of corresponding friction ridge features be present in two impressions in order to effect an identification."

Instead, the determination of whether there is a sufficient basis for an identification is left entirely to the subjective judgment of the particular examiner. Indeed, in his recent book, David Ashbaugh repeatedly stresses that "*[t]he opinion of individualization or identification is subjective*." Ashbaugh, Basic and Advanced Ridgeology at 103; see also, David Stoney, *Fingerprint Identification: Scientific Status*, in 3 Modern Scientific Evidence: The Law and Science of Expert Testimony § 27-2.3.1 at 387 ("What then are the standards in fingerprint identification practice ? Any unbiased, intelligent assessment of fingerprint identification practices today reveals that they are, in reality, no standards.")

While the official position of the IAI and SWGFAST, as supported by Mr. Ashbaugh, is that there is no basis for a minimum point requirement, many fingerprint examiners in the United States continue to employ either their own informal point standards or those that have been set by the agencies that they work for. Simon Cole, What Counts For Identity? The Historical Origins

Of The Methodology Of Latent Fingerprint Identification, 12 SCI. IN CONTEXT 1, 3-4 (Spring 1999) [hereinafter Cole, What Counts For Identity?], Exhibit 53. This variability of standards is confirmed by Professors Giannelli and Imwinkelried: "There is no consensus on the number of points necessary for an identification. In the United States, one often hears that eight or ten points are 'ordinarily' required. Some local police departments generally require 12 points." Paul Giannelli and Edward Imwinkelried, 1 Scientific Evidence (3d. Ed 1999)§ 16-7(A), p. 768.

Prior to the IAI's 1973 proclamation, the informal standard most commonly employed in the United States was 12. See, FBI, Fingerprint Identification, supra, at 6. To this day, FBI latent fingerprint experts testify that "[i]n the FBI latent fingerprint section, at present time, there is no set number of points. However, we have an administrative rule which is on the books which requires any latent print of less than 12 points of identity - and that being the dots, the end of ridges or enclosures - requires supervisory approval before it can be reported in a report that it is in fact an identification." *United States v. Timothy McVeigh*, Testimony of Special Agent Louis Hupp, Reporter's Transcript of Proceedings, Vol. 68, April 29, 1997, http://www.papillion.ne.us/mriddle/okctr/4-29-1.htm, Exhibit 54. See also, *People v. Clarence Powell*, S. F. Muni Ct. No. 167003, Testimony of Inspector Michael Byrne, Preliminary Hearing Transcript, April 5, 1978, p. 70, Exhibit 55 ("Now, the San Francisco Police Crime Laboratory for years we have liked to testify on 12 points ... We stop at 12. We are completly satisfied at 12 but ... that doesn't mean we will not testify on nine or eight or - I have never done it myself - I have testified to ten but I don't think I have gone to nine yet.").

In addition, while there is no uniform identification standard in the United States, "many" other countries have, in fact, set such standards based on a minimum number of points of

comparison. Ashbaugh, Basic and Advanced Ridgeology, supra, at 6-7. As indicated above, until quite recently, in England, many examiners used 16 points as a rule of thumb and triple checked the results. "In France, the required number used most often is 24 while the number is 30 in Argentenia and Brazil." Paul Giannelli and Edward Imwinkelried, 1 Scientific Evidence (3d. Ed 1999)§ 16-7(A), p. 768. Italy has a minimum standard of 17 matching ridge characteristics. Christophe Champod, Numerical Standards and "Probable" Identifications, 45 J. OF FORENSIC IDENTIFICATION 136, 138 (1995). The primary purpose of establishing such standards is to try to insure against erroneous identifications. K. Luff, The 16-Point Standard, 16 Fingerprint Whorld 73 (Jan. 1990), Exhibit 56. See also, Ashbaugh, Basic and Advanced Ridgeology, supra, at 102 ("[T]he static training threshold is an acceptable practice as a safeguard and permits one to gain experience and confidence with a reduced fear of committing an error."). Such a standard is legally necessary to ensure "forensic reliability" as that term is used in *Venegas*.

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. See, Cole, What Counts For Identity, supra, at 1. While latent print examiners have somehow managed to maintain a united front in the courtroom, they have been at odds in the technical literature. *Id*. at 6. For example, Mr. Ashbaugh has written that "it is unacceptable to use the simplistic point philosophy in modern day forensic science." Ashbaugh, Premises, supra, at 513.[17] As Mr. Ashbaugh has correctly recognized, the selection of any particular point standard

[17]Of course, the identification in the instant case appears to have been made by Agent Holmes on the basis of "ridgeology" supplemented by a forced reliance on point counting.

is based, not on scientifically conducted probability studies, but "through what can best be described as an 'educated conjecture'." Ashbaugh, Basic and Advanced Ridgeology, *supra*, at 2; see also, Ashbaugh, Premises, *supra* at 512 ("superficial and unsubstantiated quips became the methodology of the point system").

The problem, however, is that while Mr. Ashbaugh is correct that the point system, as employed by fingerprint examiners over the past hundred years, is scientifically invalid, neither Mr. Ashbaugh nor any other member of the fingerprinting community has advanced a scientifically sound alternative. Here, for example, is Mr. 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, 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.
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> * * *
>
> 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 there are 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.

Ashbaugh, Basic and Advanced Ridgeology, *supra*, at 103.

The utter meaninglessness of this explanation speaks for itself. Mr. Ashbaugh's prior writings on this subject provide little in the way of additional insight. He has stated, for example,

that while "in 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." David Ashbaugh, The Key to Fingerprint Identification, 10 Fingerprint Whorld 93, 93 (April 1985), Exhibit 58. Mr. Ashbaugh's explanation for this sliding scale is that some ridge characteristics are more unique than others. *Id*. at 94, 95. But, as discussed above, no weighted measures of the different characteristics have ever been adopted by the fingerprint community. As California Department of Justice fingerprint expert Dusty Clark has explained, "*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 ... Ridgeology hasn't been scientifically proven to be repeatable, and it's application is not standardized.*" Dusty Clark, What's The Point (Dec. 1999), http://www.latent-prints.com/id_criteria_jdc.htm. Accordingly, as Mr. Ashbaugh has recognized, the particular examiner's determination of whether eight or twelve matching characteristics is sufficient in a particular case is entirely "subjective." Ashbaugh, Basic and Advanced Ridgeology, supra, at 103. But as Mr. Clark again points out, "*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 that yours?" *Id*.

Ashbaugh and others place principle reliance on the experience and training of the analyst as a hedge against erroneous results. However, as indicated above, Evett and Williams found in an extensive collaborative study that "*[s]tatistical analysis did not suggest any association between the number of [correct] identifications made by an expert and his/length of experience.*" I. W. Evett and R.L. Williams, *A Review of the Sixteen Point Fingerprint Standard in England*

and Wales, (1996) 12(1) The Print 1, 7. In their study, the FBI and other North American experienced experts were sent 10 sets of samples, only six of which should have resulted in a court quality identification and the tenth of which came from two differant individuals. Significantly, " four experts at the FBI were unanimous in deciding that there were nine court quality identifications, the tenth comparison being not identical. Most of the north American experts decided on eight or nine full identifications." *Id.* at 8. This study perfectly illustrates the truth of Dr. John Thornton's observation that

> [S]ome experts exploit situations where intuitions or mere suspicions can be voiced under thr guise of experience. When an expert testifies to an opinion, and bases that opinion on "years of experience," the practical result is that the witness is immunized against effective cross examination. When the witness testifies that "I have never seen another similar instance in my 26 years of experience ...," no real scrutiny of the opinion is possible. No practical means exists for the questioner to delve into the extent or quality of that experience. Many witnesses have learned to invoke experience as a means of circumventing the responsibility of supporting an opinion with hard facts. For the witness, it eases cross-examination. But it also removes the scientific basis for the opinion.
>
> Experience is neither a liability nor an enemy of the truth; it is a valuable commodity, but it should not be used as a mask to deflect legitimate scientific srutiny, the sort of scrutiny that customarily is leveled at scientific evidence of all sorts. To do so is professionally bankrupt and devoid of scientific legitimacy, and courts would do well to disallow testimony of this sort. Experience ought to be used to enable the expert to remember the when and the how, why, who, and what. Experience should not make the expert less responsible, but rather **more** responsible for justifying an opinion with scientific facts.

John Thornton, *The General Assumptions and Rationale Of Forensic Identification*, in 3 Modern Scientific Evidence: The Law and Science of Expert Testimony § 24-5.5, p. 161.

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. Take for example, the simple issue of how

points of similarity should be counted. When examiners find themselves struggling to reach a certain point criteria, they often engage in a practice known as "pushing the mark." Clegg, *supra*, at 99 . Pursuant to this practice, a single characteristic, such as a short ridge, is counted not as one point, but rather as two separate ridge endings. *Id*. Or, a single enclosure is counted as two bifurcations. See, Robert Olsen, Friction Ridge Characteristics and Points of Identity: An Unsolved Dichotomy of Terms, 41 J. FORENSIC IDENTIFICATION 195(1991) (IAI has declared in a formal report that an enclosure should be counted as a single point rather than as two separate bifurcations.). While the IAI has declared that points should not be counted in this fashion, it is nevertheless commonly done, as can be seen by the work of the FBI examiner in the *Mitchel*l case, where an enclosure was counted as two bifurcations. The obvious danger of this practice, as one examiner has candidly recognized, is its "potential to generate error." Clegg, *supra*, at 101.

The lack of objective standards in fingerprint comparisons can also be seen with respect to the so called "one dissimilarity rule." See, John I. Thornton, The One-Dissimilarity Doctrine in Fingerprint Identification, 306 INT'L CRIM. POLICE REV. 89 (March 1977), Exhibit 58. Pursuant to this doctrine, if two fingerprints contain a single genuine dissimilarity then the prints cannot be attributed to the same finger or individual. *Id*. This doctrine is well recognized in the fingerprint community and has been endorsed in the writings of the leader of the "ridgeologists." David Ashbaugh, Defined Pattern, Overall Pattern and Unique Pattern, 42 J. OF FORENSIC IDENTIFICATION 505, 510 (1992), exhibit 59 [hereinafter Ashbaugh, Defined Pattern]. The doctrine, however, is effectively ignored in practice. As Dr. Thornton has recognized, 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 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.

Thornton, *supra*, at 91.

Dr. Thornton has also noted an additional problem which plagues those few police departments which adhere to an illusory standard of eight points of identification. As he explains, under this rationale

> [E]ight matching characteristics, if they are clear and unambigious, will serve for purposes of identification. A problem, however, is that <u>if</u> the evidence print can be gleaned for no more than eight characteristics, it is likely that the print suffers from some lack of clarity. Evidence fingerprints that possess only eight characteristics, but with those eight characteristics being brillant and unequivocal, are not commonly encountered. So at the same time that the criterion for identification is being relaxed, the ambiguity of each characteristic is being

augmented.

John Thornton, *The General Assumptions and Rationale Of Forensic Identification*, in 2 Modern Scientific Evidence: The Law and Science of Expert Testimony § 24-9.2.5, p. 185.

The absence of real standards in the fingerprint field also can be seen with respect to the issue of verification. Independent verification is considered an essential part of the identification process. See, SWGFAST Quality Assurance Guidelines, Guideline 1.1 ("All identifications must be verified by a qualified latent print examiner."). But, in real practice, fingerprint agencies sometimes "waive the verification requirement." William Leo, Identification Standards - The Quest for Excellence, CAL. IDENTIFICATION DIG. (December 1995), Exhibit 60. Moreover, as revealed by one of the government's experts in the *Mitchell* case, some examiners will simply go from one supervisor to another until a desired verification is obtained. Pat Wertheim, The Ability Equation, 46 J. OF FORENSIC IDENTIFICATION 149, 153 (1996), Exhibit 61. Mr. Wertheim candidly recounts in this article his experience of shopping for a supervisor so as to obtain the positive verification that he believed was warranted. *Id*.

More subtle, but no more scientifically acceptable, is the verification process which may have been used in this case. As indicated in the statement of facts, it is unclear from discovery whether the verification process ever took place with respect to the four reports identified in the Summary, since no review checklists were provided for any of these examinations. It also appears that some of the other review checklists were signed after Hankerson issued his report and certain boxes are checked which should not have been if the government's current

representations are true. Although this issue should be resolved in a hearing, it is common practice for one examiner to merely give his report to another and ask him or her to "verify" the results already obtained. The obvious problem is that the result is biased when the verifier is given access to his colleague's report before he is asked to do the verification. Even Mr. Asbaugh condemns such a biasing process. Ashbaugh, Basic and Advanced Ridgeology, *supra*, at 108 ("The latent print is always analyzed first, before comparison to the exemplar. This rule ensures an uncontaminated analysis of the unknown friction ridge detail. Comparisons conducted in this fashion ensure objectivity and prevent contamination through previous knowledge."). See also, Y. Mark and D. Attias, *What Is the Minimum Standard for Characteristics for Fingerprint Identification* (1996) Fingerprint Whorld 148 ("We wish to emphasize that the determination of a positive identification by one of our experts is made independently from other experts and from the circumstances of the case."). Violation of this principle no doubt explains how two separate misidentifications were made in England, despite the presence of triple verification. See *supra* at 49-50. See also, *United States v. Plaza*, 179 F. Supp. 2d at 505 n. 11 ("With respect to the ACE-V process at issue here, reliance on a second examiner's same result as a confirmatory 'test' is subject to the further dilution that, not infrequently, the second examiner has been advised of the prior result.").

Finally, the lack of standards in the fingerprint community extends to the training and experience requirements for latent print examiners. To put it simply, no such requirements currently exist. See Leo, *supra* (recognizing need for "minimum training and experience standards" for latent print examiners). As one of the government's experts in *Mitchell* has recognized, "[P]eople are being hired directly into latent print units without so much as having

looked at a single fingerprint image." Wertheim, *supra* at 152 (Ex. 41 at 152). Once hired, the training that examiners receive is typically minimal. Consider what government expert David Grieve has said on the subject of training:

> The harsh reality is that latent print training as a structured, organized course of study is scarce. Traditionally, fingerprint training has centered around a type of apprenticeship, tutelage, or on-the-job training, in its best form, and essentially a type of self study, in its worst. Many training programs are the "look and learn" variety, and aside from some basic classroom instruction in pattern interpretation and classification methods, are often impromptu sessions dictated more by the schedule and duties of the trainer than the needs of the student. Such apprenticeship is most often expressed in terms of duration, not in specific goals and objectives, and often end with a subjective assessment that the trainer is ready.

David L. Grieve, The Identification Process: The Quest For Quality, 40 J. OF FORENSIC IDENTIFICATION 109, 110-111 (1990), Exhibit 63 .

As Mr. Grieve has recognized, the direct result of this poor training is deficient examiners. "The quality of work produced is directly proportional to the quality of training received." *Id*. See also David L. Grieve, The Identification Process: Traditions in Training, 40 J. OF FORENSIC IDENTIFICATION 195, 196 (1990), Exhibit 64 (that there are "examiners performing identification functions who are not qualified and proficient ... unfortunately has been too well established"); Robert D. Olsen, Cult of the Mediocre, 8 Fingerprint Whorld 51 (Oct. 1982), Exhibit 65 ("There is a definite need for us to strengthen our professional standards and rise above the cult of the mediocre.").

Moreover, the lack of training and standards has not only resulted in a plethora of deficient examiners but dishonest ones as well. New York police officers have fabricated

fingerprint evidence in numerous cases. See, Mark Hansen, *Trooper's Wrongdoing Taints Cases*, A.B.A. J., Mar. 1994, at 22; Ronald Sullivan, *Trooper's 2d Tampering Charge*, N.Y. Times, Jan. 6, 1994, at B9. This fiasco came to light when a New York State policeman bragged in a CIA interview about his fabrication skills. In January 1991, the CIA passed the information on to the FBI. It took over a year, however, for an investigation to be commenced. The special prosecutor found that up to forty cases may have been tainted, and he "wonder[ed] why more prosecutors in the region didn't grow suspicious about the sudden avalanche of good fingerprint evidence." Gary Taylor, *Fake Evidence Becomes Real Problem*, NAT'L L.J., Oct. 9, 1995, at A1, A28. One of the experts in the *Mitchell* case, Pat Wertheim, estimates that there have been "hundreds or even thousands" of cases of forged and fabricated latent prints. Pat Wertheim, Detection of Forged and Fabricated Latent Prints, 44 J. OF FORENSIC IDENTIFICATION 653, 675 (1994), Exhibit 65 ("A disturbing percentage of experienced examiners polled by the author described personal exposure to at least one of these cases during their careers.").

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, training, and proficiency testing. Accordingly, another indicia of good science is critically lacking in this case.

6. There Is No General Consensus That Fingerprint Examiners Can Reliably Make Identifications on the Basis of "Ridgeology"

As indicated at the outset of this motion, the relevant question in this case is not whether entire fingerprints are unique and permanent, but whether that fingerprint examiners can make reliable identifications from partial latent prints on the basis of "ridgeology." The answer to that

question is plainly "NO." As discussed above, many countries require that there be at least 16 to 30 matching ridge characteristics before fingerprint evidence is deemed sufficiently reliable so as to warrant its admission at a criminal trial, and there is no general acceptance of the new subjective method of "ridgeology." Moreover, in this country, no relevant scientific community, beyond fingerprint examiners themselves, generally accept that latent fingerprint identifications are reliable.

Except for scientists in the field of biometrics, who have questioned the reliability of fingerprint identification even of computer scanned prints, other mainstream scientists have essentially ignored the question of whether individuals can be reliably identified through latent fingerprint impressions. Saks, *supra* at 1081. And as discussed above, the forensic science experts that have examined the issue, have found the fingerprint field to be scientifically deficient. See Saks, *supra*, at 1106 ("A vote to admit fingerprints is a rejection of conventional science as a criterion for admission."); 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* § 27-1.0 at 347(2002 ed.)("(S)urprisingly little conventional 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 thoughtful and scientifically literate judge, would face a number of serious difficulties"); Stoney, *Fingerprint Identification: Scientific Status*, in 3 Modern Scientific Evidence: The Law and Science of Expert Testimony (2002 ed.) § 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."). Simon Coles, Suspect Identities: A History of Fingerprinting and Criminal Identification (Harvard University Press, 2001) p. 5 ("(L)ongstanding fissures in the reliability of fingerprint identification have become visible cracks."). Accordingly, the factor of general acceptance by impartial experts outside the fingerprint profession weighs heavily in favor of Mr. Stayner's motion to exclude the government's fingerprint evidence.

7. The Fingerprint Literature Confirms the Scientific Bankruptcy of the Field.

Prominent fingerprint experts themselves, such as the California Department of Justice's Dusty Clark, have made it clear that they do not accept the precepts and teachings of David Asbaugh. See, Dusty Clark, What's The Point (Dec. 1999) *supra* ("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 ... 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 quantization makes the identification process as reliable as astrology... Ridgeology hasn't been scientifically proven to be repeatable, and it's application is not standardized.")

Astoundingly, even Ashbaugh himself has declared that " *[i]t is becoming more apparent as time passes that friction ridge identification science is more vulnerable now than at any time in its history* ... [T]he *Daubert* hearing in the U.S. federal court in Philadelphia, PA, will continue to unfold over the next few years. The future will habor many similar challenges." Ashbaugh,

Basic and Advanced Ridgeology, *supra*, at 6-7.

The source of this pessimism by one of the profession's leading advocates is easy to trace. The fundamental premises underlying latent print identifications have not been critically examined in the technical literature of the fingerprint community. As Mr. Ashbaugh has stated "it is difficult to comprehend that a complete scientific review of friction ridge identification has not taken place at sometime during the last one hundred years[;] [a] situation seems to have developed where this science grew through default." (*Id*. at4.) The truth of Mr. Ashbaugh's comments can be seen by an examination of the publications that are typically listed as authoritative sources on the "science" of fingerprinting. While some of the titles typically listed might convey the impression of science, a review of their actual contents will readily reveal otherwise. Take for example the FBI publication The Science of Fingerprints(1979). 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 as to the fundamental premises that underlie latent print identifications or even how such comparisons should be conducted. As Mr. Ashbaugh has correctly recognized, "Little, if anything, has been reported on the importance and need for scientific knowledge, understanding the evaluative proces, or the training necessary to be able to analyze, compare, and evaluate friction ridge prints." *Id*. at 5.

Even when the premises of latent print identifications have been considered in the technical literature, they have not been critically examined. A perfect example is Alan McRobert's article *Nature Never Repeats*, The Print 12(5), Sept/Oct`96, pp 1-2, Exhibit 66.

In this article, Mr. McRoberts cites with approval the following statement which was originally made by Wilder and Wentworth in their 1916 text, Personal Identification:

> Finally, there is never the slightest doubt of the impossibility of the duplication of a fingerprint, or even of the small part of one, on the part of anyone who has carefully studied the subject at first hand, whether 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.

It is probably statements such as these that have led government expert David Ashbaugh to bemoan the "failure of the identification community to challenge or hold meaningful debate." Ashbaugh, Basic and Advanced Ridgeology, supra, at 4. As Mr. Ashbaugh explains:

> In the past the friction ridge identifications 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, which did not support the concept of an exact and infallible science, could lead to its destruction and the credibility of those supporting it.

Id.

Thus, while the phrase "Nature never repeats itself" is catchy, it is not, to paraphrase former Justice Potter Stewart, a talisman in whose presence the protections of *Daubert* disappear. It is generally held that no two snowflakes are exactly the same. But see, N.C. Knight, *No Two Alike?* 69 BULLETIN AM. METEOROLOGICAL SOC'Y 496 (1988) (finding " apparent contradiction of the long-accepted truism that no two snow crystals are alike."). As Dr. John Thornton observes,

> Based on the same type of not very rigorous observation, it is held that no two fingerprints have ever been found to have the same ridge positioning. ... Observations such as these have gradually become tenets of the beliefs of the forensic scientist of the uniqueness of all objects. In some quarters, these tenets have been scooped up and extended into a single all-encompassing, generalized principle of uniqueness, which states that "Nature never repeats itself."

John Thornton, *The General Assumptions and Rationale Of Forensic Identification*, in 3 Modern Scientific Evidence: The Law and Science of Expert Testimony § 24-4.1, p. 156. Yet, as Dr. Thornton argues, the principle is false as applied to fingerprint evidence or any other kind of physical evidence:

> The principle is probably true, although it would not seem susceptible of rigorous proof. But the general principle cannot be substituted for a systematic and thorough investigation of a physical evidence category. One may posit that no two snowflakes are alike, but it does not immediately follow that no two shoes are alike, since snowflakes are made in clouds and shoes are not. If no two shoes are alike, the basis for this uniqueness must rest on other grounds, and those grounds must be identified and enunciated.

Id.

Leading forensic science commentators who have recently examined this issue have agreed with this analysis. For example, in discussing *United States v. Havvard*, (S.D. Ind. 2000) 117 F.Supp.2d 848, which rejected a fingerprint challenge with little or no analysis, the editors of the treatise Modern Scientific Evidence have written:

> The court assumes that no special research effort is needed, that in the course of ordinary casework errors would become apparent. One must ask what opportunity ordinary casework affords for falsification. It is not obvious how such fortuitous testing is likely to occur. For example, where a suspect's prints are compared to crime scene prints, the circumstances do not permit such a test. In normal casework, when a match is found, the search ends, and there is no chance of finding further matches. The usual process might often or typically prevent rather than create a test of the hypothesis. A more serious problem is that this is not the relevant hypothesis given the usual task-at-hand. The more practical question is: given fragmentary or distorted latent prints and examiners of varying skills and differing judgement, how often are false positive errors made? Mistaking one

> person's prints for those of another person has occurred in both actual cases and in proficiency testing. Normal science would pose the following sorts of questions:
>
> What is the probability of an erroneous match? Under what circumstances are errors more likely or less likely to occur? And then designs research to find answers.

Faigman, et al., Modern Scientific Evidence, *supra*, § 27-1.2 at 361.

In sum, the literature of latent fingerprint examiners "fails to meet the expectations of the *Daubert* (and *Kelly*) Court(s) -- that a competitive, unbiased community of practitioners and academics would generate increasingly valid science." *United States v. Starzecpyzel*, 880 F. Supp. 1027, 1037 (S.D.N.Y. 1995).

8. Latent Fingerprint Identifications Are Analogous to Other Techniques That Courts Have Found Scientifically Unreliable.

Latent fingerprint comparisons are analogous to four other long standing forensic identification techniques that, in the wake of *Daubert*, have been found scientifically deficient; these techniques are handwriting analysis, hair comparisons, earmark and footwear impression evidence, and toolmark comparisons.

The field of handwriting analysis is currently in a state of complete disarray. Since *Daubert*, seven different federal trial court judges have found that the government's handwriting experts failed to meet the *Daubert* requirements. See, *United States v. Starzecpyzel*, 880 F.Supp. 1027 (S.D.N.Y. 1995); *United States v. Hines*, 55 F.Supp.2d 62 (D.Mass. 1999); *United States v. Santillan*, No. CR-96-40169 DLJ, 1999 WL 1201765 (N.D. Cal. Dec. 3, 1999); *United States v. Fuji*, 152 F.Supp.2d 939 (N.D. Ill. 2000); *United States v. Saelee*, 162 F.Supp.2d 1097 (D. Alaska 2001); *United States v. McVeigh*, 1997 WL 47724 (D. Colo. Feb. 5, 1997) (No. 96-CR-

68); *United States v. Rutherford*, 104 F.Supp.2d 1190 (D. Neb. 2000). Four of these judges have limited the expert's testimony in precisely the same manner as the Court in *Plaza* initially did with respect to the government's fingerprint experts.[18] The two most recent handwriting decisions have excluded the handwriting experts entirely.[19] Similar to what the defense is urging here, the courts that have examined handwriting analysis have concluded that (1) there has been a "lack of testing of the theories and techniques used in handwriting analysis," (2) that "little is known about error rates," (3) that there is no evidence of "peer review by disinterested parties, such as academics," and (4) that the field "suffers from a lack of controlling standards." *Saelee*, 162 F. Supp. 2d at 1103-1104. Indeed, there is not a single post-*Kumho* decision in which *Daubert* challenges to handwriting experts did not result in the district courts sharply limiting or entirely excluding the document examiner's testimony.

Explicitly recognizing that the field of handwriting analysis is in a "state of upheaval," (United States Department of Justice (DOJ) National Institute of Justice, Forensic Sciences Review of Status and Needs at 31), the DOJ has issued the same type of Solicitation for scientific validation studies that it has issued for fingerprints. National Institute of Justice, Solicitation, Forensic Document Examination Validation Studies (June 1998). As a result of this Solicitation, the DOJ has funded research in an effort to develop a completely different way of performing handwriting analysis from how it is presently conducted, a "computerized system which may one

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[18] See Hines, Santillan, McVeigh, and Rutherford.

[19] See Fuji, Saelee *supra*. In the seventh case noted above, United States v. Starzycpyzel, the court, after finding that the handwriting expert did not meet the test of Daubert, then determined that Daubert was inapplicable because the handwriting expert was not testifying on the basis of scientific knowledge. This latter part of the court's decision has now been effectively overruled by the Supreme Court's decision in Kumho Tire.

day be able to determine if handwriting was authored by a particular person with a defined degree of random match probability." Risinger, Handwriting Identification, Computer Authentication and Identification of Handwriting, § 28-2.4.2 at 483, in Modern Scientific Evidence: The Law and Science of Expert Testimony (Faigman, et al. eds., 2002). This research is still in its developmental stage. *Id*.

Like latent fingerprint identifications, the fundamental premises of handwriting analysis are that no two people write alike and that forensic document examiners can reliably determine authorship of a particular document by comparing the document with known samples. *Starzecpyzel*, 880 F. Supp. at 1031. As with fingerprints, however, these premises have not been tested. *Id*. at 1037. Nor has an error rate for forensic document examiners been established. *Id*. As the court in *Starzecpyzel* recognized, while "an unknown rate does not necessarily imply a large error rate ... if testing is possible, it must be conducted if forensic document examination is to carry the imprimatur of 'science.'" *Id*. The parallel between the handwriting and fingerprint fields extends to the issue of objective standards. As in the fingerprint field, forensic document examiners do not have any numerical standards to govern their analysis. *Id*. at 1032. And, like the fingerprint community, forensic document examiners have not subjected themselves to "critical self-examination" in their literature. *Id*. at 1037. For these various reasons, the district court in *Starzecpyzel* concluded that "forensic document examination ... cannot after *Daubert*, be regarded as 'scientific ... knowledge.'" *Id*. The courts followed similar reasoning in *Santillan*, *Hines* and *Mcveigh*.

Hair analysis also is analogous to latent fingerprint comparisons. Like latent print examiners, hair analysts look for a number of matching characteristics in doing hair comparisons.

Williamson v. Reynolds, 904 F. Supp. at 1553 ("Hett testified that there are approximately 25 characteristics used in hair comparisons."). Hair analysts then state whether the hair found at the crime scene is consistent microscopically with the hair of the defendant.[20] *Id*. As with fingerprints, there has been a "scarcity of scientific studies regarding the reliability of hair comparison testing." *Id.* at 1556. And, like fingerprints, "[T]here is no research to indicate with any certainty the probabilities that two different hair samples are from the same individual." *Id*. at 1558. Accordingly, as with fingerprints, the "evaluation of hair evidence remains subjective, the weight the examiner gives to the presence or absence of a particular characteristic depends upon the examiner's subjective opinion." *Id*. at 1556. Given these various considerations, the district court in *Williamson* concluded that "expert hair comparison testimony [does not] meet any of the requirements of Daubert" and that the state trial court thus erred in admitting it. *Id*. at 1558.

Latent earprint analysis is obviously closely analogous to latent fingerprint comparisons. As explained in *State v. Kunze*, 97 Wash.App. 832, 988 P.2d 977 (1999), the technique involved in recovering the latent earprint in that case is identical to the procedure used in this case to recover latent fingerprints: "[The technician] 'dusted' the print by applying black fingerprint powder with a fiberglass brush. He 'lifted' the print by applying palm-print tape first to the door and then to a palm-print card." 988 P. 2d at 980. And as with the fingerprints in this case, there was in *Kunze* variability in the way a known earprint is made and a lack of knowledge as to how a latent earprint was created: "[The technicians] knew that earprints of the same ear vary

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[20] Unlike latent print examiners, hair analysts candidly concede that they cannot make absolute identifications. *Williamson*, 904 F. Supp. at 1554, 1555.

according to the angle and rotation of the head, and also according to the degree of pressure with which the head is pressed against the receiving surface. They did not know the angle and rotation of the head that made the latent print, or the degree of pressure with which that head had been pressed against McCann's door." *Id*. at 981. The one distinguishing feature between the two techniques actually marks forensic earprint analysis a more forensically conservative technique than fingerprint analysis. Thus, while the expert in this case proposes to render an opinion of absolute certainty as to the identity of the latent print, the expert in *Kunze* testified only that "David Kunze is a likely source for the earprint and cheekprint which were lifted from the outside of the bedroom door at the homicide scene." *Id.*

Despite this conservative stance, the Washington Court of Appeal, after reviewing the testimony of the 15 expert witnesses called at the *Frye* hearing and two letters supporting the technique from scientists in Germany and England, concluded that forensic earprint analysis did not meet the general acceptance test of *Frye*. The head of the state' crime lab testified and based on his experience of over twenty years "[h]e claimed that latent earprint identification is generally accepted in the scientific community, reasoning that 'the earprint is just another form of impression evidence,' and that other 'impression evidence is generally accepted in the scientific community.'" *Id* at 982. The court rejected this testimony because "he had not seen any data or studies on earprints, or on 'how often an ear having the general shape of the questioned print in this case appears in the general human population." *Id*. at 981.

The counterpart of David Asbaugh also testified and stated that he had compared over 7000 photographs of earprints and that "he [had] published a book describing his system, which he calls 'earology' or the 'science of ear identification.'" *Id*. at 983. The Court was obviously

unimpressed, stating that "(h)e did not know of any published scientific studies confirming his theory that individuals can be identified using earprints, ... he did not claim that his system was generally accepted in the scientific community, [and his book] ... contains no bibliography and no scientific verification". *Id* at 983-984. The Court also cited with approval another expert who had stated that the book "was 'narrative,' not 'reported in a scientific manner,' and 'not subjected to any statistical analysis.' *Id*. The Court also quoted favorably yet another expert who testified that forensic earprint analysis had not been generally accepted in the broader scientific community because it had never been tested by scientific methodology, it had never been subjected to scientific peer review, and it had never been shown that results can be reliably obtained in terms of an acceptable rate of error. *Id* at 984. The Court concluded its opinion with these words:

> We agree with and adopt the statements of a commentator who, after noting two generally held tenets – "that no two snowflakes are exactly the same," and "that no two fingerprints have ever been found to have the same ridge positioning" - states as follows:
>
> > In some quarters, these tenets have been scooped up and extended into a single, all- encompassing, generalized principle of uniqueness, which states that "Nature never repeats itself." This principle is probably true, although it would not seem susceptible of rigorous proof. But the general principle cannot be substituted for a systematic and thorough investigation of a physical evidence category. One may posit that no two snowflakes are alike, but it does not immediately follow that no two shoe soles are alike, since snowflakes are made in clouds and shoes are not. If no two shoe soles are alike, the basis for this uniqueness must rest on other grounds, and those grounds must be identified and enunciated.

Id. at 992, quoting John Thornton, *The General Assumptions and Rationale Of Forensic Identification*, in 2 Modern Scientific Evidence: The Law and Science of Expert Testimony § 20-

4.2, p. 11-12.

Similarity, the same result has recently been reached with respect to footwear impression evidence, even though, unlike fingerprint experts, footwear impression experts do not couch their opinions in terms of absolute and infallible conclusions. See, *State v. Jones,* 343 S.C. 562, 574, 541 S.E.2d 813 (2001) ("In our opinion, it is premature to accept that there exists a science of 'barefoot insole impressions' ... We find, therefore, that the trial judge erred in permitting expert testimony purporting to demonstrate that "barefoot insole impression" testing revealed [defendant's] foot to be consistent with the impression made by the primary wearer of the ... [crime scene] boot."); *State v. Berry*, 143 N.C. App. 187, 546 S.E. 2d 545 (2001) (same)(foot impression testimony excluded in part because there was no " use of visual aids before the jury so that the jury is not asked to sacrifice its independence by accepting [the] scientific hypotheses on faith.").

Finally, as discussed above, the attempt by a toolmark expert to express a subjective opinion in absolute terms was recently rejected under the Frye standard in *Rameriz v. State*__So. 2d. 2d __, 2001 WL 1628609. These case are sending the powerful message that, in the words of Judge Jensen, "The [legal] world has changed" and that " a past history of admissibility does not relieve this Court of the responsibility of now conducting [*Kelly*] analysis as to ... proffered expert testimony." *United States v. Santillan*, 1999 WL 1201765 at p. 4 (N.D. Cal. 1999). Just by the standards set forth in these cases, it is clear that the subjective and arbitrary technique used in this case to identify a partial latent print with absolute certainty is neither forensically reliable nor generally accepted within the broader community of scientists.

9. Latent Fingerprint Comparisons Have Not Been Put to Any Non-Judicial Applications

There have been no non-judicial applications of latent fingerprint comparisons. As expert David Ashbaugh has recognized, the use of fingerprints has been "under the control of the police community rather than the scientific community" and latent prints are used by law enforcement solely as a "tool for solving crime." Ashbaugh, Basic and Advanced Ridgeology, *supra*, at 4 .

As indicated above, to the extent that non-latent prints have been employed in such fields as biometrics, the experience is anything but helpful to establishing the reliability and general acceptance of partial latent print comparisons. In biometrics, a clear fingerprint image is generated, usually by a high resolution digital camera behind a Plexiglas plate where the users presents their finger. Adrian Dysart, Biometrics (Winter 1998), **http://www.monkey.rg/~dysart/598/.** Even with this high-tech method of collecting the print, it is generally recognized that "fingerprint verification systems are subject to a mimicry attack ...[that] can be avoid[ed] [only] by having thermal sensors detect subcutaneous blood vessels and reject the sample if none are found." *Id*. More significantly, it is generally recognized that "biometrics are not reliable enough on their own to act as identifiers, but in conjunction with other, more traditional forms of access control, such as passphrases and PINs, they provide a considerable layer of security." See also, *Let Your Fingers Do the Logging In*, Network Computing, Issue 910, June 1, 1998 ("Unfortunately, some of the lowest-cost systems are simply gadgets and too gimmicky for consideration in the enterprise. In our review of fingerprint recognition devices in this issue, we found much of the current crop too insecure and unreliable for practical enterprise-wide deployment.") See, http://www.techweb.com/se/directlink.cgi?NWC19980601S0021. Thus, this

factor also favors Mr. Stayner's motion to exclude latent fingerprint evidence.

In sum, having considered the various indicators of scientific reliability set forth by the courts, and having surveyed the fingerprint literature produced by forensic scientists, biometric scientists, and fingerprint technicians themselves, it is clear that latent fingerprint comparisons do not constitute scientifically reliable and generally accepted scientific 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 in the absence of any uniform standards and in the absence of any testing to validate the fundamental premises upon which the technique rests. It should therefore hardly be surprising that forensic science commentators have concluded that a "vote for science is a vote to exclude fingerprint expert opinions." Saks, *supra*, at 1106

10. Two Federal Courts Have Rejected Fingerprint Identification Evidence Because of its Scientific Unreliability.

Mr. Rudolph began this memorandum with the observation that with one exception, the admissibility of expert testimony based upon fingerprint evidence is well established in every jurisdiction in the United States. In two instances in which a federal trial court has performed the type of analysis that is now mandated by *Daubert*, the district court excluded the government's fingerprint identification evidence, finding that there was no scientific basis for the latent print examiner's opinion of identification.

The first such case was *United States v. Parks* (C.D. Cal. 1991) (No. CR-91-358-JSL). The relevant transcript pages of *Parks* are provided under separate cover. The district court in *Parks* reached this determination after hearing from three different fingerprint experts produced by the

government in an effort to have the evidence admitted. The testimony of these three experts, however, confirms virtually every argument that has been advanced above.

The first fingerprint expert to testify in *Parks* was a Los Angeles Police Department latent fingerprint examiner, Diana Castro. (RT at 469 -557). Ms. Castro testified that she identified three different fingerprints at the crime scene as having between 10 and 12 points of similarity with the known prints of the defendant. What particularly concerned the court about these identifications was Ms. Castro's testimony that her minimum standard for an identification is only eight points of similarity. (RT at 538). Ms. Castro acknowledged that her standard is on the "low side" and that other examiners require ten or twelve points or even more. (RT at 539). Ms. Castro further acknowledged that there has never been any empirical studies done to determine if two people might have the same fingerprints. (RT at 541).

The district court in *Parks* found Ms. Castro's testimony disturbing because all the latent print examiners that had previously testified before the court had testified to higher minimum point thresholds. In this regard, the court stated:

> This business of having a sliding scale – and this is a very high risk business, because I've had a lot of fingerprinting testimony, and it's been from the same group of people by and large, and my impression, correct me if you can – that it slides up and down, that if you have only 10 points, you're comfortable with 8, if you have 12, you're comfortable with 10, if you have 50, you're comfortable with 20.
>
> * * *
> I've had them say that when they had 20 and 25, and say, "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.

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

(RT at 551-553).

The district court then questioned the government as to what the fingerprint treatises state with respect to a minimum point standard. (RT at 555). The court was incredulous over Ms. Castro's testimony that no studies had been performed. If there are no studies the court stated, "Then this is not a science and there are no experts in it." (RT at 556).

In response to the court's concerns, the government called Ms. Castro's supervisor, Darnell Carter, to testify regarding the "standard in the industry." (RT at 556). Mr. Carter's testimony, however, only succeeded in further revealing the unreliability of the evidence. Mr. Carter disclosed to the court that while the Los Angeles Police Department has a 10 point standard, which can slide down to 8 with a supervisor's approval, the Los Angeles Sheriff's Department employs a 12 or 15 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 for a comparison." (RT at 559-61).[21] Mr. Carter 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 why there is no uniform rule. (RT at 561).

After hearing Mr. Carter's testimony, the district court was only more convinced that the fingerprint evidence should be excluded. To try to "resuscitate" the evidence, the government

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[21] Mr. Carter further testified in this regard that he had attended the FBI Academy for training and that the lowest number that anyone from the FBI had "gone to court on has been seven." (RT at 561).

called yet a third fingerprint expert, Steven Kasarsky, a board certified member of the IAI and an employee of the United States Postal Inspection Service. (RT at 567-68, 596). The court specifically questioned Mr. Kasarsky as to where the "science" is to support fingerprint identifications. (RT at 576-92.) Mr. Kasarsky, however, could not provide a satisfactory response.

Like Mr. Carter and Ms. Castro, Mr. Kasarsky testified that "everyone in our field basically has independent standards." (RT at 584). Mr. Kasarsky also acknowledged that misidentifications in the field had occurred, (RT at 568-569), and, in response to a question from the court, he admitted that no published studies regarding false identification had ever been done. Mr. 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. (RT at 599, 600). While Mr. Kasarsky testified that he was able to observe a dissimilarity between these prints 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. (RT at 600, 602). Accordingly, Mr. Kasarsky conceded that latent print examiners are in "dangerous territory" when making identifications on the basis of only eight points of similarity:

> The Court: Unless you have a very clear full print, you can't rule out a dissimilarity someplace on it that you didn't have, and if you have only five or six, or seven or eight, you're in dangerous territory.
> The Witness: Yes, Your Honor, because if you can't see the area that might have the dissimilarity, one can only guess.

(RT at 602) (emphasis added).

After hearing Mr. Kasarsky's testimony, the district court ruled that he 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 been studied?
>
> * * *
>
> I have discovered . . . that there are very limited objective standards, and that the training in this area, if it exists, other than "I've done this for a long time and I'm teaching you what I know," is almost nonexistent.
>
> People that have done it teach each other. So far as I've heard from you, and so far I've heard from anybody, those kinds of studies that would turn this into a bona fide science simply haven't been done.
>
> The information is there, it could be done, but it hasn't been done. There has been no study about how far qualified experts with existing prints could look at them and make a mistake on which kinds of things. That's something that can be done. Those prints exist. It wouldn't be hard for those studies to be made.
>
> This thing could be turned into a science, but it isn't now, not from what you've said, and not from what she said, and not from what her supervisor said.
>
> * * *
>
> Now I have heard a lot of conversation about what it takes to become an expert in this field, and I will say, based on what I've heard today, the expertise is 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.

(RT at 587, 591-92, 606-07).

Unites States v. Parks thus stands as a compelling precedent for the instant motion. 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.

More recently, in *Government of the Virgin Islands v. Jacobs*, 2001 WL 1735083, (D.Virgin Islands 2001), although the government had notice that a hearing would be held to determine the admissibility of the fingerprint evidence under *Daubert,* it did not present any evidence or even produce the proffered expert witness for examination by the defendant or the court. The government also refused to reveal the precise identification technique used by the examiner or the reasoning behind his opinion. The appellate court held that "(u)nder these circumstances, the trial court was virtually compelled by default to reject the government's fingerprint identification opinion as unreliable, and thus inadmissible, under *Daubert* and *Kumho Tire.* In doing so, the trial court did not abuse its discretion, and the evidence was properly excluded." Id. at 4. Mr. Rudolph respectfully submits that this Court should reach the same determination here unless the government sustains its burden of both identifying the precise basis for Agent Hankerson's opinion and showing that his opinion was reached using scientifically valid and generally accepted techniques.

VIII. The Forensic Fingerprint Examination in this Case Is Inadmissible under

Daubert and Rule 702 Because the Analyst Has Not Reliably Applied the Principles and Methods of His Own Profession to the Facts of this Case

As indicated above, recently amended Evidence Rule 702 provides,

> a witness qualified as an expert by knowledge, skill, experience, training, or education may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) *the witness has applied the principles and methods reliably to the facts of the case.*

"The proponent of expert testimony always bears 'the burden to show that... the methodology by which the expert reach[ed] his conclusions is sufficiently reliable." *United States v. Frazier,* 387 F. 3d 1244, 1260 (11th Cir. 2004). And, "*Daubert's* requirement that the expert testify to scientific knowledge - conclusions supported by good grounds for each step in the analysis - means that any step that renders the analysis unreliable under the *Daubert* factors renders the expert's testimony inadmissible. This is true whether the step completely changes a reliable methodology or merely misapplies that methodology." *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 745 (3rd Cir.1994). See also, *United States v. Beasley* (8th Cir. 1996) 102 F.3d 1440,1448("In every case, of course, the reliability of the proffered test results may be challenged by showing that a scientifically sound methodology has been undercut by sloppy handling of the samples, failure to properly train those performing the testing, failure to follow the appropriate protocols, and the like."); *State v. Jackson*, 255 Neb. 68, 582 N. W. 2d 317, 325 (Neb. 1998) (the results of an unspecified STR procedure should not have been admitted absent a foundation that the lab had followed its own testing protocols).

The problem of applying Rule 702's third prong to fingerprint experts is manifest. Since, as demonstrated above, there are no objective standards governing the profession, it is hard to judge

whether "the witness has applied the principles and methods reliably to the facts of the case." The fingerprint expert's solution to this problem is to declare that reliable methodology is whatever procedure each individual fingerprint expert decides it to be. But this is obviously not what Congress had in mind.

Mr. Rudolph urges that at a minimum, a showing of reliable methodology correctly applied would require proof that Agent Hankerson complied with the SWGFAST Guidelines, as well as the ATF's own fingerprint manuals and protocols.

Significantly, there are no National research Council Reports purporting to vouch for the reliability of fingerprint evidence or setting forth the correct scientific procedures to follow. The closest attempt at such standardization are the SWGFAST GUIDELINES, http://onin.com/ twgfast/ twgfast.html, which are not binding on any agency. Still, if these Guidelines are to be considered "the minimum necessary to perform consistent quality examinations" (Preface to Guidelines), then it is clear that there must be a showing that Agent Hankerson followed these or some comparable guidelines.

SWGFAST requires that each analyst must pass written tests and/or practical exercises demonstrating knowledge of "Required Objectives," "Friction Ridge Analysis," "Friction Ridge Detection and Preservation," and " Documentation of Examination." SWGFAST Training to Competency for Latent Print Examiners, Guidelines 1.3, 2, 3, 4. The Quality Assurance Guidelines require that "a Quality Manual must be maintained," and that the Manual must contain documentation of: Methods and Procedure for Latent Print Development, Evidence Handling Procedures, Proficiency Testing, Equipment Calibration and Maintenance Logs, Method Validation Records, and Policy and Procedure Manuals for Electronic Fingerprint

Systems.(Guideline 3). Guideline 4 requires that latent lift prints and photographic images must show "significant information about the orientation and/or position of the latent print on the object through description and/or diagram. Guideline 5 provides that "[e]vidence must be collected, received, and stored so as to preserve the identity, integrity, condition, and security of the item", and that "a clear, well-documented chain of custody must be maintained from the time that the evidence is collected or receive until it is released." Guideline 6 provides that "[p]rocedures must be in place to ensure the accuracy and completeness of documentation" and that "[d]ocumentation must be sufficient to ensure that any qualified latent print examiner could evaluate what was done and replicate any comparisons."

Although these requirements would appear to be minimal, and although complete resolution of "prong 3" issues must obviously await the hearing of this motion, it already appears that Mr. Hankerson is not in compliance with correct scientific procedures. Most significantly, he has no documentation of his examination. And, as indicated above, the any required verification process may have been performed in such a way as to bias the results. Finally, and most importantly, the making of an identification on the basis of "ridgeology" is a failure to follow reliable methods.

Because the issue of whether "the witness has applied the principles and methods reliably to the facts of the case" is a factual inquiry, this Court should hold a hearing on the issue to conduct the "exacting" and "rigorous" analysis mandated by *Frazier*.

IX. The Testimony of a Forensic Fingerprint Analyst Is Inadmissible Because it Will Not "Assist the Trier of Fact" Within the Requirements of Rule 702 of the Federal Rules of Evidence and it Will Be More Prejudicial and Misleading than Probative under Rule 403 of the Federal Rules of Evidence.

"The final requirement for admissibility of expert testimony under Rule 702 is that it assist the trier of fact. By this requirement, expert testimony is admissible if it concerns matters that are beyond the understanding of the average lay person. See *United States v. Rouco*, 765 F.2d 983, 995 (11th Cir.1985) (expert testimony admissible if it offers something "beyond the understanding and experience of the average citizen"). Proffered expert testimony generally will not help the trier of fact when it offers nothing more than what lawyers for the parties can argue in closing arguments." *United States v. Frazier,* 387 F. 3d at 1262-1263.

Further, "[b]ecause of the powerful and potentially misleading effect of expert evidence, see *Daubert*, 509 U.S. at 595, 113 S.Ct. at 2798, sometimes expert opinions that otherwise meet the admissibility requirements may still be excluded by applying Rule 403. Exclusion under Rule 403 is appropriate if the probative value of otherwise admissible evidence is substantially outweighed by its potential to confuse or mislead the jury, ... or if the expert testimony is cumulative or needlessly time consuming. ... Simply put, expert testimony may be assigned talismanic significance in the eyes of lay jurors, and, therefore, the district courts must take care to weigh the value of such evidence against its potential to mislead or confuse." 387 F. 3d at 1262-1263.

The risk of undue prejudice and confusion is especially great when it comes to latent fingerprint identifications. With fingerprint evidence having been uncritically accepted by the American legal system for the past 80 years, the general public has come to firmly believe that fingerprint identifications are scientifically based and that they are invariably accurate. In a study that was conducted concerning jurors' attitudes toward fingerprint evidence, 93% of the 978 jurors questioned expressed the view that fingerprint identification is a science, and 85% ranked

fingerprints as the most reliable means of identifying a person. Charles Illsley, Juries Fingerprints and the Expert Fingerprint Witness 16, presented at The International Symposium on Latent Prints (FBI Academy, Quantico, VA, July, 1987), Exhibit 67. As demonstrated above, however, these commonly held views are completely unwarranted. Latent fingerprint identifications are not scientifically supported and there are substantial questions regarding their reliability. Thus, while the probative value of the government's fingerprint evidence is, in reality, low, the danger of undue prejudice is extremely high, since there is a substantial danger that the jury will give the evidence considerably more weight than it deserves.

To paraphrase the court in *People v. Venegas*, supra.,

> to ... leave it to jurors to assess the current scientific debate on (fingerprint evidence) as a matter of weight rather than admissibility, would stand *[Daubert}Kelly-Frye* on its head. We would be asking jurors to do what judges carefully avoid-decide the substantive merits of competing scientific opinion as to the reliability of a novel method of scientific proof. ... The result would be predictable. The jury would simply skip to the bottom line-the only aspect of the process that is readily understood-and look at the ultimate expression of (an absolute opinion), without competently assessing the reliability of the process by which the laboratory got to the bottom line. This is an instance in which the method of scientific proof is so impenetrable that it would ' ... assume a posture of mystic infallibility in the eyes of a jury ...."

(18 Cal 4th at 83)

The government's fingerprint evidence, therefore, is properly excludable not only under Federal Rule of Evidence 702 and *Daubert*, but under Rule 403 as well. See *United States v. Santillan*,1999 WL 1201765 at 5 (N.D. Cal. 1999) ("[Handwriting comparison] testimony, when it is buttressed by the fact that it comes from an 'expert,' would appear to be more prejudicial and misleading than probative in the Court's consideration of the application of Rule 403 of the Federal Rules of Evidence."); *Williamson v. Reynolds*, 904 F. Supp. at 1558 (finding

that the probative value of hair comparison evidence was substantially outweighed by its prejudicial effect). Accord, *United States v. Van Wyk*, 83 F. Supp. 2d 515 (D. N.J. 2000); *United States v. Hines*, 55 F. Supp. 2d 62 (D. Mass. 1999) and *United States v. McVeigh*, 1997 WL 47724 (D. Colo. 1997).

Additionally, under the reasoning in theses cases, a fingerprint examiner's subjective opinion as to the identity of a latent fingerprint is not helpful and is thus inadmissible.

X. No Testimony from a Fingerprint Examiner Should Be Allowed Absent Specification of the Precise Points of Identification Being Relied upon by the Expert

As indicated above, the government has been ordered to produce to the defense the precise points of comparison being used as the basis for any his identification. See, *United States v. Robinson*, 44 F. Supp. 2d 1345 (N.D. Ga. 1997) (suppressing fingerprint evidence for failure to produce such information under then Rule 16(a)(1)(E)); *United States v. Wilkerson*, 189 F.R.D. 14, 15 (D.Mass.1999)(Rule 16(a)(1)(G) required a detailed summary of the tests at issue, including what occurred which led the examiner to his or her conclusion that the substance was cocaine). *Robinson* and *Wilkerson* should be followed in this case. Under Rule 16(a)(1)(G), the government should be precluded from introducing the testimony of a a fingerprint expert absent specification of the precise points of identification being relied upon by the expert.

Conclusion

Under *Daubert*, *Kumho Tire* and Rule 702, as recently interpreted by the Eleventh Circuit in *Frazier*, the Court must now act as a gatekeeper when expert testimony is proposed by one side in a federal trial. When the "factual basis, data, principles, methods or their application are called sufficiently into question,...the trial judge *must* determine whether the testimony has a 'reliable basis in the knowledge and experience of the relevant discipline.'" *Kumho Tire*, supra., 526 U.S. at 149, 119 S.Ct. 1167 (emphasis added). Defendant has more than called "into question" the testimony of the proposed fingerprint examiner.

Defendant asks that the Court either exclude the government's fingerprint testimony for all of the reasons stated above or conduct a *Daubert* hearing to consider whether the government can sustain its burden of proof under *Daubert* and Rule 702.

Dated: December 20, 2004

Respectfully Submitted,

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CERTIFICATE OF SERVICE

This is to certify that a copy of the foregoing has been served upon the following by mailing the same by first class United States mail, properly addressed and postage prepaid, on this 21th day of December, 2004 to:

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