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## Commentary

### A Critical Look at Some Needed Reforms in the Landscape of Forensic Science Education and Mentorship Training Standards

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#### Introduction

Unlike other sections of the Academy, the Jurisprudence Section is primarily made up of lawyers and judges who use, challenge, or evaluate the reliability/credibility of forensic expert opinions. However, some of our section members actually do work full-time as expert witnesses in a forensic discipline. For example, I am a third generation forensic document examiner in private practice for more than 35 years, who was fortunate enough to also experience the trials and tribulations of serving the public as a state prosecutor. My education and training in the forensic sciences and the law was comprehensive and multifaceted. It taught me how to think critically when evaluating data or evidence and to consider alternative possibilities, and it reinforced the importance of maintaining neutrality when embarking upon any truth-seeking endeavor. In my chosen field of forensic science, I had the luxury of receiving my principal training from an internationally recognized expert in forensic document examination who happened to be my mother. My initial training was augmented by the training and continuing education I received from a retired FBI document examiner and numerous other document examiners and forensic scientists trained in the public and private sector. In this article, my thoughts and perspectives on some of the reforms needed with respect to

education, training and mentorship, and standards development, undoubtedly shaped by my educational and professional background and experience, are directed towards all the significant role players in the American judicial system (criminal and civil) — crime laboratories, forensic practitioners, trial lawyers, and even trial judges.

#### Reforming the Education and Mentorship Training Standards for Forensic Practitioners

In view of the 2009 NAS Report, the recent highly publicized revelations of systemic flaws and forensic practitioner errors occurring in state crime laboratories, the ongoing discovery of forensic science errors in DNA exoneration cases, and other instances of wrongful convictions, the current paradigm for educating and training forensic practitioners needs to be scrutinized and evaluated critically and objectively, preferably by qualified professionals within and without the forensic science community, and preferably with international input from trusted forensic resources in the European Union (EU) and Australia.

Traditionally, entry into a forensic science discipline has come by way of apprenticeship, achieved through on-the-job mentorship training in a government crime lab, or as an apprentice to a mentor in the private sector. Although the educational component of training has become more formalized during the past 15-20 years, tutelage via mentorship

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has and still remains an essential component of training, especially in forensic disciplines dependent upon human pattern recognition skills. Unfortunately, there is still no formalized or standardized method of mentorship training in either crime laboratories or the private sector, and the quality and consistency of the training being provided is laboratory-dependent and/or mentor-dependent, with differences reflected in procedures, content, standards, and outcomes.

While working with an instructor-mentor on actual cases is considered essential to acquiring hands-on practical experience, developing best practices, and optimizing skill sets for performing the full range of forensic examinations routinely encountered in a particular discipline, there are no verifiable data to substantiate that mentorship training in its present form achieves its intended purpose, regardless of whether such training occurs in the public or private sector. Moreover, since the mentor is often entrusted with the responsibility of testing and assessing the trainee's abilities upon completion of the mentorship training, there clearly exists an intrinsic bias towards "passing" the trainee. Curing deficiencies of this sort is essential if forensic science is to move forward and achieve the recognition and respect it seeks.

Regrettably, some forensic disciplines insist on modeling their training on the basis of it having been done historically in a particular way, despite the absence of valid, independent research studies supporting the efficacy of that particular training method. For example, the claim by some government-trained forensic document examiners that mentorship training achieved through a two-year "in-residence" internship produces more skilled practitioners than any other form of mentorship training is unfounded and as yet not empirically proven. Insisting on a particular training paradigm "because that's the way we've always done it" or "because the majority of practitioners believe it to be the most effective method of training" reflects the type of confirmatory bias that can produce undesirable results.

Group-serving bias, characterized by coordinated action towards a common goal by members of a particular group or coalition, is yet another source of bias that impacts all sorts of decision-making within the forensic science community. It is one of the dangers and risks of having the process for developing

forensic standards controlled by members of the law enforcement community or any other coalitional alliance, especially when it comes to the development of standards recommending minimum training requirements for practitioners in a given forensic discipline. This became apparent with the closure of ASTM Subcommittee E30.02 on Questioned Documents, which ensued after complaints were filed that a coalition of subcommittee members comprising individuals affiliated with government agencies and/or government-sponsored membership organizations were using the ASTM voluntary consensus standards development process to obtain an unfair economic advantage in the marketplace of forensic document examination expert services.

In order to develop true consensus forensic standards — ones that can lay claim to industry-wide acceptance — the standards-setting process requires fundamental fairness and transparency, with task group participation and input afforded to all interested stakeholders, without regard to group membership or affiliation. Academicians and research scientists active in the forensic science community, as well as representatives from competing stakeholder interests, must be included in this process. As online education becomes more prevalent in the forensic sciences, empirical support for the educational effects of different training venues will become increasingly important. Considerable independent research needs to be conducted to evaluate different training methods and assess their respective strengths and weaknesses in an effort to establish suitable training models, if not the best training model, for future forensic scientists; domestic and international training methods should be evaluated with a view towards developing international training standards.

The importance of educational reforms to improve the quality, integrity and accuracy of decision-making by forensic examiners cannot be overstated. Today, whether a particular forensic discipline is viewed as a science or technical skill is not nearly as important as the reliability of the expert opinions derived from practicing the discipline.

While the last 15 years have seen a considerable increase in research studies supporting the validity of various forensic disciplines, more research needs to be directed towards studying the reliability of the

protocols and techniques used in particular forensic disciplines, and how they can be improved to minimize the likelihood of error. For example, an extensive body of experimental research conducted by cognitive and social psychologists, as well as empirical data obtained from recent research and forensic casework studies, clearly demonstrate that various sources of bias can and often do adversely impact a forensic examiner's visual perception and decision-making. Perceptual and cognitive judgments made by forensic examiners performing comparative analyses of fingerprints, hair, tool marks, bitemarks, handwriting, and even DNA typing are susceptible to biasing influences that can improperly taint and sway the examiner's decision-making process. Understanding these various sources of bias and learning how to limit or minimize their influence is essential for improving the reliability and accuracy of decisions made by forensic experts. Further research studies specific to the forensic sciences should be undertaken to evaluate techniques and develop protocols for minimizing biasing influences that can contaminate the decision-making of even well intentioned forensic examiners, especially in those disciplines that rely heavily on visual perception and interpretation. The fingerprint identification errors exposed in the Brandon Mayfield case, and many other criminal and civil cases involving forensic experts who received the same fundamental training yet reached contradictory opinions based upon examination and analysis of the very same evidence, strongly suggest that cognitive and motivational bias trumps either incompetence or training as the principal source of error in forensic decision-making.

### **Educational Reforms for Trial Lawyers and Trial Judges**

Despite the recent downturn in law school attendance due to the dismal state of employment opportunities for young lawyers, the last ten years have seen an increase in the number of forensic science courses that have been incorporated into the law school curriculum, with more law schools offering students the opportunity to obtain both a JD and MS in Forensic Science, as I did when I graduated from George Washington University in 1975. While the opportunity for law students, trial lawyers and members of the judiciary to take an elective course

in forensic science or to attend seminars devoted to forensic science issues has increased significantly since the release of the 2009 NAS Report, there is still an urgent need for many more trial lawyers and judges to attend forensics CLE courses in order to develop the knowledge and practical skills necessary to competently deal with forensic science evidence and testimony. The path forward should encourage members of the forensic science community to support and participate in furthering the forensics education of the non-forensics participants in the administration of justice; this mindset will serve both the long-term interests of the forensic science community and the interests of justice.

### **Conclusion**

As the most prestigious membership organization for forensic practitioners and other professionals involved with the forensic sciences, the Academy needs to pave the road along the path forward by spearheading the reforms needed to improve the education, training and decision-making of forensic practitioners and enhance the knowledge of trial lawyers and judges with respect to forensic science evidentiary issues. It has already done so by supporting the efforts of the Forensic Specialties Accreditation Board (FSAB) to set meaningful standards for professional boards that certify practitioners in various forensic disciplines and by continuing to sponsor and host educational programs that seek to improve forensic science by acknowledging deficiencies and developing more reliable ways of doing things. The path forward in forensic science needs more than the good intentions of the Academy and a mindset that is willing to acknowledge flaws and deficiencies in the forensic science system — it needs adequate funding to support research efforts directed at identifying shortcomings in education, clarifying the effectiveness of different types of training models, and improving the reliability and accuracy of evidence derived from the forensic sciences.