

The Response of the Association of Firearm and Tool Mark Examiners[1] to the February 2009 National Academy of Science Report “Strengthening Forensic Science in the United States: A Path Forward.”[2]

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ABSTRACT

The National Academy of Science Report, “Strengthening Forensic Science in the United States: A Path Forward” made 13 general recommendations regarding Forensic Science. Six of these recommendations directly relate to AFTE. Activities conducted by AFTE and SWGGUN already meet certain conditions of these six recommendations and are fully described in this response. The NAS report briefly critiqued firearm and toolmark identification directly; however, as stated on page S-5 of the report, a detailed evaluation by the NAS was not feasible. The critiques are addressed in this response even though it is evident that the NAS did not look critically at the scientific underpinning of firearm and toolmark identification despite having been provided with hundreds of relevant references.

In February 2009, the National Academy of Science (NAS) issued a report authored by its Committee on Identifying the Needs of the Forensic Science Community (herein referred to as the NAS Committee) entitled, “Strengthening Forensic Science in the United States: A Path Forward.” The aim of the NAS Committee, as stated on page P-1 of the report, was “to chart an agenda for progress in the forensic science community and its scientific disciplines,” including firearm and toolmark identification. Pursuant to this goal, the report offers 13 recommendations that represent the Committee’s studied opinion on how best to achieve its agenda.

The Association of Firearm and Tool Mark Examiners (AFTE) acknowledges what a tremendous undertaking it must have been to report on the needs of the forensic science community outside of the discipline of DNA analysis. Our review of the thirteen recommendations made by the NAS Committee found that six of them, numbers 2, 3, 6, 7, 8 and 9, directly relate to AFTE. We are pleased to report that activities conducted by AFTE and the Scientific Working Group for Firearms and Toolmarks (SWGGUN) already meet certain requirements or expectations of these six recommendations. These recommendations and our responses are as follows:

Recommendation 2 (page S-16):

The National Institute of Forensic Science (NIFS), after reviewing established standards such as ISO 17025, and in consultation with its advisory board, should establish standard terminology to be used in reporting on and testifying about the results of forensic science investigations. Similarly, it should establish model laboratory reports for different forensic science disciplines and specify the minimum information that should be included. As part of the accreditation and certification processes, laboratories and forensic scientists should be required to utilize model laboratory reports when summarizing the results of their analyses.

AFTE response to Recommendation 2:

In 1980, AFTE established an extensive glossary of terms and definitions covering all phases of firearm and toolmark examinations. This document, which is periodically revised as necessary, has served to establish standardized terminology and statements that can be rendered as conclusions in reports.

Recommendation 3 (pages S-16 and S-17):

Research is needed to address issues of accuracy, reliability, and validity in the forensic science disciplines. The National Institute of Forensic Science (NIFS) should competitively fund peer-reviewed research in the following areas:

(a) Studies establishing the scientific bases demonstrating the

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validity of forensic methods.

(b) The development and establishment of quantifiable measures of the reliability and accuracy of forensic analyses. Studies of the reliability and accuracy of forensic techniques should reflect actual practice on realistic case scenarios, averaged across a representative sample of forensic scientists and laboratories. Studies also should establish the limits of reliability and accuracy that analytic methods can be expected to achieve as the conditions of forensic evidence vary. The research by which measures of reliability and accuracy are determined should be peer reviewed and published in respected scientific journals.

(c) The development of quantifiable measures of uncertainty in the conclusions of forensic analyses.

(d) Automated techniques capable of enhancing forensic technologies.

AFTE response to Recommendation 3:

There is an extensive body of research, extending back over one hundred years, which establishes the accuracy, reliability, and validity of conclusions rendered in the field of firearm and toolmark identification. A list of some of this pertinent research has been compiled by SWGGUN and is easily accessible on their website [3]. Since its inception in 1969, AFTE has emerged as a leading forensic organization and represents the relevant scientific community for the publication and dissemination of research in firearm and toolmark identification. In this role, AFTE actively encourages collaboration with educational institutions and governmental agencies.

Recommendation 6 (page S-18):

To facilitate the work of the National Institute of Forensic Science (NIFS), Congress should authorize and appropriate funds to NIFS to work with the National Institute of Standards and Technology (NIST), in conjunction with government laboratories, universities, and private laboratories, and in consultation with Scientific Working Groups, to develop tools for advancing measurement, validation, reliability, information sharing, and proficiency testing in forensic science and to establish protocols for forensic examinations, methods, and practices. Standards should reflect best practices and serve as accreditation tools for laboratories and as guides for the education, training, and certification of professionals. Upon completion of its work, NIST and its partners should report findings and recommendations to NIFS for further dissemination and implementation.

AFTE response to Recommendation 6:

AFTE facilitates the exchange of information between its members by holding annual training seminars and by the quarterly publication of a peer-reviewed, scientific journal. AFTE has also adopted documentation standards [4] and collaborates with SWGGUN in not only the development of examination protocols but also the periodic review of established ones. Finally, AFTE has had a comprehensive training program since 1982. This program has been frequently updated.

Recommendation 7 (page S-19):

Laboratory accreditation and individual certification of forensic science professionals should be mandatory, and all forensic science professionals should have access to a certification process. In determining appropriate standards for accreditation and certification, the National Institute of Forensic Science (NIFS) should take into account established and recognized international standards, such as those published by the International Organization for Standardization (ISO). No person (public or private) should be allowed to practice in a forensic science discipline or testify as a forensic science professional without certification. Certification requirements should include, at a minimum, written examinations, supervised practice, proficiency testing, continuing education, recertification procedures, adherence to a code of ethics, and effective disciplinary procedures. All laboratories and facilities (public or private) should be accredited, and all forensic science professionals should be certified, when eligible, within a time period established by NIFS.

AFTE response to Recommendation 7:

AFTE, through the assistance of a National Institute of Justice (NIJ) grant, developed and implemented a certification program in firearms, toolmarks, and gunshot residue examination and identification in 1999 [5]. This program includes all of the minimum requirements for a certification program recommended above.

Recommendation 8 (page S-19):

Forensic laboratories should establish routine quality assurance and quality control procedures to ensure the accuracy of forensic analyses and the work of forensic practitioners. Quality control procedures should be designed to identify mistakes, fraud, and bias; confirm the continued validity and reliability of standard operating procedures and protocols; ensure that best practices are being followed;

and correct procedures and protocols that are found to need improvement.

AFTE response to Recommendation 8:

AFTE endorses the quality assurance and quality control (QA/QC) requirements of accreditation inspections conducted by the American Society of Crime Lab Directors-Laboratory Accreditation Board (ASCLD-LAB), as well as the QA guidelines recommended by SWGGUN. Furthermore, SWGGUN has recently developed training and quality assurance recommendations that, if followed, help ensure accurate examination results.

Recommendation 9 (page S-19):

The National Institute of Forensic Science (NIFS), in consultation with its advisory board, should establish a national code of ethics for all forensic science disciplines and encourage individual societies to incorporate this national code as part of their professional code of ethics. Additionally, NIFS should explore mechanisms of enforcement for those forensic scientists who commit serious ethical violations. Such a code could be enforced through a certification process for forensic scientists.

AFTE response to Recommendation 9:

For many years, AFTE has had a comprehensive ethics code (adopted in 1980) and an equally comprehensive enforcement process.

However, AFTE is disappointed about what appears to be a deliberate oversight, expressed by the NAS Committee on page S-5:

The committee decided early in its work that it would not be feasible to develop a detailed evaluation of each discipline in terms of its scientific underpinning, level of development, and ability to provide evidence to address the major types of questions raised in criminal prosecutions and civil litigation.

By approaching their stated task with this self-imposed limitation in mind, the NAS Committee in effect chose to ignore extensive research supporting the scientific underpinnings of the identification of firearm and toolmark evidence, despite having been provided with documentation referencing many of these studies as early as June 2008.

The NAS report specifically addresses the subject of firearm and toolmark examination on pages 5-18 through 5-21. However, the Committee's discussion of the discipline is

inconsistent at times. For example, after stating on page 5-21, "because not enough is known about the variabilities among individual tools and guns, we are not able to specify how many points of similarity are necessary for a given level of confidence in the result," the Committee goes on to comment, "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."

The NAS report also cites several statements critical of firearm and toolmark identification that appear in the National Research Council (NRC) 2008 report on ballistic imaging, while not referencing the AFTE response [6] to these statements, dated August 20, 2008. This AFTE response was sent to NRC Chairman, Dr. John Rolph, NAS Director-Committee of Law and Justice, Carol Petrie, and NAS Media Relations Officer, Sara Frueh. Additionally, in May 2008, Dr. Rolph wrote an affidavit to correct some misconceptions surrounding the critical comments contained in the NRC report for a court proceeding regarding the admissibility of firearms-related evidence. Both the AFTE response and Dr. Rolph's affidavit should have been readily available to the NAS Committee for review prior to publication of their February 2009 report.

In their report, the NAS Committee painted an incomplete and inaccurate portrait of the field of firearm and toolmark identification using a very broad brush, and in doing so did not consider the appropriate scientific principles on which our discipline was founded. AFTE is confident that the majority of its members can dispel the limitations and inaccuracies portrayed in the NAS report through well-prepared court testimony, which gives us the opportunity to explain and defend the identification of firearms and toolmarks using what we feel will be perceived as a compelling justification for our conclusions. A partial listing of relevant literature articles summarizing some of the foundational scientific research that has been conducted in the discipline of firearm and toolmark identification is provided below. [7-15]

Unfortunately, some firearm and toolmark examiners performing casework today are clearly outside the mainstream of forensic consciousness and do not conform or adhere to the current protocols and standards recommended by AFTE when conducting such examinations. These examiners take few case notes or other forms of documentation and are not familiar with the extensive amount of empirical and theoretical research that serves as the scientific basis of firearm and toolmark identification. Some of these examiners have been responsible for judicial rulings wherein their testimony has been limited in some way by the court due to their

nonconformity to accepted forensic protocols. Those of us in the mainstream of our profession are working very hard to overcome the cloud of suspicion that has formed over all of us by the shallow court presentations of a few. Justice cannot be served if the results of well-documented firearm and toolmark comparisons are precluded from American courts. Forensic casework performed by trained and competent examiners not only has the potential to identify the responsible firearm used in a crime, but may also quickly exclude a suspected firearm as having any association with a shooting incident. Either of these determinations can be of critical importance to the administration of justice.

The NAS report states that firearm and toolmark examinations have “a heavy reliance on the subjective findings of examiners rather than on the rigorous quantification and analysis of sources of variability” (page 5-21). However, the NAS report again does not address the relevant scientific literature that demonstrates a concerted effort by researchers to achieve a statistical foundation for the conclusions rendered in firearm and toolmark casework. [16-20] There was no apparent attempt by the Committee to acknowledge either existing research or that which is ongoing at various academic institutions across the country in order to formulate statistical foundations for toolmark identifications. [21, 22] This research has the potential to further support the validity and reliability of firearm and toolmark identifications and provide quantitative data to supplement the many years of empirical research that has been conducted in the field.

In closing, regardless of whether or not the NAS Committee’s vision of the formation of a National Institute of Forensic Science (NIFS) ultimately comes to fruition, AFTE remains committed to the advancement of the field of firearm and toolmark identification and looks forward to diligently working with whatever entity may eventually become responsible for the forensic enterprise in the United States. The stakes are too high to do anything less.

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- [2] A copy of the NAS report is currently available on the internet at: <http://www.nap.edu>.
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