

***** NATIONAL ACADEMY OF SCIENCES REPORT *****
Legacy of historic document depends on good-faith collaboration

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The scientific process is about evidence and facts that “are never twisted or obscured by politics or ideology.” – President-Elect Barack Obama, December 20, 2008

A historic report titled “*Strengthening Forensic Science in the United States – A Path Forward*” was released on February 18, 2009 by a special committee convened by the National Academy of Sciences (NAS) in Washington, D.C. to examine the forensic sciences and identify needs that must be satisfied in order to maximize their value and reliability.

Although the report made several recommendations, its underlying theme was the need for a national commitment to support the forensic sciences and build a more impressive body of research.

Disappointingly, the public briefing that was held to announce the report had yet to conclude when the *Los Angeles Times* released a distorted and somewhat myopic assessment of the recommendations reported by the NAS committee. Other newspapers followed suit as they painted a picture of a chaotic and discombobulated forensic science community seemingly mired in its own incompetence.

According to *Los Angeles Times* reporter Jason Felch, “For decades, forensic scientists have made sweeping claims in court about fingerprints, ballistics, handwriting, bite marks, shoe prints and blood spatters that lack empirical grounding and have never been verified by science.”

The *Chicago Tribune* ran a similar story on February 19th accompanied by a photograph of an exonerated prisoner named Robert Stinson who was convicted, in part, on bitemark evidence. The *Tribune* boasted that the NAS report validated a series of articles it published in 2004, which the *Tribune* says identified “a number of forensic disciplines, including some used in police stations and courtrooms every day, [that] relied on flawed science, and their use contributed to the arrests and convictions of innocent people.”

We are certain that the *Los Angeles Times* and the *Chicago Tribune* have no idea what the NAS report really means, nor have they demonstrated the ability or willingness to decipher the many nuances that lie within it.

Crime Lab Report resisted the temptation to act quickly on the release of the report – opting to let the dust settle before digging deeply into its 255 pages of observations and recommendations. To our surprise, what we discovered was a report that was considerably sympathetic to the plight of many forensic practitioners and their laboratories.

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The report, however, is not the first attempt to characterize and quantify the needs of the forensic science community. In February 1999 a report was issued to the United States Congress by the National Institute of Justice which called for many of the same improvements identified by the National Academies – including a national Forensic Science Commission “to identify issues and needs of particular disciplines and provide national leadership to improve the practice of forensic science.” Forensic science leaders were heavily involved in the study and have remained consistent in their message ever since:

We need resources to meet skyrocketing demand and rising expectations. In the absence of those resources, please be fair and reasonable in what you expect of us.

The following two excerpts from the recent NAS report captured this sentiment quite accurately:

“For decades, the forensic science disciplines have produced valuable evidence that has contributed to the successful prosecution and conviction of criminals as well as to the exoneration of innocent people. Over the last two decades, advances in some forensic science disciplines, especially the use of DNA technology, have demonstrated that some areas of forensic science have great additional potential to help law enforcement identify criminals. Many crimes that may have gone unsolved are now being solved because forensic science is helping to identify the perpetrators.”

“There are scores of talented and dedicated people in the forensic science community, and the work that they perform is vitally important. They are often strapped in their work, however, for lack of adequate resources, sound policies, and national support. It is clear that change and advancements, both systemic and scientific, are needed in a number of forensic science disciplines—to ensure the reliability of the disciplines, establish enforceable standards, and promote best practices and their consistent application.”

We would politely argue that there are *thousands* of talented and dedicated people in the forensic science community, but the intent of the language is not misunderstood.

Reasonable people can disagree over the report’s recommendations and the representation on the committee that prepared it. It is simply impossible for a report of this magnitude to please all of its readers all of the time. Everyone’s view will be shaped by his or her own professional experiences and expectations. *Crime Lab Report* is no exception.

But as we suggested earlier, the true spirit and practicality of the report lies in a few critical nuances that have yet to be captured in the predominant media coverage. Therefore, *Crime Lab Report* will address these points for the benefit of journalists, scientists, lawyers, researchers, laypersons, and others who have a sincere desire to understand the National Academy of Sciences’ assessment of the forensic sciences.

First, the most profound and promising aspect of the NAS report was its refusal to affirmatively deny the reliability of many forensic disciplines that have come under the fire of critics around the country. The report makes no claim that disciplines such as firearm identification, toolmark

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identification, latent print identification, and forensic odontology (bitemark comparisons), to name a few, are invalid or incapable of producing consistently accurate results.

In fact, the report openly acknowledges that these disciplines may very well have significant scientific underpinnings. In its discussion of latent fingerprints for example, the report explains that historically, “friction ridge analysis has served as a valuable tool, both to identify the guilty and to exclude the innocent. Because of the amount of detail available in friction ridges, it seems plausible that a careful comparison of two impressions can accurately discern whether or not they had a common source.”

Similarly, in its assessment of firearm and toolmark identification (commonly referred to as ballistics), the committee agreed that “class characteristics are helpful in narrowing the pool of tools that may have left a distinctive mark. Individual patterns from manufacture or from wear might, in some cases, be distinctive enough to suggest one particular source, but additional studies should be performed to make the process of individualization more precise and repeatable.”

In other words, the committee remains undecided on issues pertaining to scientific validity because many forensic sciences have yet to present an underlying body of empirical data and literature that conform to today’s standards for conducting and documenting scientific research.

John Collins, *Crime Lab Report’s* Chief Managing Editor and the director of an internationally accredited forensic science laboratory in the Midwest, testified before the NAS committee in June 2007. He argues that the report is a reason for optimism if it is kept in perspective.

“The National Academies aren’t saying that the engines driving forensic science are pushing in the wrong direction. They are simply recommending more horsepower. Much of the research they call for will further add to the validity of the most commonly practiced disciplines.”

Collins’ point is underscored by the fact that the NAS report did not reprimand the forensic science community for any shortfalls that may exist in the accessibility or completeness of the available research. Instead, the committee seemed to understand and appreciate the unique history of the forensic sciences and how that history shaped research that was performed many decades ago.

Like so many other legitimate fields of study, most forensic sciences did not grow up in the kind of academic environment that we know today. By necessity, they were incubated under the protective watch of the law enforcement community and the armed forces mainly because there were no incentives for other institutions or professions to nurture them on a large scale.

Police departments and army bases are certainly not bastions of scientific research and have never claimed to be. But it was the police and military that needed the capacity to scientifically detect crime, identify perpetrators, and exonerate the innocent. So they did what they had to do to make it work – often with the help of noteworthy scientific pioneers at universities around the world.

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In 2005, a major study was published by the American Society of Crime Laboratory Directors which addressed the growing need for research in the forensic sciences. According to the report, “work in the forensic sciences does not receive the type or level of funding that basic research receives. Few forensic laboratories (20%) have resources dedicated to research and, historically, research is performed at universities. Practitioner partnerships are needed for these research programs.”

Any portrayal of the forensic science community as acting in defiance of modern scientific expectations or intentionally avoiding rigorous scrutiny is false and irresponsible.

The real story, unfortunately, may not help the *Los Angeles Times* and *Chicago Tribune* sell newspapers. But we hope citizens are afforded the opportunity to understand these issues before any serious public policy changes are enacted.

All reputable and qualified forensic practitioners derive most of their confidence from training and experience. And in most instances, a large body of accumulated knowledge exists to support their work. As a result, they can provide a service that allows triers of fact to make more informed choices about the guilt or innocence of defendants in our justice system.

Even though research exists in many embattled forensic disciplines, much of it lacks the completeness and statistical underwriting that are necessary for objective researchers to independently evaluate these sciences and arrive at a consensus on their validity. Whether right or wrong, universities and other independent research bodies of similar standing are expected to put their stamp of approval on critical scientific practices – usually by undertaking large studies that can establish valid quantitative expressions about the reliability and uncertainty of certain methods.

Future studies will likely begin from scratch so that all commonly practiced forensic sciences will eventually have the necessary scientific foundations.

Crime Lab Report will be watching to make sure that the input and expertise of reputable and active forensic practitioners weigh heavily on the research that occurs from this point forward. To isolate these men and women from the efforts to make lasting progress in the forensic sciences would entirely defy the NAS report’s intent to inspire collaboration and communication among a variety of scientific professionals.

Ballistics and fingerprint studies performed by law professors and economists will be the first clue that something has gone terribly wrong.

This leads us into another critical point raised by the NAS committee regarding the capacity of our justice system and its officers to objectively elicit scientific facts.

For years forensic scientists have gathered around dessert tables at professional conferences and voiced their displeasure about the procedural constraints that seem to inhibit scientists from freely discussing the implications of their scientific results during a trial or other legal

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proceeding. Most expert witnesses, at some point in their careers, experience the frustration of being admonished by a judge or lawyer for volunteering information that exceeds the scope of the question asked.

In very clear language, the NAS committee gave credence to these frustrations when they opined that the “adversarial process relating to the admission and exclusion of scientific evidence is not suited to the task of finding ‘scientific truth.’”

We agree wholeheartedly with this assessment but we also believe it applies to adversarial clashes occurring *outside* the courtroom. Many dangerous misperceptions about forensic science have been propagated by lawyers and professors who are intent on bringing forensic science to its knees by whatever means possible. This has created an equally unsuitable environment for finding scientific truth.

For this reason, we wish the NAS committee would have cautioned its readers to be wary of the potential dangers and distractions presented by ideologues who hope to influence the funding and staffing of the many research projects that will take place in the coming years.

Forensic science leaders must focus on the establishment of new partnerships with honest and collaborative researchers in academia – and there are many of them. As these partnerships take hold, misguided activists will lose relevance and credibility.

Dr. Roger Kahn, former president of the American Society of Crime Laboratory Directors and a practicing DNA expert in Texas noted that there is a precedent for this ability of science to transcend ideology. According to Kahn, “this clearly happened with DNA after the second report by the *National Research Council* on DNA testing. It led to important research and publications that resolved a variety of statistical questions in a rigorous manner. In doing so it strengthened the underpinnings of forensic DNA.”

Until that time, a rather uncomplimentary image of DNA was being painted by many of the same individuals who now hold DNA up as proof that other forensic disciplines are substandard.

This transcendence will likely begin as forensic science leaders identify and partner with collaborators and researchers in the academic community. Eventually, critical commentators having a limited perspective on the realities of the forensic sciences will disqualify themselves from serious consideration and be less able to hinder the scientific progress that can be made in the coming years.

Just before the release of the NAS report, the *Consortium of Forensic Science Organizations (CFSO)* took the first steps towards this objective by inviting a variety of stakeholders to a roundtable discussion in Washington, D.C. According to the *CFSO*, invitees included defense attorneys, prosecutors, police officials, judges, and civil rights advocates. No other gesture could have more appropriately reflected the goodwill and optimism that exists in the forensic science community to do right by our justice system. No other act of leadership could have been more effective.

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When given the choice to float a few superficial sound bites to a reporter or engage in a meaningful discussion, forensic science leaders will probably start looking for a comfortable conference room. That's exactly what the *CFSO* did.

The potential for positive outcomes in the wake of the NAS report are limitless, but the committee's recommendation to form a National Institute of Forensic Science is one that is fraught with as many threats as there are opportunities. *Crime Lab Report* believes that vigilance and strong leadership will be needed to prevent forensic science from becoming as slow, political, and bureaucratic as our federal government and many of our universities.

In our experience, these kinds of environments can erode the culture needed to operate a responsive and reputable forensic science laboratory. Any suppression or discouragement of ingenuity, productivity, critical thinking, and ethical centeredness will bring harm to the forensic sciences and weaken the foundations of our justice system. Yet it is difficult for any external agency to regulate another organization's culture and internal management practices.

In some ways, the FBI's misidentification of a latent print in the Brandon Mayfield case served as the most painful example of how a large bureaucratic culture can become compromised by its own internal struggles.

Admittedly, the authors of the NAS report took a different view when they remarked that the Mayfield case "and the resulting report from the Inspector General surely signal caution against simple, and unverified, assumptions about the reliability of fingerprint evidence."

In our opinion, the lessons learned from the Mayfield case have little to do with the validity of fingerprint evidence. Even the report explains that the FBI investigation "determined that once the fingerprint examiner had declared a match, both he and other examiners who were aware of this finding were influenced by the urgency of the investigation to affirm repeatedly this erroneous decision."

This is evidence of a cultural problem, not a scientific one.

We suspect that in recent years the FBI has suffered an organizational shock with the unimaginable pressures placed on its employees to rapidly support the homeland security efforts of our federal and state governments. Only the very best leadership practices galvanized by a strong scientific philosophy could ever inoculate scientists from these pressures – and even that might not be enough.

The FBI is to be commended for much of the work that was done to remedy the problems revealed in the Mayfield case. But others who quickly discounted the criticality of organizational stability in providing *good* science were relegated to settling on *bad* science as an explanation for what happened. This was a gross misdiagnosis of a dangerous disease that gave rise to some horrific symptoms.

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The recommended National Institute of Forensic Science could easily follow the same path. As we have witnessed in recent years with only a minimal influx of funding for the forensic sciences, whenever money and influence are at stake, political maneuvering becomes rampant and clear solutions are sometimes obscured.

The stockpile of history is packed with failed attempts by our federal government to remedy perceived social problems. We believe these failures often occur because individuals involved in the process are not really interested in the reforms that they were hired or appointed to bring about. Instead, they seek personal influence or cater to special interests that are not necessarily healthy or honorable.

Just last week, many crime laboratory directors received their printed copy of a Department of Justice survey of publicly funded crime laboratories that was performed back in 2005 – four years ago. This is not the kind of efficiency and responsiveness that should be recommended to support and strengthen forensic science.

Readers of the NAS report will notice how much it demands that scientific opinions be underwritten by complete and proper research. But we wonder what research supports the argument that a new government agency is an appropriate way to govern and support the forensic sciences. In our judgment, the evidence shows that accreditation and certification have demonstrated themselves to be reliable mechanisms for providing the professional governance and oversight that are needed to ensure that the profession of forensic science continues to advance.

If a National Institute of Forensic Science is created, however, we sincerely hope it is able to achieve the same levels of effectiveness and scholarship as the National Academy of Sciences. But as is always the case, it will require the involvement of people who hold themselves to the highest levels of professionalism and integrity – yes, the same professionalism and integrity that courts now demand of forensic scientists each and every day.

In the end, there is nothing that the National Academy of Sciences can recommend to make human beings perfect. But it *can* inspire forensic scientists and researchers to strive for a level of excellence that perhaps was never contemplated before. What a wonderful thing this would be.

Standing in the way of these efforts, unfortunately, will be the brand of politics that has found its way into the world of forensic science. The scope of this phenomenon will only magnify as larger sums of money begin flowing in as recommended by the NAS committee. Universities tapped to undertake new research projects in support of the forensic sciences, for example, will enjoy potential windfalls of funding and notoriety as a result of their work. This introduces an inherent bias that rarely gets talked about. But like all biases, they are only a problem when they adversely impact professional judgments and prevent independent thinking.

While political dynamics may be frustrating for many forensic science leaders and practitioners who are fighting just to manage their incoming caseloads, it is a small price to pay for being given access to tax-payers' hard-earned dollars.

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Even if every NAS recommendation is adopted, nothing can change the constitutional requirement that judges and lawyers protect innocent defendants from injustice. Not even the most rigorous and well-controlled research will stop opposing counselors from challenging forensic evidence and scrutinizing the credentials of scientists – nor should it.

Furthermore, disagreements among researchers will always occur over interpretations and results. As one university completes its research on a particular forensic practice, there will be another university waiting to find flaws with the work so that funding might be allocated to support an alternative methodology. This is how science works.

There will also be irresponsible reporters and activists who continue to misunderstand and mischaracterize the forensic sciences; therefore, they will portray rare and isolated instances of failure as being pervasive problems necessitating the adoption of specific reforms. This is how activism works.

Whatever happens from this point forward, resources allocated to the forensic science community must be commensurate with the demand for its services. And as the NAS report rightly recommends, accreditation and professional certification can be made mandatory to ensure the external and independent oversight of forensic practitioners.

As we pointed out in a recent editorial, forensic science has probably been a leading *preventer* of wrongful convictions over the last twenty years. But there was little incentive or funding to attract researchers willing to help the profession vault itself to the next level. And quite frankly, some forensic practitioners were not necessarily warm to the idea of outsiders playing in their sandbox. For sure, these days have passed and hopefully everyone will focus on the work that needs to be done and the resources that need to be allocated.

In our opinion, The National Academy of Sciences report on forensic science is not perfect. But it is good enough to usher in a bright new day for all of the forensic sciences if it is acted upon responsibly.

Only time – and good-faith collaboration – will tell. * * * * *

Recommended Reading

1999 NIJ *Needs and Status* Study: <http://www.ncjrs.gov/pdffiles1/173412.pdf>

2005 ASCLD *180-Day* Study: <http://www.ncjrs.gov/pdffiles1/nij/grants/213422.pdf>

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