

THE PREVALENCE AND POTENTIAL CAUSES OF WRONGFUL CONVICTION BY FINGERPRINT EVIDENCE

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INTRODUCTION

This paper discusses a problem that might at first glance appear to be either non-existent or unimportant: wrongful conviction by fingerprinting. Latent print individualization, more commonly known as “fingerprint identification,” has long enjoyed a reputation as one of the most powerful and trustworthy forms of evidence available to the criminal law. For most of the past century, in which latent print evidence was used in criminal justice systems of the United States and the rest of the world, it was widely assumed that wrongful convictions by fingerprint were either impossible or so rare that the problem

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could be safely ignored.¹ To be sure, wrongful convictions by fingerprint appeared in case law not long after the introduction of latent print evidence into the U.S. criminal justice system in 1906,² the earliest known such case appearing in 1920.³ But such cases were quite rare. In addition, in many cases the erroneous evidence was explained as more a product of expert testimony by an incompetent or unscrupulous latent print examiner rather than a flaw in latent print evidence itself. These two arguments sustained the belief that wrongful conviction by fingerprint was so rare that it could be safely ignored. They explain the apparent oxymoron by which latent print examiners pronounced fingerprinting “infallible” even as latent print errors were known to them.⁴

Therefore, it has long been assumed that fingerprints could not contribute to wrongful conviction or that, if they did, it was only in extraordinarily rare cases. This widespread belief persisted well into the 1990s. It survived even the criminal defense bar’s challenge to the *validity* of latent print evidence; defendants essentially argued that the accuracy of latent print evidence had not been established, but they maintained that they could not estimate the prevalence of latent print misattributions or wrongful convictions (nor, they insisted, was it their burden to do so for the government’s evidence).⁵ This belief also survived the wave of attention to wrongful convictions that swept the country during the 1990s, prompted in large measure by post-conviction DNA exonerations and shocking numbers of death row exonerations.⁶ It survived even the growing realization that forensic science was among the principal con-

¹ Simon A. Cole, *More Than Zero: Accounting for Error in Latent Fingerprint Identification*, 95 J. CRIM. L. & CRIMINOLOGY 985, 987 (2005) [hereinafter Cole, *More Than Zero*].

² COLIN BEAVAN, *FINGERPRINTS: THE ORIGINS OF CRIME DETECTION AND THE MURDER CASE THAT LAUNCHED FORENSIC SCIENCE* 190 (Hyperion, 2001).

³ *Commonwealth v. Loomis*, 110 A. 257 (Pa. 1920); *Commonwealth v. Loomis*, 113 A. 428 (Pa. 1921).

⁴ Federal Bureau of Investigation, *The Science of Fingerprints: Classification and Uses*, at iv (1985).

⁵ Robert Epstein, *Fingerprints Meet Daubert: The Myth of Fingerprint “Science” is Revealed*, 75 S. CAL. L. REV. 605, 605-607 (2002); Lisa J. Steele, *The Defense Challenge to Fingerprints*, 40 CRIM. L. BULL. 213 (2004).

⁶ BARRY SCHECK ET AL., *ACTUAL INNOCENCE: WHEN JUSTICE GOES WRONG AND HOW TO MAKE IT RIGHT* (New American Library 2003); JAMES S. LIEBMAN ET AL., *A BROKEN SYSTEM: ERROR RATES IN CAPITAL CASES, 1973-1995* (2000).

tributors to known cases of wrongful conviction.⁷ Surely, it was thought, fingerprint evidence must be immune to whatever problems had been exposed for serology, microscopic hair comparison, or arson and explosives investigation.

Indeed, for a time, the wave of post-conviction DNA exonerations seemed to provide evidence *against* the proposition that latent print evidence could contribute to wrongful convictions. As the number of post-conviction DNA exonerations mounted and the Innocence Project undertook to treat these exonerations as a data set indicating the principal causes of wrongful conviction,⁸ the absence of fingerprint cases in that data set could have been interpreted as soft evidence that latent print evidence was unlikely to contribute to wrongful convictions.

That situation changed in 2004 when Stephan Cowans became the first – and thus far the only – person to be exonerated by DNA evidence for a wrongful conviction in which fingerprint evidence was a contributing factor. Cowans's wrongful conviction in Boston in 1997 for the attempted murder of a police officer was based almost solely on eyewitness identification and latent print evidence. The *Cowans* case not only provided dramatic additional support for the already established proposition that wrongful conviction by fingerprint was possible, it also demonstrated why the exposure of such cases, when they do occur, is exceedingly unlikely. These points have already been made in a comprehensive 2005 study of exposed cases of latent print misattributions.⁹ In this article, I discuss some additional things that we have learned about the prevalence and potential causes of wrongful conviction by fingerprint in the short time since the publication of that study.

I. THE COWANS CASE

Stephan Cowans was convicted of attempted homicide for the non-fatal shooting of a police officer in 1997.¹⁰ It is not en-

⁷ See SCHECK ET AL., *supra* note 6; JOHN F. KELLY & PHILLIP K. WEARNE, *TAINTING EVIDENCE: INSIDE THE SCANDALS AT THE FBI CRIME LAB* (The Free Press 1998); see also Michael J. Saks & Jonathan J. Koehler, *The Coming Paradigm Shift in Forensic Identification Science*, 309 SCIENCE 892 (2005).

⁸ SCHECK ET AL., *supra* note 6.

⁹ Cole, *More Than Zero*, *supra* note 1.

¹⁰ See *Commonwealth v. Cowans*, 756 N.E.2d 622 (Mass. App. Ct. 2001).

tirely clear how Cowans emerged as a suspect; it appears that his name was suggested during the police canvass as someone who might have sold a hat to the true perpetrator.¹¹ But the tenuousness of the connection between Cowans and the crime changed dramatically when Cowans was implicated by a latent fingerprint.¹² The print was recovered from a home that the perpetrator had invaded during flight.¹³ The perpetrator held a mother and a daughter hostage for around ten minutes and drank a glass of water before fleeing the home.¹⁴ A latent print was recovered from the water glass.¹⁵

Two Boston Police Department (“BPD”) latent print examiners, Dennis LeBlanc and Rosemary McLaughlin, testified that Stephan Cowans was the source of the latent print on the water glass.¹⁶ The victim, Officer Gary Gallagher, and an eyewitness to the shooting identified Cowans.¹⁷ The hostages, who spent far more time in the perpetrator’s company, failed to identify him. Two investigators hired by defense counsel reportedly also confirmed the latent print attribution.¹⁸ Cowans was convicted and sentenced to forty-five years in prison, which was later reduced to thirty years.¹⁹

Cowans worked biohazard duty in prison in order to save money for post-conviction DNA testing.²⁰ Biological evidence had been recovered from the water glass, a hat left at the scene of the shooting, and a sweatshirt left at the invaded home.²¹ It is a testament to the evidentiary strength of latent print identi-

¹¹ For additional discussion of the Cowans case, see generally Cole, *More Than Zero*, *supra* note 1, and Simon A. Cole, *Witnessing Identification: Latent Fingerprint Evidence and Expert Knowledge*, 28 SOCIAL STUDIES OF SCIENCE 687 (1998).

¹² Cole, *More Than Zero*, *supra* note 1, at 1014.

¹³ *Id.*

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ *Id.* at 1014-15.

¹⁷ The precise sequence of the latent print “match” and the eyewitness identifications has never been clearly established and is of obvious importance in exploring the issue of the potential “contamination” of purportedly “independent” evidence by other evidence. Elizabeth F. Loftus & Simon A. Cole, *Contaminated Evidence*, 304 SCIENCE 959 (2004).

¹⁸ David Weber & Kevin Rothstein, *Man Freed After 6 Years: Evidence Was Flawed*, BOSTON HERALD, Jan. 24, 2004, at 4.

¹⁹ Jack Thomas, *Two Police Officers are Put on Leave: Faulty Fingerprint Evidence is Probed*, BOSTON GLOBE, Apr. 24, 2004, at B1 [hereinafter Thomas].

²⁰ See Cole, *More Than Zero*, *supra* note 1, at 1015.

²¹ *Id.*

fication that the state opposed post-conviction DNA testing, partly because it failed to see how such evidence, even if found to be exclusionary, would prove Cowans's innocence given the fingerprint evidence.

After Cowans had served six years in prison, the New England Innocence Project ("NEIP") persuaded the state to allow post-conviction DNA testing.²² The DNA analysis found that the same contributor had left biological evidence on all three items – the glass, the hat, and the sweatshirt – and that Cowans was not that contributor.²³ The state re-examined the latent print evidence, concluded that Cowans was not the source of the latent print, joined NEIP's motion for his immediate release, and apologized to Cowans.²⁴

It is still not entirely clear what caused the latent print misattribution in the Cowans case. It was stated that Cowans's name appeared on a ten-print card containing prints taken from the hostages (so-called "elimination prints").²⁵ It was suggested that this meant that the Cowans misattribution was not a "true" latent print error, but rather a mere "clerical error" involving the mislabeling of a card. But it has still not been adequately explained how an elimination ten-print card containing a victim's fingerprints could have been labeled with the name of a suspect who was not developed as a suspect until several days after the crime, except through outright deliberate fabrication of evidence.²⁶

Further investigation uncovered allegations that the Boston Police Department's Latent Print Unit ("LPU") was functioning as a "dumping ground" or "punishment duty" for troubled police officers.²⁷ Much of the blame focused on Dennis

²² New England Innocence Project, http://www.newenglandinnocence.org/site/content/recent_exonerations.php (last visited Aug. 1, 2006).

²³ See Cole, *More Than Zero*, *supra* note 1, at 1015.

²⁴ *Id.*

²⁵ A "ten-print card" is a card containing a complete set of ten inked (or optically scanned) prints taken from a known individual. "Elimination prints" are prints taken from individuals known to have had legitimate access to a crime scene, such as victims or responding police officers. The idea is that if these individuals are "eliminated" as sources of a latent print, it can be inferred that the source of that print may be the perpetrator.

²⁶ Presumably, the elimination prints would have been taken relatively soon after the crime was reported.

²⁷ Maggie Mulvihill & Franci Richardson, *Unfit Cops Put in Key Evidence Unit*, BOSTON HERALD, May 6, 2004, at 2.

LeBlanc, who, it was claimed, had “discovered his mistake” before trial “and concealed it all the way through trial.”²⁸ The District Attorney even unsuccessfully sought a grand jury indictment against LeBlanc, apparently the only time such a sanction has been sought against a latent print examiner implicated in a misattribution. LeBlanc, for his part, blamed “the system,” telling reporters, “The system failed me. . . . And the system failed Cowans.”²⁹ Cowans recently settled a civil suit against the city of Boston, the BPD, and six police officers for \$3.2 million, the largest amount ever paid by the city in a wrongful conviction suit.³⁰ LeBlanc and McLaughlin were not covered by the settlement.³¹

Boston Police Commissioner Kathleen O’Toole shut down the LPU and all BPD latent print work was temporarily handled by Ron Smith & Associates, a respected independent latent print consultancy, in an expensive no-bid contract.³² In addition to taking on the BPD’s casework, Smith was also commissioned to issue a report on the state of the LPU.³³ As part of this report, Smith undertook to test the unit’s examiners in their knowledge and proficiency at fingerprint work.

The BPD latent print unit had six examiners.³⁴ All but one of the examiners participated in a Written Knowledge Assessment, an Interview Assessment, a Friction Ridge Evaluation and Orientation Exercise, and a Latent Print Comparison Exercise Level I. Four of the examiners also completed a Latent Print Comparison Exercise Level II, which consisted of more difficult comparisons.

The Written Knowledge Assessment consisted of questions on the following topics: the history of the “science” of friction ridge comparison and identification, the fundamentals of fin-

²⁸ Flynn McRoberts & Steve Mills, *U.S. Seeks Review of Fingerprint Techniques; High Profile Errors Prompt Questions*, CHICAGO TRIBUNE, Feb. 21, 2005, at 1.

²⁹ *Id.*

³⁰ Shelley Murphy, *\$3.2m Award in Wrongful Jailing: Man Served 6 Years After Police Error*, BOSTON GLOBE, Aug. 11, 2006, at B1.

³¹ *Id.*

³² Michele McPhee, *Police Keep Fingerprint Unit Empty; Firm Grabbed \$250G, Looking for Extension*, BOSTON HERALD, Sept. 16, 2005, at 4.

³³ Ron Smith, Boston Police Department Latent Print Unit Evaluation (Oct. 5, 2006) [hereinafter Smith], available at http://www.nlada.org/Defender/forensics/for_lib/Documents/1128571746.15/Latent%20Print%20Unit%20Evaluation.PDF.

³⁴ *Id.* at 3.

gerprint classification methods and systems, biological aspects of the friction ridge “science,” finger, palm, and foot latent print orientation principles, the principles of the latent print comparison and identification process, and chemical and non-chemical latent processing techniques.³⁵ The percentage of correct responses to the written examination questions is presented in Table 1.

Examiner	Score
A	65%
B	54%
C	50%
D	62%
E	47%

Table 1. Percentage of correct scores on Written Knowledge Assessment of Boston Police Department Latent Print Unit, 2004.

These results seem quite poor. The highest score just reaches the conventional academic “passing” grade, sixty-five percent.

It might be argued, however, that none of the topics covered in the Written Knowledge Assessment is necessarily required to accurately attribute latent prints. That skill measured by the latent print comparison exercises. The results of those exercises would have been significant merely by adding more data to the paucity of existing proficiency test data on latent print individualization.³⁶ But the BPD test was even more significant because of one design choice. In contrast to every other latent print proficiency test ever conducted, the BPD test was not only proctored but also unannounced.³⁷

³⁵ *Id.* at 4.

³⁶ See Joseph L. Peterson & Penelope N. Markham, *Crime Laboratory Proficiency Testing Results, 1978-1991, II: Resolving Questions of Common Origin*, 40 J. FORENSIC SCI. 1009 (1995); Lyn Haber & Ralph Norman Haber, *Error Rates for Human Fingerprint Examiners*, in AUTOMATIC FINGERPRINT RECOGNITION SYSTEMS 339 (Ratha and Bolle eds., 2003); Cole, *More Than Zero*, *supra* note 1.

³⁷ Smith, *supra* note 33, at 2. Smith stated that, “It should be noted at the outset that these individuals did not know what was going to be expected of them prior to the actual on site assessment; therefore, they had no time to conduct any special preparations for the evaluations. All they had been instructed to do was to have a current resume prepared for inspection during the interview portion of the assessment.” *Id.*

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Every previous latent print proficiency test has been conducted by mail with generous allowances for response time.³⁸ Respondents received the test package in the mail and were instructed to complete the test and return it by a specified date. This, of course, made the tests “open” rather than “masked”; the subjects knew that the test was a test and not actual case-work.³⁹ This is significant because, psychologists report that on a wide variety of tasks, subjects tend to perform better on proficiency tests.⁴⁰ In addition, the “open” test design allows subjects to choose when to take the test. It may also allow subjects to check their answers with colleagues or supervisors or otherwise collaborate in generating test responses.

The BPD test subjects likewise knew they were being tested; it was not a “masked” proficiency test. However, in contrast to every other latent print proficiency test ever conducted, the BPD test subjects did not know they would be tested when they reported to work.⁴¹ They were required to complete the test in a time period of the tester’s choosing⁴² rather than their

³⁸ See, e.g., Cole, *More Than Zero*, *supra* note 1, at 1029-31 (describing a series of proficiency tests administered by a private company, Collaborative Testing Services (“CTS”).)

³⁹ On masked (or “blind”) proficiency testing in forensic science, see John I. Thornton & Joseph L. Peterson, *The General Assumptions and Rationale of Forensic Identification*, in SCIENCE IN THE LAW: FORENSIC SCIENCE ISSUES 1 (Faigman et al. eds., 2002). The term “blind” is generally used in the context of forensic science. I use the term “masked,” having been informed by an ophthalmology colleague that this term is politically preferable as well as more precise.

⁴⁰ Lyn Haber & Ralph Norman Haber, *Error Rates for Human Fingerprint Examiners*, in AUTOMATIC FINGERPRINT RECOGNITION SYSTEMS 339 (Ratha and Bolle eds., 2003).

⁴¹ Smith, *supra* note 33, at 2.

⁴² It has sometimes been argued that time limits, such as in the case of BPD evaluation or the International Association for Identification (“IAI”) certification examination, are ecologically invalid because in performing casework examiners are not under any specific time limit. That argument has some validity to it, but, on the other hand, it does not seem correct to assume that an ecologically valid accuracy study would necessarily provide subjects with unlimited time. Surely, practicing latent print examiners are under *some* time pressure, perhaps not in each individual’s case, but overall, to get a reasonable amount of work done in a reasonable period of time. Indeed, some evidence appears to be emerging that time pressure may be a more significant cause of forensic error than was previously believed. See William C. Thompson, *Tarnish on the ‘Gold Standard:’ Understanding Recent Problems in Forensic DNA Testing*, 30 CHAMPION 10 (2006) [hereinafter Thompson, *Tarnish on the ‘Gold Standard’*]. What time constraints are most ecologically valid is, therefore, not entirely clear. Certainly, the BPD exercises provide a useful counterpoint to the CTS results, which were generated under very generous time constraints. See Cole, *More Than Zero*, *supra* note 1, at 1029-31, 1072-73.

own, although it should be noted that one of the LPU's six examiners, for whatever reason, did not participate in the evaluation at all.⁴³ Finally, the test was supervised, unlike the tests that were conducted by mail. This presumably greatly reduced the likelihood of test subject collaboration. The "surprise inspection" nature of the BPD test, therefore, makes it a unique source of data concerning the proficiency of latent print examiners. Although it may be thought that the data is unrepresentative because it draws on a latent print unit beset by scandal, there is, in fact, no *a priori* reason to assume that the quality of work at the BPD is any worse than that of any other latent print unit located in a comparably sized (or smaller) law enforcement agency.⁴⁴

At the same time, the BPD test did share several design problems with existing proficiency tests. For example, the designation of "medium" and "difficult" prints is subjective, and the number of exemplars (the universe of known prints to which the latents must be compared) is quite small.

Latent Print Comparison Exercise Level I consisted of fifteen latent prints "of medium levels of difficulty" which were to be compared to five sets of inked finger and palm prints (a total of fifty fingerprints and ten palm prints).⁴⁵ In contrast to some Collaborative Testing Services ("CTS")⁴⁶ proficiency tests, all fifteen latents had a true mate among the exemplars; there were no latents for which the correct answer was "none of the above." It is not clear whether or not this parameter was communicated to the participants. The results of this exercise are presented in Table 2.

⁴³ *Id.* at 3.

⁴⁴ In contrast, a plausible argument can perhaps be made that, all other things being equal, we should assume that latent print units located in law enforcement agencies *larger* than the BPD *may* do higher quality work than the BPD LPU.

⁴⁵ Smith, *supra* note 33, at 8-9.

⁴⁶ See Cole, *More Than Zero*, *supra* note 1, at 1029-32, 1072-73 (describing a series of proficiency tests administered by a private company, Collaborative Testing Services ("CTS")).

Examiner	Correctly identified latent prints	Failed to identify correctly (false negatives)	Erroneous identifications (false positives)	Total
A	8	7	0	15
B	9	6	0	15
C	9	5	1	15
D	3	12	0	15
E	9	6	0	15
Total	38	36	1	75

Table 2. Results of Latent Print Comparison Exercise Level I.

Latent Print Comparison Exercise Level II consisted of fifteen latent prints “of more advanced levels of difficulty,” which were to be compared to five sets of inked finger and palm prints.⁴⁷ In this exercise, one of the fifteen latent prints had no true mate among the exemplar finger and palm prints. The results of this exercise are presented in Table 3.

Examiner	Correctly identified latent prints	Failed to identify correctly (false negatives)	Erroneous identifications (false positives)	Total
A	Did not participate			
B	1	13	1	15
C	5	9	1	15
D	0	15	0	15
E	5	10	0	15
Total	11	47	2	60

Table 3. Results of Latent Print Comparison Exercise Level II.

The results of these exercises are not reassuring. The fact that a false positive occurred at all in the Level I exercise composed of “medium” difficulty, is disturbing in itself. If false positives are, as proponents of latent print individualization

⁴⁷ Smith, *supra* note 33, at 10-11.

and courts have claimed, exceedingly rare events, then one would expect them to occur, when they do occur at all, only on very difficult latent prints. This one false positive defies that expectation. In addition, one might note that the BPD examiners reported one false positive out of 375 comparisons, a false positive rate of 0.3 percent. But what distinguishes the results of the BPD tests from the CTS tests is the high number of test items for which the examiner simply reported no result, presumably because the examiner was unable or unwilling to individualize that latent print to any of the exemplar prints. These trials could be characterized as false negatives. Obviously, on these trials, since no conclusion was reached, it was not possible for the examiner to report a false positive. If one factors out these trials, then one false positive occurred out of thirty-nine attempted individualizations, a false positive rate of 2.6 percent on latent prints deemed of "medium" difficulty.

Similarly, on the Level II exercise, two false positives occurred out of sixty trials, a false positive rate of 3.3 percent. Again, this figure does not represent the false positive rate entirely faithfully because of the high number of comparisons that were not attempted (false negatives). In fact, on the Level II exercise, the two false positives occurred in a context in which only eleven correct individualizations were made, generating a false positive rate of fifteen percent.

The high rate of false negatives in the BPD data illustrates the necessity for signal detection analysis of proficiency test results.⁴⁸ It has been noted that, given that the justice system is primarily concerned with false positives, forensic analysts could reduce the false positive rate simply by reporting "no result" on difficult test items.⁴⁹ In fact, if the focus is solely on false positives, an examiner could appear "perfect" simply by answering "inconclusive" to all test items. Signal detection analysis corrects for this by analyzing the rate of false positives *relative to* the rate of false negatives. In other words, it provides a general measure of the examiner's *ability to discriminate*. This is a commonly used tool in assessing the accuracy of human or machine identification abilities.

Although a complete signal detection analysis of these re-

⁴⁸ See Victoria L. Phillips et al., *The Application of Signal Detection Theory to Decision-Making in Forensic Science*, 46 J. FORENSIC SCI. 294 (2001).

⁴⁹ See, e.g., Cole, *More Than Zero*, *supra* note 1, at 1031.

sults is beyond the scope of this article,⁵⁰ it should be clear even to laypersons that the false positives reported in the BPD exercises are all the more disturbing because they were accompanied by a large number of false negatives, which presumably correspond to latent prints that the examiners found too difficult to identify. In other words, these false positives were committed in an environment in which the subjects were clearly behaving quite conservatively. Were they to behave less conservatively we would expect the rate of false positives to be even higher. In addition, it indicates that the examiners' ability to avoid erroneous identification, relative to their ability to make correct identifications, is surprisingly poor. Examiners are avoiding the danger of making erroneous identifications by declining to identify large numbers of latent prints, and yet still committing erroneous identifications at an alarming rate.

These shocking results are obviously based on a small number of trials concerning a single laboratory. It is important to emphasize, however, that based on what is publicly known at this time, there is no *a priori* reason to assume that the level of practice in the BPD was any worse than that at any comparable latent print unit in the United States (assuming, for the sake of argument, that size of laboratory correlates roughly with quality). It must be emphasized that the BPD came under scrutiny solely because of the fortuitous circumstance that the true perpetrator of the Gallagher shooting left recoverable, preserved DNA at the crime scene. Without this fortuitous event, there is no credible basis for believing that the BPD examiners would not still be offering evidence today, under the same aura of "infallibility," or presumption of reliability, enjoyed by their peers today. For a profession that has produced very little validation or proficiency test data, the BPD data may be interpreted as a snapshot of the state of the skill level of a typical major city police department latent print unit.⁵¹ That the test-

⁵⁰ For such an analysis, see John R. Vokey et al., *On the Psychophysics of Fingerprint Identification* (forthcoming). Vokey et al. take issue with the somewhat simplistic method of calculating the "false positive rate" that I have adopted here, arguing that it is necessary to treat the individual examiner, rather than the judgment, as the unit of analysis.

⁵¹ In the absence of any sort of objective measure of the quality of a latent print unit, I am simply assuming, based on the principle of cosmopolitanism, that good practices correlate roughly with the size of the latent print unit and the law enforcement agency within which it housed. This may or may not be a valid assumption, especially given that the organization brought in to "clean up" the BPD LPU was from Missis-

ing was conducted as a “surprise inspection” may in fact make the BPD data more indicative of the true performance of latent print examiners than the mail-in proficiency tests conducted by CTS.

II. LATENT PRINTS AND POST-CONVICTION DNA TESTING

Though the *Cowans* case itself is not necessary to formulate the argument, it contains the explanation for the seeming paucity of wrongful convictions by fingerprint. Though it is true that the raw number of exposed cases of wrongful conviction by fingerprint is small, it is equally true that the likelihood of exposure, *given* a wrongful conviction by fingerprint is also extremely small. The *Cowans* case illustrates this perfectly: without the extremely fortuitous circumstance of the true perpetrator leaving three different biological traces containing DNA (not to mention the recovery, preservation for more than six years, and legal allowance of testing of those traces), the likelihood of Cowans being able to prove his innocence can only be regarded as infinitesimally small.

This problem, which we might call *the problem of exposure* is, of course, well known within the wrongful conviction literature. Scholars of wrongful convictions have argued persuasively that exposed miscarriages of justice *must* be understood as constituting only a small portion of actual miscarriages of justice given the unlikelihood that any given miscarriage of justice will be exposed as such.⁵² This conclusion may be arrived at via a number of different routes, from the fortuity associated with exposure of miscarriages of justice to the overrepresentation of homicide cases among known wrongful convictions.⁵³ Although no one has yet generated a precise estimate of the proportion of actual wrongful convictions constituted by exposed wrongful convictions, scholars agree that the ratio is a significant one.⁵⁴

sippi. But the crucial variable relevant to Ron Smith & Associates, Inc. may well be that they are independent, not located in any law enforcement agency.

⁵² See SCHECK ET AL., *supra* note 6; Lawrence C. Marshall, *Do Exonerations Prove that the 'The System Works'?* 86 JUDICATURE 83 (2002); Samuel R. Gross et al., *Exonerations in the United States 1989 Through 2003*, 95 J. CRIM. L. & CRIMINOLOGY 523 (2005) [hereinafter Gross].

⁵³ Gross, *supra* note 52, at 528-29, 531-33.

⁵⁴ *Id.* at 551.

What is said about wrongful convictions in general must also hold for the specific causes of wrongful convictions: the problem of exposure ensures that exposed wrongful convictions attributed, wholly or in part, to a particular cause (such as eyewitness identification, to name what is widely agreed to be the primary cause of wrongful convictions⁵⁵) must be regarded as only a subset of actual wrongful convictions caused, wholly or in part, by eyewitness identification. However, we should not expect that the problem of exposure would apply equally to all potential causes. Wrongful convictions caused by some “triggers” would be expected to be exposed more easily (and thus at a greater rate) than wrongful convictions caused by others.

How might these differences in the problem of exposure manifest themselves? The key would seem to be the degree of trust that criminal justice system actors place in the triggering cause. This is because exposure of a wrongful conviction requires what we might call a *suspension of belief* in the evidence that supported the conviction in the first place. In order for a wrongful conviction to be exposed, a wide range of criminal justice system actors must first *believe* that a wrongful conviction has occurred, or at least believe that one *may* have occurred. To begin with, a defendant must convince an attorney – whether it be a trial attorney, an appellate attorney, post-conviction counsel, or an innocence project – that a wrongful conviction may have occurred. In addition, the exposure of a wrongful conviction becomes much more likely if the victim can convince the prosecutorial authority that the conviction was erroneous. Further through the process, a wrongful conviction is, of course, *by definition* a statement that a judge or judges believe that a wrongful conviction has occurred.

In order to believe that a wrongful conviction has occurred, criminal justice system actors must *disbelieve* the evidence that produced the conviction in the first place.⁵⁶ Obviously, it is easier to produce this disbelief for some forms of evidence than for others. For example, to pick two causes from the standard taxonomy of causes, it is easier for most criminal justice system

⁵⁵ *Id.* at 542.

⁵⁶ Gary Edmond, *Constructing Miscarriages of Justice: Misunderstanding Scientific Evidence in High Profile Criminal Appeals*, 22 OXFORD J. LEGAL STUD. 53, 65-67 (2002).

actors to disbelieve the testimony of a jailhouse snitch than to disbelieve a confession. There is something intuitively implausible to most people about the idea that someone would confess to a crime that they did not commit.⁵⁷ Even those criminal justice system actors who have been sufficiently educated to understand that there is such a thing as a false confession are still likely to regard such occurrences (perhaps not incorrectly) as rather rare. On the other hand, criminal justice system actors may well believe that jailhouse snitch testimony is in fact *very often* false. There is, moreover, no intuitive implausibility to the idea that a convicted, or at least suspected, criminal might give false testimony in order to earn a reduction in sentence or other considerations.

No data exists with which to try to estimate the differential effects of the problem of exposure on various causes of wrongful convictions. Nor is it easy to even make intuitive guesses about how these effects might be felt. Jailhouse snitch testimony is an exceptionally easy case. When examining the Innocence Project's taxonomy of causes,⁵⁸ however, *most* causes would seem to be generally difficult to disbelieve. Criminal justice system actors are likely to have at least some difficulty believing that eyewitnesses can be mistaken, that confessions can be false, that police officers or prosecutors would lie, or that forensic evidence can be false.

All of this goes to show that the potential of a type of evidence to cause a wrongful conviction cannot be estimated by constructing a simple ratio, with the number of exposed wrongful convictions associated with that type of evidence in the numerator and the number of (presumed correct) uses of that evidence in the denominator. In any such formulation, the numerator would have to be multiplied by a coefficient representing the estimated rate at which actual wrongful convictions caused by that type of evidence are converted into exposed wrongful convictions, and this coefficient may be expected to be different, in ways yet unknown, for each type of evidence. The *Cowans* case illustrates this problem: without the fortuitous DNA evidence, any such calculation would have (falsely) placed

⁵⁷ Richard J. Ofshe & Richard A. Leo, *The Decision to Confess Falsely: Rational Choice and Irrational Action*, 74 DENV. U. L. REV. 979, 983 (1997).

⁵⁸ The Innocence Project, <http://www.innocenceproject.org/causes/index.php> (last visited Aug. 1, 2006).

the *Cowans* case in the denominator of correct applications of latent print individualization, rather than in the numerator of incorrect applications.

The principle elucidated here is that forensic evidence in general, and latent print evidence in particular, is among the forms of evidence for which wrongful convictions are least likely to be exposed. In other words, it may be far less likely that any given innocent person will be wrongfully convicted by fingerprint evidence than by jailhouse snitch testimony. Once wrongfully convicted, however, the innocent convicted on jailhouse snitch testimony must be considered far more likely to have the wrongful conviction exposed. The paradoxical effect here is that the “better” the evidence, or to be more precise, the more favorable criminal justice system actors’ perception of the evidence, the less likely one is to be wrongfully convicted by it. But, at the same time, *once wrongfully convicted*, the “better” the evidence, the less likely one is to be able to prove one’s innocence. Relatively reliable forms of evidence, like latent print evidence,⁵⁹ are thus more problematic causes of wrongful conviction than weaker evidence, not in terms of raw numbers but in terms of difficulty of exposure.⁶⁰ Stephan Cowans himself succinctly summed up this argument in lay terms, describing the situation of being convicted on the basis of two forms of evidence with very high degrees of perceived reliability, latent print individualization and eyewitness testimony, stating, “[i]f I had been on the jury, I would have voted to convict myself.”⁶¹

⁵⁹ The accuracy of latent print evidence is, in fact, not known, but it is generally presumed to be relatively accurate, even among many of those who insist that its accuracy remains unknown and urge that it be measured.

⁶⁰ By this measure, those wrongly convicted on DNA evidence may be in the toughest bind of all. The Innocence Project lists three such cases among the first 130 exonerations. See The Innocence Project, <http://www.innocenceproject.org/causes/> (last visited Aug. 1, 2006); and see Thompson, *Tarnish on the 'Gold Standard'*, *supra* note 42 (discussing those and similar cases). But those wrongfully convicted on DNA evidence do enjoy a crucial advantage over those wrongfully convicted on fingerprint evidence: DNA evidence consists, in part, of instrumental measurements which can theoretically, assuming access is made available, be re-analyzed and re-evaluated by independent experts to determine whether the results do indeed support what government analysts inferred from them. Latent print individualizations are merely subjective determinations formed in the government examiners’ minds. Although the prints themselves may be re-analyzed, it is impossible to reconstruct the process by which the government examiners formed their original conclusion of “individualization.” See the discussion of documentation, *infra* notes 81-109 and 215-216 and accompanying text.

⁶¹ Thomas, *supra* note 19.

III. WRONGFUL CONVICTION AND FORENSIC EVIDENCE

The above argument may be sufficient to sustain the point that forensic evidence in general may be an even more significant cause of wrongful conviction than the Innocence Project data suggests. Even compared to other forms of forensic evidence, however, latent print evidence looks like a relatively insignificant contributor to the wrongful conviction problem. Latent print evidence is named as a contributor in only one of the 180 post-conviction DNA exonerations reported so far, *Cowans*.⁶² By contrast, serology was named as a contributor in forty of the first seventy post-conviction DNA exonerations analyzed by the Innocence Project, and microscopic hair comparison is named in twenty-one of those seventy exonerations.⁶³ It would seem that serology and hair evidence are far more significant contributors to the wrongful conviction problem than latent print evidence.

Before reaching this conclusion, however, we have to again consider the problem of exposure. The lack of reliability of serology and hair evidence has been relatively well known in legal circles for some years now.⁶⁴ Serology has now been almost entirely replaced by forensic DNA profiling. Hair evidence has been implicated in a number of sensational forensic scandals and it too seems poised to be replaced by DNA, given the facil-

⁶² See The Innocence Project, <http://www.innocenceproject.org> (last visited Aug. 1, 2006).

⁶³ Analysis of the first seventy exonerations, originally reported at <http://www.innocenceproject.org/causes/> (last visited Mar. 10, 2005) (on file with author). The page may now be viewed at <http://web.archive.org/web/20041112150419/http://www.innocenceproject.org/causes/> (last visited Aug. 1, 2006). That analysis has been replaced on the Innocence Project web site by a new analysis of 130 cases, which reports the number of microscopic hair analysis cases, but not serology or fingerprint cases. That the number of microscopic hair cases did not go up, even after the addition of sixty more cases, suggests that cases involving hair may have been clustered in the Innocence Project's earlier cases. Perhaps convictions based on hair evidence may have occurred earlier, or perhaps convictions based on hair evidence were "easier pickings" for post-conviction exoneration. *Id.*

⁶⁴ See Randolph Jonakait, *Forensic Science: The Need for Regulation*, 4 HARV. J. LAW & TECH. 109 (1991); Clive A. Stafford Smith & Patrick D. Goodman, *Forensic Hair Comparison Analysis: Nineteenth Century Science or Twentieth Century Snake Oil?* 27 COLUM. HUM. RTS. L. REV. 227 (1996); Joseph L. Peterson & Penelope N. Markham, *Crime Laboratory Proficiency Testing Results, 1978-1991, II: Resolving Questions of Common Origin*, 40 J. FORENSIC SCI. 1009 (1995); Michael J. Saks & D. Michael Risinger, *Baserates, the Presumption of Guilt, Admissibility Rulings, and Erroneous Convictions*, 2003 MICH. ST. L. REV. 1051 (2003).

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ity of mitochondrial DNA testing for hair samples. Fingerprint evidence, until very recently and perhaps still, enjoyed an aura of “infallibility.” It seems plausible that criminal justice system actors would find it far easier to disbelieve serology and hair evidence than latent print evidence.

There is yet another reason that we may see fewer latent print cases among post-conviction DNA exonerations. It may be that DNA is more likely to be available for post-conviction testing in convictions founded on serology or hair than in cases founded on latent print evidence. Post-conviction DNA exonerations generally rely on biological evidence that was recovered and preserved, but not tested, at the time of the initial investigation. Generally, this is because the initial investigation predates the period in which forensic DNA testing was widely available (though *Cowans*, investigated in 1997, is an exception). It seems plausible that convictions founded on serology or hair are more likely to have biological evidence than convictions founded on latent print evidence. In the case of serology, this argument is simply a truism: serological evidence is by definition biological evidence. As it turns out, the argument also holds for hair evidence. Using Professor Peterson et al.’s data, I have shown elsewhere that in a set of cases that occurred between 1976 and 1980, where hair evidence was recovered, biological evidence was also recovered eighty-six percent of the time, whereas in cases in which fingerprint evidence was recovered, biological evidence was recovered only twenty-nine percent of the time.⁶⁵

In short, the greater number of serology and hair cases than latent print cases among post-conviction DNA exoneration seems to be a product of the combination of two factors: first, they are “worse,” or more error-prone, forms of evidence; and second, wrongful convictions founded on serology or hair are more likely to be amenable to exposure through post-conviction DNA testing than wrongful convictions founded on latent print evidence. This latter factor, in turn, may account in part for the small number of latent print cases among *all* exonerations⁶⁶ (that is, both DNA-generated and non-DNA-generated)

⁶⁵ Cole, *More Than Zero*, *supra* note 1 at 1026; *see also* Joseph L. Peterson et al., *Forensic Evidence and the Police, 1976-1980*, Inter-University Consortium for Political and Social Research, Study No. 8186 (1985), *available at* <http://www.icpsr.umich.edu/cgi-bin/bob/newark?study=8186> (last visited Aug. 1, 2006).

⁶⁶ *See* Gross, *supra* note 52, at 531.

because, in the contemporary criminal justice system, post-conviction DNA testing is such a significant engine of exoneration.⁶⁷

IV. PREVIOUS RESEARCH ON FINGERPRINT ERROR

As argued above, the number of known latent print misattributions is likely to be small. A search for such cases confirms this; the number of latent print misattributions in the United States and United Kingdom⁶⁸ that have become known to the public, typically through press or legal reports, numbers just more than twenty. Elsewhere, I reported an analysis of these twenty-two cases in an attempt to understand the possible causes and attributes of cases of latent print misattribution.⁶⁹ Only ten of these cases resulted in wrongful convictions. Nonetheless, these misattribution cases are important for understanding the potential for wrongful conviction by fingerprint *because misattributions may be expected to cause wrongful convictions*. In other words, the *unknown* fingerprint wrongful convictions, the cases we do not know about, were caused by misattributions, misattributions like the ones I analyzed, in every dimension *except* perhaps whatever dimensions govern likelihood of exposure.

In my analysis of exposed misattribution cases, I argued that we might infer some support for the hypothesis that, given a latent print misattribution, exposure is relatively unlikely.⁷⁰ I offered several reasons for this. First, exposed cases have been appearing with far greater frequency recently. I argued that this is more likely to be a result of improved exposure mechanisms than a degradation of latent print examiner performance. Second, only around a quarter of the cases were exposed through what I called the routine working of the criminal

⁶⁷ In other words, there are not that many effective ways of exposing a wrongful conviction as such, *other than* post-conviction DNA testing. In saying this, I recognize that more exonerations have occurred through means other than DNA. The fact that DNA exonerations number (slightly) fewer than exonerations *by all other means*, however, does not negate the point that DNA is probably the single most significant generator of exonerations.

⁶⁸ I have not obtained information on misattributions outside these countries. *But see* David Eade, *Controversy over Rocío Case Fingerprint*, COSTA DEL SOL NEWS, (Sept. 25, 2002).

⁶⁹ Cole, *More Than Zero*, *supra* note 1, at 1017-28.

⁷⁰ *Id.* at 995.

justice process.⁷¹ Most cases, Cowans is an example, were exposed through fortuitous circumstances that cannot reasonably be expected in most criminal cases (e.g., presence of DNA, confession of the true perpetrator, trial of the co-conspirator, deceased turning up alive,⁷² etc.). Third, following Gross and his colleagues,⁷³ I showed that homicide cases were drastically overrepresented among exposed latent print misattributions, and, again following Professor Gross et al., I argued that there were two possible explanations for this finding: a greater prevalence of misattribution in serious cases due to explicit or implicit pressure on forensic examiners to help close the case, or more effective exposure mechanisms in serious cases. If the latter explanation is preferred, then the number of actual misattributions (and thus, by extension, wrongful convictions) may be expected to be several times greater than the number of exposed misattributions.

This analysis also showed all the supposed mechanisms that have been offered in legal and professional discussions of latent print individualization as safeguards against the possibility of misattribution (and thus wrongful convictions).⁷⁴ These purported safeguards are “verification” (double-checking by one or more additional examiners), high minimum “point” standards, certification, and review by a defense expert.

Finally, my analysis discussed potential causes of latent print misattributions.⁷⁵ I dismissed “one-off” explanations, grounded in circumstances particular to a specific case, as deliberate rhetorical exercises designed to limit the applicability of exposed latent print misattributions to future cases. Most notable in this regard were causal discussions that relied on the supposed competence of the implicated examiners. I showed that users of this explanation were willing and able to draw on this explanation no matter how qualified the implicated examiners appeared to be (absent, of course, the knowledge that they had been implicated in an exposed misattribu-

⁷¹ *Id.* at 1020.

⁷² See WILKIE COLLINS, *THE DEAD ALIVE: THE NOVEL, THE CASE, AND WRONGFUL CONVICTIONS* (Rob Warden ed., 2005) for an excellent discussion of this rare, but consistently present, non-DNA method of definitively proving that a wrongful conviction has occurred.

⁷³ Gross, *supra* note 52.

⁷⁴ Cole, *More Than Zero*, *supra* note 1, at 1023-25.

⁷⁵ *Id.* at 1017-28, 1059-61.

tion). For example, examiners certified by the International Association for Identification (“IAI”) were treated as “incompetent” in this manner.⁷⁶ A relatively new “one-off” explanation is the “high-profile case.” There have been some efforts to explain one particularly embarrassing latent print misattribution, the *Mayfield* case, as being caused by the high-profile nature of the case.⁷⁷

Instead of these “one-off” explanations, I posited two more systemic potential causes of latent print misattribution. First, I suggested that the inherent similarity of different individuals’ friction ridge skin patterns might be a cause of latent print misattributions; what I called *confounding prints*.⁷⁸ Historically, this phenomenon has been dismissed as a significant cause of latent print misattribution based on the unproven, but reasonable, assumption that no two individuals had exact duplicate friction ridge skin patterns. With the benefit of hindsight, of course, we can see that such reasoning was fallacious because it is not necessary to have exact duplicate friction ridge skin patterns in order to attribute a mark made by one finger to another finger. All that is required is for the friction ridge skin patterns to be similar enough, within the small area necessary to generate a usable mark,⁷⁹ that they would be deemed consistent by a latent print examiner. The exposed cases of misattribution demonstrate that there are such cases, often within a common suspect pool (e.g., the population of a suburb of Philadelphia or a region of Scotland). This potential cause of misattribution has recently become even more salient because of advancing technology, specifically the increasing computeri-

⁷⁶ The IAI has offered a certification program since 1977. Although some examiners were grandfathered into certification, today certification requires passage of practical test involving the attribution of latent prints. Many practicing latent print examiners who testify in court in the U.S. today are not certified. Although the IAI certification program remains somewhat controversial within the profession, many view certification as at least a proxy measurement, in the absence of any other objective measurement, of excellence in latent print analysis. *Certification for Latent Fingerprint Examiners*, 27 IDENTIFICATION NEWS 3 (1977); James R. McConnell, *Certification (To Be or Not to Be)*, 42 J. FORENSIC IDENTIFICATION 205 (1992).

⁷⁷ See *infra* Part V.C.3; Robert B. Stacey, *A Report on the Erroneous Fingerprint Individualization in the Madrid Train Bombing Case*, 54 J. FORENSIC IDENTIFICATION 706 (2004) [hereinafter Stacey].

⁷⁸ Cole, *More Than Zero*, *supra* note 1, at 1059-60.

⁷⁹ The FBI has estimated that the *average* size of a latent print is around twenty-two percent of the distal phalange of the finger (the area of the finger that is most commonly the source of what are generically called “fingerprints”).

zation and inter-networking of fingerprint databases. As growing fingerprint databases effectively enlarge the suspect pool against which unidentified marks may be searched (i.e., in cases where conventional investigative methods have not generated a suspect pool), a comparably large number of individuals might potentially have small areas of friction ridge skin that might be found consistent with a particular mark.

Second, following Professors Risinger et al., I suggested that context bias might be a potential contributor to latent print misattributions.⁸⁰ Psychological studies suggest that the very process of placing a mark and a print in side-by-side comparison might cause an observer to overvalue similarities and undervalue differences. In addition, studies suggest that when examiners are cued that the provided known prints come from a suspect, “context effects” might further bias him or her to overvalue similarities and undervalue differences. Further, studies suggest that even when known prints are provided to the examiner without any cuing, *the very fact that a comparison has been requested* and the knowledge that the known prints likely are related to the case in some way (e.g., a suspect or a victim) might still create “context effects” which further bias the examiner toward seeing similarities and overlooking differences. Finally, studies suggest that context effects will surely infect the “verification” process in which “verifier” knows that a previous examiner has made a source attribution.

I summarize this previous study not to beat a dead horse, but rather to set the stage for what I want to do here, which is to provide an update on what we have learned since that study was completed. A number of developments have occurred that may further inform us about the prevalence and potential causes of wrongful conviction by fingerprint evidence.

V. NEW DEVELOPMENTS ON FINGERPRINT ERROR

A. NEWLY EXPOSED ERRORS: HOW SERIOUSLY DOES THE PROFESSION TAKE MISATTRIBUTIONS?

Since publication of the previous study of latent print misattributions, one new case has been exposed.⁸¹ Because the

⁸⁰ Cole, *More Than Zero*, *supra* note 1, at 1060-61.

⁸¹ The name of this case is not known for reasons explained *infra* note 84 and

number of exposed misattributions is so small, this one case adds significantly (around five percent) to the total. This additional case of error came to light through a discovery motion filed by a defendant in a criminal case. The motion requested “a copy of all documentation of corrective actions . . . taken as a result of a discrepancy in a technical case review . . . maintained by the laboratory that performed fingerprint analysis in this case.”⁸² This motion was based on a fingerprint protocol document that stated that such documentation should be maintained.⁸³ The defendant had no *a priori* reason to suspect that this particular laboratory had committed any misattributions, and at that time no known misattributions had been attributed to this particular laboratory.

What follows is the totality of prosecutor’s response to this section of the discovery motion:

Ms. Wright testified about a mis-ID that occurred early in her career in the early 1990’s. Ms. Wright does not recall the name of the case nor does the Lab have any record of the case. Even if such records exist, release of them may require a court order.⁸⁴

There are several things to note about this shocking statement. We should first note the ease with which an additional misattribution was exposed within mere months of publication of my original study. The discovery motion used in that case has been available to defense attorneys on the National Legal Aid & Defender Association (“NLADA”) web site only since 2004.⁸⁵ It is, of course, not possible to know how

accompanying text.

⁸² Letter from Karsten Boone, Deputy Public Defender, San Diego County, CA to Karl Eppel, Deputy District Attorney, San Diego County, CA (April 4, 2005) (on file with the author).

⁸³ Scientific Working Group on Friction Ridge Analysis, Study and Technology [hereinafter SWGFAST], Quality Assurance Guidelines for Latent Print Examiners, version 2.11, § 8.2 (Aug. 22, 2002) [hereinafter SWGFAST, Quality Assurance Guidelines], *available at* http://www.swgfast.org/Quality_Assurance_Guidelines_for_Latent_Print_Examiners_2.11.pdf (last visited Aug. 1, 2006).

⁸⁴ Letter from Karl Eppel, Deputy District Attorney, San Diego County, CA, to Kartson [sic] Boone, Deputy Public Defender, San Diego County, CA (May 31, 2005) (on file with the author).

⁸⁵ National Legal Aid & Defender Association, http://www.nlada.org/Defender/forensics/for_lib/Index/Fingerprints/index_html#Fingerprints.

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many discovery motions containing similar requests may have been filed independently of this particular motion. But one can still assume that not many such discovery motions have been requested and that even this one positive response makes for a fairly disturbing “yield rate.” It should also be noted that it is only the scrupulous honesty of both the prosecutor and the laboratory that have made this additional error known to us. Given that, as the prosecutor notes, records of the error may not exist, a deliberate or inadvertent negative response could not have been challenged. It is, therefore, not implausible to think that future discovery motions may yield additional errors and that some actual errors will still not be discovered through this process because they have been lost to the institutional memory of the laboratories, deliberately or not.

Indeed, in this case the operative unit appears to be the personal memory of the examiner, rather than the institutional memory of the laboratory. It should further be noted that the above discussion only refers to the most discoverable of misattributions, those of which the misattributing examiner herself is aware. As has been noted elsewhere, only a small number of misattributions may be expected to be detected by the misattributing examiner herself.⁸⁶

Next we might note the laboratory’s apparent nonchalance about the matter of a false positive error. This is particularly surprising because the profession’s literature portrays false positive errors as extremely rare but serious events. The Scientific Working Group on Friction Ridge Analysis, Study and Technology (“SWGFAST”) guidelines state that, “[a]n erroneous individualization is the most serious error a latent print examiner can make in casework.”⁸⁷ Elsewhere, forensic scientists have suggested that any false positive errors would be taken so seriously as to engender substantial soul-searching and remedial measures:

We have to understand that error rate is a difficult thing to

⁸⁶ This is, of course, why an examiner’s unawareness of having made any misattributions should be treated as very weak evidence of that examiner not, in fact, having made any misattributions. This speaks to the absurdity of Judge Pollak’s reliance on precisely this evidence in concluding that the error rate of latent print identification is not “unacceptably high.” *United States v. Llera Plaza*, 188 F. Supp. 2d 549, 566 (E.D. Pa. 2002).

⁸⁷ SWGFAST, *Quality Assurance Guidelines*, *supra* note 83, § 2.2.1, at 2.

calculate. I mean[,] people are trying to do this, it shouldn't be done, it can't be done. I'll give you an example as an analogy. When people spell words, they make mistakes. Some make consistent mistakes like separate, some people I'll say that I do this, I spell it S-E-P-E-R-A-T-E. That's a mistake. It is not a mistake of consequence, but it is a mistake. It should be A-R-A-T-E at the end.

That would be an error. But now with the computer and Spell Check, if I set up a protocol, there is always Spell Check, I can't make that error anymore. You can see, although I made an error one time in my life, if I have something in place that demonstrates the error has been corrected, it is no longer a valid thing to add [as] a cumulative event to calculate what a error rate is. An error rate is a wispy thing like smoke, it changes over time because the real issue is, did you make a mistake, did you make a mistake in this case? If you made a mistake in the past, certainly that's valid information that someone can cross-examine or define or describe whatever that was, but to say there's an error rate that's definable would be a misrepresentation.⁸⁸

Some examiners have even gone so far as to suggest that a single positive error would be a career-ending event. In *United States v. Sullivan*, an examiner "testified that an examiner who made a false identification would be finished as an examiner due to the difficulty in rehabilitating him or her as a witness."⁸⁹ This statement is important because the court used it as evidence in support of its conclusion that, "[t]here is no evidence . . . that the ACE-V methodology as performed by the FBI suffers from any significant error rate" in a ruling on the admissibility of latent print individualization as expert evidence.⁹⁰ If this evidence is in fact false, then the court's conclusion is tainted.

How do we square these statements with the fact that the San Diego Laboratory appears not to have even maintained a record of *the name of the case* in which it committed a misattribution?⁹¹ We must entertain the possibility that in practice the latent print profession does not take misattribution as seri-

⁸⁸ Trial Transcript at 122-23, *United States v. Mitchell*, Cr. No. 96-407 (E.D. Pa. Jul. 9, 1999).

⁸⁹ *United States v. Sullivan*, 246 F. Supp. 2d 700, 703 (E.D. Ky. 2003).

⁹⁰ *Id.*

⁹¹ Here I refer to the unnamed San Diego case introduced *supra* note 81. The name of this case is not known for reasons explained *supra* note 84 and accompanying text.

ously as it claims to on paper.

I too have perpetuated the perhaps fallacious notion that the latent print profession takes *exposed* misattributions very seriously indeed. In 1998, I advanced the argument that the latent print profession used a tactic that I characterized as “sacrificing the examiner” in order to inoculate itself against being tainted by exposed misattribution.⁹² Errors were blamed on the incompetence of the practitioners, thus allowing the credibility of “the technique itself” to remain unperturbed. My principal evidence was the *Caldwell* case,⁹³ where the profession showed its willingness to sacrifice even highly regarded members (i.e., three IAI-certified examiners). These examiners had their certifications revoked for their participation in a single false positive error, effectively, I assumed, ending their careers and “excommunicating” them from the profession. This, I argued, was actually a quite interesting case for the sociology of the professions because it contradicted observations of other professions, which suggested that professions tend to rally around embattled colleagues. As I portrayed it, the tactic represented an extremely draconian policy and demonstrated an impressively disciplined approach to maintaining the credibility of the profession at the expense of the comfort of some of its members.⁹⁴ This tactic could also be seen in the Jackson misattribution, for example, which resulted in another decertification for involvement in a single false positive error.⁹⁵

At the same time, my most recent study did produce some contravening evidence. In particular, one anonymous case, dubbed “Midwestern,” involved a purportedly certified expert who was *protected* by the profession after an apparent false positive error.⁹⁶ The report on this misattribution casually states that the examiner continues to practice and has apparently not made any additional errors.⁹⁷ The author of the re-

⁹² See Simon A. Cole, *Witnessing Identification: Latent Fingerprint Evidence and Expert Knowledge*, 28 SOC. ST. OF SCI. 687 (1998) [hereinafter Cole, *Witnessing Identification*].

⁹³ See generally *State v. Caldwell*, 322 N.W.2d 574 (Minn. 1982); see also James E. Starrs, *A Miscue in Fingerprint Identification: Causes and Concern*, 12 J. OF POLICE SCI. & ADMIN. 287 (1984).

⁹⁴ Cole, *Witnessing Identification*, *supra* note 92.

⁹⁵ See Rachel Scheier, *Fingerprint Expert Decertified: New Trial Sought in Murder Conviction*, PHILADELPHIA INQUIRER, Aug. 16, 1999.

⁹⁶ Cole, *More Than Zero*, *supra* note 1, at 1004.

⁹⁷ See Ed German, *Latent Print Examination: Fingerprints, Palmprints and*

port justifies his decision to protect the examiner's identity "because I am proud of his (and his department's) integrity and professionalism."⁹⁸ In addition, in the Fayetteville *series* of latent print misattributions,⁹⁹ the examiners were also apparently allowed to continue practicing. The errors were explained as a result of their inexperience, and hope was expressed that they would do better in the future.

The *Mayfield* case (*See infra* Part V.C.3) posed the most serious challenge to this policy because the error was under greater media scrutiny than any previous error and because the examiners involved were so highly regarded by their peers.¹⁰⁰ Three were FBI examiners, two of them IAI-certified, and the fourth examiner, Ken Moses, who examined the print on behalf of *the defendant*, was not only IAI-certified, but a highly regarded examiner who trained other examiners.¹⁰¹ Moses and Michael Wieners voluntarily relinquished their certifications in August 2004 and were suspended for a period of one year.¹⁰² John Massey did not voluntarily relinquish his certification; it was revoked by the IAI in October 2004. Notice of the decertifications were not published in the IAI's official organ, the *Journal of Forensic Identification*, until September 2005.

On July 11, 2005, a San Francisco Police Department certified examiner, Ronan Shouldice, wrote an open letter to the FBI detailing a recent trial that had resulted in a hung jury, in which the crucial evidence was a latent palm print.¹⁰³ Shouldice blamed this outcome on the IAI's besmirching of his credential of certification. His inability to clearly answer the question of whether Moses – who incidentally happened to live in San Francisco and was a frequent consultant to defendants there—would be decertified, he argued, had "devalued greatly" this credential. He further stated that, "[w]hen the subject of CLPE [certified latent print] examiners being involved in the

Footprints, at <http://onin.com/fp/problemidents.html> (last visited Aug. 1, 2005).

⁹⁸ *Id.*

⁹⁹ Cole, *More Than Zero*, *supra* note 1, at 1006-07.

¹⁰⁰ *Id.* at 985-86.

¹⁰¹ *Id.* at 986.

¹⁰² IAI, *Latent Print Certification Actions* 55 J. FORENSIC IDENTIFICATION 658 (2005) [hereinafter IAI].

¹⁰³ *People v. Bussani*, No. 192248 (Cal. Super. Ct. 2005). The author was an expert witness for the defendant in this case.

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mis-identification was hammered home to the jury, the defense [attorney] sat down and her job of obliterating claims of expertise and the value of Certification was done.”¹⁰⁴ Shouldice was no longer able to use certification as an unproblematic marker of “reliability,” but without certification, he had no other foundation upon which to rest his reliability claims.

The decertified examiners will be eligible to apply to recertification following the suspension period, “remedial training, and proficiency testing.”¹⁰⁵ They will be required to meet all normal requirements. These decertifications raise epistemological paradoxes that inhere in the attempt to use credentialing mechanisms as a source of epistemological validity. It is not clear why Moses should be any worse at analyzing latent prints during his probationary year than he was before. Similarly, if Moses is deemed “incompetent” during his probationary year, it is not clear why he should be deemed competent after it. It is also not clear how a year of probation would be expected to enhance Moses’s skill. The theory of punishment behind Moses’s decertification appears to be simply retribution; it is as if the IAI expects him to sit in solitary confinement and contemplate his overreaching. This impression that the purpose of decertification is punitive, rather than rehabilitative, is strengthened by the fact that, according to the IAI Latent Print Certification Board, only Massey, the examiner who did not voluntarily surrender his certification, “will be required to successfully complete a special comparison segment of the examination that has been traditionally used in situations where a certification has been revoked for technical error involving an erroneous identification.”¹⁰⁶ There is no other obvious reason for Massey’s punishment being more severe other than his declining to voluntarily surrender his certification.

All of this suggests that in 1998 I may have overstated the vigor with which the latent print profession “sacrificed the examiner” for the good of the profession. The truth, it appears, may be at once more scandalous and more sociologically mundane. It would appear that, to a larger extent than previously

¹⁰⁴ Ronan Shouldice, Letter to the International Association for Identification Regarding Certification Issues (Jul. 11, 2005) *available at* <http://www.clpex.com/Articles/TheDetail/200-299/TheDetail204.htm> (last visited Aug. 31, 2006).

¹⁰⁵ IAI, *supra* note 102 at 658.

¹⁰⁶ *Id.* at 659.

believed, the latent print profession deals with embarrassing errors the way other professional and organizations tend to deal with them; by keeping quiet about them to whatever extent possible.¹⁰⁷ It now appears likely that examiners who commit false positives do continue to practice, that not all such errors are deliberately made known to the public, and that it may require discovery motions or sworn testimony in order to expose some of these errors.

It should also be noted that, whatever the truth about how the profession deals with error, a fundamental paradox remains. The more highly qualified the examiner, the more severe the punishment. It appears that misattributions are excused for the novice examiners, while the most experienced examiners are subject to sanctions that have teeth, such as decertification. Although this difference has some appearance of logic to it, latent print protocols suggest that there should not be a difference in the weight attached to a latent print individualization according to the degree of experience or certification status of the examiners. All latent print individualizations generated by examiners “trained to competency” are essentially given equal weight.¹⁰⁸ “Training to competency,” it should be noted, is a lower threshold than that required by certification. Indeed, that the individualization was made by an examiner “trained to competency” is one of the attributes that purportedly vouches for the correctness of the individualization.¹⁰⁹

The relatively quick exposure of yet another documented case of error supports the sense, clearly articulated in my earlier study, that additional errors were probably known within the profession but not known to the public.¹¹⁰ This suspicion is

¹⁰⁷ This possibility is also emphasized by the last sentence of the prosecutor’s discovery response, which hints at potential resistance to full disclosure of information concerning the misattribution. Letter from Karl Eppel, *supra* note 84.

¹⁰⁸ SWGFAST, Quality Assurance Guidelines, *supra* note 83, § 1.1, at 1.

¹⁰⁹ See SWGFAST, Friction Ridge Examination Methodology for Latent Print Examiners, version 1.01, § 3.3.1 (Aug. 22, 2002) [hereinafter SWGFAST, Methodology] (“Individualization occurs when a latent print examiner, trained to competency [citation], determines that two friction ridge impressions originated from the same source, to the exclusion of all others.”), *available at* http://www.swgfast.org/Friction_Ridge_Examination_Methodology_for_Latent_Print_Examiners_1.01.pdf (last visited Aug. 1, 2006).

¹¹⁰ Cole, *More Than Zero*, *supra* note 1, at 997-998 (“Since I have occasionally seen reference in the fingerprint literature to cases of misattribution that were not publicized, I believe that the number of known cases of misidentification listed here is probably significantly less than the number known to the ‘collective mind’ of the fin-

further supported by the rather startling revelation in the Office of the Inspector General's ("OIG") report on the Mayfield error (*See infra* Part V.C.3) by U.S. Postal Inspection Service Examiner Ken Smith, that during a fourteen-year tenure as a member of the IAI's Latent Print Certification Board, which according to Smith, "was responsible for investigating complaints of erroneous identifications by IAI-certified examiners," he "encountered 25 to 30 erroneous identifications, mostly by local law enforcement agencies."¹¹¹ This figure, compiled over a fourteen-year period, exceeds the total number of publicly known erroneous identifications that I was able to compile in a period covering the entire history of the deployment of latent print evidence in the United States. Moreover, the twenty-two cases I compiled included five cases from the U.K., leaving only seventeen U.S. cases, so Smith's figure exceeds mine by an even greater margin.¹¹² Using the midpoint of Smith's estimate, erroneous identifications were exposed to the Latent Print Certification Board at a rate of around two per year, a rate far higher than the rate of occurrence of publicly known erroneous identifications that I compiled, and nearly twice the accelerated rate of slightly more than one per year that I calculated for the post-*Mitchell* period.¹¹³

More to the point is the simple fact that only a limited number¹¹⁴ of the "25 to 30" erroneous identifications known to Smith could be represented in the data set of twenty-two publicly known erroneous identifications analyzed in my earlier study. In other words, as I suspected, the institutional memory of the IAI knows about a number of exposed erroneous identifications unknown to the public. This is further reason not to

gerprint profession.")

¹¹¹ OFFICE OF THE INSPECTOR GENERAL, DEPT OF JUSTICE, A REVIEW OF THE FBI'S HANDLING OF THE BRANDON MAYFIELD CASE 137 (Mar. 2006) [hereinafter OIG REPORT], available at <http://www.usdoj.gov/oig/special/s0601/final.pdf> (last visited Aug. 1, 2006).

¹¹² It is not clear whether erroneous identifications reported to the IAI Latent Print Certification Board are limited to U.S. cases. Even if this is not the case *de jure*, it is certainly the case *de facto* because only five of approximately 750 IAI-certified examiners live outside the United States. *See* Latent Print Certification Board, <http://onin.com/clpe/> (last visited Aug. 1, 2006). That Smith's figure relates only to IAI-certified examiners is, of course, cause for further concern, as discussed *infra* Part V.C.1.

¹¹³ Cole, *More Than Zero*, *supra* note 1, at 1018.

¹¹⁴ Around seven at the very most, according to my calculations, which are necessarily rough because we do not know the period in which Smith served on the Board.

treat those twenty-two cases as the extent of *actual* erroneous individualizations.

In the context of the Mayfield report, it is not clear that Smith's designation, "local law enforcement agency," means anything other than "not the FBI." It should be noted, that Smith was a witness, and presumably had this information, at the historic *Daubert*¹¹⁵ hearing in *Llera Plaza II*, in which Judge Pollak upheld the admissibility of latent print evidence based in part on the FBI's assurances that it was not aware of having made any errors and in part on the defendant's failure "to present examples of erroneous identifications attributable to FBI examiners."¹¹⁶

We should also note that the lack of precision of Smith's recollection supports what I claimed elsewhere, that "[n]o mechanism for recording, compiling, reviewing, or analyzing cases of fingerprint misattribution exists."¹¹⁷ If anybody were performing these functions, it would be the IAI Latent Print Certification Board. And yet, that Board apparently treats erroneous identifications, which professional guidelines call "the most serious error a latent print examiner can make in case-work,"¹¹⁸ so casually that Smith does not even recall, or, apparently have records with which to refresh his recollection, the precise figure. Again, this suggests that the attitude toward error within the latent print profession may be more blasé than both the profession and I have previously made it out to be.

B. "CLERICAL" ERRORS

Another issue that has received attention recently concerns errors that have occurred on latent print proficiency tests that have been conducted since 1983. A recent article in the journal *Science* by Professors Saks and Koehler used these errors as "obviously imperfect indicators of the rate at which errors occur in practice."¹¹⁹ The proficiency test data used by

¹¹⁵ *Daubert v. Merrell Dow*, 516 U.S. 869 (1995).

¹¹⁶ *United States v. Llera Plaza*, 188 F.Supp. 2d 549, 566 (E.D. Pa. 2002). For further discussion, see *infra* note 170 and accompanying text, and Simon A. Cole, *Grandfathering Evidence: Fingerprint Admissibility Ruling from Jennings to Llera Plaza and Back Again*, 41 AM. CRIM. L. REV. 1189, 1263 (2004).

¹¹⁷ Cole, *More Than Zero*, *supra* note 1, at 997.

¹¹⁸ SWGFAST, Quality Assurance Guidelines, *supra* note 83, § 2.2.1, at 2.

¹¹⁹ Michael J. Saks & Jonathan J. Koehler, *The Coming Paradigm Shift in Foren-*

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Professors Saks and Koehler has also been analyzed by other scholars.¹²⁰

The use of this data by Saks and Koehler, and by other scholars seeking to estimate the accuracy of latent print practice, has been vociferously denounced by the latent print community.¹²¹ Some of the criticisms can be dismissed as adversarial rhetoric. For example, the argument that proficiency tests do not adequately replicate actual casework conditions is reasonable enough, but it does not constitute a valid criticism of discussing the proficiency tests, given that all such discussions have been couched with caveats acknowledging the possible limitations of proficiency tests data as measures of casework accuracy. Those scholars who have used such data have clearly stated that they have used such data in the absence of better data on the accuracy of latent print casework.¹²² Moreover, there is no basis for latent print examiners' assumption that proficiency data overstate the false positive error rate of casework.

Recently, a seemingly more meritorious criticism has been made of critics' use of proficiency test data. In a symposium presentation, Langenburg argued that Saks and Koehler's use of the CTS proficiency test data overstated the false positive rate.¹²³ In a recent article, Wertheim, Langenburg, and Professor Moenssens similarly criticized proficiency test data as "inappropriate measures of examiner reliability."¹²⁴ Langenburg's criticism is as follows: Saks and Koehler simply reported all the *false positives* reported on the test, cases in which a respondent attributed a latent print to finger which was not, in fact, the

sic Identification Science, 309 *SCIENCE* 892, 895 (Aug. 5, 2005) [hereinafter Saks & Koehler].

¹²⁰ Haber & Haber, *supra* note 36; Cole *More Than Zero*, *supra* note 1.

¹²¹ Glenn Langenburg, *Defending Against the Critic's Curse* (2002), available at <http://www.clpex.com/Articles/CriticsCurse.htm> (last visited Aug. 21, 2003); *Questions About Forensic Science*, 311 *SCIENCE* 607, 608 (Feb. 3, 2006).

¹²² Saks & Koehler, *supra* note 119; Haber & Haber, *supra* note 36; Cole *More Than Zero*, *supra* note 1.

¹²³ Glenn Langenburg, *Detection Errors*, presented at Human Identification: e-Symposium on Forensic DNA, Fingerprinting, and Criminal Law (Feb. 28, 2006) [hereinafter Langenburg, *Detection Errors*], available at <http://www.forensic.e-symposium.com/humid/> (last visited Aug. 31, 2006) (Presentation also available from glenn.langenburg@mn.state.us).

¹²⁴ Kasey Wertheim, Glenn Langenburg, & André Moenssens, *A Report of Latent Print Examiner Accuracy During Comparison Training Exercises*, 56 *J. FORENSIC IDENTIFICATION* 55, 59 (2006).

donor. Langenburg argued that “digging just a little bit deeper” revealed that not all of all these false positives should be considered true false positives.¹²⁵ In particular he posited that most of the errors counted as false positives by Saks and Koehler should in fact be classified as “clerical errors.”¹²⁶ Using CTS test 02-516 as an example, he pointed to two cases in which the respondent offered the correct finger (e.g., right ring finger), but the wrong donor. In two cases the donor named by the respondent was not in fact present in the test materials.¹²⁷ In two other cases, the respondent had reported the correct finger of the *opposite hand* of the correct donor. In other words, they attributed a latent print to the right middle finger of a donor, whereas in fact it came from the left middle finger. In another case, the respondent erroneously attributed a latent to a finger *adjacent* to the true donor finger.¹²⁸ In all of these cases, Langenburg implied, the errors were most likely “clerical” – that is, they probably represented, not erroneous attributions or decisions on the part of the examiner, but rather errors in the transcribing and reporting of those decisions. Langenburg stated, “If you look at the actual latents themselves, you will see that many of them are most likely clerical errors.”¹²⁹ On the CTS test 02-516, Langenburg concluded, only one, “or perhaps two,” of the fifteen reported false positives could *not* be explained as “clerical errors.”¹³⁰ The implication is that Saks and Koehler should have reported only one or two false positives on that test, rather than fifteen, and that they inflated the false positive rate with “clerical errors.”

Langenburg expanded on the notion of clerical error in a recent study he conducted in collaboration with Wertheim and Professor Moenssens in which they measured the accuracy of participants in latent print training sessions. In that study, a whopping fifty-nine of the sixty-one false positive errors were

¹²⁵ Langenburg, *Detection Errors*, *supra* note 123.

¹²⁶ *Id.*

¹²⁷ *Id.* In other words, the respondent identified a latent to the right ring finger of “item 5,” but no material called “item 5” had been provided on the test.

¹²⁸ *Id.* In other words, the respondent identified a latent to the right ring finger of a particular donor, whereas the latent actually derived from the right middle finger of that donor.

¹²⁹ *Id.*

¹³⁰ *Id.*

classified as “clerical errors.”¹³¹ In the paper reporting that study, Langenburg (and co-authors) explicate more fully the notion of “clerical errors.” Wertheim et al. discuss three types of clerical errors.¹³² The first is called a “transcription transposition error.” These are cases in which the respondent erroneously attributes a latent print to the correct finger of the *opposite hand* of the true donor. For example, the respondent might report that a latent print was made by the left ring finger (called the “#9 finger” in latent print parlance) of the true donor, whereas in fact it was made by the right ring finger (the “#4 finger”). The obvious temptation here is to conclude that the examiner attributed the latent print correctly but confused left and right in reporting.

The second type of error is not named but consists of responding with the correct donor but the wrong finger number. For example, the latent print examiner might report that a latent print was made by the #9 finger of a particular individual, whereas in fact it was made by the #8 finger of that same individual. Since Wertheim et al. did not name these errors, we might for convenience call them “right-person-wrong-finger errors.” As with transcription transposition errors, it is easy to see why an analyst might be tempted to infer that the examiner attributed the latent print correctly, but recorded the incorrect finger number.¹³³

The third type of error consists of responding with the correct finger number but the wrong donor. For example, the latent print examiner might report that a latent print was made by the #9 finger of exemplar #1, whereas, in fact, it was made by the #9 finger of exemplar #2. We might call these “right-finger-wrong-person errors.” Again, it is possible to see why an analyst might infer that the latent print examiner made the attribution correctly but made an error in reporting, although this inference seems less plausible than the previous two.

On the face of it the notion of clerical errors might appear to be yet another manifestation of what Professor Koehler has called “a sinister semantic game” concerning error and I have

¹³¹ Wertheim et al., *supra* note 124, at 67.

¹³² *Id.* at 67-69.

¹³³ In addition, one might be tempted to conclude that such attributions, though factually false, are not legally, or even morally, incorrect. The latent print is attributed to the correct individual, who may be punished appropriately. Such errors might be viewed as producing a legally just, though factually false, result!

called (following David Bloor) “the sociology of error.”¹³⁴ By positing *post hoc* explanations for errors and parsing them into ever finer categories, proponents of particular types of evidence can minimize the perceived prevalence of error.¹³⁵ But even if we take the notion of “clerical errors” at face value does it, in fact, explain away the bulk of the CTS false positive results?

It is possible to answer this question by referring to those CTS tests for which complete test materials are publicly available. Although current and recent CTS reports are publicly available through the internet, tests produced prior to 2001 are not. The results on all proficiency tests conducted since 1983 are available in at least some form, but in many cases only a summary report is available. Summary reports only report the number of false positives, and they do not make it possible to determine whether or not those false positives are of the “clerical” nature Langenburg hypothesized.

I analyzed all the proficiency tests for which it was possible to determine whether false positives are of the nature that Langenburg hypothesized. These consist of all proficiency tests conducted between 1983 and 1991 and 2001 and 2006. Between 1991 and 2001 only two tests (1995 and 1999) are available in complete enough form (generally through discovery in litigation) to ascertain the nature of the false positives committed on those tests. On these tests, it is possible to examine the proficiency test data to determine whether each of the false positives could be classified as one of the clerical error types defined by Langenburg et al. However, because of the way in which the tests conducted between 1983 and 1991 were reported by Professor Peterson *et al.*,¹³⁶ it was possible to detect only one of the three types of “clerical errors” defined by Langenburg et al., the “right-person-wrong-finger” errors.

It should be noted that in their own study, Wertheim et al. used another step to determine whether a *reported* false positive should be classified as a “clerical error.” According to Wertheim et al.:

[Clerical errors] are easily identified by the instructor by

¹³⁴ Jonathan J. Koehler, *Error and Exaggeration in the Presentation of DNA Evidence at Trial*, 34 JURIMETRICS 21, 24 (1993); Cole, *More Than Zero*, *supra* note 1, at 1055.

¹³⁵ Koehler, *supra* note 134, at 24; Cole, *More Than Zero*, *supra* note 1, at 1055.

¹³⁶ Peterson et al., *supra* note 36.

merely examining the latent print and recorded exemplar. For instance, if the latent print is a left-slant loop pattern and the exemplar bears a right-slant loop pattern, it is highly unlikely that a participant with even minimal training and experience would effect such an individualization.¹³⁷

In other words, Wertheim et al. reasoned that if a false positive was made to an exemplar bearing an inconsistent gross pattern type, the error was likely to be a “clerical error,” rather than a true erroneous source attribution.¹³⁸ The “clerical error” designations made in the Wertheim et al. study, therefore, required not merely the mere fact that the true donor was the opposite finger of the same hand, a different finger from the same donor, or the same finger of a different donor, but also a finding of inconsistency in gross pattern type.

It is not entirely clear from Langenburg’s remarks whether he followed the same procedure in his classification of clerical errors in the CTS proficiency tests. Such a procedure would require access not just to the complete CTS reports which, as mentioned, are publicly available, but also to the test materials (the finger and palm print images) themselves in order to determine the gross pattern type. These materials are not publicly available, but they presumably may be retained by participants in the tests. Langenburg’s statement, “If you look at the actual latents themselves, you will see that many of them are most likely clerical errors,”¹³⁹ does indeed seem to imply that his “clerical error” designations were made in consultation with the test materials, but some uncertainty still remains on this point. In any case, it was not possible for me, as an external researcher without access to the tests materials, to follow this added step. On the one test on which Langenburg reported his findings (the 02-516 test), I was able to classify the same number of false positives (thirteen) as “clerical errors” as Langenburg. Table 4 shows the results of this analysis.

¹³⁷ Wertheim et al., *supra* note 124, at 67.

¹³⁸ Typically, there are said to be three gross pattern types (arch, loop, and whorl). Since loops constitute around sixty to sixty-five percent of all fingerprint patterns, they are often subdivided into “left-slant” and “right-slant” (or, sometimes, “radial” and “ulnar”) loops. Gross pattern type is not always apparent in a latent print, however, particularly if the latent print is limited to detail originating from the upper portion of the print.

¹³⁹ Langenburg, *Detection Errors*, *supra* note 123.

Test #	# of participants	# of test items	Total comparisons	Conventionally defined false positives	Conventionally defined false positive rate	Wrong person right finger errors	Right person wrong finger errors	Transposition transcription errors	Total inferred "clerical" errors	"Non-clerical" False Positives	"Non-clerical" False Positive Rate
83-4	24	21	504	13	2.58%		2		2	11	2.18%
84-5	28	21	588	22	3.74%		7		7	15	2.55%
85-7	37	21	777	5	0.64%		2		2	3	0.39%
86-7	43	25	1075	12	1.12%		3		3	9	0.84%
87-7	52	13	676	13	1.92%		3		3	10	1.48%
88-7	62	12	744	2	0.27%		0		0	2	0.27%
89-7	56	12	738	6	0.81%		0		0	6	0.81%
90-7	74	12	1622	18	1.11%		4		4	14	0.86%
91-8	88	12	1723	76	4.41%		57		57	19	1.10%
9508	156	7	1092	48	4.40%	3	3	0	6	42	3.85%
99-516	231	12	2772	16	0.58%	3	7	5	15	1	0.04%
01-516	296	11	3256	10	0.31%	1	3	3	7	3	0.09%
01-517	120	11	1320	2	0.15%	1	0	1	2	0	0.00%
02-516	303	11	3333	15	0.45%	7	1	5	13	2	0.06%
02-518	31	12	372	0	0.00%	0	0	0	0	0	0.00%
02-517	146	10	1460	7	0.48%	1	5	0	6	1	0.07%
03-516	336	10	3360	5	0.15%	1	1	1	3	2	0.06%
03-518	28	12	336	2	0.60%	0	2	0	2	0	0.00%
03-517	188	9	1692	1	0.06%	0	1	0	1	0	0.00%
04-516	306	12	3672	14	0.38%	1	7	1	9	5	0.14%
04-517/8	259	11	2849	18	0.63%	2	9	1	12	6	0.21%
05-516	327	12	3924	3	0.08%	0	2	0	2	1	0.03%
05-517/8	250	12	3000	12	0.40%	0	5	4	9	3	0.10%
06-516	333	11	3663	21	0.57%	1	10	2	13	8	0.22%
Totals	3774	312	44548	341	0.77%	21	134	23	178	163	0.37%

Table 4. Representation of "clerical" and "non-clerical" errors, in CTS proficiency test errors, 1983 – 2006 (years in which data available), according to method proposed by Langenburg *et al.*

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Of 341 false positives¹⁴⁰ reported on the relevant proficiency tests, 178 of them (fifty-two percent) can be classified as “clerical errors,” as defined by Langenburg et al. Twenty-one were “right-finger-wrong-person” errors, 134 were “right-person-wrong-finger” errors, and twenty-three were “transcription transposition” errors. In other words, if taken completely at face value, the notion of “clerical error” explains about half of the false positive problem that appears on latent print proficiency tests. Put another way, removing “clerical errors,” as defined by Langenburg et al., from consideration reduces the false positive rate in this sample from 0.8 percent to 0.4 percent.

This result may be skewed by the fact that on the earlier (1983-1991) tests we were only able to detect one of the three types of “clerical errors” (albeit a type of error that appears to be as common as the other two types combined). If those tests are removed from the analysis, we are left with 174 false positives, 100 of which can be classified as “clerical errors,” as defined by Langenburg et al. The results of this analysis are presented in Table 5.

¹⁴⁰ Note again that Vokey et al., *supra* note 50 take issue with this simplistic method of calculating false positives (and even for using the term “false positive” for all of these errors). I feel that the presentation of this simpler calculation is warranted here because Vokey et al.’s more sophisticated characterization of target discrimination is unlikely to be meaningful to a legal audience.

Test #	# of participants	# of test items	Total comparisons	Conventionally defined false positives	Conventionally defined false positive rate	Wrong person right finger errors	Right person wrong finger errors	Transposition transcription errors	Total inferred clerical errors	"Non-clerical" False Positives	"Non-clerical" False Positive Rate
9508	156	7	1092	48	4.40%	3	3	0	6	42	3.85%
99-516	231	12	2772	16	0.58%	3	7	5	15	1	0.04%
01-516	296	11	3256	10	0.31%	1	3	3	7	3	0.09%
01-517	120	11	1320	2	0.15%	1	0	1	2	0	0.00%
02-516	303	11	3333	15	0.45%	7	1	5	13	2	0.06%
02-518	31	12	372	0	0.00%	0	0	0	0	0	0.00%
02-517	146	10	1460	7	0.48%	1	5	0	6	1	0.07%
03-516	336	10	3360	5	0.15%	1	1	1	3	2	0.06%
03-518	28	12	336	2	0.60%	0	2	0	2	0	0.00%
03-517	188	9	1692	1	0.06%	0	1	0	1	0	0.00%
04-516	306	12	3672	14	0.38%	1	7	1	9	5	0.14%
04-											
517/8	259	11	2849	18	0.63%	2	9	1	12	6	0.21%
05-516	327	12	3924	3	0.08%	0	2	0	2	1	0.03%
05-											
517/8	250	12	3000	12	0.40%	0	5	4	9	3	0.10%
06-516	333	11	3663	21	0.57%	1	10	2	13	8	0.22%
Totals	3310	163	36101	174	0.48%	21	56	23	100	74	0.20%

Table 5. Representation of "clerical" and "non-clerical" errors, in CTS proficiency test errors, 1995 – 2006 (years in which data available), according to method proposed by Langenburg *et al.*

Obviously, the number of “right-finger-wrong-person” (twenty-one) and “transcription transposition” (twenty-three) errors remains the same, and there were fifty-six “right-person-wrong-finger” errors. In other words, around fifty-seven percent of false positives in this smaller sample can be explained as “clerical errors” if the notion of “clerical error” is taken completely at face value. Put another way, removing “clerical errors,” as defined by Langenburg et al., from consideration reduces the false positive rate in this sample from 0.5 percent to 0.2 percent. The effect is, therefore, not quite as dramatic as implied by Langenburg’s example of test 02-516; intentionally or not, Langenburg chose as an example the test with the second highest number of false positives that were re-classifiable as “clerical errors.”¹⁴¹

Should the notion of “clerical error” be taken completely at face value? A number of issues present themselves. First, a high number of the “right-person-wrong-finger” errors appear to involve palm-to-finger or finger-to-palm errors. In other words, many of these “right-person-wrong-finger” errors involved cases in which the true source of the latent print was a finger and the respondent erroneously attributed it to the palm (of the true donor). Of the fifty-six “right-person-wrong-finger” errors, fully half of them (twenty-eight) involved such finger-to-palm or palm-to-finger errors. It is not obvious that the “clerical error” hypothesis is necessarily as plausible when the misattribution is of this nature as when the misattribution merely concerns reporting the wrong finger. Finger and palm exemplars are of very different sizes and occupy different areas of ten-print cards, and it would seem less plausible that one might slip from attributing a finger to transcribing an attribution to the palm than, say, attributing to finger #4 and transcribing an attribution to finger #5. Langenburg himself is silent on the issue; it is not clear whether or not he would categorize finger-to-palm or palm-to-finger errors as “clerical errors.” The Wertheim et al. article appears to view finger-to-palm/palm-to-finger errors as legitimate clerical errors by de-

¹⁴¹ The only post-1995 test that would have made Langenburg’s case more dramatically than test 02-516 was test 99-516, in which fifteen of sixteen false positives were re-classifiable as “clerical errors.” Test 06-516, like test 02-156, contained thirteen false positives, which were re-classifiable as “clerical errors,” but the effect on 06-516 was less dramatic because the total number of false positives (twenty-one) was greater.

scribing such errors as “correct individual but incorrect finger, hand, or foot.”¹⁴² Since merely reversing the palm or foot (e.g., responding “left palm” when the true source is the right palm) would be categorized as a “transcription transposition” error, we can infer that this nomenclature is meant to include finger-to-palm/palm-to-finger errors. On the other hand, the 02-516 test, the only one analyzed in detail by Langenburg in his presentation,¹⁴³ did not contain any finger-to-palm or palm-to-finger errors.

If the finger-to-palm/palm-to-finger cases are removed, then only 72 of the 174 false positives may be classified as “clerical errors.” The results of this analysis are presented in Table 6.

¹⁴² Wertheim et al., *supra* note 124, at 69 (emphasis added).

¹⁴³ Langenburg, *Detection Errors*, *supra* note 123.

Test #	Conventionally defined false positives	Wrong person errors	Right person wrong finger errors that involved palms-to-fingers or fingers-to-palms	Right person wrong finger errors w/out palms cases	Right person wrong finger errors w/out palms cases	“Clerical” errors w/out palms cases	“Non-clerical” false positives w/out palms	“Clerical” errors w/out palms cases	“Non-clerical” false positives w/out palms	“Clerical” errors without palms or wrong person right finger errors	“Non-clerical” false positives w/out palms or wrong person right finger errors
9508	48	3	3	0	3	6	42	6	3.85%	3	45
99-516	16	3	7	5	2	10	6	2	0.22%	7	9
01-516	10	1	3	0	3	7	3	3	0.09%	6	4
01-517	2	1	0	0	0	2	0	0	0.00%	1	1
02-516	15	7	1	0	1	13	2	2	0.06%	6	9
02-518	0	0	0	0	0	0	0	0	0.00%	0	0
02-517	7	1	5	1	4	5	2	2	0.14%	4	3
03-516	5	1	1	1	0	2	3	2	0.09%	1	4
03-518	2	0	2	0	2	2	0	0	0.00%	2	0
03-517	1	0	1	1	0	0	1	1	0.06%	0	1
04-516	14	1	7	3	4	6	8	6	0.22%	5	9
04-517/8	18	2	9	3	6	9	9	9	0.32%	7	11
05-516	3	0	2	1	1	1	2	2	0.05%	1	2
05-517/8	12	0	5	3	2	6	6	6	0.20%	6	6
06-516	21	1	10	10	0	3	18	3	0.49%	2	19
Totals	174	21	56	28	28	72	102	51	0.28%	51	123

Table 6. “Clerical” errors with palms cases and wrong person right finger errors removed.

Under these conditions, removing “clerical errors” eliminates around forty percent of the false positives and reduces the false positive error rate from 0.5 percent to 0.3 percent.

A second consideration concerns whether the “right-finger-wrong-person” errors really belong in the same category as the other two types of “clerical errors.” The other two types of errors involve erroneous attributions *to the correct donor*. Though the finger attribution is incorrect, the misidentified finger belongs to the true donor. At some crude level, a “correct” result has been achieved because the correct individual has been identified as the source of the latent print. Although criminal cases can be imagined in which this could produce an unjust result (e.g., cases in which the theory of the crime depended upon the positioning of the fingers, as, for example, if the fingerprint evidence indicated not merely that a particular individual held a particular object but that they held it in a position that allowed them to use it as a weapon), such cases are presumably rare.

Such considerations do not seem to apply to “right-finger-wrong-person” errors. When the wrong donor has been identified, it is not clear why it should be mitigating that the finger number is correct. Indeed, given that latent print examiners, plausibly, claim to have some ability to *a priori* identify the finger type of any given latent (see discussion in Part V.C.1), we should expect that *many*, if not most, false positive errors would be to the correct finger type. Wertheim et al. themselves note that “This type of error, though deemed clerical, could have a serious impact in the case, as it incorrectly associates an individual with the case who otherwise could have been excluded.”¹⁴⁴ As they understate it, “the consequences of an undiscovered clerical error could potentially be quite serious.”¹⁴⁵ Only two such errors occurred in Wertheim et al.’s data set; apparently both met the criterion of bearing a gross pattern type that is inconsistent with the true donor finger. This allows Wertheim et al. to argue, plausibly, that, although these errors, in casework, would falsely implicate innocent individuals, the errors would likely be detected upon reexamination, either through the “verification” process or through defense review, because of the inconsistency of pattern type. As noted

¹⁴⁴ Wertheim et al., *supra* note 124, at 69.

¹⁴⁵ *Id.*

above, it is not clear whether the same can be said of the twenty-one such errors that occurred on the CTS test because it is not clear whether the pattern types are inconsistent in all twenty-one cases.

Perhaps then, “right-finger-wrong-person” errors should not be considered “clerical errors” at all. If both the “palms” cases and the “right-finger-wrong-person” errors are removed, then only 51 of the 174 false positives (around thirty percent) are explained by “clerical error” (Table 6).

This analysis shows that even if the notion of “clerical error” is taken at face value it hardly eliminates the problem of false positives occurring on latent print proficiency tests. However, we must also ask whether Langenburg et al.’s approach to categorizing false positives as “clerical errors” is appropriate in the first place. At one level, of course, an error is an error. If a latent print examiner reports that an individual (or a finger) made a latent print when that individual (or finger) did not, in fact, make the latent print, it is of little consequence to that individual, or to the causes of truth or justice, whether the error was “clerical” or otherwise. The *Cowans* case is a case in point.¹⁴⁶ Even if it is true that a victim’s fingerprint card was mislabeled with Cowans’s name and the latent bore no resemblance to any of Cowans’s fingerprints, the fact of the matter is that the process of latent print analysis produced false evidence, evidence which *because of the presumed infallibility of latent print evidence* would not have been reexamined were it not for the fortuitous recovery of DNA evidence from the crime scene. In this sense, “clerical errors” are of no less consequence than “true” errors, and the attempt to remove “clerical errors” from the category of false positives amounts to what Professor Koehler has called a “sinister semantic game.”¹⁴⁷

On the other hand, Wertheim et al. surely have a point when they argue that when erroneous attributions are made to an exemplar that bears an inconsistent gross pattern type, such errors are more likely to be detected by either “verification” or defense review. Indeed, their own study musters some evidence that “verification” does indeed catch such errors. Wertheim et al. submitted fifty “clerical errors” to “verifiers,”

¹⁴⁶ See *supra* Part I.

¹⁴⁷ See Koehler, *supra* note 134 and accompanying text.

and verifiers caught forty-nine of them.¹⁴⁸

This result is impressive, but, at the same time, two percent of the “clerical errors” were *not* caught.¹⁴⁹ In addition, if we again assume that the *Cowans* case was a “clerical error,” it shows that in at least one real-world case neither “verification” nor defense review detected the supposedly obvious error. The Cowans identification was made in 1997, hardly the “dark ages” of latent print analysis.

Another way of looking at the “clerical error” rate findings is that, even if the notion of “clerical error” diminishes the apparent “true false positive” problem, it substitutes one problem for another. Wertheim et al.’s finding of a one percent “clerical error” rate, even if taken at face value, is actually rather high. Given the volume of fingerprint work currently being conducted in fingerprint laboratories, clerical errors in one percent of all cases would in fact generate numerous problems.¹⁵⁰

But perhaps the most fundamental problem with the notion of “clerical errors” concerns the redefinition of test results that are to be considered “correct” and “incorrect.” Readers may already have an intuitive sense that Langenburg’s argument constitutes changing the rules after the game has already begun. On a test on which it was presumably understood at the outset that there was only one answer that would be scored “correct,” the true donor finger or palm, and all other responses scored “incorrect,” Langenburg has now posited new rules under which numerous responses can be considered, if not “correct,” at least not “incorrect.” In other words, even leaving aside the issue of possible “data dredging” (i.e., the selection of categories that should not “count” as errors *after* the data have already been viewed), Langenburg’s willingness to reclassify numerous categories of apparently “incorrect” responses as “not incorrect” or “incorrect but not seriously so” threatens to undermine the value of the tests altogether.

Consider the following: on the 02-516 test used as an example by Langenburg in his presentation,¹⁵¹ there were eleven latent prints which were to be compared to exemplar finger and

¹⁴⁸ Wertheim et al., *supra* note 124, at 83-88.

¹⁴⁹ Wertheim et al.’s post hoc explanation that the verifier who failed to catch the error was inexperienced is inadequate. If Wertheim et al. don’t want to count that verifier’s negative results, they should not count her positive results either.

¹⁵⁰ See Cole, *More Than Zero*, *supra* note 1, at 1034.

¹⁵¹ Langenburg, *Detection Errors*, *supra* note 123.

palm impressions of four individuals. In other words, for each test item (each latent), there were forty-nine possible responses (forty fingers, eight palms, and “none of the above”) only one which was correct. A test-taker who merely guessed at random stood a ninety-eight percent chance (forty-eight out of forty-nine) of being wrong.

Consider what happens when “clerical errors” are introduced. Assuming that the true donor is among exemplars (i.e., that the correct answer is *not* “none of the above,” as was the case in ten of the eleven test items), of the forty-eight incorrect responses, one would no longer be considered incorrect because it could be classified as a “transcription transposition error,” eleven would no longer be considered incorrect because they could be classified as “right-person-wrong-finger, hand or foot” errors, and three would no longer be considered incorrect because they could be classified as “right-finger-wrong-person” errors. Thus, instead of forty-eight possible responses being incorrect, only thirty-three out of forty-nine responses would be considered “incorrect.” Put another way, only thirty-three of the forty-eight “incorrect” responses would be classified as “true false positives” under this scheme. The test-taker’s opportunity to commit a false positive is greatly reduced, and the test’s ability to measure examiners’ ability to avoid false positives has been reduced accordingly. Fully sixteen out of forty-nine possible responses (one third) would be considered either “correct” or “clerical errors”! Under these conditions, a test-taker guessing randomly, instead of having a ninety-eight percent chance of being scored wrong, would have only a sixty-seven percent chance of being scored wrong.

This problem also highlights a weakness of the CTS tests in general: the number of exemplars is quite low. Therefore, the number of potential *confounding prints*, exemplars that are similar enough to the true donor to induce an erroneous attribution, is also presumably quite low. Unless an effort is made to select confounding exemplar, as apparently occurred on the 1995 test (the test which yielded the highest number of false positives) when test-makers used a subject’s identical twin to generate an exemplar,¹⁵² it may be very unlikely that the exemplars contain any prints that are similar enough to the true

¹⁵² Studies seem to indicate the identical twins tend to have “similar,” though not identical friction ridge patterns.

donor to induce a false positive result. This stands in marked contrast to real-world conditions, especially computer aided searches in which computers present latent print examiners with the most similar exemplars that could be found in the database. In other words, the tests may be rather poorly designed for detecting false positives.

The small number of exemplars also raises questions about the value of the “right-person-wrong-finger” designation where the universe of exemplar consists of only four people. In other words, any given false positive has a slightly less than one in four chance of being erroneously attributed *to the true donor* (and thus, according to the “clerical error” concept, discounted as a true false positive)!

This problem is also exacerbated when one considers the very gross pattern type issue raised by Wertheim et al. If four pattern types are considered, populations of fingerprint patterns generally break down to approximately ten percent arches, thirty percent left loops, thirty percent right loops, and thirty percent whorls. Thus, assuming (as likely to be the case in nine out of ten cases) that the true donor is one of the more common pattern types, of the thirty-three potential “incorrect” responses, the examiner should be able to eliminate twenty-three of them simply for bearing an inconsistent gross pattern type. That leaves only ten potentially confounding exemplars, and many of these exemplars may bear little resemblance to the true donor though they share the same gross pattern type. This may constitute a largely overlooked design flaw in the CTS tests, especially in terms of measuring an error rate for cases, such as Mayfield, in which an Automated Fingerprint Identification System (“AFIS”) selects candidates from a database because they closely resemble the unknown latent print.

C. NEW DEVELOPMENTS IN EXPOSED MISATTRIBUTIONS

In addition to the new case discussed above, there have been some interesting developments in some of the already documented cases that further inform us about the prevalence and causes of wrongful conviction by fingerprint.

1. *McGee Case*

Perhaps the most drastic development is that it turns out

that the case that I reported as having falsely implicated Martin Blake¹⁵³ actually implicated a man named Terry McGee. Through a mix-up of information, I reported the wrong name of the defendant in this case.¹⁵⁴ But additional informative facts about this case were also learned.

Specifically, whereas based on insufficient information, I had previously conservatively reported that the misattribution had been attested to be only one examiner, it turns out that it was, in fact, attested to by four examiners.¹⁵⁵ Not only that, but the identities of those examiners are now known, and two of them were IAI-certified examiners.¹⁵⁶ In addition, one of them was Thomas Krupowicz, the author of a textbook on fingerprint identification.¹⁵⁷ He now joins Moses as one of the most prominent latent print examiners to be implicated in a misattribution.

These new facts further inform some of the conclusions I drew in my earlier analysis. They further strengthen my conclusion that “verification” cannot be viewed as a reliable safeguard against misattribution. *McGee* is yet another case in which a misattribution was successfully verified (three times in this case). At the same time, it should be noted that the fifth, sixth, and seventh government analysts to look at the print did detect the misattribution.

These new facts also strengthen my conclusion that IAI-certified examiners are certainly not underrepresented, and perhaps are overrepresented, among examiners implicated in misattributions. With Krupowicz and Booker Washington, the other certified examiner implicated in the *McGee* case, the ratio of certified examiners among all U.S. examiners implicated in misattributions rises slightly, from seven out of twenty-two to nine out of twenty-five. This argument is strengthened when we consider that we are now aware that two of the FBI examiners who participated in the Mayfield misattribution were

¹⁵³ Cole, *More Than Zero*, *supra* note 1, at 1007.

¹⁵⁴ For-gettable Science or For-ensic Science: Wrongful Convictions and Accusations attributable to Forensic Science, at http://www.law-forensic.com/cfr_science_myth.htm#note (last visited Aug. 1, 2006).

¹⁵⁵ Motion *In Limine* to Exclude Palm Print Evidence and Memorandum in Support of that Motion, *People v. Luna*, No. 02-CR-15430 (on file with the author).

¹⁵⁶ *Id.*

¹⁵⁷ See THOMAS E. KRUPOWICZ, FINGERPRINTS: INNOCENCE OR GUILT: THE IDENTITY FACTORS (Terk Books & Publishers 1994).

IAI-certified.¹⁵⁸ This brings the ratio to eleven out of twenty-five. So, rather than saying that “nearly one-third”¹⁵⁹ of American latent print examiners implicated in misattributions were certified, the figure is now closer to forty-four percent. This argument is strengthened still more by the realization that Smith’s “25 to 30 erroneous identifications” during a recent fourteen-year period (*supra* Part V.A) pertain only to IAI-certified examiners. Again, we are left with two unpalatable explanations. It is possible that certified examiners commit errors at a higher rate than uncertified examiners, perhaps due to overconfidence in their own abilities. If this is the case, then certification, counterintuitively, increases the likelihood of error. The more intuitive position is that certified examiners, who presumably possess, as a general matter, greater skills, commit errors at a lower rate than uncertified examiners. If this is the case, then both my study and Smith’s report drastically underestimate the prevalence of misattribution. If this hypothesis is correct, for example, then the number of errors committed by *uncertified* examiners during the fourteen year period of Smith tenure on the Latent Print Certification Board should be equal to or greater than the number committed by certified. Thus, the total number of misattributions, committed by all examiners, both certified and uncertified, that occurred during that fourteen year period should be at least double, and possibly several times, the “25 to 30” reported by Smith.

On a more visceral level, the involvement of Krupowicz, who literally “wrote the book” on fingerprints, adds further weight to the conclusion that even the profession’s best are not immune from error, and may in fact be more vulnerable to it.¹⁶⁰

The *McGee* error is also informative of some of the fundamental scientific problems with latent print individualization itself. After the misattribution was exposed and McGee was released, investigation of the murder continued.¹⁶¹ Investigators

¹⁵⁸ IAI, *supra* note 102.

¹⁵⁹ Cole, *More Than Zero*, *supra* note 1, at 1024.

¹⁶⁰ I should say again here, as I have said elsewhere, that I do not criticize latent print examiners for making errors. I criticize them for denying that they make errors or trying to minimize the significance of error before fact-finders by claiming that latent print individualization is “infallible” or that its error rate is zero. See Cole, *More Than Zero*, *supra* note 1.

¹⁶¹ Motion *In Limine* to Exclude Palm Print Evidence and Memorandum in Support of that Motion, *People v. Luna*, No. 02-CR-15430 (on file with the author).

eventually generated another suspect, Juan Luna.¹⁶² Another latent print was then attributed to Luna's palm.¹⁶³ Luna is mounting a vigorous challenge to this evidence. This latent print is particularly interesting because it is so fragmentary that it appears the examiners were not certain from which anatomical area of friction ridge skin the print originated. At various times, the print was searched in the local database as a fingerprint, a palm print, and an impression of what is called a "remote finger area" (the medial and proximal phalanges of the fingers – the areas below the distal phalange, which is the most commonly the source of what are generically called "fingerprints").¹⁶⁴ Certainly, these multiple searches demonstrate that the examiners could not determine the anatomical point of origin with certainty.

Latent print examiners claim to be able to infer the anatomical point of origin of latent prints, even down to the finger type (i.e., right ring finger), from certain latent prints. This claim has some plausibility for latent prints that are relatively large in area and high clarity, but latent print examiners would presumably concede that the claim would not necessarily hold for all latent prints, even for all latent prints "of value." The ability of latent print examiners to correctly determine the anatomical point of origin from a latent print is yet another of their claims that remains unmeasured and untested. But from a scientific point of view, the more interesting story concerns how one should think probabilistically about evidence that derives from a mark whose anatomical point of origin is not *a priori* determinable. This is particularly interesting in light of latent print examiners' institutionally mandated claim of "individualization;" the claim that, when they make a source attribution, all fingers in the universe have been eliminated as donors.¹⁶⁵ If this claim is taken seriously, it would be a staggering task. As the Interpol European Expert Group on Fingerprint Identification ("IEEGFI") has noted, it effectively demands eliminating sixty billion fingers as potential donors of

¹⁶² *Id.*

¹⁶³ *Id.*

¹⁶⁴ *Id.*

¹⁶⁵ See SWGFAST, Standards for Conclusions, version 1.0 (Sep. 11, 2003), available at http://www.swgfast.org/Standards_for_Conclusions_ver_1_0.pdf (last visited Aug. 1, 2006).

each latent print.¹⁶⁶ This, as I have argued elsewhere, is a preposterous claim, unsupported by data or evidence.¹⁶⁷ But even if this claim is taken at face value, the Luna print shows that, *for some marks*, the potential donor pool is *even larger* than the approximately sixty billion fingers on the current world's population.¹⁶⁸ In the case of the McGee/Luna mark, the potential donor pool includes sixty billion fingers *plus* approximately twelve billion palms (which comprise a larger area than a single finger) plus approximately 108 billion remote finger areas.¹⁶⁹ Scientifically speaking, the fact that the anatomical origin of the latent print is not *a priori* determinable vastly enlarges that potential donor pool.

The IEEGFI emphasizes that if the claim of individualization is to be taken seriously, latent print examiners must implicitly estimate the rarity of the features present in a latent fingerprint relative to the totality of the friction ridge detail that appears on the world's sixty billion fingers *in each case*.¹⁷⁰ Since examiners have not seen all sixty billion fingers, they are expected to extrapolate this totality of friction ridge detail based on training and experience.¹⁷¹ In other words, based on the fingers that they *have* seen, examiners are expected to extrapolate an imagined population of sixty billion fingers, based on the variability of friction ridge skin in the much smaller universe of fingers that they have actually seen, and then estimate the rarity of the features in each latent print within that population. Again, the ability of anyone, let alone a latent print examiner, to make such an extrapolation, strikes me as highly implausible.¹⁷² However, according to IEEGFI, a group

¹⁶⁶ Interpol European Expert Group on Fingerprint Identification II, Method for Fingerprint Identification, 1, 29 (2004) [hereinafter IEEGFI II], available at <http://www.interpol.int/Public/Forensic/fingerprints/WorkingParties/IEEGFI2/IEEGF2.pdf> (last visited Aug. 1, 2006).

¹⁶⁷ William C. Thompson & Simon A. Cole, *Psychological Aspects of Forensic Identification Evidence*, in EXPERT PSYCHOLOGICAL TESTIMONY FOR THE COURTS 31 (Costanzo et al. eds., 2007) [hereinafter Thompson & Cole, *Psychological Aspects*].

¹⁶⁸ IEEGFI II, *supra* note 166, at 117.

¹⁶⁹ Most individuals have eighteen "remote finger areas," two on each finger and one on each thumb.

¹⁷⁰ IEEGFI II, *supra* note 166, at 29.

¹⁷¹ Thomas J. Ferriola, *Scientific Principles of Friction Ridge Analysis & Applying Daubert to Latent Fingerprint Identification*, available at <http://www.clpex.com/Articles/ScientificPrinciplesbyTomFerriola.htm> (last visited Aug. 23, 2006).

¹⁷² See Thompson & Cole, *Psychological Aspects*, *supra* note 167.

of forensic practitioners convened in order to describe a “scientific” methodology of latent print analysis, this is what must be done.¹⁷³ The point here is that the enlargement of the donor pool in response to the realization that it is not limited to the world’s fingers should, in theory, necessitate a revision of the implicit calculations described by IEEGFI.

Yet in the *Luna* case, there is no sign of any such revision. There is no sign that the examiners took this enlargement of the donor pool into account or that they even noted that it had occurred and had implications for the claim of “individualization.” The fact that the mark is of this nature appears to have had no impact on the value they attach to their finding it consistent with Luna’s known print or their confidence in testifying that Luna made it. What this suggests, of course, is that the IEEGFI methodology is very likely a myth, or at least an idealization, and that latent print examiners do not actually in any serious way consider the size of the donor pool when reaching conclusions of “individualization.”

2. *McKie Case*

The ongoing saga of the Shirley McKie case, probably the most convoluted of the misattribution cases, continues. The Scottish Criminal Records Office (“SCRO”) allegedly misattributed *two* marks in a single murder investigation.¹⁷⁴ One was attributed to police officer Shirley McKie, who was acquitted of perjury charges for allegedly entering a crime scene she had been ordered not to enter.¹⁷⁵ The second was attributed to David Asbury, who was convicted of murder.¹⁷⁶ Both attributions were attested to by the same four SCRO examiners, and both allegedly contained the requisite sixteen matching “points of identification” required in the United Kingdom at that time.¹⁷⁷

The *McKie* case has an extensive history, due in part to McKie and her father Iain’s refusal to drop the matter of the misattribution until a full inquiry has been held. The Scottish

¹⁷³ See IEEGFI II, *supra* note 166.

¹⁷⁴ *Murder Appeal After Print Error*, BBC NEWS, Aug. 17, 2000, available at http://news.bbc.co.uk/2/hi/uk_news/scotland/884895.stm (last visited Aug. 1, 2006).

¹⁷⁵ *Id.*

¹⁷⁶ *Id.*

¹⁷⁷ *Id.*

government has issued a report but resisted a full inquiry.¹⁷⁸ Currently, the Scottish Parliament is conducting a further inquiry. The scandal now threatens to even involve the Lockerbie investigation. It was recently alleged that the FBI asked the American examiners who testified on McKie's behalf, David Grieve and Pat Wertheim, to keep quiet about the case so as not to jeopardize the Lockerbie prosecution.¹⁷⁹

The misattribution is also particularly interesting because it remains a case in which qualified examiners disagree about the ultimate attribution of the print to McKie. (Less is known about the print attributed to Asbury.) Thus, while the bulk of world opinion, at least as evidenced by Internet comments, has generally supported McKie and the American and British examiners who testified on her behalf, several credentialed British examiners have supported the SCRO's conclusion.¹⁸⁰

The case has also taken several turns. In October 2004, seven years after the misattribution, it was revealed that five examiners within the SCRO had disputed the attribution of the mark to McKie, a fact that was never disclosed to McKie.¹⁸¹ No sooner had this news broken, than it was discovered that McKie's initial expert, Peter Swann, had agreed with the SCRO's attribution.¹⁸² Thus, in a surprising turn of events, government experts supported the defendant's view of the evidence, and defense experts supported the government's view.

What made this particularly intriguing was that, viewed through the *McKie* case, fingerprint errors became not so much misattributions as comparisons about which qualified examiners can disagree. What makes this particularly explosive is that, in addition to the claim that misattributions are so rare

¹⁷⁸ Ass'n of Chief Police Officers in Scotland, *Report of the Scrutiny of the SCRO Fingerprint Bureau and Structure of the Scottish Fingerprint Service* (Oct., 2000), available at <http://www.scottish.police.uk/main/campaigns/interim/report.pdf> (last visited Aug. 1, 2006).

¹⁷⁹ Eddie Barnes, *Cover-up, Conspiracy and the Lockerbie Bomb Connection*, SCOTSMAN, Feb. 19, 2006.

¹⁸⁰ Letter from David A. Russell, Towells Solicitors, to Colin Boyd, Lord Advocate, Crown Office (Apr. 28, 2005) [hereinafter Russell Letter], available at <http://shirleymckie.com/documents/LetterRussellversion.pdf> (last visited Aug. 1, 2006); Malcolm Graham, *Your Comments on Fingerprints on Trial*, BBC NEWS, May 19, 2002, available at <http://news.bbc.co.uk/1/hi/programmes/panorama/1997258.stm> (last visited Aug. 1, 2006).

¹⁸¹ *McKie v. Strathclyde Joint Police Board*, A4960/01 (Sess. 2003).

¹⁸² Russell Letter, *supra* note 180, at 6.

that they can be effectively ignored, latent prints dogma also holds that it is not possible for qualified latent print examiners to disagree about the origin of a mark. It is not entirely clear what leads latent print examiners to believe this unlikely proposition,¹⁸³ but the *McKie* case clearly shows that it is not true. It has led, however, to seemingly surreal statements like the following:

In the UK, I encountered a situation I knew existed, but did not realize was so active. The situation involves opinions and actions surrounding the Scottish Criminal Records Office's erroneous Shirley McKie fingerprint identification. There are growing camps in the UK on BOTH sides of the fence regarding identity and nonidentity of this print. In fact, at the time of my attendance of the Fingerprint Society meeting in Oxford, there was a retired independent (private) examiner traveling the UK presenting the McKie print as an identification. I have firsthand knowledge of this because this individual showed me several poster-sized demonstrations containing many depictions of the latent and known print drawn up as if they matched. I informed the gentleman of my position regarding the nonidentity of the print, and further articulated my position that, in the field of latent prints, it is impossible to have opposite opinions based on the same evidence. We allow for three possible conclusions: The prints were made by the same person, the prints were not made by the same person, and I don't know. He reported that I was the first person to question the charts and to state that he was incorrect. I explained that it was my pleasure to do so, and we parted on decent terms. I did not share my viewpoints as representative of the IAI.¹⁸⁴

In other words, an expert who disagrees with another expert believes it is "impossible" for experts to disagree. This apparent paradox is also visible in the outrage that followed a report by head of the Scottish Fingerprint Service, Euan Innes, that held that fingerprint attributions were "opinions."¹⁸⁵ The latent print community, supporters of the McKie's, opponents of the government, and others treated this statement as heresy.

¹⁸³ Cole, *Witnessing Identification*, *supra* note 92.

¹⁸⁴ Kasey Wertheim, *2002-2003 Report from the Science and Practice Committee*, 53 J. FORENSIC IDENTIFICATION 603 (2003).

¹⁸⁵ Euan Innes, *FP Identification - Opinion or Fact*, 1 (Nov. 2005).

Doubtless, it was little more than a bureaucratic response intended to defuse blame for the shameless treatment of McKie and unconscionable efforts at cover-up. But, in a scientific sense, Innes had a point. Latent print attributions *are* matters of opinion, and the McKie case shows it.

Another twist in the case occurred when at least one of the staunchest defenders of the SCRO from outside the organization abruptly switched sides, and declared that the attribution was erroneous.¹⁸⁶ Malcolm Graham reportedly sent a letter to Iain McKie “apologizing for his ‘terrible mistake.’”¹⁸⁷ This is an astonishing turn of events, given the vehemence with which Graham had defended the attribution.¹⁸⁸

The position of Peter Swann, McKie’s first defense expert, is less clear. Swann, like Graham, had defended the attribution in the strongest possible terms and had leveled serious charges at the McKies.¹⁸⁹ Although one newspaper reportedly got Swann to admit “that he fundamentally disagrees with the SCRO’s method of analyzing the fingerprint,”¹⁹⁰ at the recent Parliamentary hearing it appeared that Swann was sticking to the attribution, and he accused the McKies of trying to “gag” him.¹⁹¹ At the same hearing, the four SCRO examiners also stuck to the attribution and claimed that ten SCRO examiners had corroborated that conclusion.¹⁹²

3. *Mayfield Case*

New information has also been forthcoming about the sensational *Mayfield* case. The *Mayfield* case has prompted the most extensive review of any exposed latent print misattribu-

¹⁸⁶ Liam McDougall, *Key Experts Undermine Lord Advocate's McKie Decision*, SUNDAY HERALD, Mar. 5, 2006 [hereinafter McDougall], available at <http://www.sundayherald.com/54473> (last visited Aug. 1, 2006).

¹⁸⁷ *Id.*

¹⁸⁸ Cole, *More Than Zero*, *supra* note 1, at 999.

¹⁸⁹ Russell Letter, *supra* note 180, at 6.

¹⁹⁰ McDougall, *supra* note 186.

¹⁹¹ Louise Gray, *MSPs Told of Claim Officer Let McKie into Crime Scene*, SCOTSMAN, May 18, 2006; Tom Gordon, *McKie Fingerprint Four Defend Stance on Identification*, THE HERALD, May 18, 2006, available at <http://www.theherald.co.uk/news/62188-print.shtml> (last visited Aug. 1, 2006).

¹⁹² Michael Howie, *Print Experts Defend Role in McKie Case*, SCOTSMAN, May 31, 2006.

tion, surpassing even the *McKie* case.¹⁹³ An international review panel issued several reports that still have not been made public, although an FBI-authored “synopsis” of them has.¹⁹⁴ The FBI also convened seven internal review teams that investigated different areas and completed reports.¹⁹⁵ Only one of these reports appears to have been made public, a review of scientific problems concerning latent print identification.¹⁹⁶ The most extensive source of information on the *Mayfield* case is a report issued by the Department of Justice’s Office of the Inspector General (“OIG”).¹⁹⁷

The OIG report contains a number of interesting insights into the *Mayfield* case. Perhaps most relevant to our purposes here is a factor that plays a rather minor role in the report; the fact that we know about the Mayfield misattribution at all.¹⁹⁸ The report details that the FBI put Mayfield under covert surveillance in response to its attribution of the Madrid latent to him.¹⁹⁹ A media leak in Europe and the realization that the story of the attribution would soon be published forced the FBI to apprehend Mayfield sooner than they wished out of fear that he would flee.²⁰⁰ The apprehension of Mayfield based on latent print evidence generated press coverage; thus, when Mayfield was exonerated the error of the attribution was publicly aired. It is quite conceivable that, absent the media leak, the public would not be aware that the Mayfield misattribution even occurred. Had the error of the attribution been resolved internally, there is no reason to believe that it would have been publicly reported. As noted above, there is no formal mechanism for such reporting. Indeed, had the media leak not forced the FBI to issue the affidavit stating that the Madrid latent was a

¹⁹³ See generally, Stacey, *supra* note 77; see also Cole, *More Than Zero*, *supra* note 1, at 985-87, 1016.

¹⁹⁴ Stacey, *supra* note 77.

¹⁹⁵ OIG REPORT, *supra* note 111, at 195.

¹⁹⁶ See Bruce Budowle et al., *Review of the Scientific Basis for Friction Ridge Comparisons as a Means of Identification: Committee Findings and Recommendations*, 8 Forensic Science Communications 1 (2006), available at http://www.fbi.gov/hq/lab/fsc/backissu/jan2006/research/2006_01_research02.htm (last visited Aug. 1, 2006).

¹⁹⁷ OIG REPORT, *supra* note 111.

¹⁹⁸ *Id.*

¹⁹⁹ *Id.* at 2.

²⁰⁰ *Id.* at 19-20, 40-41.

“100 percent identification” to Mayfield,²⁰¹ the FBI might well have considered the Mayfield error more akin to an error that is caught before leaving the laboratory through the “verification” process than a true erroneous individualization. Reports indicate that the FBI has committed several such errors in the past and that they have never been publicly reported.²⁰²

So perhaps the most important thing to keep in mind about the *Mayfield* case is that we are lucky that we even know about it at all. Once again, this speaks to the great danger of assuming that actual erroneous identifications are limited to exposed erroneous identifications. But our awareness of the Mayfield misattribution is also important because of the significance that the FBI’s claim of being error-free has taken on in the legal rulings on the admissibility of latent print evidence. In one of the best-known admissibility rulings on latent print individualization, the court grounded its claim that the error rate of latent print individualization was not “unacceptably high” on the testimony of an FBI examiner, who stated that the FBI was not involved in any exposed erroneous individualizations.²⁰³ Treating practitioners’ lack of awareness of their own errors as evidence of the non-occurrence of such errors was poor enough reasoning at the time, but the interesting thing is that the claim was falsified within only two years.²⁰⁴ However, had the Mayfield error not been public, the FBI would presumably still be testifying that its practice is error free, and courts would still be treating such assertions as a trustworthy evidence that FBI practice actually is error free. Since May-

²⁰¹ See, e.g., Sarah Kershaw & Eric Lichtblau, *Spain Had Doubts Before U.S. Held Lawyer in Madrid Blasts*, NEW YORK TIMES, May 26, 2004, at A1; David Feige, *Printing Problems: The Inexact Science of Fingerprint Analysis*, SLATE (May 27, 2004), available at <http://slate.msn.com/id/2101379> (last visited Aug. 1, 2006).

²⁰² OIG REPORT, *supra* note 111, at 124.

²⁰³ *Llera Plaza*, 188 F. Supp. 2d at 566.

²⁰⁴ The fortuity of the timing on this issue is given added salience by other crucial timing issues that may have impacted the courts’ dispositions on latent print admissibility challenge. First, as described by the court in *United States v. Mitchell*, 365 F.3d 215, 255 (3d Cir. 2004), the government may have delayed the release of a scientific grant solicitation that acknowledged the need for validity testing of latent print individualization until after it successfully defended the admissibility challenge in that case. Second, Pamela A. MacLean, *War of the Whorls*, NAT’L L. J. (2006), notes that publication of a review of “potentially questionable fingerprint analysis” by a Bureau of Alcohol Tobacco and Firearms examiner was delayed for thirteen months “at a critical time in 2004, when the scientific reliability of fingerprint analysis in general was under intense scrutiny.”

field now tells us that, although the testimonial claims were truthful, the conclusion drawn from them was in fact false, this is a disturbing thought.

One of the principal areas of speculation concerning the *Mayfield* case was whether the “suspicious facts” about Mayfield, principally his religious preference and his somewhat peripheral association with known terrorist conspirators, penetrated the laboratory analysis.²⁰⁵ The OIG report concludes that these facts did not influence the initial attribution of the Madrid latent to Mayfield, but that they may have helped solidify the examiners’ opinions once the attribution had been made.²⁰⁶

The OIG report also contained extensive findings on an issue of importance to us here: the cause of the Mayfield misattribution.²⁰⁷ The FBI synopsis of the international review panel’s work had identified “the inherent pressure of working an extremely high-profile case”²⁰⁸ as a principal cause of the misattribution. I was skeptical of this explanation,²⁰⁹ noting that the FBI synopsis did not support it with any actual evidence of pressure of any kind. The OIG report dismisses this explanation as well.²¹⁰ In my previous discussion of the *Mayfield* case, I discussed two possible causes of the misattribution: confounding prints and confirmation bias.²¹¹

First, I suggested that, given that the Madrid latent might be one of the most widely searched latent prints of all time, it was not unreasonable to imagine that the totality of databases searched might contain at least one image of friction ridge skin that though by no means identical to the area of Daoud’s friction ridge skin (now believed to be the true source of the latent) that apparently did leave the Madrid latent, is nonetheless similar enough in a small area that the Madrid latent could be attributed to it.²¹² The OIG report endorses this explanation, citing “the unusual similarity of the prints” as the principal

²⁰⁵ See OIG REPORT, *supra* note 111, at 11-12, 18-19.

²⁰⁶ *Id.*

²⁰⁷ See OIG REPORT, *supra* note 111.

²⁰⁸ Stacey, *supra* note 77, at 713.

²⁰⁹ Cole, *More Than Zero*, *supra* note 1; William C. Thompson & Simon A. Cole, *Lessons from the Brandon Mayfield Case*, 29 THE CHAMPION 42, 43 (2005).

²¹⁰ OIG REPORT, *supra* note 111, at 177-78.

²¹¹ Cole, *More Than Zero*, *supra* note 1.

²¹² *Id.*

cause of the error.²¹³ The OIG report, describes the similarity of Mayfield and Daoud's friction ridge skin as "an extremely unusual event."²¹⁴ Here, however, the OIG report goes too far. It offers no basis to assume that this is an extraordinary occurrence. Since no studies have been done measuring the extent of variability of friction ridge skin formations, there is no way of assessing how unusual this occurrence would be. Again, it should be emphasized that if anything is unusual about the Madrid latent, it is probably the extent to which it was searched in a large number of international databases. It is quite possible that many, or any, latent(s) of comparable size and clarity to the Madrid latent would, if searched as extensively as the Madrid latent, yield one or more confounders. Indeed, the similarity of a small area of Mayfield's friction ridge skin to the area that apparently produced the Madrid latent, suggests that were all the world's friction ridge skin to be searched it would not be surprising to find a number of individuals with areas of friction ridge skin to which it could be attributed. The number of such individuals is, of course, precisely the piece of information that we need to know, an empirical question that latent print examiners answer with the simplistic, unsupported, and implausible claim of "individualization."

Unlike the other reports on the *Mayfield* case or the report on the *McKie* case, the OIG reports goes into great detail on what led the examiners to their erroneous conclusions. Indeed, the report notes that the lack of documentation that is routine to latent print practice imposed severe limitations on the ability to reconstruct the process that led to the erroneous individualization.²¹⁵ It is simply impossible to reconstruct what the examiners saw and when, given the current documentation practices. Hence, one of the OIG's chief recommendations for reform is for improved documentation.²¹⁶

Nonetheless, based on what it was able to reconstruct, the OIG report reveals that one of the crucial causes of the error was the explaining away of discrepancies between the Madrid

²¹³ OIG REPORT, *supra* note 111, at 130.

²¹⁴ *Id.* at 136.

²¹⁵ *Id.* at 13-14.

²¹⁶ *Id.* at 201.

latent and the Mayfield exemplar print.²¹⁷ The “one-dissimilarity doctrine” holds that any genuine dissimilarity between a latent print and an exemplar is necessary and sufficient grounds for excluding the exemplar as the source of the latent.²¹⁸ The doctrine lacks teeth, however, because there are no clearly articulated rules for distinguishing a “genuine” from a spurious dissimilarity. Instead, examiners are expected to determine the genuineness of dissimilarities, based solely on training and experience.²¹⁹ Thornton noted long ago that as the number of “similarities” accumulates, the examiner becomes decreasingly likely to consider a dissimilarity to be “genuine.”²²⁰ The *Mayfield* case seems to uncannily fulfill Thornton’s prediction. Examiners apparently treated numerous dissimilarities, that with the benefit of hindsight seemed quite glaring, as spurious, apparently influenced by their conviction that the amount of detail that was *consistent* rendered different origins for the print so unlikely as to be impossible. This is another form of confirmation bias in which, with each finding of a “similarity” examiners bias themselves against treating any dissimilarities as genuine.²²¹ This illustrates a further danger of the doctrine of “individualization;” not only is the claim itself unsustainable, but the latent print analysts who believe in the doctrine are apt, once they have observed a certain number of similarities, to believe that it would be impossible for the prints to come from different sources.²²² They are, therefore, extremely likely to attribute any perceived difference to “distortion.” The result is an asymmetry in the importance the analysts accord consistent and inconsistent ridge detail. As the OIG report noted, in the Madrid latent,

Some of these shapes arguably corresponded with shapes in the Mayfield known prints; they were marked as similarities. Many other shapes in the latent print do *not* correspond to the Mayfield known prints, but there is no evidence that

²¹⁷ *Id.* at 6-13.

²¹⁸ See John I. Thornton, *The One-Dissimilarity Doctrine in Fingerprint Identification*, 306 INT’L CRIM. POLICE REV. 89 (1977).

²¹⁹ Ferriola, *supra* note 171.

²²⁰ Thornton, *supra* note 218.

²²¹ OIG REPORT, *supra* note 111, at 144; Cole, *More Than Zero*, *supra* note 1, at 1058 (making precisely this point).

²²² See Thornton, *supra* note 218.

these differences in appearance were treated as important enough to require explanation. They were apparently attributed to the variability in appearance that occurs in any transfer of detail from 3-dimensional friction ridges into a 2-dimensional latent print under uncontrolled conditions. This selective “cherry-picking” of only those Level 3 details that seemed to support the identification, while dismissing all Level 3 differences elsewhere in the print, falls short of “fair reasoning.”²²³

Perhaps most egregious in this regard was the upper left quadrant of the latent print, which showed numerous inconsistencies with Mayfield’s prints.²²⁴ The FBI examiners posited that this portion of the print was not, in fact, contiguous with the rest of the latent and that it represented a “double touch,” either by another individual or another portion of Mayfield’s friction ridge skin.²²⁵ Thus, they concluded that the Madrid latent print was a collage of at least two different impressions of friction ridge skin.²²⁶ With the benefit of hindsight, the OIG’s expert consultants contended that this explanation strained credulity.²²⁷ Most importantly, most of the ridges *were* contiguous between the two prints, forcing the examiners to posit the relatively unlikely explanation that the two touches had accidentally lined up perfectly in such a way as to make the ridges appear contiguous (Fig. 1, Section A).

²²³ OIG REPORT, *supra* note 111, at 153.

²²⁴ *Id.* at 164.

²²⁵ *Id.* at 156-66.

²²⁶ *Id.*

²²⁷ *Id.* at 164-66.

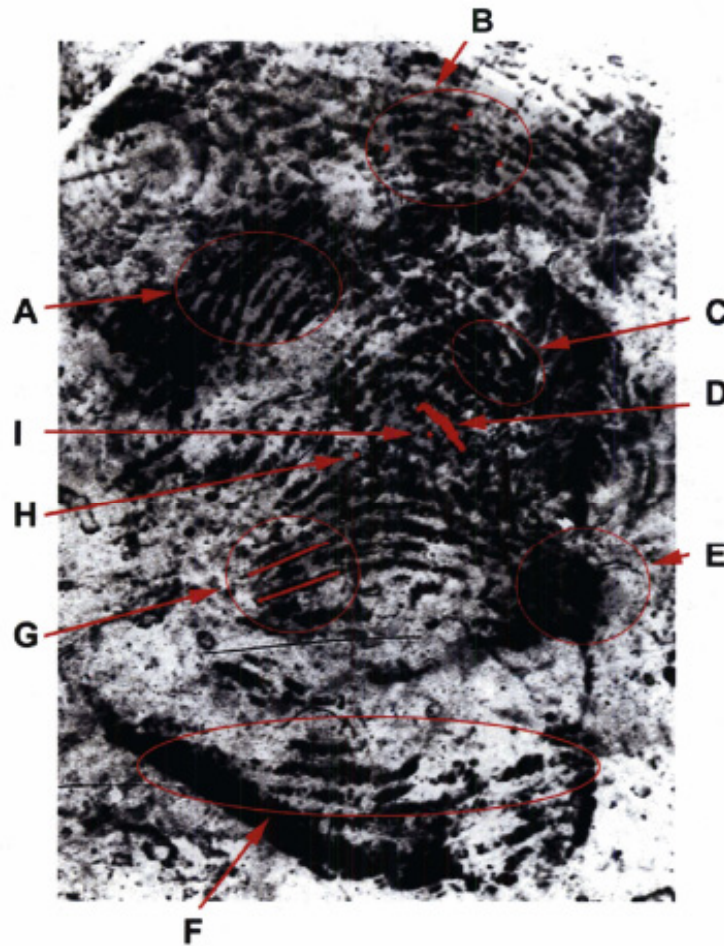


Figure 1. Differences in appearance between LFP 17 and Mayfield Exemplar. *Source:* Department of Justice Office of the Inspector General.

The hindsight with which the OIG consultants' conclusions were reached must be emphasized. The OIG consultants knew that the Madrid latent had been attributed to Daoud by all professional examiners who had previously examined that print, that Daoud was a far more plausible suspect than Mayfield,²²⁸ and that Mayfield had been released with an official apology by

²²⁸ Simon A. Cole, *Brandon Mayfield, Suspect*, in *SUSPECT 172* (Knechtel ed., 2005).

the FBI.²²⁹ However contrived the FBI examiners' explanation for the dissimilarities may have appeared *in this context* to the consultants, we cannot necessarily conclude that they would not have found it convincing in a different context. Indeed, reviewers ("verifiers") within the FBI *and* the independent consultant apparently did find the FBI examiners' explanation convincing. Thus, we cannot assume that such contrived explanations will be detected as such by either "verifiers" or even defense consultants. No figures are available on how often such contrived explanations are detected and withdrawn through verification or defense review. The crucial question, then, becomes how many *unexposed* erroneous individualizations have been based on similarly contrived explanations of apparent dissimilarities?

There has been a great deal of debate within the latent print community over the use of so-called "third level detail."²³⁰ "Third level detail" was posited by Ashbaugh to make the scientifically defensible point that "points of similarity" or "ridge characteristics" ("second level detail") did not necessarily represent the totality of potentially identifying (or exclusionary) information in a latent print.²³¹ The location of pores, curves in contiguous ridges, and even the shapes of ridges, Ashbaugh suggested, also conveyed potentially identifying information.²³² Gradually, the profession came to accept and even embrace Ashbaugh's argument, and, by the time of the first legal admissibility challenge to latent print evidence under *Daubert v. Merrell Dow*,²³³ witnesses testified confidently about the three "levels" of detail. Even so, some misgivings remained within the profession. It was noted that there was far less evidence concerning the rarity, individuality, and even the consistency of appearance ("permanence") of third level detail.²³⁴

The OIG report details that apparently consistent third

²²⁹ OIG REPORT, *supra* note 111, at 81-82.

²³⁰ See DAVID R. ASHBAUGH, QUANTITATIVE-QUALITATIVE FRICTION RIDGE ANALYSIS: AN INTRODUCTION TO BASIC AND ADVANCED RIDGEOLOGY (CRC Press 1999).

²³¹ *Id.*

²³² *Id.*

²³³ *Daubert v. Merrell Dow*, 516 U.S. 869 (1995).

²³⁴ John Thornton, *Setting Standards in The Comparison and Identification*, Address at the 84th Annual Training Conference of the California State Division of IAI (May 9, 2000), available at <http://www.latent-prints.com/Thornton.htm>; Dusty Clark, *What Is the Point?* (1999), available at http://www.latent-prints.com/id_criteria_jdc.htm (last visited Aug. 1, 2006).

level details were used to add value to the correspondences between the section of the latent that did appear to be consistent with Mayfield's inked print, in an apparent attempt to compensate for the inconsistencies in the upper left section.²³⁵ In the OIG's view, this illustrated the danger of relying on third level detail.

D. NEW PSYCHOLOGICAL STUDIES

The FBI synopsis report on the *Mayfield* case was significant in that it adopted the term "confirmation bias" to explain the cascading of the misattribution through the series of checks (verification, second verification, independent review) designed to detect errors.²³⁶ This represented an implicit concession to the argument put forward around two years earlier by Professors Risinger et al. that forensic analysis is prone to confirmation bias, if for no other reason than that psychological research has found that nearly all, if not all, human observational measurements are prone to such bias.²³⁷ I similarly suggested that confirmation bias was a plausible explanation for the Mayfield misattributions.²³⁸

The FBI's concession was quite remarkable, given that latent print individualizations have generally been marketed as being objective matters of fact that would command agreement from all qualified observers. But the contention that latent print individualization is prone to observer effects has now been supported by new empirical evidence derived from a study that cleverly harnessed the notoriety of the Mayfield case for its experimental design.²³⁹

Using a sample of five practicing latent print examiners, drawn from the international latent print community, Professor Dror and colleagues took a latent print from each examiner's completed casework, which had been successfully "indi-

²³⁵ OIG REPORT, *supra* note 111, at 164-66.

²³⁶ Stacey, *supra* note 77, at 713.

²³⁷ See generally 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, 5-6 (2002).

²³⁸ Cole, *More Than Zero*, *supra* note 1, at 1064.

²³⁹ Itiel E. Dror et al., *Contextual Information Renders Experts Vulnerable to Making Erroneous Identifications*, 156 FOR. SCI. INT'L 74 (2006).

vidualized” to the donor of a known print.²⁴⁰ The latent and known pairs were reproduced and re-presented to the examiners with a cover story.²⁴¹ The examiners were told that the prints represented the falsely matched prints from the notorious Mayfield case.²⁴² The subjects were all familiar with the particulars of the Mayfield case, but had not seen the prints from the case.²⁴³ Thus, the examiners were presented with prints that they had previously testified to (or otherwise legally attested to) as “individualizations,” that is, as “positive identifications” made with 100 percent certainty, in a context in which they were manipulated into thinking that many other qualified examiners had concluded that the prints were *not* from a common source.

The results were startling. Only one of the five subjects remained consistent with his or her original conclusion and insisted that the prints were from a common source.²⁴⁴ One examiner changed his or her conclusion to “inconclusive.”²⁴⁵ Three of the five examiners changed their conclusions to “exclusion.”²⁴⁶

The study focuses on changing biasing examiners toward *exclusion*, whereas, in this article, we have principally been concerned with bias toward inclusion. Nonetheless, the study powerfully demonstrates the more fundamental point that latent print conclusions are malleable and susceptible to bias and that latent print analysis, purportedly so objective, in fact appears to be highly sensitive to context. The context to be principally concerned about, of course, is the context of a police investigation in which the examiner is aware that the donor of an inked print is suspected of being the donor of a latent print. Such context may, for example, have been salient in the *Cowans* case.²⁴⁷

In addition, in a subsequent study, Professor Dror and colleagues were able to prompt latent print examiners to change their conclusions from “inconclusive” to “individualization”

²⁴⁰ *Id.* at 75.

²⁴¹ *Id.*

²⁴² *Id.*

²⁴³ *Id.*

²⁴⁴ *Id.* at 76.

²⁴⁵ *Id.*

²⁴⁶ *Id.*

²⁴⁷ *See supra* Part I.

simply by manipulating context, although such switches did not occur as frequently as switches from “inconclusive” to “exclusion” or “individualization” to “inconclusive.”²⁴⁸ Of particular interest is that fact that in one case, an examiner changed his or her conclusion from “individualization” to “exclusion.”²⁴⁹ This would seem to skip over an entire area in the continuum of similarity as conceptualized by latent print examiners (Fig. 2).²⁵⁰

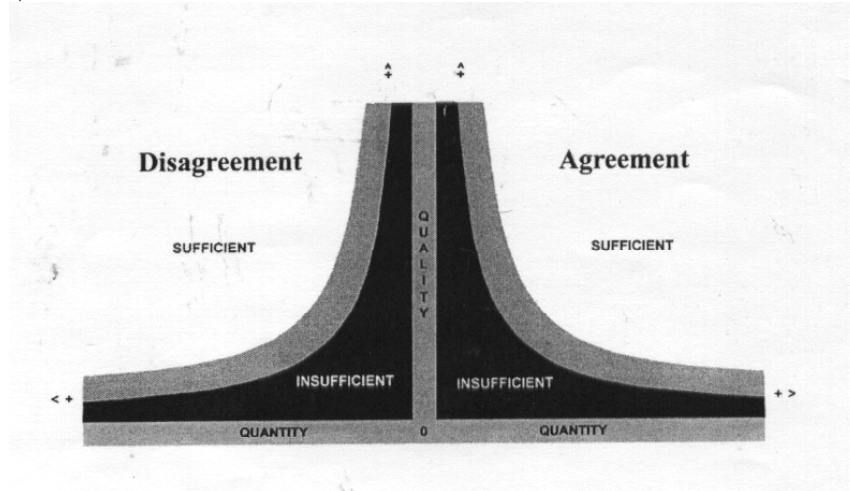


Figure 2. Model of latent print individualization decision-making process. *Source:* John R. Vanderkolk, *ACE+V: A Model*, 54 *J. FORENSIC IDENTIFICATION* 45 (2004).

If we accept latent print examiners’ own conceptualization of the individualization process, it would make sense to imagine that comparisons that lie very close to the boundary between sufficient and the gray area might shift from “individualization” to “inconclusive.” But it would seem quite surprising for comparisons to shift from “individualization” to “exclusion,” effectively “crossing” the entire gray area. And yet, that is precisely what Professor Dror and colleagues found.²⁵¹

²⁴⁸ Itiel E. Dror et al., *Why Experts Make Errors*, 56 *J. FORENSIC IDENTIFICATION* 600, 610 (2006) [hereinafter Dror, *Why Experts Make Errors*], available at <http://www.ecs.soton.ac.uk/~id/JFI%20expert%20error.pdf> (last visited Aug. 1, 2006).

²⁴⁹ *Id.*

²⁵⁰ John R. Vanderkolk, *ACE+V: A Model*, 54 *J. FORENSIC IDENTIFICATION* 45 (2004).

²⁵¹ Dror, *Why Experts Make Errors*, *supra* note 248, at 610.

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VI. CONCLUSION

Our knowledge about both the prevalence and the potential causes of wrongful conviction by fingerprint remains, like our knowledge about the phenomenon of wrongful conviction itself, ultimately obscure. The phenomenon of wrongful conviction by fingerprint is, I have argued, particularly prone to this problem; such cases appear to be very unlikely to become known to the public or to researchers. No matter how much we learn, our knowledge base thus far remains largely anecdotal, potentially vulnerable to dismissal by an endless sequence of *post hoc* “one-off” explanations. We can make reasoned arguments to support our perception that the exposed cases are representative of a significantly larger portion of unexposed. But sadly, those unknowns who have been left behind outnumber the fortunate few and are likely to remain unknown and forgotten, both to justice and to science.