

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. )

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

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

1. I have been asked to write an affidavit supplementary to the affidavit filed on December 21, 2004 (doc. 410, Exhibit A) in response to the *Government's Response in Opposition to Defendant's Motion to Exclude the Testimony of Forensic Fingerprint Examiner and Request for a Daubert Hearing* (doc. 439, Jan. 24, 2005, hereinafter Government's Response).

2. All of the arguments made in my affidavit of December 21, 2004 stand unrebutted in the Government's Response. The crucial unrebutted arguments are: (1) §II.B, in which I declared that no studies establishing the validity or measuring the accuracy of latent print identification exist; and (2) §II.C, in which I declared that the latent print community has failed to establish an objective standard for what constitutes a "positive identification." Also unrebutted is my declaration that the weight of scholarly opinion now clearly holds that the arguments above are correct (¶¶25-30). The Government's Response addresses

none of these arguments and essentially makes a legal argument against holding a *Daubert* hearing.

3. I agree with the Government that a *Daubert* hearing is not necessary. More so than at the *Daubert* hearing held in United States v. Mitchell in 1999, a substantial published literature on the invalidity of latent print identification exists. I am confident that even a cursory review of the published literature cited in my affidavit of December 21, 2004 and in this rebuttal affidavit, and the exhibits attached to the defendants motion to exclude the fingerprint evidence will clearly demonstrate that the Government's latent print evidence fails to meet the admissibility threshold set by *Daubert* and *Kumho Tire*.

## **I. PROPOSED TESTIMONY OF EXPERT WITNESS LARRY HANKERSON**

4. In Exhibit C, Supplement to Summary of Testimony of Expert Witness Larry Hankerson, the government states that Mr. Hankerson "will testify that the defendant made the latent print on Exhibits 7a (Ingles receipt), 7b (Burger King receipt), 7c (BI-LO receipt) and 57." The government also states that Mr. Hankerson "will testify that the defendant made one of the latent prints on Exhibit 10." Third, the government states that Mr. Hankerson "will testify that the defendant made the latent prints on Exhibit 367." The Government's Response also states that Mr. Hankerson will testify that a latent print "was made by the defendant" (at 4-5), "that the defendant made" other latent prints (at 5), and that a print "belonged to the defendant" (at 5).

5. The testimony that the government proposes to elicit is not scientifically supportable. Mr. Hankerson does not have a scientific basis upon which to base the

conclusion that the defendant “made” the latent print in question or that “belonged to the defendant.”

6. I do not dispute that Mr. Hankerson has a great deal of experience analyzing latent prints and comparing them to exemplars of known origin. Nor do I dispute that the ridge detail in the latent prints detailed above may, in Mr. Hankerson’s expert opinion, appear consistent with exemplar prints known to originate from the defendant. But none of these undisputed facts is sufficient to warrant the conclusion that the defendant “made” the latent prints.

7. It might, for example, be scientifically supportable for Mr. Hankerson to say that, in his opinion, the ridge detail in the latent prints detailed above is consistent with the ridge detail in the exemplars known to originate with the defendant. It might similarly be scientifically supportable for Mr. Hankerson to say that the defendant is not excluded as the source of the latent print detailed above. But neither of these assertions leads inevitably to the conclusion that the defendant “made” the latent prints.

8. As detailed in my previous declaration, two principal pieces of scientific knowledge are lacking that would be necessary to support the testimony that the government proposes to elicit: (1) It would be necessary to know the relative rarity within the relevant population of the ridge details used in Mr. Hankerson’s analysis; (2) It would be necessary to have a responsible estimate of how often Mr. Hankerson specifically, and/or latent print examiners generally, are correct when they conclude that a certain individual is the source of a latent print.

9. Item (1), above, may be illustrated by a brief comparison with forensic DNA typing. An expert witness testifying about a matching DNA profile will testify that the crime-scene profile and the defendant's profile are consistent or that the defendant is not excluded as the source of the crime-scene sample. The witness will then testify about the rarity of the profile within a relevant population – that is, the witness will testify that the crime-scene sample might be expected to match 1 in [some number] of randomly chosen individuals in the population (the “random match probability”). Even for those DNA analysts who (controversially) propose to testify that the defendant “is” the source of the crime-scene sample (e.g., Bruce Budowle *et al.*, *Source Attribution of a Forensic DNA Profile*, FORENSIC SCI. COMM., July 2000, at <http://www.fbi.gov/hq/lab/fsc/backissu/july2000/index.htm>), the conclusion is implicitly probabilistic. That is, Dr. Budowle *et al.* claim that the random match probability is so small that they are justified in giving testimony that the defendant “is” the source of the crime-scene sample. Whatever the merits of this argument, the difference between Dr. Budowle *et al.* and latent print examiners is that Dr. Budowle *et al.* have actually computed a random match probability. For latent print examiners to similarly testify *without* having computed a random match probability defies reason.

10. In other words, both forensic DNA and latent print conclusions are probabilistic in nature.<sup>1</sup> But forensic DNA *testimony* is probabilistic in nature, and latent print testimony is not.<sup>2</sup>

11. The Government's Response states that Mr. Hankerson will testify about two "basis [*sic*, basic] principles of fingerprint identification": "permanence" and "uniqueness" (at 4). Exhibit B, Summary of Testimony of Expert Witness Larry Hankerson, also states "Mr. Hankerson will testify that fingerprint and/or palm print identification is based on two premises:" permanence and uniqueness (at 2).

12. In my affidavit of December 21, 2004, I demonstrated the fallacy of using the -- undisputed -- uniqueness of friction ridge skin detail to vouch for the accuracy of latent print identification (see ¶35). This is what I have called "the fingerprint examiner's fallacy."<sup>3</sup>

13. However, upon further review of the Government's Response and Exhibit B, I discovered that I had given the Government too much credit. The uniqueness

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<sup>1</sup> Christophe Champod & Ian W. Evett, *A Probabilistic Approach to Fingerprint Evidence*, 51 J. Forensic Identification 101 (2001).

<sup>2</sup> Christophe Champod & Ian W. Evett, *A Probabilistic Approach to Fingerprint Evidence*, 51 J. Forensic Identification 101, 109 (2001). ("The point is that Asbaugh [the leading proponent of the ACE-V fingerprint methodology] evokes the need to eliminate all other possible donors in the world, but does not say how it can be done--essentially this is because it cannot be done. Certainly it cannot be done by scientific means but even leaving science to one side, no one person can attain and retain comprehensive knowledge of the prints of every person in the world. It has to be an inference, be it scientific (which it cannot be) or otherwise. The conclusion has to be, as Stoney eloquently put it 'a leap of faith': as such, it is ultimately obscure.")

<sup>3</sup> Simon A. Cole, Grandfathering Evidence: Fingerprint Admissibility Ruling from Jennings to Llera Plaza and Back Again, 41 Am. Crim. L. Rev. 1189, 1197 (2004).

premise is stated as follows: “the principle that no two fingerprints made by two different fingers are the same.” The statement may or may not be true, but it is scientifically irrelevant. Within the fingerprint literature itself, it is well understood that no two fingerprints, *even when emanating from the same finger*, are ever identical.<sup>4</sup> If it is accepted that no two fingerprint from the same finger are identical, of what scientific significance would it be to establish that no two fingerprints from *different* fingers are identical? Even if this premise had been proven – which it has not – it would be of no scientific value.

14. A similar error is found in Exhibit B, when the Government states “Mr. Hankerson will also testify that subsequent to the arrest of the defendant, he obtained additional known major case prints of the defendant and compared them to the previously known fingerprints contained in the defendant’s military records and found them to be *identical*” (at 7, emphasis added). Again, this violates the well-understood principle stated above in item (13).

15. A recent authoritative treatise on fingerprints is worth quoting at length on this topic:

Considerable confusion exists among laymen, indeed also among fingerprint examiners, on the use of words such as *unique*, *identical*, *same*, and *identity*. Although the phrase “all fingerprints are unique has been used to justify fingerprint identification opinions, it is no more than a statement of the obvious. Every entity is unique; no two entities can be

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<sup>4</sup> See e.g., Christophe Champod & Ian W. Evett, *A Probabilistic Approach to Fingerprint Evidence*, 51 J. Forensic Identification 101, 102 (2001). (“Whenever a mark and print are compared there may be similarities and there will always be differences of detail, even if mark and print are from the same region of friction ridge skin.”)

“identical” to each other because an entity can only be identical to itself. Thus, to say that “this mark and this print are identical to each other” is to invoke a profound misconception: the two might be indistinguishable, but they cannot be identical. In turn, the notion of “indistinguishability” is intimately related to the quantity and quality of detail that has been revealed. The question for the fingerprint examiner is not, “Is this mark and that print identical?” The proper question is, “Given the detail that has been revealed and the comparison that has been made, what inference might be drawn in relation to the propositions that I have set out to consider?”<sup>5</sup>

16. Other statements in Exhibit B illustrate the “fingerprint examiner’s fallacy.”

Exhibit B states that friction ridges “have certain *unique* characteristics, minutiae, or points of comparison” (at 3, emphasis added), that Mr. Hankerson’s analysis “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 print” (at 3-4, emphasis added), and that Mr. Hankerson “evaluates the totality of *unique* features” (at 4, emphasis added).

17. Notice that the government has argued not merely that given topological combinations of ridge characteristics are unique to the individual, but further that each ridge characteristic, each pore structure, each ridge edge is *itself* unique. This argument is consistent with the latent print literature.<sup>6</sup>

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<sup>5</sup> Christophe Champod et al., Fingerprints and Other Ridge Skin Impressions, 24 (2004).

<sup>6</sup> Kasey Wertheim, 9 The Weekly Detail, Oct. 1, 2001,

<http://www.clpex.com/Articles/TheDetail/TheDetail9.htm>. (“The fact is, a single ridge is unique. Therefore, anything comprised of multiple units of something unique must also be unique. Many use the reverse argument, which is just as valid... if a whole fingerprint is unique and you cut it in half, it is still unique. There is no such thing as “half” of unique. Unique is unique.”)

18. In some absolute sense, the government's argument is unobjectionable. No doubt, given powerful enough imaging technology, each ridge characteristic *is* unique unto itself. But that does not mean that these characteristics are *distinguishable* from one another, given the analytic tools available to latent print examiners.<sup>7</sup>

19. The flaw in the government's argument is that it proves too much. Yes, each ridge characteristic is unique. But even latent print examiners would agree that, under normal circumstances, a "positive identification" cannot be made from a single ridge characteristic. Therefore, the uniqueness of the object of analysis cannot establish the validity of the analysis.

20. Something more is needed. That "something" would be: (1) specifying the amount of matching ridge detail necessary to reach a conclusion of "positive identification"; and (2) measuring the accuracy of latent print examiners' conclusions. Neither condition has been met by the latent print community in general, by Mr. Hankerson's proposed testimony, or by the Government's Response.

21. According to the Government's Response, Mr. Hankerson will testify that his conclusions were "verif[ied]" by a second fingerprint examiner (at 4). In Exhibit

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<sup>7</sup> Christophe Champod & Ian W. Evett, *A Probabilistic Approach to Fingerprint Evidence*, 51 J. Forensic Identification 101, 115 (2001). ("It is axiomatic that no two fingerprints are identical—indeed, no two entities of any kind can be identical to each other but the crux of the matter is not the individuality of the friction skin ridges but the ability of the examiner to recognize sufficient information for the disclosure of identity from a small distorted latent fingerprint fragment that may reveal only limited information in terms of quality or quality. It is the examiner's capacity to reveal individuality from a papillary impression that is at question and not the individuality of the skin surface that produced it.")

B, the Government states that Mr. Hankerson will testify that this second examiner “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” (at 4, emphasis added).

22. The process as described in Exhibit B is not what is called in the scientific literature “blind verification.” Blind verification would entail that the second examiner have no knowledge of the *conclusion* reached by Mr. Hankerson. It is well established in the psychological literature that an observer who knows the conclusion reached by another observer will be biased towards reaching the same conclusion.<sup>8</sup>

23. The FBI’s recently released official report on the Brandon Mayfield misidentification advocates that blind verification “should be implemented on designated cases.”<sup>9</sup> It should be noted that the report’s definition of “blind verification” is consistent with that given above (“previous *results* unknown to the verifier”).<sup>10</sup> Although what the report means by “designated cases” is not entirely clear, the plainest reading of the report is that it means “high-profile or high-pressure cases.”<sup>11</sup>

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<sup>8</sup> D. Michael Risinger et al., The Daubert/Kumho Implications of Observer Effects in Forensic Science: Hidden Problems of Expectation and Suggestion, 90 Cal. L. Rev. 1, 19 (2002).

<sup>9</sup> Robert B. Stacey, A Report on the Erroneous Fingerprint Individualization in the Madrid Train Bombing Case, 54 J. Forensic Identification 706, 715 (2004).

<sup>10</sup> *Id.* (emphasis added).

<sup>11</sup> *Id.* at 716.

24. The reason for this is that the report concludes that the high-profile nature of the Madrid Train Bombing Case was a contributing cause of the egregious errors committed by three highly experienced FBI examiners and one court appointed expert in that case.<sup>12</sup>

25. If the report is correct, then latent print examiners are more prone to false positive errors, in both the initial examination and the “verification” process, in “high-profile” cases. If fingerprinting were a truly objective and scientific form of analysis, there would be no reason why this should be the case. This, therefore, highlights the subjective and unscientific nature of latent print analysis.

26. By any definition, the present case is a “high-profile” case. It is also one in which Mr. Rudolph was a known suspect before the fingerprint comparison process began. Indeed, I am informed and the record reflects that Mr. Rudolph was identified as a suspect in numerous media outlets as early as January 30, 1998. Mr. Hankerson’s May 7, 1998 report attached to Government’s exhibit B indicates that

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<sup>12</sup> *Id.* at 713 (“The power of the IAFIS correlation, coupled with the inherent pressure of working an extremely high-profile case, was thought to have influenced the examiner’s judgment and subsequent examination. This influence was recognized as confirmation bias (or context effect) and describes the mind-set in which the expectations with which people approach a task of observation will affect their perceptions and interpretations of what they observe.... Once the mind-set occurred with the initial examiner, the subsequent examinations were tainted. Latent print examiners routinely conduct verifications in which they know the previous examiners’ conclusions. However, because of the inherent pressure of such a high-profile case, the power of an IAFIS correlation in conjunction with the similarities in the candidate’s print, and the knowledge of the previous examiners’ conclusions (especially because the initial examiner was a highly respected supervisor with many years of experience), it was concluded that subsequent examinations were incomplete and inaccurate. To disagree was not an expected response.”)

copies of Mr. Rudolph's known prints were "previously submitted" to his receipt and comparison of Exhibit 10 on February 5, 1998. I am also informed and the record reflects that Mr. Hankerson personally participated in the highly publicized search of Mr. Rudolph's Nissan truck on February 8-9, 1998, right before his comparisons of Exhibits 7a, 7b, 7c, and 57 on February 10-11, 1998, and well before his comparison of Exhibit 367 on July 15, 1998. Thus, investigative information contaminated Mr. Hankerson's analysis, another potential source of bias.<sup>13</sup> He therefore obviously knew before his comparisons began that Mr. Rudolph was the suspect in this case, just as, but with lesser justification, the initial examiner in Mayfield knew that Mayfield was a suspect because he was the number four candidate on an IAFIS search. Further, as in Mayfield, Mr. Hankerson, by the government's own account, was a highly respected supervisor with many years of experience, a fact that, according to the FBI, would undoubtedly influence any reviewer in this high profile case. Finally, it is unclear whether a crucial step in the ACE-V methodology- verification- ever took place in this case. The defendant alleges in his motion, and it is nowhere rebutted by the government, that no documentation exists that the particular comparisons at issue in this case were ever verified.<sup>14</sup> Under all the

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<sup>13</sup> D. Michael Risinger et al., *The Daubert/Kumho Implications of Observer Effects in Forensic Science: Hidden Problems of Expectation and Suggestion*, 90 Cal. L. Rev. 1, 35 (2002).

<sup>14</sup> The motion (doc. 409) states at pages 16-17: "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.

circumstances, I must conclude that the failure to conduct and document any verification review in the circumstances of this high profile case is fatal to the government's assertion that "Mr. Hankerson's analysis complied with approved methods of fingerprint identification . . ." (Government's Response at 24).

## **II. THE GOVERNMENT'S LEGAL ARGUMENTS AGAINST HOLDING A DAUBERT HEARING**

27. As noted above, the Government's Response lets stand unrebuted, the numerous facts established in my affidavit of December 21, 2004. The bulk of the Government's Response is devoted to legal arguments that other courts have visited the issue of the admissibility of latent print evidence and resolved in favor of the government. It is not my place, or within my expertise, to make a legal argument. However, as a scholar whose expertise lies in the area of how scientific knowledge claims are advanced in legal setting, I believe that it is appropriate for me to comment on these aspects of the Government's Response. My comments are not

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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."

legal arguments, but rather arguments about how scientific knowledge claims are advanced in legal settings.

28. The Government's Response correctly notes that *Daubert*, *Kumho Tire*, and Rule 702 mandate that the trial courts *must* consider whether proffered expert evidence is reliable<sup>15</sup> (at 9, 11), that trial courts "enjoy 'considerable leeway'" in deciding *how* to assess reliability (at 8), and that the burden of proof in such determination rests on the proponent of the evidence (at 9-10).

29. The bulk of the Government's Response consists of citations to *legal* authorities in defense of the proposition that latent print evidence is reliable. Not a single citation is made to any scientific authority supporting this position. No validation study of latent print identification is cited. No study measuring the accuracy of latent print identification is cited.

30. Only in one paragraph (at 21) does the Government's Response advance arguments in favor of the reliability of fingerprint identification, other than the argument that other courts have said it is so. It is, therefore, instructive to examine this paragraph in detail.

31. The Government's Response advances five arguments:

1. Latent print identification "rests on a painstaking comparison of unique fingerprint characteristics."

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<sup>15</sup> As I noted in my affidavit of December 21, 2004 (n. 4), the vernacular term "reliable" corresponds to the meaning of the technical terms "accuracy" and "validity." In this declaration, I use the term reliability, as the Court did, as essentially synonymous with "accuracy" and "validity."

2. “[I]ts methodology is grounded in over 100 years of academic and practical research.”
3. “[I]t has been proven accurate on countless occasions.”
4. “[I]t is universally accepted throughout law enforcement and civil communities.”
5. “[I]t is subject to constant testing and review” (at 21).

32. None of these arguments provides convincing evidence of the reliability of latent print identification. Let us examine each in turn:

1. **Latent print identification “rests on a painstaking comparison of unique fingerprint characteristics.”** Just because a method of analysis is “painstaking” does not mean it reaches correct results. Astrologers or psychics may be painstaking their analyses, but unless they can show that they reach correct results an acceptable percentage of the time they should not be permitted to offer expert evidence in court.
2. **“[I]ts methodology is grounded in over 100 years of academic and practical research.”** The Government does not elucidate to what “academic” research it is referring. Not a single citation is offered. Presumably, the government is referring to the anatomical and statistical literatures that address, but do not resolve, the matter of the uniqueness of friction ridge skin. The anatomical literature detailing the formation of friction ridge skin is almost entirely irrelevant to the issue of the accuracy of latent print identification.

Similarly, the statistical literature on the individuality of friction ridge skin does not address the issue of the accuracy of latent print identification. Nor does the government elucidate what is meant by “practical research.” I will again conjecture that it means the experience of trying to match latent print to databases of inked prints. The process of completing casework can in no way be construed as “research” concerning the question of the accuracy of latent print identification. Such research would require knowing the true origin of the latent prints being analyzed in casework.

**3. “[I]t has been proven accurate on countless occasions.”**

Again, the Government gives no indication as to what evidence it is referring to that establishes that fingerprint evidence was accurate on “countless occasions.” If I again try to project a more focused argument onto the Government’s blanket declarations, I would hazard that the government means that in many cases in which fingerprint evidence indicated the guilt of the perpetrator some sort of external confirmation corroborated this conclusion (such as a confession). Using casework in this manner is extremely hazardous: no one knows the “ground truth” (whether the perpetrator truly is guilty) in a criminal case, and, therefore, criminal proceedings cannot be used as “tests” of the accuracy of the evidence proffered in them. Even setting this point aside, the Government’s statement is logically bankrupt. One could simply declare the defendant guilty in all criminal cases, and be “accurate on countless occasions” because the

“baserate” of guilt in criminal trials is probably greater than 50%.<sup>16</sup> The relevant question is not whether the evidence is “accurate on countless occasions,” but how often it is accurate relative to how often it is inaccurate. Astrology may be “accurate on countless occasions”; it is its rate of inaccuracy that renders it unacceptable as expert evidence.

**4. “[I]t is universally accepted throughout law enforcement and civil communities.”** This argument does not even purport to address reliability. As *Kumho Tire* states, “Nor . . . does the presence of *Daubert’s* general acceptance factor help show that an expert’s testimony is reliable where the discipline itself lacks reliability.” (*Kumho Tire v. Carmichael*, 526 U.S. at 151). Moreover, acceptance within the group (law enforcement) that promotes the technique should be accorded even less weight. Finally, it is not clear what the government means by “civil communities.”

**5. “[I]t is subject to constant testing and review.”** Again, it is difficult to address this point since the Government does not specify what processes or procedures it is construing as “constant testing and review.” I can again surmise that the Government is referring to procedures like “verification.” But, as stated above, the ground truth is not known in casework. Verification determines whether a second examiner agrees with the initial examiner’s conclusion, but it does

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<sup>16</sup> On base rates, see Michael J. Saks & D. Michael Risinger, *Baserates, the Presumption of Guilt, Admissibility Rulings, and Erroneous Convictions*, 2003 Mich. St. L. Rev. 1051, 1059 (2003).

not determine whether the initial examiner's conclusion is, in fact, correct. Only controlled studies, in which the ground truth is known can accomplish that.

33. The court opinions attached to the Government's Response (Exhibits A and D) are notable for their absence of reference to any scientific study establishing the validity, or measuring the accuracy, of latent print identification. The Government's Response thus continues the pattern I described in my affidavit of December 21, 2004 (¶8), that latent print examiners, prosecutors, and courts have used legal authority as a substitute for scientific studies of the reliability of latent print identification.

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

DATED: February 17, 2005

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s/SIMON A. COLE

# **EXHIBIT 74**