

**When “Certainty”
Is No Longer
An Option**

**Re-Thinking Expert
Interpretation-Based
Forensic Sciences**

By

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Introduction

With the February 2009 release of its report, “Strengthening Forensic Science in the United States: A Path Forward,” the National Academy of Science (NAS), in association with the National Research Council, brought to light the fallacies and imperfections of forensic science. While the report recognized the value of forensics to the law enforcement mission, they were found to “exhibit wide variability with regard to techniques, methodologies, reliability, level of error, research, general acceptability, and published material” (The National Research Council, 2009, Ch. 1 p. 3). In short, forensic sciences were said to be “badly fragmented” and in need of substantial reforms. This issue has been brewing for several years; as you will see, resolution is necessary now.

The Accidental Illumination

In 2005, Congress, at the urging of the Consortium of Forensic Science Organizations, called for a study on the needs of the forensic community (Edwards, 2009, p. 1). The Consortium knew the forensic science community was plagued with serious problems. The Consortium believed the problems were the result of the “one-sided attention” being paid to DNA. At the time, billions of dollars were being pumped into DNA programs, even though they accounted for only “6-7 percent of the forensic services...” (Polski, 2009, p.1).

It could be the Consortium wanted to push for reform. Maybe the Consortium thought if it shed light on the problems plaguing forensics, more funding would be diverted to shore up these labs. Never could the Consortium have expected the study would ultimately reveal there was no compelling scientific research assessing the accuracy of forensic disciplines other than what existed for DNA and drugs (Edwards, 2009, p. 1).

The National Academy of Science acknowledged advances in forensic sciences have great potential to help law enforcement identify criminals. Those same advances, however, revealed “substantive information and testimony based on faulty forensic science analyses may have contributed to wrongful convictions of innocent people” (National Research Council, 2009, Summary p. 3). The NAS report concluded many of the forensic sciences had been given “undue weight derived from imperfect testing...or exaggerated expert testimony.” With many of the forensic sciences claiming findings amounting to “absolute certainty”, and law enforcement’s utilization of such certainty, it is easy to see why the National Academy of Sciences was concerned.

Law Enforcement Response to NAS

The majority response to the NAS report came from associations and organizations representing persons working in the forensic fields. Responses from organizations such as the International Association of Identification (IAI) and the Scientific Working Group on Friction Ridge Analysis, Study and Technology (SWGFAST) agreed in concept to the thirteen recommendations on accreditation and certification, standardized terminology, best practices, enhanced training, proficiency testing and national coordination of these efforts. Interestingly though, one of the largest consumers of forensic science services, criminal justice agencies, remained relatively mute.

The timing of the NAS report, in the midst of a significant economic decline, could explain the lack of commentary. This is unfortunate, as the report contained important information for police managers about the complexities and limitations of forensics, in particular fingerprint evidence, as used in the criminal justice system.

Challenge to Fingerprint Identification

The “modern” recognition of the uniqueness of fingerprints, and their application to law the enforcement mission has existed for well over a century. In fact, there was no challenge by the NAS report against the uniqueness of fingerprints. The report states, “...*The question is less a matter of whether each person’s fingerprints are permanent and unique – uniqueness is commonly assumed...*” The report continues that the issue is “...more a matter of whether one can determine with adequate reliability that the finger that left an imperfect impression at a crime scene is the same finger that left an impression...in a file of fingerprints” (The National Research Council, 2009, Summary p. 7) (*emphasis added*). The issue, therefore, is not the validity of fingerprints as a means of identification, but rather on claims that fingerprint identifications are infallible.

Fingerprints 101

Fingerprint examiners essentially work with two types of prints; 10-prints which are prints taken as a matter of record and; latent prints which are prints developed at crime scenes or from evidence. In order for fingerprint identification to work, there must be an exemplar to which the evidence can be compared and there must be *sufficient* detail to make a comparison.

This may be an obvious statement but, it is worth making here; to make identification on a latent (crime scene) print, an exemplar record (10-print) must exist. That record may come from a pre-existing fingerprint card file or be taken by the investigator during the course of the investigation. Technology has provided many jurisdictions access to automated fingerprint identification systems (AFIS) but, as the NAS report reveals, AFIS is unique to each jurisdiction. If the exemplar is not contained within the database being searched, the search will be unsuccessful. Additionally, AFIS relies on finding “look-alike” prints. In this regard technology

has created one of the biggest problems for fingerprint identification. AFIS' are capable of searching hundreds of thousands of records to find matches. Without proper controls agencies run the risk of making erroneous identifications on "look-alike" prints.

The process to identify latent prints is inconsistent and largely dependent upon the sufficiency of the print. Sufficiency refers to the amount and quality of ridge detail in a print. "While it is quite clear that friction ridge identification works well with good-quality prints, the reliability of the examination becomes increasingly more difficult when prints are smudged and incomplete" (The National Research Council, 2009, Ch. 5 p. 10). The lower the quality of print, the more an examiner might have to rely on human interpretation to make individualization. The more human interpretation, the greater possibility of bias and error, which calls the science into question.

What Makes a Science "Science"?

"Scientific method presumes events occur in consistent patterns that can be understood through careful comparison and systematic study" (National Research Council, 2009, Ch 4 p.1). The admission of scientific evidence relies on "(1) the extent to which a forensic science discipline is founded on a reliable scientific methodology, leading to accurate analyses of evidence and proper reports of findings and (2) the extent to which practitioners in those forensic science disciplines that rely on human interpretation adopt procedures and performance standards that guard against bias and error" (National Research Council, 2009, Ch. 3 p. 2).

Sufficiency as a Personal Standard

Because sufficiency is a personal standard, it is difficult to achieve the consistency required to scientifically validate both the examination process and the identification. As the NAS report identified, even if the same examiner were to recreate his work, the process could be

remarkably different each time. Within the world of “science”, forensic sciences (which require a level of human interpretation) can never really be called science. As Dusty Clark, a Fingerprint Training Specialist with the Western Identification Network points out, “...two persons who are unaware of their color blindness, can have repeatable outcomes following ACE and verify their perceptive conclusions inaccurately” (Clark, 2010).

Clarks “ACE” refers to the acronym ACE-V, which stands for analysis, comparison, evaluation and verification. ACE-V is a standardized protocol in fingerprint analysis. ACE-V intends to provide a systematic, scientific framework to ensure consistency of latent print results and safeguard against bias and error. Unfortunately the process of comparing and verifying under ACE-V falls short of the rigor required in the scientific method to demonstrate consistency.

ACE-V is less a means of scientific validation and more a process. ACE-V follows inductive logic. Its strength comes from the premise that examiners have been fully trained to an as of yet undefined standard. While ACE-V may provide the requisite consistency for satisfying the “process” of the scientific method, consistency does not necessarily equate to elimination of error, which is what the scientific method seeks to accomplish. The inability to adhere to the pure definition of “science” changes significantly the admission of evidence in trial.

Examiner Training & Working Conditions

Mr. Clark’s concern seemed to be verified through the NAS investigation. The report found significant variation in training and oversight throughout the forensic field (NAS, S-4). The research found agencies in which personnel were assigned to forensic functions on a temporary basis. Often, training was minimal or word of mouth with no formal education to validate the currency of the training provided (NAS, page 5-8).

In addition to inconsistent training methodologies, the NAS report found many labs operate understaffed and face significant backlogs (Page S-10). Because many labs operate under law enforcement or prosecutorial agencies, the appearance of bias can be an issue of fact in criminal prosecution or civil litigation (NAS, page 4-10). With bias comes the potential for pressure to make identifications in support of a “get tough on crime” perspective or to get high-profile suspects off the streets. Such pressures could result in erroneous identifications as labs push to meet quotas, including keeping case clearance rates high.

The Academy’s Goal

As noted, the intent of the NAS report was not to eliminate fingerprint identification or other expert interpretation-based forensic sciences as a viable investigative tool. Rather, the report emphasizes the fragility of a field which has rested on a century of predictability. The Academy was to encourage the fingerprint community to address issues of certainty and probability in an unbiased, scientific study and to ensure practitioners in the fields are properly trained and managed. In light of the National Academy’s findings, it is possible that some crime lab managers do not necessarily have the depth of knowledge to understand the functions of their labs (NAS, page S-4). This is complicated by the public’s media-fueled misperception regarding the “infallibility” of forensic science.

The “CSI Effect”, where cases are “solved in an hour, highly technical analyses are accomplished in minutes, and laboratory...capabilities are often exaggerated...” (NAS, page 1-10) is commonplace even within the law enforcement community. These perceptions are a bad foundation on which to make fiscal and operational decisions. Police managers, especially executives and those under whom forensic services is within their span of control, must work to understand the full-range of services, the challenges presented as a result of the NAS report and

the time and labor issues involved in the forensic fields. They must continue to monitor the on-going national-level discussion about forensics. Despite the fragmentation of the system, there are organizations which are working to create operational polices and training and certification requirements consistent with the NAS recommendations.

There are several immediate recommendations that labs should be considering as well. These include establishing policies related to documentation of identifications, requirements of blind proficiency testing, revising court testimony processes, and specifically eliminating the practice of testifying to 100% certainty. Lastly, as has been evidenced through the various examples of lab missteps highlighted in the report, crime lab managers must take an active role in managing their labs. Employee performance and behavioral issues cannot be ignored as they ultimately impact the integrity of the entire field.

Conclusion

The NAS report challenged long-standing beliefs about the various forensic fields, including fingerprint identification. Many service providers were stunned to learn their life's work was no longer considered "scientific" and the manner in which they were conducting business was considered "imprecise or exaggerated" (NAS, page S-3). Considering the response, agencies (many of whom may be in denial) need to review their practices and change their perspectives. Unfortunately, almost two years after the report's release, not much has been accomplished.

The initial flurry of activity on the reforms seems to have faded as the amount of work required to coordinate and change these fields has been realized. Work has been underway at the national level to address the recommendations; however, without financial support for research and collaboration, the report recommendations are in jeopardy of being lost. The anticipated

legal fallout has been just as lackluster. Defense Attorney associations were providing a lot of training shortly after the NAS recommendations, but not much has come about as a result.

Without consistent legal challenge, for many agencies, there is little motivation to initiate reform.

The lack of momentum on both fronts is unfortunate for forensic service providers. There may be a temptation to settle into the idea that no one is paying attention anymore; Such a tactic is ill-advised. If the field does not continue to work on the recommendations and cannot show even a slight interest in reform, there will be fallout as juries and courts no longer view forensic sciences as credible. Instead, agencies should be reviewing policies, testing their examiners, helping them understand the probability models and the uncertainty associated with finding look-alikes.

Lastly, agencies need to document their identifications through technical summaries, which outlines the process the examiner went through to come to his/her conclusion. Agencies willing to take these minor steps create a potential to enhance the integrity of their forensic science services and avoid a possible lab shutdown. Doing this work is necessary and should not have to wait for funding or another scandal. Proactive review will serve to enhance the public's perception of the work, thereby ensuring the field remains a viable investigative and prosecutorial tool.

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