FORENSIC SCIENCE

A CRISIS OF CONFIDENCE

by

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The Command College Futures Study Project is a FUTURES study of a particular emerging issue of relevance to law enforcement. Its purpose is NOT to predict the future; rather, to project a variety of possible scenarios useful for strategic planning in anticipation of the emerging landscape facing policing organizations.

This journal article was created using the futures forecasting process of Command College and its outcomes. Defining the future differs from analyzing the past, because it has not yet happened. In this article, methodologies have been used to discern useful alternatives to enhance the success of planners and leaders in their response to a range of possible future environments.

Managing the future means influencing it—creating, constraining and adapting to emerging trends and events in a way that optimizes the opportunities and minimizes the threats of relevance to the profession.

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"So, Ms. Thompson, explain to court how it is you identified my client?" spat the defense attorney, his tinny voice dripping with disdain. Annie shifted uncomfortably in her seat, thinking for a moment the defense attorney reminded her of a cartoon caricature of a Walleye fish, before she began to explain how his client's fingerprints matched latent prints recovered from the murder weapon. But, before she could finish her sentence, the Walleye objected. "How can he object to his own question?" she wondered, slightly confused by his outburst. She sat, dumbfounded, while he began to explain how fingerprint evidence had no scientific basis and should not be accepted as proof of identity.

She continued to listen, shocked by the rapt expression on the judge's face. "He's not really buying this, is he?" she thought. Her jaw nearly dropped when she heard the judge agree with the leering Walleye. "How can this be?" she thought, her confusion mounting. The defendant looked entirely too smug. She was incredulous as the judge continued,"…the LPE (latent print examiner) will not be permitted to testify that her opinion is the result of an infallible scientific process, and the Defendant is free to vigorously cross-examine the LPE on the shortcomings of the ACE-V method raised in the 2009 National Academy of Science Report entitled *Strengthening Forensic Science in the United States: A Path Forward*." She knew it was going to be a long day indeed.

THE CRISIS OF CONFIDENCE

Forensic Science in the United States is experiencing a crisis of confidence, borne from a myriad of factors which include new technologies, unrealistic claims and expectations on the part of both practitioners and triers of fact, and years of haphazard, often inconsistent training and standards applied to forensic technicians and scientists. Although fiction, the scenario described above is occurring with regularity across the country. The quote attributed to the judge is actually taken from a recent evidentiary hearing in Los Angeles County (People v. Greenwood 2010)

The National Academies of Science (NAS) report, commissioned by the National Institute of Justice at the urging of Congress, calls into question the reliability of nearly every forensic science technique other than DNA, and has become the blueprint for defense challenges to forensic evidence in court. The loss of fingerprint evidence and other commonly accepted forensic practices to successful court challenges would have a tremendous adverse impact on the prosecution of crime. Following a recent Maryland District Court decision barring fingerprint testimony in a death penalty case, Prosecutor Jason League told the court, "This ruling virtually overturns 100 years of jurisprudence with respect to the admissibility of fingerprint evidence." (Baltimore Sun 2007) Professor Jay Koehler of Arizona State University (2010) cautioned recently, "Forensics stands to experience a mighty and complete fall from grace."

HOW WE GOT HERE

Early Forensic Science, including the comparison of tool marks, tire or shoe prints, paint transfers, and handwriting exemplars were all methods of attempting to assign a source to evidence left behind at crime scenes. Once as crude as measuring the length of specific body parts to determine identity, the 'science' evolved to include fingerprint examinations, gas chromatography-mass spectrometry, and ultimately, DNA.

In its infancy, forensic science was a method of strengthening criminal cases, developed and practiced primarily by laypersons that were often also police officers. Many, if not most, had little scientific training and operated on intuition rather than sound scientific method. Over the past hundred years, forensic science has evolved and improved dramatically, but many techniques still lack the scientific, researched-based foundation necessary to be considered "science." D. Michael Risinger (2010), noted Seton Hall Law Professor, spoke of forensic science in a lecture presented recently, "In this way, these disciplines are probably best understood as being like folk medicine – they may be efficacious sometimes, maybe even most times, but we really don't know for sure." Over the past several years, a series of court challenges and high profile scandals have rocked the criminal justice community calling some forensic techniques once as universally accepted as fingerprint identification into doubt.

In United States v. Plaza, Senior U.S. District Judge Louis Pollak's opinion noted those who are considered experts in their forensic fields "tend to be skilled professionals who have

learned their craft on the job and without any concomitant advanced academic training" before ruling to exclude fingerprint evidence in the case. (2002) Although exclusion was a drastic remedy, it is easy to understand Judge Pollack's reservations. In Maryland v. Rose, the court did not allow the prosecution to provide testimony linking a latent fingerprint to the defendant. Judge Susan Souder (2007) wrote in her decision, "An error rate, or lack thereof, must be demonstrated by reliable scientific studies, not by assumption. Where tests have attempted to imitate actual conditions, error rates by fingerprint examiners have been alarmingly high." In commenting on Judge Souder's ruling, the chief of the state's public defender's forensic division, Patrick Kent, exclaimed, "It is a ruling which will reverberate throughout the country, and it should." (Baltimore Sun, 2007)

Despite claims by some fingerprint examiners that the examination of prints is an infallible science, they do make errors in the identification process. The FBI's misidentification of the Madrid train bomber is clearly an internationally known example. Until recently, though, there were no empirical studies to determine error rates, or if some level of bias could affect fingerprint examiners' expert opinions. That has begun to change, however, and the results have not been encouraging.

In a 2008 study published in the *Journal of Forensic Science*, cognitive researchers Itiel Dror and Robert Rosenthal presented several expert fingerprint examiners a series of fingerprints for comparison. Their aim was to gauge the reliability and biasability of the fingerprint experts. They presented several sets of prints to the expert examiners for comparison. The examiners, though, were not aware they had previously examined the very same fingerprints. They incorrectly identified the prints on multiple occasions. In a separate stage of the research, examiners were provided information (such as the suspect had confessed), to determine if their examinations could be biased by extraneous information. Ultimately, Dror and Rosenthal concluded, "The analyses show that experts are not totally reliable nor are they unbiasable. These findings are based on fingerprint experts' decision making, but because this domain is so well established, they apply equally well (if not more) to all other less established forensic domains." (Dror and Rosenthal 2008)

The problem is not a new one. In 1989, the Los Angeles Police Department's Firearms expert misidentified Los Angeles Sheriff's Deputy Rickey Ross' off-duty firearm as a "positive" match for the murder weapon used in the murders of three prostitutes in the Los Angeles area.

The weapon was seized after Ross was stopped in the company of a known prostitute. The *Times* attributed the error to the need to "make" the gun used in the murders. It was then the third high-profile case in which LAPD firearms examiners admittedly arrived at an "incorrect" conclusion in the previous five years. (*L.A. Times* 1989) Dr. Dror attributes some of these errors to a lack of understanding cognitive bias. "…many forensic examiners and police officers have not received proper training in cognitive biases, and appropriate procedures and best practices to deal with these issues are needed. (Dror 2008) The FBI examiners in the Madrid train bombing were likely influenced by what Judge Souder (2007) described as "'circular reasoning' [which] began to infect the examiner's mental process." Training in cognitive bias could help to mitigate the 'circular reasoning' identified by Judge Souder.

New technologies grounded in the scientific method such as DNA analysis have further degraded the public's confidence in many of the older, less precise forensic science methods. In the August 2009 issue of *Popular Mechanics*, Journalist Brad Reagan wrote "Bite marks, footprints, tire tracks, handwriting, bloodstain patterns and other forms of analysis that suffer from multiple confounding variables could end up being used as exclusionary evidence or as qualified supporting evidence only." The Director of the Los Angeles County Regional Crime Lab, and president of the American Society of Crime Lab Directors (ASCLD) Dean Gialamas, believes most forensic techniques have "a strong foundation in science" and that they will eventually be "validated by further research." (Reagan 2009) The common weakness in these disciplines seems to be the lack of standardized training, testing and validation. The lack of funding to conduct meaningful research and development has hampered the ability of the forensic science community to address many of these concerns (Fisher, personal communication, May 2010).

WHERE WE ARE NOW

In a February 2010 symposium at the UCLA Law School Campus, many noted legal scholars, forensic scientists and administrators met to discuss the state of forensic science in the United States, and the progress (or lack thereof) to address the deficiencies and concerns identified in the NAS report. The complaints of many academics and other critics of the forensic science, namely criminal defense attorneys center around the unsupportable assertions, such as a

‘zero’ error rate and individualization made daily by forensic technicians and scientists across the country. One presenter, Simon Cole, a professor of Criminology, Law and Society at the University of California Irvine, wrote in 2009, “The current perception of a ‘crisis’ in forensic science may be attributed to many factors, but it must be in part be attributed to confusion and lack of clarity about how claims of source attribution may be defensibly supported.”

One principal shortcoming discussed was the lack of “science” in forensic science. Over one hundred years after the first conviction based upon fingerprint evidence, the academics assert there is still no scientific evidence that fingerprints are, in fact, unique and can support claims of individualization. “Individualization,” Cole describes, “is understood to mean the narrowing of possible sources of a forensic trace to a single object in the universe.” (2009) In fact, there is no way, without what Dr. David Stoney (2010) calls a “leap of faith,” to make claims of individualization. “Are we really trying to *prove* uniqueness? I would offer to you that is a ridiculous notion.” On the other hand, champions of individualization would argue that national computerized databases (such as the Automated Fingerprint Identification System (AFIS)) have yet to identify two persons with the same fingerprints, and that therefore the underlying premise that no two fingerprints are exactly alike has, in essence, been proven.

WHERE DO WE GO FROM HERE

How does the Criminal Justice System address the problems identified in the NAS report? The first recommendation of the NAS was the creation of yet another Federal bureaucracy, the National Institute of Forensic Science (NIFS). There are many issues with the creation of the NIFS, not the least of which is funding.

According to Risinger (2010), it is unlikely, given the state of the federal budget, coupled with the resistance to such a body likely to come from the forensic science community, the NIFS will exist in the foreseeable future. Another of the more controversial recommendations found in the NAS report, the complete separation of crime laboratories from law enforcement’s umbrella, is not fiscally practical, according to Las Vegas Metro Crime Lab Director, Linda Krueger. (Vegas Sun 2009) An accredited laboratory, which adheres to the ISO/IEC standards and requires minimum certification standards for practitioners, is not likely to experience significant associative bias which would unduly benefit the associated agency or skew the results of

scientific testing. Krueger added, "I think you can have autonomy within a police agency." The International Association of Chiefs of Police (IACP) is also strongly opposed to the removal of crime labs from law enforcement. (2010) On the contrary, certain contextual associations can be critical to the successful conclusion of investigations, especially those as complicated and crucial as homicides and sexual assaults.

Procedures designed to minimize contextual bias like "sequential unmasking" of the type described by Forensics expert, Norah Rudin (2010) would likely help to meet the anti-bias standards advocated by the likes of Risinger and Dror, while still allowing some interaction between investigators and forensic experts which is needed to put some results and requested testing into context. Completely autonomous laboratories would immediately result in conflicts about the prioritization of testing and would likely exacerbate the current testing backlogs.

The following recommendations, adapted from the NAS report, are not only feasible, but would benefit California law enforcement agencies and crime laboratories in their endeavor to deliver accurate and defensible forensic evidence to any criminal proceeding:

1. Develop a statewide agency tasked with the establishment of universal forensic science methods and procedures which include mandatory certification and competency testing for practitioners. Recognizing the need for a statewide perspective toward the improvement of forensic science, legislation creating the California Crime Lab Review Task Force was sponsored by, among others, Los Angeles County Sheriff Lee Baca. Since 2007, the Task Force has been in operation and has made several recommendations for the improvement of forensic science, but lacks the ability to mandate changes. In California, there has been some discussion that such an accrediting body could be structured in a manner akin to the POST Commission. The *California Commission on Forensic Science or CCFS*, as it might be labeled, would need sufficient authority to mandate adoption of standardized protocols as well as sufficient, stable funding to conduct or co-sponsor independent research germane to improving the acceptance and reliability of forensic science techniques.

2. Make accreditation of forensic laboratories mandatory. The Los Angeles County Regional Laboratory is currently in the process of seeking accreditation under the

American Society of Crime Laboratory Directors/Laboratory Accreditation Board-International (ASCLD/LAB). The standards for that accreditation are found in ISO/IEC 17025. The ASCLB/LAB-International accreditation is one of only two recognized in the United States.

3. Make Certification of forensic scientists and technicians mandatory. Under the current forensic science system, there are a variety of certifying bodies who offer a variety of certifications. There are certifications offered in toxicology, blood spatter analysis, tool mark analysis, and others. Certification criteria should be standardized for the existing (and for developing) disciplines and approved by the statewide *CCFS* board. Certification and competency testing would make great strides toward improving the acceptance and reliability of forensic science's more subjective testing techniques.

4. Partner with academia to conduct relevant research to validate (or invalidate) current and developing forensic practices. Forensic science practitioners have neither the time nor the resources to conduct comprehensive studies for the purpose of developing statistical models to gauge reliability and error rates of various forensic practices and protocols and their conducting the requisite studies would inevitably lead to concerns about the impartiality of the testing. Universities have both the time and staff, but not necessarily the access, to conduct unbiased research. Advocates for research like Risinger and Mnookin (2010) believe a partnership between forensic practitioners and academia will benefit both entities. UCLA, Michigan State, Virginia Tech and Oregon are already engaged in such studies with funding from the National Institute of Justice (NIJ).

5. Develop criteria to assess the current state of forensic practices and examine standards and procedures which reduce bias and increase standardization and documentation. Ideally, these would include determining the feasibility of procedures such as utilizing masking protocols to substantially reduce the contextual bias of the type identified by researchers like Itiel Dror. These criteria should also assist the forensic science practitioner to "quantitate and communicate uncertainty" and abandon outmoded concepts and terms as suggested by Nora Rudin. Standardized

terms and reports are critical to allowing the trier of fact to accurately determine the probative value and reliability of forensic evidence presented. The training of forensic experts should include what Simon Cole, Professor of Criminology at the University of California at Irvine, describes as the ability to "articulate a defensible epistemological foundation for the testimonial claims that forensic identification experts make." (2009) These changes would assist in providing a more accurate picture about the true limits of forensic science until a more solid scientific foundation could be established through testing and could be accomplished with minimal additional funding.

These recommendations are but a few of the steps which may be taken to strengthen forensic science in California. These are, however, the first necessary steps to ensure forensic evidence remains a valid component of successfully prosecuting perpetrators of crime.

CONCLUSION

Some forensic practitioners must fundamentally change the way they currently view their role. Instead of "circling the wagons" as many in the defense community charge, crime laboratories should be open to scrutiny and cooperative in establishing realistic standards for testimony. As Dr. David Stoney asserts, "Magic is private. Science is public." (2010) Partnerships formed between forensic practitioners and academia to properly research reliability and error rates for current forensic practices are likely more critical to the continued utility of forensic science in the coming 10 years than any new techniques or equipment still on the horizon. The Vice-Chair of the California Crime Lab Task Force and former Director of the Los Angeles County Crime Lab, Barry Fisher, believes the majority of forensic science practitioners support the NAS findings, but complain the paucity of funding makes significant change nearly impossible (Fisher, personal communication 2010).

The one universal tenant of prosecutors, law enforcement and the criminal defense community, is that no one wishes to see an innocent person convicted. If Pollack and Souder unlocked Pandora's Box, then the NAS Report has kicked it open. As Professor Risinger (2010) explains, "Exclusion is a blunt instrument to try to coerce forensic science to reform, but in the end it may be the only one we are left with." However, even Judge Harry T. Edwards, co-chair of the NAS report, knows the changes will have to be a collaborative effort, "Judicial Review, by

itself, will not cure the infirmities of the forensic science community." (2009) Hopefully, law enforcement and the forensic community can help to shape their preferred future before it is decided for us.

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