

Professional Review and Commentary^a

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^aThe views expressed are those of the authors and do not necessarily reflect the view, the position, or the policy of *Forensic Science Review* or members of its editorial board.

Forensic Science Review's Professional Review and Commentary section highlights contemporary issues and events in the profession of forensic science. To contribute updates or commentary or to recommend books for review, please contact Mike Baylor (mbaylor@nc.rr.com), Jeff Teitelbaum (Jeff.Teitelbaum@wsp.wa.gov), or Ray Liu (rayliu@uab.edu).



FORENSIC SCIENCE AROUND THE WORLD

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The Poison Squad: A Look Back to Times Past—United States

From 1902 to 1907, Dr. Harvey Wiley (1844–1930) fed a variety of poisons to a group of volunteers in order to assess their effects on humans.

From the *Song of the Poison Squad* (1903):

O, they may get over it but they'll never look the same,
That kind of bill of fare would drive most men insane.



Figure 1. “Poison Squad” dining at the Department of Agriculture, circa 1903 (photo courtesy of the FDA).

Dr. Wiley was a lifelong champion of food safety, and the state of US food labeling in the early 1900s afforded him a monumental challenge. There was virtually no regulation or oversight relating to food labeling, and any of number of substances, such as borax and formaldehyde, were commonly used as preservatives. In 1883, Dr. Wiley was named head of the US Department of Agriculture’s Chemical Division (which changed its name to the Bureau of Chemistry in 1898, changed again to the Food, Drug, and Insecticide Administration in 1927, then to the Food and Drug Administration in 1930).

To try and determine whether or not these additives were safe for consumption, Dr. Wiley invited men from his agency to volunteer to ingest a variety of questionable substances and then to assess their effects. Each man (women were not invited) had to agree to a six-month



Figure 2. Dr. Wiley (standing, center) with men of the Poison Squad, circa 1903 (photo courtesy of the FDA).

term during which he would eat no food other than the meals that were provided by the kitchen at the Department of Agriculture. The newspapers quickly gave the first group of volunteers the moniker “the Poison Squad” and regularly reported on their experiences.

Borax was the first preservative to be administered, followed by salicylic acid, sulfuric acid, sodium benzoate, and formaldehyde. Dosages ranged from one-half to four grams daily, and they were given in capsule form to be consumed at the end of each meal. Initially, the compounds were cooked into the food, but the men were able to detect them and ate less of the food. The men were weighed and examined following each meal, and urine and fecal samples were taken to be studied in the lab. Dosages would gradually increase over the course of each six-month trial, stopping only when members of the squad became ill. Nausea and headaches were common symptoms. Of course each volunteer had signed a waiver absolving the government of any responsibility regarding his health, but for most of them, it was a point of pride that they could eat virtually anything. However, one of the substances ingested during the later years of the squad, copper sulfate, had particularly deleterious effects on the men’s health and was soon discontinued. Today, copper sulfate is used as a pesticide.

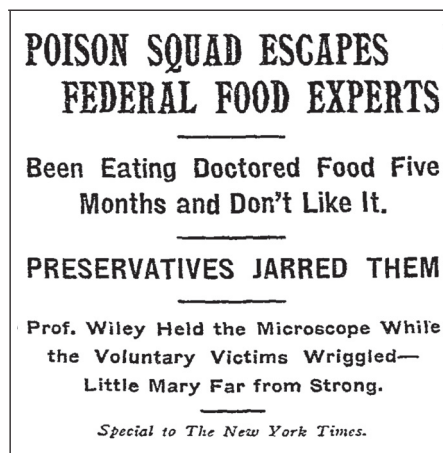


Figure 3. Coverage by the New York Times, May 22, 1904.

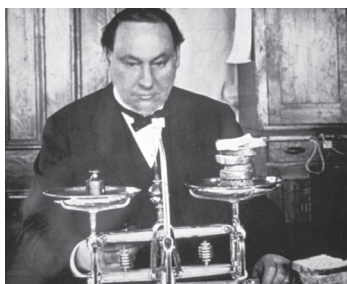


Figure 4. Dr. Wiley weighing food at the Department of Agriculture, circa 1903 (photo courtesy of the FDA).

Dr. Wiley's tireless efforts to promote food safety ultimately resulted in the passage of the Pure Food and Drug Act in 1906, the first-ever federal law relating to the regulation of food safety. In 1912, Dr. Wiley retired from the Bureau of Chemistry and became the director of health safety for Good Housekeeping magazine. During his time with the magazine, he developed the Good Housekeeping Seal of Approval (although it was originally called the somewhat less catchy "Tested and Approved Bureau of Foods, Sanitation, and Health Seal"), a product guarantee that is still in use today. Still another achievement on Dr. Wiley's resume was his help in founding, in 1884, the Association of Official Agricultural Chemists, a prestigious analytical organization that continues to this day. But it is Dr. Wiley's work with the Poison Squad, due in no small part to the media attention it received during the food trials, that remains his most lasting legacy.

From the *Song of the Poison Squad* (1903):

On Prussic acid we break our fast;
We lunch on a morphine stew;
We dine with a match head consomme,
And drink carbolic acid brew

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NIST's Forensic Science Center of Excellence—United States

The National Institute of Standards and Technology (NIST) has awarded a five-year, up to \$20 million grant to establish a Forensic Science Center of Excellence to be based at Iowa State University (Ames, IA). It will be the third NIST Center of Excellence and the only one focused on forensic sciences. The primary goal of the center will be "to build a statistically sound and scientifically solid foundation under two branches of forensics, pattern evidence (including fingerprints and bullet marks) and digital evidence (including data from cell phones and computers)." Alicia Carriquiry, a statistician and distinguished professor in liberal arts and sciences at Iowa State, will lead the center. The center will also include collaborating researchers from Carnegie Mellon University, the University of California—Irvine, and the University of Virginia.

A 2009 report by the National Research Council, *Strengthening Forensic Science in the United States: A Path Forward*, cited serious problems with the way forensic science is utilized in America's criminal justice system. The report stated that although DNA analysis appeared to be sound, many other forensic methods needed substantial research to validate techniques, assess limitations, and discover the sources of errors. To address these problems, the report made numerous recommendations and called for an establishment of a national institute to lead research, establish national scientific standards, and oversee education.

Although a "National Institute of Forensic Science" has never been created by the Federal government, NIST took steps to create a NIST Forensic Science Center of Excellence and recently awarded it to Iowa State University. "We're proud that Iowa State is leading this new national center," said Iowa State President Steven Leath. "This center will do important scientific research for the country's law enforcement and criminal justice systems. This is one more example of Iowa State researchers working to meet today's biggest challenges." Researchers at the new center plan to take the pattern evidence—fingerprints, blood spatter, firearms, tool marks, and bite marks, as well as digital evidence from computers, phones, and other devices—and help establish the guidelines and standards as to how forensic evidence will be presented and evaluated in the criminal justice system. In addition to its scientific work, the new center will also address forensics training and education. A timeline for the opening of the center has not been announced. [Source: Iowa State University News Release]

DEA Releases 2015 National Heroin Threat Assessment

— *United States*

The *National Heroin Threat Assessment* (NHTA) was released May 22 by the US Drug Enforcement Administration (DEA). It shows heroin use and availability on the rise and causing more overdose deaths than at any time in the last decade. Although fewer people presently use heroin than other illicit drugs, the heroin user population is growing at a faster rate than any other drug of abuse, almost doubling between 2007 and 2013 — from 161,000 to 289,000 — according to the Substance Abuse and Mental Health Services Administration (SAMHSA).

According to the Centers for Disease Control, deaths involving heroin more than tripled between 2007 (2,402) and 2013 (8,260). “DEA is targeting the cartels that produce and smuggle heroin into the US and organized criminals that distribute this poison.” said DEA Administrator Chuck Rosenberg. “We will continue to combat heroin trafficking to protect Americans from this severe and growing threat.”

The NHTA is based, in part, on survey responses from more than 1,100 law enforcement agencies, which were asked to identify the greatest drug threats in their areas. A majority of agencies that responded indicated heroin as the primary drug threat. Historically, the percentage of agencies reporting heroin as their greatest concern appears to have steadily increased from 8% in 2007 to 38% in 2015. According to National Seizure System data, heroin seizures in the US rose 81% in the past five years, from 2,763 kg in 2010 to 5,014 kg in 2014. During that same period, the average size of a heroin seizure more than doubled, from 0.86 kg to 1.74 kg. The higher demand for heroin is partly driven by an increase in controlled prescription drug (CPD) abuse over the past decade.

Many CPD users became addicted to opioid medications originally prescribed for a legitimate medical purpose. A recent SAMHSA study found that four out of five recent new heroin users had previously abused prescription pain relievers. The reasons an individual shifts from one opiate to another vary, but today’s heroin is higher in purity, less expensive, and often easier to obtain than illegal CPDs. Higher purity allows heroin to be smoked or snorted, thereby avoiding the stigmas associated with injection. Heroin users today tend to be younger, more affluent, and more ethnically and geographically diverse than ever before.

The NHTA is a document prepared in close collaboration with federal, state, local, and tribal law enforcement agencies across the nation; it is intended to provide policy-makers, law enforcement personnel, and prevention and treatment specialists with strategic drug intelligence to help formulate counterdrug policies, establish law enforcement priorities, and allocate resources. [Source: *DEA Public Affairs News Release*]

COMMENTARY/UPDATE

NIST Forensic Science Research Update

NIST Special Programs Office

National Institute for Standards and Technology

Gaithersburg, Maryland

United States of America

The United States and other countries are striving to improve the use of forensic science in the application of justice with the dual aims of exonerating the falsely accused and convicting the guilty. The National Institute of Standards and Technology (NIST) plays a key role in this ongoing effort. The news briefs below describe several recent forensic science developments at NIST.

NIST Research Presented at American Academy of Forensic Sciences Meeting. The future of forensic science was on display during the February 2015 American Academy of Forensic Sciences (AAFS) annual meeting in Orlando, FL. Numerous NIST researchers and scientific program managers took part to represent how NIST is contributing to a future vision for forensic science.

This future vision includes improved confidence in forensic measurements, as well as new technologies, databases, and analytical methods for crime laboratories. NIST contributed 25 scientific presentations to the 2015 AAFS meeting. Find a complete listing of NIST scientific presentations on the NIST forensic science website at <http://www.nist.gov/forensics/aafs-2015.cfm>.

NIST also ran an exhibit booth in the AAFS exhibit hall where attendees were able to learn about NIST Standard Reference Materials for crime laboratories, get updates on forensic science research in NIST laboratories, and pick up copies of brochures about NIST forensic science efforts.

OSAC Priorities Discussed at American Academy of Forensic Sciences Meeting. In addition to research presentations, NIST held the first public meetings of the Organization of Scientific Area Committees (OSAC) to coincide with the February 16–17 AAFS meeting in Orlando, FL. During these meetings, OSAC subcommittee chairs presented and discussed forensic science standards development priorities. Those who missed these meetings can watch them online.

Visit the OSAC meeting agenda page at www.nist.gov/forensics/osac/sac-agenda-orlando-2015.cfm for full details about the two-day event. Viewers may also go directly to the OSAC public documents library online at <https://workspace.forensicosac.org/kws/public/documents?view=> to watch archived videos and

download PDF files of each subcommittee's priority recommendations.

To stay up to date with OSAC and other NIST forensic science news, go to www.nist.gov/forensics and sign up to receive NIST forensic science news alerts. [**Editor's Note:** See Table II (p. 149–150) and Tables III-1 to III-5 (p. 151–163) in the Appendix for members of OSAC's Forensic Science Standards Board (and its resources committees) and Scientific Area Committees (and each area's subcommittees).]

NIST International Symposium Seeks Improved Quality in Forensics. The NIST Forensic Science Program will host the International Symposium on Forensic Science Error Management.

NIST's first-ever international forensic science meeting will take place July 20–24 at the DoubleTree by Hilton Hotel in Arlington, VA. The technical program will cover eight tracks: death investigation, crime scene, human factors, digital evidence, legal factors, quality assurance, laboratory management, and criminalistics. Each track will consist of plenary lectures, poster sessions, and panel discussions.

“We anticipate that this symposium will draw global attention to the best practices for detecting, reducing, and eliminating errors in forensic science laboratories,” said Mark Stolorow of the NIST Forensic Science Program. “We will be addressing quality assurance, bias, and ethics — topics relevant to every discipline of forensic science.”

For more information on the symposium, go to www.nist.gov/director/international_forensics_home.cfm.

NIST Report Recommends Policies for Improved Preservation of Biological Evidence. All states should have laws ensuring that criminal justice systems properly handle, store, and retain forensic biological evidence, according to a new NIST publication, *Biological Evidence Preservation: Considerations for Policy Makers*.^a The report encourages legislators, judges, law enforcement officials, crime laboratory managers, and other policy makers to implement or update laws that support best practices in this critical area.

“While 43 states and the District of Columbia have enacted statutes related to the preservation of biological evidence, policies and procedures can be enacted in states that currently have no laws”, as well as states looking to improve existing legislation, according to the report.

^a Technical Working Group on Biological Evidence Preservation: *Biological Evidence Preservation: Considerations for Policy Makers* (NISTIR 8048); 2015; www.nist.gov/manuscript-publication-search.cfm?pub_id=917581 (accessed May 22, 2015).

Biological evidence refers to two types of evidence commonly recovered from crime scenes or collected during criminal investigations: biological samples such as blood, semen, and other bodily fluids; hair; tissue; bones and teeth; or items containing biological material such as a bloody T-shirt. An earlier NIST report, *The Biological Evidence Preservation Handbook: Best Practices for Evidence Handlers*,^b detailed a set of best practices to help ensure biological evidence is properly stored to avoid contamination, is protected against premature destruction or degradation, and is accurately tracked to prevent loss.

The new guide for policy makers discusses key issues that influence and drive policies in this area. Based on a thorough examination of existing state statutes, current trends, law, scientific literature, and expert opinions, the authors make nine recommendations for actions that support best practices for preserving biological evidence.

“Biological evidence can carry a lot of weight in solving crimes, but if you can't find it or find it in an unusable state, it won't help you conduct the necessary forensic analyses to administer justice fairly,” said Shannan Williams, project manager in the NIST Forensic Science Research Program.

Among the report's policy recommendations are that each state require:

- Establishment of an authoritative body to define and enforce standards related to biological evidence preservation;
- Biological evidence be stored in appropriate environmental conditions, based on known scientific practices;
- Evidence be retained according to timetables based on the type of crime and the status of the case; and
- A means for defendants or petitioners to seek recourse in cases where it has been judicially determined that a denial of access to biological evidence has occurred.

Both reports were authored by the Technical Working Group on Biological Evidence Preservation, a group of 20 experts from various forensic, law enforcement, and scientific disciplines, as well as legal scholars, medical personnel, and representatives of relevant professional organizations.

The National Commission on Forensic Science, coordinated by the Department of Justice and NIST, has chosen to address this topic through the creation of an Evidence Retention and Preservation Working Group. The working group is developing a document that will summarize the status of scientific and legal issues surrounding the retention and preservation of biological

^b Technical Working Group on Biological Evidence Preservation: *The Biological Evidence Preservation Handbook: Best Practices for Evidence Handlers* (NISTIR 7928); 2013; www.nist.gov/manuscript-publication-search.cfm?pub_id=913699 (accessed May 22, 2015).

as well as nonbiological evidence. [Editor's Note: See Table I (p. 148) in the Appendix for commissioners of the National Commission on Forensic Science.]

The commission discussed policies to support best practices for biological evidence preservation at its meeting April 30–May 1 in Washington, DC. Williams presented the new NIST report to the commission during the meeting. To learn more about biological evidence preservation, see the NIST Forensic Evidence Management Web page, www.nist.gov/forensics/evidence-management.cfm.

Annotated Bibliographies Available. The NIST Forensic Science website now offers a new and valuable resource of annotated bibliographies of foundational research for 10 forensic science disciplines. The bibliographies, which span several decades, are available at www.nist.gov/forensics/workgroups.cfm. They cover the following areas:

- Firearms and toolmarks
- Hair analysis
- Latent prints
- Footwear and tire tread analysis
- Digital evidence
- Odontology
- Fiber analysis
- Bloodstain pattern analysis
- Paint and other coatings
- Arson and burn pattern

The bibliographies were created in 2011 and 2012 by various forensic science working groups and professional organizations. The US National Science and Technology Council's Subcommittee on Forensic Science requested the bibliographic information as part of its efforts to improve the practice of forensic science following publication of the 2009 National Academy of Sciences report, *Strengthening Forensic Science in the United States: A Path Forward* (<http://www.nap.edu/catalog/12589/strengthening-forensic-science-in-the-united-states-a-path-forward>).

The bibliographies have not undergone review or analysis, and are not endorsed by the federal government. NIST is providing them as an informational resource for interested stakeholders.

Forensic Science Standards Inventory. NIST's Organization of Scientific Area Committees (OSAC) is making progress toward developing an official OSAC Registry of Approved Standards and an OSAC Registry of Approved Guidelines.

In order to capture and build upon existing forensic science standards, guidelines, and best practices, NIST Forensic Science Program staff members have compiled an inventory of existing documents. NIST staff included more than 700 standards, guidelines, best practices, protocols, and policies that are applicable to forensic science. This initial inventory was created as a starting point for OSAC.

OSAC is working from this existing collection to begin to establish its own uniformly vetted and approved

registries of standards and guidelines. OSAC may decide to accept some of the existing documents included in the inventory and may work to update and revise others before routing them for approval to be placed on the OSAC registries. OSAC may also determine needs for new documents and coordinate their development.

The inventory is available to download as a sortable Excel spreadsheet file (<http://www.nist.gov/forensics/osac/upload/Forensic-Standards-and-Guidelines-Catalog-2015.xlsx> — link opens an Excel xlsx file). It contains the titles and source information for more than 700 standards, guidelines, and related documents. The inventory also lists web addresses for documents that are available online. See the OSAC Catalog of Standards and Guidelines web page at www.nist.gov/forensics/osac/standards-guidelines-catalog.cfm.

COMMENTARY/UPDATE

The Forensic Technology Center of Excellence — Recent and Upcoming Activities

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The National Institute of Justice (NIJ) created the Forensic Technology Center of Excellence (FTCoE) in 2007 to support its research, development, testing, and evaluation. Since 2011, the FTCoE has comprised RTI International and its academic partners: the University of North Texas Health Science Center Department of Forensic and Investigative Genetics and the Center for Human Identification; Duquesne University Center for Forensic Science and Law; and Virginia Commonwealth University Department of Forensic Science. The goals of the FTCoE are to determine technology needs; develop technology program plans to address those needs; provide solutions; demonstrate, test, evaluate, and transition potential solutions into practice; develop and update technology guidelines; and build capacity and conduct outreach. Services are customized to support forensic service providers such as crime laboratories, corrections and court agencies, and other criminal justice practitioners to combat crime. Through these efforts, the FTCoE increases the capacity of state and local law enforcement to effectively and professionally serve society in matters involving forensic science, crime, and public safety.

The FTCoE promotes the exchange of ideas and encourages open dialogue by highlighting the most current and relevant forensic information. Our comprehensive reports are designed to inform and guide the forensic community on relevant topics originating from credible research and expertise. By providing these essential resources, the FTCoE promotes changes in forensic science policy and procedure, which improves forensic science practice on a national scale.

The FTCoE primarily offers three types of reports: landscape studies, technology evaluations, and special focus. These reports are publicly available to provide information that helps decision-making strategies. To date, the FTCoE has published 15 reports (4 landscape studies, 6 technology evaluations, and 5 special focus) featuring technology and best-practice topics. All FTCoE reports are available on the FTCoE website (www.forensicCOE.org). Reports that were published from 2014 onward are summarized in this update.

Landscape Study Reports

A landscape study report provides a broad view of issues and products identified as having value and usefulness in forensic applications. These reports offer laboratory managers and investigators a survey of current commercially available forensic technologies. In addition, the reports provide decision makers and potential end users with issues to consider related to implementation and use examples that illustrate successful adoption of a technology. Upon review, the reader may better understand whether a technology can benefit an organization and how to proceed with selecting a platform and implementing use.

Landscape Study on Field-Portable Fingerprint Scanning Devices. The FTCoE conducted this technology landscape with support from Scientific Working Group (SWG) and TWG members. Technology providers offer a variety of solutions along the mobile ID fingerprint capture process. A wide range of devices are available, from single-feature to multimodal capture devices. Complexity and sensor type affect price, size, weight, and ease of use. The final report includes key findings, practitioner insights, technology gaps, and current available technologies. This report was finalized in January 2014.

Landscape Study on Handheld and Portable Raman Spectrometers. This report highlights field-portable Raman spectrometers for the identification of powders, liquids, gels, or tablets. The document is intended to furnish law enforcement, first responders, and hazardous materials experts with a survey of commercially available products.

As Raman spectrometers and their components (e.g., lasers and detectors) continue to decrease in price and as technology advancements enable innovative packaging and pairing of accessories (e.g., GPSs [global positioning systems], cameras, and wireless printers), handheld and portable Raman devices may continue to appeal to a growing number of law enforcement agencies. Specifically, the report provides decision makers and potential end users with the exemplary cases that illustrate successful adoption, issues to consider related to implementation of portable Raman spectrometers, and comparison of the capabilities of commercially available Raman spectrometers. The document provides a summary of considerations that can impact procurement, training, fielding, and evaluation. This report was published in September 2014.

DNA Mixture Interpretation Software Tools. The FTCoE has completed this study on expert system software options. The utility and features of several platforms, ranging from fully commercial to free-assessable, have been evaluated with discussions covering validation and implementation considerations. The report was published in the second quarter of 2015.

3D Imaging for Scene Investigations. The FTCoE is completing a landscape study on technological options for three-dimensional (3D) imaging instrumentation for accident, crime, and death scene reconstruction and investigation. The report will be published in the third quarter of 2015.

Technology Evaluation Reports

The FTCoE technology evaluation reports objectively compare selected technologies to assess the capabilities, requirements, benefits, and challenges of each. The evaluation reviews the methods used for assessment; findings; technology pricing; training requirements; conclusions, and recommendations. The reports also outline the steps an agency may consider taking when adopting and implementing a new technology.

Magneto-Optical Sensor to Visualize Obliterated Serial Numbers in Firearms — Midwest Forensic Resource Center, The Ames Laboratory, Iowa State University. This technology evaluation was a multiphase project over a two-year period. In Phase I, the evaluation focused on establishing performance factors for the magneto-optical (MO) sensor technology utilizing ideal bar stock samples of five different metals and one composite material commonly used in the manufacturing of firearms. Technical performance factors included MO sensor sensitivity (detection limit), accuracy, reproducibility, recovery, and

selectivity. Nontechnical performance factors included sample preparation, system operation, sample processing, worker safety, and cost. The evaluation indicated that MO sensor technology is a valid and reliable method for obliterated serial number identification in ferromagnetic materials, comparing favorably to chemical etching and magnetic particle inspection in utility and effectiveness on the samples tested. This report was published in March 2014.

In Phase II of the project, the application of the MO sensor technology to visualize obliterated serial numbers in realistic firearm samples was evaluated. Results of realistic samples of firearm-obliterated serial numbers closely resembled those of the bar stock samples. Excellent results were obtained for obliterated serial numbers in firearms made of stainless steel and soft magnetic metals, with lesser results obtained from hard, magnetic metal firearms. An interesting finding was the fact that both press-stamped and laser-etched serial numbers yielded favorable results. Dot matrix/pin-stamped numbers were also examined. The study also suggests that the MO sensor film resisted deterioration when dropped, moved around on the firearm, and cleaned repeatedly. It was concluded that MO sensor technology is a quick and easy nondestructive method for the visualization of obliterated serial numbers in firearms. The Phase II report will be finalized this summer.

Interpretation of Organic and Inorganic Gunshot Residue— This is a multiphase project that has completed two phases and is entering a new phase in which identified technologies will be placed in a practitioner laboratory to test in a practical setting. This project evaluates existing technologies for novel analysis and probabilistic interpretation of organic and inorganic gunshot residue. The final report for phase 1 of this project was delivered to the FTCoE on December 31, 2013. Phase 2 began in April, and the report entitled *Evaluation of Existing Technologies for Novel Analysis and Probabilistic Interpretation of Organic and Inorganic Gunshot Residue* was published to the FTCoe website in December 2014. The FTCoE is currently working on an “In Brief” report covering the work that occurred in both phases. The anticipated date of publication of that report is this summer.

Special Project Reports

The FTCoE recognizes that certain areas within the forensic community may need more detailed, specialized assistance with coordinating knowledge transfer, adopting new technologies, and advancing research and development into the hands of practitioners. Often these areas face special challenges such as multidisciplinary national communication and coordination in order to

achieve successful implementation of new ideas, policies, and practices. The FTCoE has created a team with specialized expertise to specifically address these concerns and provide workable solutions to these exceptionally challenging situations.

Sexual Assault Nurse Examiner — Sexual Assault Response Team Project. In 2014, the FTCoE began a comprehensive federal effort to organize and transfer knowledge and best practices of sexual assault nurse examiners, sexual assault forensic examiners, and collaborative sexual assault response teams (SANE/SAFE/SART). The effort focuses on systemic challenges that impede the investigation of criminal sexual assaults in the United States, with goals that include creating an awareness of resources and ensuring that existing research, information, knowledge, and best practices are available and accessible to SANE/SAFE/SART and other practitioners who contribute to the nation’s response to sexual assault.

Several recent federally sponsored roundtables and forums identified gaps in education and policies governing sexual assault response; however, further documentation and compilation of proven best practices in sexual assault response are still needed. Although standardized protocols, guides and other resources exist for practitioners, specific requirements, techniques, preferences, and protocols can vary among state, local, and tribal communities. To address the incongruent approaches of forensic sexual assault evidence collection, a system of knowledge transfer and outreach was established to address strategies for developing more effective forensic sexual assault response practices. All archived knowledge-transfer components and a final report of this initiative were completed in November 2014 (<https://www.forensiccoe.org/Our-Impact/Focusing-on-Special-Initiatives/Sexual-Assault>).

Forensic Optical Topography Working Group (FOTWG). The FTCoE, in partnership with the NIJ and NIST, held a meeting of the Forensic Optical Topography Working Group March 17–18 in Gaithersburg, MD. This working group consists of highly knowledgeable researchers and practitioners at local, state, and federal crime laboratories who have vast experience regarding forensic applications of microscopy.

Over the next 6 to 12 months, the FOTWG will review various technologies associated with the collection of 3D data using optical means, including confocal microscopy as well as techniques that use interferometry, focus variation, or other approaches. They will also examine the extension of current procedures for comparisons based on 2D image data to 3D topographic images for ballistic

identification and toolmark comparison. As part of this latter task, the FOTWG intends to develop process maps that capture current and proposed comparison methods, including aspects related to data interpretation, such as baseline correction. Finally, the FOTWG will describe mathematical methods that may be applied to topographic data, such as cross-correlation functions.

The FOTWG seeks to improve the ability of NIST and affiliated organizations to collect reference data that may be used to validate mathematical approaches, as well as to establish the applicability and validity of optical topography to forensic investigations through application workshops and laboratory experimentation. Laboratory experimentation will establish baseline protocols and approaches for practical application in the crime laboratory. Upon completion in 2016, laboratory-based virtual training and a final report will provide guidance to practitioners on applications and recommendations for further research, development, and capacity assistance.

COMMENTARY/UPDATE

20th Scientific Meeting of the Society of Hair Testing

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The 20th Scientific Meeting of the Society of Hair Testing (SOHT) was held May 3-6 in Sao Paulo, Brazil. This International meeting hosted 64 participants representing 17 countries (Argentina, Australia, Belgium, Brazil, Canada, Chile, France, Germany, Italy, Luxembourg, Norway, Portugal, Spain, Switzerland, United Kingdom, United States of America, Uruguay). The meeting was held at the Tivoli Hotel and Resort in the Jardins district, one block from Avenida Paulista, the heart of the financial district of Sao Paulo. The Laboratórios Chromatox Limitada hosted the meeting with Maristela Andraus serving as chairperson. SOHT President Markus Baumgartner presided over the meeting.

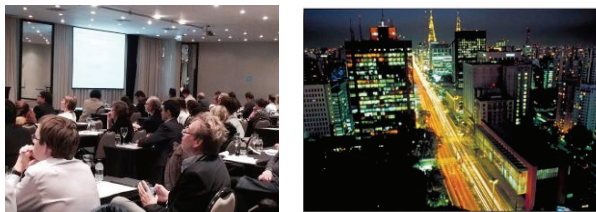


Figure 5. The 20th Scientific Meeting of the Society of Hair Testing; May 3–6, 2015 (Sao Paulo, Brazil).

The three-day agenda focused on hair testing for forensic purposes such as crime and death investigations, workplace drug testing, compliance (probation/parole) testing, and litigation cases such as child custody and child protection. The agenda comprised 10 plenary sessions, 26 platform presentations, 6 poster presentations, and a sponsor presentation. Meeting topics included: the evolution of hair testing; hair analysis in drug treatment; analytical challenges; legal issues of alcohol markers; drug impairment and driving; environmental contaminants; and quality proficiency testing and accreditation. In addition to the scientific sessions, every morning began with a workshop provided in Portuguese, the official language of Brazil. At the close of each day, a roundtable discussion allowed attendees to bring questions or information to a forum for conversation. The Best Scientific Presentation at the meeting was entitled “Association between plasma and hair concentration of pesticides after controlled exposure of animals” and was presented by Caroline Chata from the Laboratory of Analytical Human Biomonitoring, Luxembourg Institute of Health. Evening festivities highlighted traditional cuisine in local eateries, dance, music, and theater. Attendees were very complimentary of their experience. Throughout the week, gratitude and heartfelt “*Obrigado*” (“thank you” in Portuguese) were echoed by all!

FORENSIC SCIENCE EDUCATIONAL PROGRAMS — United Kingdom (UK) & Ireland

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 Southampton, Hampshire, England
 United Kingdom

In recent years, forensic science has been a subject matter of much public attention. It has also attracted the interest of higher educational institutions at various levels. The Chartered Society of Forensic Sciences (Harrogate, North Yorkshire, UK) posts a list of “Accredited University Courses” (<http://www.forensic-science-society.org.uk/Accreditation/AccreditedUniversityCourses>) including 55 undergraduate and 15 postgraduate “courses” or “programs” at 28 universities/institutes (as accessed January 25, 2015). It should be noted that this “Accredited University Courses” list is periodically updated with necessary changes, additions, and/or deletions. The Chartered Society’s accreditation is “based first and foremost on the forensic aspects of the designated courses”. These forensic aspects are defined in the Society’s Component Standards. The Society states that “the specialist topics involved in the courses such as anthropology and archaeology are not assessed beyond the contribution made by the ‘specialism’ to the achievement of the Society’s Component Standards”.

However, the Society goes on to say that they are aware that there is value in expanding their accreditation scheme to include some of the specialist topics. With this in mind, the Society professes to be in the process of actively expanding their range of Component Standards to cover a selection of those specialist topics. The first “specialism” to be accredited under the Society’s Accreditation Scheme in this way was the digital forensic arena. Further updates to this process will be available on the Society’s website.

Information related to *courses/programs* offered by these institutions (except two that are located in Australia and the Netherlands) is summarized in **Table 1**. A significant number of forensic science-related *courses/programs* in this region (UK and Ireland) may not be included in Table 1. Many of these “omitted” *courses/programs* are offered by some of the same institutions included in Table 1 and can be found through the websites provided. Finding *courses/programs* offered by other institutions is challenging and would require more substantial efforts.

Table 1. Accredited forensic science university courses in UK and Ireland

Institution/Program’s housing unit/ Mailing address/Website	Key faculty/Contact	Degree & course title	Content ^a		
			IEPE	CSI	LA
Abertay University — Dundee Division of Computing and Forensics School of Science, Engineering & Technology Dundee, Angus DD1 1HG Scotland, UK http://www.abertay.ac.uk/studentlife/schools/set/forensicsciencecourses/	Dr. Geoffrey R. Lund g.lund@abertay.ac.uk +44 (0) 1382 308635	BSc (Hons); Forensic sci.	X	X	X
Anglia Ruskin University Department of Biomedical and Forensic Sciences & Department of Life Sciences Cambridge, Cambridgeshire CB1 1PT England, UK http://ww2.anglia.ac.uk/ruskin/en/home/central/employability/what_can_your_faculty/science_technology/life_sciences_-_forensic.html	Dr. Sarah Hall Sarah.Hall@anglia.ac.uk +44 (0) 1223 363271 x 2170	BSc (Hons); Forensic sci. MSc; Forensic sci.	X X	X X	X X
University of Central Lancashire School of Forensic and Investigative Sciences JB Firth Building Preston, Lancashire PR1 2HE England, UK http://www.uclan.ac.uk/schools/forensic_investigative_sciences/index.php	Fiona Cameron fccameron@uclan.ac.uk +44 (0) 1772 89 5465	BSc (Hons); Forensic sci. BSc (Hons); Forensic sci. & anthrop. BSc (Hons); Forensic sci. & crim. invest. BSc (Hons); Forensic chem.	X X X X	X X X X	X X

Table 1. (Continued)

Institution/Program's housing unit/ Mailing address/Website	Key faculty/Contact	Degree & course title	Content ^a		
			IEPE	CSI	LA
Cranfield University Cranfield Forensic Institute College Road Cranfield, Bedfordshire MK43 0AL England, UK http://www.cranfield.ac.uk/about/people-and-resources/schools-institutes-research-centres/cranfield-defence-and-security/groups-institutes-and-centres/cranfield-forensic-institute.html	Prof. Keith Rogers	MSc; Forensic archaeol. & anthropol.	X	X	X
	k.d.rogers@cranfield.ac.uk	MSc; Forensic ballistics	X	X	X
	+44 (0) 1793 785399	MSc; Forensic engineering & sci.	X	X	X
		MSc; Forensic explosive & explosion Invest.	X	X	X
		MSc; Forensic invest.	X	X	X
De Montfort University Leicester School of Pharmacy Faculty of Health and Life Sciences Edith Murphy Building Leicester LE1 9BH England, UK http://www.dmu.ac.uk/study/courses/undergraduate-courses/forensic-science.aspx	Dr. Mark Fowler	BSc (Hons); Forensic sci.	X	X	X
	mrfowler@dmu.ac.uk				
	+44 (0) 116 250 6385				
University of Derby Forensic Science, Dept. of Natural Science College of Life and Natural Sciences Kedleston Road Derby DE22 1GB England, UK http://www.derby.ac.uk/courses/forensic-science-bsc-hons/	Adam S. Long	BSc (Hons); Forensic sci.	X	X	X
	a.long@derby.ac.uk	BSc (Hons); Forensic sci. with criminology	X	X	X
	+44 (0) 1332 591759				
University of East Anglia School of Chemistry Norwich Research Park Norwich NR4 7TJ England, UK https://www.uea.ac.uk/study/undergraduate/degree/detail/mchem-forensic-and-investigative-chemistry	Dr. Stephen Day	MChem; Forensic & investigative chem.	X		X
	Stephen.day@uea.ac.uk				
	+44 (0) 1603 59 3983				
University of Greenwich Dept. of Pharmaceutical, Chemical & Envir. Sci. Faculty of Engineering & Science Old Royal Navy College Park Row, London SE10 9LS England, UK http://www2.gre.ac.uk/study/courses/ug/forensic	Linda Brownlow	BSc (Hons); Forensic sci.	X	X	X
	l.brownlow@gre.ac.uk	BSc (Hons); Forensic sci. with criminology	X	X	X
	+44 (0) 20 8331 8136				
University of Huddersfield Forensic and Analytical Science Team School of Applied Sciences Huddersfield, West Yorkshire HD1 3DH England, UK http://www.hud.ac.uk/sas/forensicandanalytical/	Dr. Peter Maskell	BSc (Hons); Forensic & analytical sci.	X		X
	p.d.maskell@hud.ac.uk	MSci; Forensic & analytical sci.	X	X	X
	+44 (0) 1484 471612				
Institute of Technology Sligo Forensic Investigation and Analysis School of Science Ash Lane, Sligo Ireland http://itsligo.ie/courses/bsc-in-forensic-investigation-and-analysis/	Dr. Aodhmar Cadogan	BSc (Hons); Forensic invest. & analysis	X	X	X
	admissions@itsligo.ie				
	+353 (0) 71 93 18510				
Keele University Forensic Science School of Physical & Geographical Sciences Lennard Jones Laboratories Staffordshire ST5 5BG England, UK http://www.keele.ac.uk/forensic/	Dr. Mike Edwards	BSc (Hons); Forensic sci. (major award)	X	X	X
	m.g.edwards@keele.ac.uk				
	+44 (0) 1782 733252				
	forensics@keele.ac.uk				
	+44 (0) 1782 734211				

Table 1. (Continued)

Institution/Program's housing unit/ Mailing address/Website	Key faculty/Contact	Degree & course title	Content ^a		
			IEPE	CSI	LA
University of Kent — Canterbury Forensic Science School of Physical Sciences Ingram Building University of Kent — Canterbury Kent CT2 7NH England, UK http://www.kent.ac.uk/physical-sciences/prospective/undergraduate/forensic-science/	Dr. Stuart Gibson	BSc (Hons); Forensic sci.	X	X	X
	S.J.Gibson@kent.ac.uk	BSc (Hons); Forensic sci.; a year in Industry	X	X	X
	+44 (0) 1227 823271	BSc (Hons); Forensic chem.	X	X	X
		BSc (Hons); Forensic chem.; a year in industry	X		X
		MSci (Hons); Forensic chem.	X	X	X
King's College London Department of Forensic and Analytical Science Faculty of Life Sciences & Medicine Waterloo Campus, Room 4.68 Franklin Wilkins Building, 150 Stamford Street London SE1 9NH England, UK http://www.kcl.ac.uk/prospectus/department/department-of-forensic-amp-analytical-science	Prof. David Cowan	MSc; Forensic sci.	X		X
	postgrad-biomed@kcl.ac.uk	MSci (Hons); Forensic sci.	X	X	X
	+44 (0) 20 7848 4329				
Kingston University Forensic Science Faculty of Science, Engineering and Computing Penrhyn Road Kingston upon Thames London KT1 2EE England, UK http://www.kingston.ac.uk/postgraduate-course/forensic-analysis-msc/	Dr. James Barker	MSc; Forensic analysis	X	X	X
	j.barker@kingston.ac.uk				
	+44 (0) 20 8417 2981				
University of Lincoln Forensic Science School of Chemistry Brayford Pool, London, Lincolnshire LN6 7ST England, UK http://www.lincoln.ac.uk/home/course/frsfrsub/	Dr. Jose Gonzalez-Rodriguez	BSc (Hons); Forensic sci.	X	X	X
	jgonzalezrodriguez@lincoln.ac.uk				
	+44 (0) 1522 88 6878				
Liverpool John Moores University Forensic Science School of Pharmacy & Biomolecular Sciences New Barn Lane, Cheltenham Gloucestershire GL52 3LZ England, UK http://www.ljmu.ac.uk/courses/undergraduate/2015/forensic-science	Dr. Suzanne McColl	BSc (Hons); Forensic sci.	X	X	X
	s.m.mccoll@ljmu.ac.uk	BSc (Hons); Forensic anthropology	X	X	X
	+44 (0) 151 231 2156				
London South Bank University Forensic Science Dept. of Applied Sciences School of Applied Sciences Kensington and Chelsea, London SE1 0AA England, UK http://www.lsbu.ac.uk/search?clive=lsbu-courses&collection=lsbu-meta&query=forensic+science#	Dr. Clive Steele	BSc (Hons); Forensic sci.	X	X	X
	course.enquiries@lsbu.ac.uk	MSc; Forensic sci.	X	X	X
	+44 (0) 20 7815 7989				
Nottingham Trent University Chemistry and Forensic Science Academic Team School of Science & Technology Burton Street Nottingham NG1 4BU England, UK http://www.ntu.ac.uk/sat/about/academic_teams/forensics.html	Prof. Steve Allin	BSc (Hons); Forensic sci.	X	X	X
	steve.allin@ntu.ac.uk	BSc (Hons); Forensic sci. (physical)	X	X	X
	+44 (1) 115 848 6352	BSc (Hons); Forensic biology	X	X	X
Robert Gordon University Forensic and Analytical Science School of Pharmacy & Life Sciences Riverside East, Garthdee Road Aberdeen AB10 7GJ Scotland, UK http://www.rgu.ac.uk/laboratory-biomedical-and-sports-sciences/study-options/undergraduate-full-time/forensic-science	Dr. Catherine Inverarity	BSc (Hons); Forensic & analytical sci.	X	X	X
	c.hunter@rgu.ac.uk				
	+44 (0) 1224 262819				

Table 1. (Continued)

Institution/Program's housing unit/ Mailing address/Website	Key faculty/Contact	Degree & course title	Content ^a		
			IEPE	CSI	LA
University of South Wales Forensic Science School of Applied Sciences Pontypridd, Cardiff, Newport CF37 1DL Wales, UK http://www.southwales.ac.uk/study/subjects/forensic-sciences/	Richard Price richard.price@southwales.ac.uk +44 (0) 1443 4 82284	BSc (Hons); Forensic sci.	X	X	X
		BSc (Hons); Forensic sci. (abridged)	X	X	X
		BSc (Hons); Forensic sci. (sandwich)	X	X	X
		BSc (Hons); Forensic sci. with criminology (sandwich)	X	X	X
		BSc (Hons); Forensic chem.	X	X	X
		BSc (Hons); Forensic chem. (sandwich)	X	X	X
		BSc (Hons); Forensic biology	X	X	X
		BSc (Hons); Forensic biology (sandwich)	X	X	X
		MSc; Analytical & forensic & sci.	X	X	X
Staffordshire University Dept. of Forensic and Crime Science School of Science Science Centre, Leek Road Stoke-on-Trent, Staffordshire ST4 2DF England, UK http://www.staffs.ac.uk/academic_depts/sciences/subjects/forensics/	Prof. Andrew Jackson a.r.jackson@staffs.ac.uk +44 (0) 1782 294579	BSc (Hons); Forensic sci.	X	X	X
		BSc (Hons); Forensic invest.	X	X	X
		BSc (Hons); Forensic sci. & criminology	X	X	X
		MSc; Forensic sci.	X	X	X
University of Strathclyde Centre of Forensic Science Dept. of Pure & Applied Chemistry 295 Cathedral Street Glasgow, Scotland G1 1XQ Scotland, UK http://www.strath.ac.uk/chemistry/centres/centreforforensicscience/	Prof. James Fraser Jim.fraser@strath.ac.uk +44 (0) 141 548 2069	MChem; Forensic & analytical chem.	X		X
		MSc; Forensic sci.	X	X	X
Teesside University Crime Scene & Forensic Science School of Science & Engineering Middlesbrough, Tees Valley TS1 3BA England, UK http://www.tees.ac.uk/undergraduate_courses/Crime_Scene_&_Forensic_Science/	Shirley Marshall s.marshall@tees.ac.uk +44 (0) 1642 384292	BSc (Hons); Forensic sci.	X	X	X
		BSc (Hons); Crime scene sci.	X	X	
		BSc (Hons); Crime scene sci. (extended programme)	X	X	
		BSc (Hons); Forensic biology	X		X
		BSc (Hons); Computer & digital forensics	X	X	X
		MSc; Forensic sci.	X	X	X
The University of the West of England Forensic and Chemical Science Dept. of Biolog., Biomed. & Anal. Sciences Faculty of Health and Applied Sciences Frenchay Campus, Coldharbour Lane Bristol BS16 1QY England, UK http://www.tees.ac.uk/Undergraduate_courses/Crime_Scene_&_Forensic_Science/ http://www.tees.ac.uk/Postgraduate_courses/Crime_Scene_&_Forensic_Science/	Dr. Carolyn Morton Carolyn.Morton@uwe.ac.uk +44 (0) 117 32 82379	BSc (Hons); Forensic sci.	X	X	X
		BSc (Hons); Forensic sci. (biology)	X	X	X
		BSc (Hons); Forensic sci. (chem.)	X	X	X
		MSc; Advanced forensic analysis	X	X	X
University of Wolverhampton School of Biology, Chemistry & Forensic Sci. MA Building, City Campus South Wulfuna Street, Wolverhampton WV1 1LY England, UK http://www.wlv.ac.uk/about-us/our-schools-and-institutes/faculty-of-science-and-engineering/school-of-biology-chemistry-and-forensic-science/why-forensic-science/	Dr. Edward J. Mole e.j.mole@wlv.ac.uk +44 (0) 1902 322126	BSc (Hons); Forensic sci.	X	X	X
University of Worcester Forensic & Applied Biology Institute of Science and the Environment Henwick Grove, Worcester WR2 6AJ England, UK http://www.worcester.ac.uk/courses/forensic-and-applied-biology-bsc-hons.html	Kate Unwin kate.unwin@worc.ac.uk +44 (0) 1905 54 2211	BSc (Hons); Forensic & applied biology	X	X	

^a IEPE = Interpretation, Evaluation & Presentation of Evidence; CSI = Crime Scene Investigation; LA = Laboratory Analysis.

UPCOMING EVENTS

NIST International Symposium on Forensic Science Error Management

July 20–24, 2015; DoubleTree by Hilton Hotel
Arlington, VA, US

International Association for Identification (IAI) — 100th International Education Conference

August 2–8, 2015; Sacramento Convention Center
Sacramento, CA, US

The National Commission on Forensic Science* — NCFS Meeting 7

August 10–11, 2015; Office of Justice Programs Building
(810 7th Street NW, 3rd Floor Ballroom)
Washington, DC, US

2015 Impression, Pattern and Trace Evidence Symposium (IPTES)

August 25–27, 2015; Grand Hyatt San Antonio
San Antonio, TX, US

The International Association of Forensic Toxicologists (TIAFT) — 53rd Annual Meeting

August 30–September 4, 2015; Palazzo dei Congressi
Florence, Italy

20th Congress of the International Society for Forensic Genetics (ISFG)

August 31–September 5, 2015; Jagiellonian University
Krakow, Poland

California Crime and Intelligence Analysts' Association Conference

September 1–4, 2015; Catamaran Resort Hotel and Spa
San Diego, CA, US

The Borkenstein Drug Course

September 14–15; Mission Palms & Conference Center
Tempe, AZ, US

Northwest Association of Forensic Scientists (NWAFS) — 2015 Annual Meeting

September 14–18, 2015; Red Lion Hotel
Spokane, WA, US

Midwestern Association of Forensic Scientists (MAFS) — Annual Fall Meeting

September 20–25, 2015; Mission Point Resort
Mackinac Island, MI, US

California Association of Criminalists (CAC) — Fall Conference 2015

(Hosted by San Mateo County Crime Laboratory)
September 21–25, 2015; San Francisco Airport DoubleTree
San Francisco, CA, US

2015 International Symposium on Human Identification

October 12–15, 2015; Gaylord Texan Hotel & Convention
Center
Grapevine, TX, US

Southern Association of Forensic Scientists — Annual Meeting

October 12–16, 2015; Georgian Terrace Hotel
Atlanta, GA, US

Northeastern Association of Forensic Scientists (NEAFS) — Annual Meeting

October 13–17, 2015; Resort & Conference Center at
Hyannis
Hyannis, MA, US

International Forum for Drug and Alcohol Testing (IFDAT) — 2015 Annual Conference

October 18–20, 2015; Hyatt Regency Mission Bay Spa
and Marina
San Diego, CA, US

Society of Forensic Toxicologists (SOFT) — Annual Meeting

October 18–23, 2015; Hyatt Regency Atlanta
Atlanta, GA, US

Southwestern Association of Forensic Scientists (SWAFS) — 37th Annual Conference

October 19–23, 2015; Renaissance Oklahoma City
Oklahoma City, OK, US

The National Commission on Forensic Science* — NCFS Meeting 8

December 7–8, 2015; Office of Justice Programs Building
(810 7th Street NW, 3rd Floor Ballroom)
Washington, DC, US

American Academy of Forensic Sciences — Annual Meeting

February 22–27, 2016; Rio Las Vegas Hotel
Las Vegas, NV, US

The National Commission on Forensic Science* — NCFS Meeting 9

March 21–22, 2016; Office of Justice Programs Building
(810 7th Street NW, 3rd Floor Ballroom)
Washington, DC, US

American Society of Crime Laboratory Directors — Annual Symposium

April 23–28, 2016; Hyatt Regency Bellevue
Bellevue, WA, US

California Association of Criminalists (CAC) Spring Conference 2016

(Hosted by LA Police Department Crime Laboratory)
May 2–6, 2016; The Garland
North Hollywood, CA, US

* See Table I (p. 148) in the Appendix for commissioners of the National Commission on Forensic Science.

NEW FORENSIC SCIENCE BOOKS/CD-ROMS

Advanced Crime Scene Photography, 2nd ed

C. D. Duncan
CRC Press: Boca Raton, FL, US; 2015

Advanced Topics in Forensic DNA Typing: Interpretation

J. Butler
Academic Press/Elsevier: Waltham, MA, US; 2014

A Hands-On Introduction to Forensic Science: Cracking the Case

M. Okuda, F. H. Stephenson
CRC Press: Boca Raton, FL, US; 2014

Atlas of Human Poisoning and Envenoming, 2nd ed

J. H. Diaz
CRC Press: Boca Raton, FL; 2014

Biological Affinity in Forensic Identification of Human Skeletal Remains: Beyond Black and White

G. E. Berg, S. C. Ta'ala
CRC Press: Boca Raton, FL; 2014

Bloodstain Patterns, Identification, Interpretation and Application

A. Wonder
Academic Press/Elsevier: Waltham, MA, US; 2015

Case Studies in Drowning Forensics

K. Gannon, D. L. Gilbertson
Academic Press/Elsevier: Waltham, MA, US; 2014

Crime Scene Investigation Laboratory Manual

M. Miller
Academic Press/Elsevier: Waltham, MA, US; 2014

Forensic Anthropology, Current Methods and Practice

A. Christensen, N. Passalacqua, E. Bartelink
Academic Press/Elsevier: Waltham, MA, US; 2014

Forensic Biology

M. Houck (Ed)
Academic Press/Elsevier: Waltham, MA, US; 2015

Forensic Biology, 2nd ed

R. Li
CRC Press: Boca Raton, FL, US; 2015

Forensic Chemistry

M. Houck (Ed)
Academic Press/Elsevier: Waltham, MA, US; 2015

Forensic DNA Applications: An Interdisciplinary Perspective

D. Primorac, M. Schanfield (Eds)
CRC Press: Boca Raton, FL, US; 2015

Evidence Found, An Approach to Crime Scene Investigation

D. Miranda
Academic Press/Elsevier: Waltham, MA, US; 2015

Forensic Laboratory Management: Applying Business Principles

W. M. Dale, W. S. Becker
CRC Press: Boca Raton, FL, US; 2014

Forensic Photography: A Practitioner's Guide

N. Marsh
Wiley-Blackwell: Somerset, NJ, US; 2014

Fraud Prevention and Detection: Warning Signs and the Red Flag System

R. T. Stamler, H. J. Marschdorf, M. Possamai
CRC Press: Boca Raton, FL, US; 2014

Fundamentals of Fingerprint Analysis

H. M. Daluz
CRC Press: Boca Raton, FL, US; 2014

Fingerprint Analysis — Laboratory Workbook

H. M. Daluz
CRC Press: Boca Raton, FL, US; 2014

Handbook of Toxicology, 3rd ed

M. J. Derelanko, C. S. Auletta
CRC Press: Boca Raton, FL, US; 2014

Human Scent Evidence

P. A. Prada, A. M. Curran, K. G. Furton
CRC Press: Boca Raton, FL, US; 2014

Introduction to Environmental Forensics, 3rd ed

B. Murphy, R. Morrison (Eds)
Academic Press/Elsevier: Waltham, MA, US; 2014

Nuclear Forensic Analysis, 2nd ed

K. J. Moody, P. M. Grant, I. D. Hutcheon
CRC Press: Boca Raton, FL, US; 2014

Statistical Analysis in Forensic Science: Evidential Values of Multivariate Physicochemical Data

G. Zadora, A. Martyna, D. Ramos, C. Aitken
Wiley-Blackwell: Somerset, NJ, US; 2014

The Global Practice of Forensic Science

D. H. Ubelaker (Ed)
Wiley-Blackwell: Somerset, NJ, US; 2015

The Science of Forensic Entomology

D. B. Rivers, G. A. Dahlem
Wiley-Blackwell: Somerset, NJ, US; 2014

BOOK REVIEWS

Expert Report Writing in Toxicology: Forensic, Scientific and Legal Aspects*M. D. Coleman**John Wiley & Sons: Oxford, UK/Hoboken, NJ, US; 2014*Reviewed by: *F. W. Fochtman, Forensic Science and Law, Duquesne University, Pittsburgh, PA, US*

Michael D. Coleman's book is a 208-page paperback that provides an interesting perspective on expert report writing. It starts off with a brief history of occupational toxicology and finishes with an epilogue on occupational health – future perspectives. In between there are chapters on legal processes, acute toxicity of solvent exposure, chronic toxicity involving bladder cancer, chronic and acute toxicity of herbicides and pesticides, and toxicity of imported goods. In this day and age it is generally understood that any bodily injury from a chemical exposure may have forensic implications. However, there is an absence of what could be referred to as “classic” forensic toxicology content, such as drugs and chemicals involved in postmortem interpretation, psychomotor impairment, and analytical and interpretive aspects of drug testing. Therefore, “Forensic” as part of the title is a bit of a stretch.

That said, the information provided is very good regarding occupational and environmental exposures to harmful chemicals. Chapter one, a brief history of occupational toxicology, provides interesting and excellent information regarding toxic exposures in antiquity up through the Middle Ages and the Renaissance. Examples include when lead toxicity was first described and other early reports of lead toxicity, toxicity resulting from the mining industry, and the evolution of petrochemicals and their toxic effects. The first chapter includes a perspective on the chemical industry and its relationship to the industrial revolution. The relationship of demand for industrial products (e.g., tires, dyes, and explosives) and occupational exposures to toxic chemicals is presented. The first chapter includes a discussion of society's realization that occupational and environmental exposures to hazards result in serious health problems. And, that changes in social attitudes toward worker safety was slow to develop but was important in the promotion of changes in industry to protect workers and the general population from hazard exposures. The chapter ends with a good discussion of three well-known historic exposures leading to toxicity — mercury in the felt hat industry, radium painting of luminous dials, and asbestos.

Chapter two, on the expert report process in legal context, starts off with an industrial injury where there can be a claim made that it was caused by exposure to a hazard, chemical or otherwise. The chapter goes through the sequence of how the claim progresses: initiating the legal steps, the medical evaluation, and a scientific report to show causality. Included is advice for recruiting an expert, the court's expectations of the expert, the solicitor (attorney)-expert relationship and the expert's report. This is followed by a discussion, with examples of compiling the report to obviously identify the toxin, and how the exposure occurred; continuing with suggestions for discussing the chemical nature of the toxin, its absorption and mechanism as related to causation. Each area has examples that are useful for understanding the rationale for inclusion in an expert's report. The chapter also covers the importance of considering epidemiological data for inclusion in the report. Submission of a draft report is discussed, as is the presentation of the expert's report in court.

It is noted that the author is from the United Kingdom, and chapter two describes how the legal process occurs in that country, e.g., with reference to “solicitors” rather than attorneys. However, most of the areas of discussion in chapter two can be related to analogous processes in the United States.

Chapters three, four, and five provide case histories of toxic exposures and resulting claims of injury followed by claims for restitution. Each of the chapters identifies the nature of the exposure, discusses toxicity and related mechanisms, a report prepared by the book's author, and comments regarding any outcomes. Chapter three cases include exposure to a volatile petroleum mixture and dichloromethane, and a chronic solvent exposure. Chapter four discusses occupational exposure and bladder cancer. Various causes and a mechanism of beta-naphthylamine are presented along with four case histories. Included in the chapter is extensive coverage of bladder cancer in the automotive industry. Background information is provided as well as detailed expert reports prepared by the book's author. Chapter five features toxicity regarding herbicides and pesticides. There is a discussion of the rationale for the use of these agents and the desire for them to be selective with minimal or no human consequences. Included is what animal toxicity tests are required for classification by regulatory authorities and how in the US the EPA categorizes pesticides. A discussion of herbicides includes the “infamous” Agent Orange that was used by the US military in Vietnam. Several case histories for

both pesticides and herbicides are discussed that include extensive expert reports and case comments. A brief but comprehensive presentation of the mechanism of action of different pesticides with a very clear and well-labeled figure is included.

Chapter six discusses problems with imported products that are manufactured in countries where regulatory controls are lacking. The author states that vast amounts of imported goods are sold in the United Kingdom every year and relatively few are evaluated to the degree that their potential toxicity might be revealed. Various products are discussed that include exposure to naphthalene, phthalates, barium, chromium, lead, and chloroform. The products include soft plastic toys, wooden toys, and various adhesives (super glues).

The book ends with the epilogue on occupational health — future perspectives. Included is the timeframe for the case studies presented and that workers today have a system to address injuries due to hazardous exposures. A brief history of the decline of heavy industry and manufacturing in the United Kingdom in the 1970's and early 1980's and the impact this has had on hazard levels is presented.

The epilogue includes a discussion of hazardous exposures to workers in developing countries such as China, India, and Brazil. Included is a statement that 148 fatal work-related accidents were reported in the UK between 2012 and 2013, while more than 47,000 such deaths were estimated to have occurred in India in 2003, and that it is estimated that work-related deaths in developing countries exceeds 1.8 million annually.

In conclusion, the book *Expert Report Writing in Toxicology, Forensic, Scientific & Legal Aspects* provides excellent examples of industrial hazardous exposures and samples of very thorough expert descriptions of toxicity and reports. I myself will use the book as a guide in writing reports involving workplace or environmental exposure toxicity. However, as mentioned earlier, the book does not do well in describing classical forensic toxicology and related expert writing.

Forensic Laboratory Management: Applying Business Principles

W. M. Dale, W. S. Becker

CRC Press: Boca Raton, FL, US; 2015

Reviewed by: *F. W. Fochtman, Forensic Science and Law, Duquesne University, Pittsburgh, PA, US*

The second part of the book's title, "Applying Business Principles", could be considered an integral part of forensic laboratory management and therefore not necessary to include in the title. However, the experiences of author W. Mark Dale and others that direct forensic laboratories show all too well that this aspect is frequently not emphasized and it should be. Dale's diverse and extensive forensic laboratory, forensic education, and forensic laboratory quality assurance experience provides excellent insight. This insight enhances a book that comprehensively covers laboratory management issues in the American crime lab, a.k.a. forensic science laboratory. The book is organized into six chapters that provide relevant and comprehensive information applicable to ensuring the success of a modern operating forensic laboratory. References are made to the National Academy of Sciences (NAS) Report that called for an increased effort for quality in the forensic science community. Many of the topics in the book relate directly or indirectly to the recommendations made in the 2009 NAS Report *Strengthening Forensic Science in the United States: A Path Forward*.

Chapter one begins with the topic of leadership in the forensic science laboratory and sets the stage for much of the rest of the book. A strategic review of leadership is made, risks and challenges are identified, and recommendations to measure efficacy and effectiveness are included. A laboratory management performance model (LMPM) is presented that provides guidance for a quality forensic laboratory. In chapter two the LMPM is expanded and used to discuss in detail forensic laboratory involvement with law enforcement, laboratory costs, capabilities, efficiency, quality, and cost-benefit analysis. Chapter two is entitled "Forensic Laboratory Key Business Metrics and Cost-Benefit Analyses". Publicly funded agencies versus private industry and differences in key metrics are discussed. Many tables and figures are used to describe metrics and analyses such as productivity, budgeting, QC charting, causative analysis, and cost efficiency. Laboratory performance and benchmarking for best practices is also discussed. After metrics are developed, the chapter culminates in a discussion of the basics of cost-benefit analyses that includes a comprehensive example.

Excellence in the laboratory and the question of ethics are examined in chapter three. The chapter is authored by Douglas Lucas, based on his article published in the *Journal of Forensic Sciences*. The chapter emphasizes the linkage between excellence and ethics or quality and ethics. Included is a discussion of professional association mandates, public interest in ethical misconduct and academic studies. The topic of morals versus ethics and ethics versus duties is presented. A discussion of codes of ethics is very informative and comprehensive. The chapter includes examples of ethical problems, challenges, and dilemmas, and concludes with pressures put on the forensic scientist that can create an ethical dilemma. The information presented in this third chapter provides an excellent argument for the need of an absolute understanding of the relationship between forensic science and ethics in the criminal justice community.

Chapter four, "Forensic Training, Education, and Institutes", discusses the need and the "return on investment" of structured academic education. Included is a discussion of the NAS Report that identifies a need for education, training, and professional development. The chapter identifies various government agencies and professional organizations that promote education and accreditation. Examples of training workshops/academies that show numbers trained, benefits, and associated costs are provided. Various academic modules and curricula are presented. Included are forensic science student experiences that culminate in their mock testimony as a capstone experience. Accompanying this chapter is a DVD video recording and transcript of mock trial exercises. This chapter also has an appendix that accompanies a 233-slide presentation titled *Population Statistics and Forensic DNA Analysis* by instructor George Carmody, Ph.D. The DVD that also contains the slides comes with the book.

Chapter five is titled "ISO Accreditation Implementation", authored by Harold Peel and Murray Malcolm. The chapter provides background information about the International Organization for Standardization (ISO) and various accrediting bodies. The advantage of accreditation is discussed. Terminology used is identified and defined. The chapter presents a very informative discussion of each management and technical requirement under ISO/IEC 17025 standards. Each of the 15 management requirement topics and 10 technical requirement topics are included. The steps to becoming accredited, how to get started, documentation needed, validation issues, and corrective actions for nonconforming events are discussed.

The sixth and last chapter, titled "Writing Policies and Procedures", presents the audit process and how procedures have to be developed and written to satisfy the requirements of accreditation standards. This is a fitting topic to end the book.

A detailed process for developing policies and procedures is outlined. Very informative topics, instructions, tables, and flowcharts are included that describe a detailed process for preparing accreditation standard acceptable policies and procedures.

In conclusion, in my experience of directing a forensic laboratory for 10 years, and also teaching a course titled "Quality Assurance and Laboratory Management", I welcome this book on forensic laboratory management. I intend to use it as a required text in my class. The book touches on nearly all of the aspects that I cover in the class, and does so in a clear and organized fashion.

***Forensic Science: An Introduction to Scientific and Investigative Techniques*, 4th ed**

S. H. James, J. J. Nordby, S. Bell (Eds)
CRC Press: Boca Raton, FL, US; 2014

Reviewed by: *L. N. Ferrara, Forensic Science and Law,*
Duquesne University, Pittsburgh, PA, US

The fourth edition of *Forensic Science: An Introduction to Scientific and Investigative Techniques*, edited by Stuart H. James, Jon J. Nordby, and Suzanne Bell, provides a useful compilation of information on the basic areas of forensic science. By providing an introductory overview of the major forensic disciplines, this book is well suited for an entry-level undergraduate course. The content is broken down into easy-to-digest sections with a scope limited to the primary forensic disciplines. The use of subject-matter experts as authors of each chapter allows current knowledge and experience to be expressed in both a theoretical and applied approach.

The book consists of nine sections encompassing 21 chapters. While the total page count may seem daunting to students at 614 pages, the layout and incorporation of pictures make this an engaging read. Each section begins with a short overview and ends with a section summary along with integrative questions. Additionally, all the chapters include an overview, outline, chapter summary, review material, and references/further reading. The review material section contains key terms/concepts and review questions. The questions provided at the end of each chapter along with the integrative questions in each section create a pedagogical format that can be easily implemented into an introductory course. Citations for relevant books and journal articles are listed in the references and further reading section, providing extensive resources for students interested in further exploring a particular topic.

The basic content structure of each chapter adds to the value of this textbook. The chapters include multiple sidebars covering material such as case studies, current events, and historical notes. Since the chapters are written by subject-matter experts, the case studies provide valuable real-life examples of how forensic analysis is used in different cases. Additional clarification regarding the reality of forensic science compared to the forensic fiction depicted in the media is illustrated in the current-events sidebar. There is also a career preparation and expectation sidebar in each of the forensic discipline-specific chapters that provides important information for students interested in the field. Typical education requirements and training timelines are outlined, giving students an accurate description for the various forensic science careers.

Section 1 begins by “setting the stage”, as the chapter is aptly named. This section provides a brief overview of the history of forensic science and outlines the interaction between the science and the court system. There is a particularly nice segment detailing the types of legal proceedings that occur and how a forensic scientist fits into the process. Further explanation is given specifically explaining the admissibility of evidence with descriptions of the Frye standard, Federal Rules of Evidence, and Daubert decision. This section wraps up by elucidating a number of different ways evidence can be categorized.

The next section explores the crime scene with a focus on the investigation process and analysis of bloodstain patterns. Although many forensic scientists may never be present at a crime scene, it is important to have a general understanding of the investigation process since this is typically where the evidence originates. This section explains the documentation and collection process followed at crime scenes. The second chapter in this section focuses on how bloodstain pattern analysis is performed and how it can be used to reconstruct a crime. These chapters are filled with pictures and case explanations to better illustrate the techniques discussed.

The chapters included in section 3 relate to death investigations. The progression flows from the role of a forensic pathologist to an anthropologist and finally to an entomologist. Each discipline is detailed independently as well as how they overlap. Next, sections 4–7 explore how physical evidence is examined by explaining the typical practices and procedures of forensic laboratory-based disciplines. While providing detailed information about each, the content is not overly technical. Analysis techniques and instrumentation is presented in an easy-to-read format at a basic level so students can understand what the analysis or instrumentation does without detailing the intricacies of how it works.

The layout of sections 4–7 corresponds to the division of physical evidence into four broad categories: biological, drugs, trace, and pattern evidence. Section 4 specifically focuses on forensic biology by addressing the identification of blood/body fluids and DNA typing. The next three chapters covered in Section 5 revolve around forensic chemistry-related disciplines, which includes forensic toxicology, seized drug analysis, and arson, fire, and explosives. The classic pattern evidence analyses of fingerprints, firearms and toolmarks, and tread impressions are detailed in section 6, while section 7 includes trace evidence and questioned documents because they are described as being integrative and cross-cutting forensic disciplines.

Section 8 is unique in that it includes chapters on forensic engineering and forensic computing in order to introduce disciplines that do not require a traditional science background. The forensic engineering chapter details the investigation and analysis of vehicular accidents and structural collapses by explaining the underlying principles of physics. The forensic computing chapter provides a brief overview of the basic procedures to collect electronic evidence as well as other applications of forensic digital analysis.

The last forensic discipline discussed in chapter 20 does not focus on the analysis of evidence, but rather the study of human behavior as it applies to forensic science. The behavioral science chapter includes basic information on how psychologists and psychiatrists can assist law enforcement, forensic science, and the judicial system. Some examples include determining competency to stand trial, identifying true mental illness, and determining sanity. Additionally, this chapter explains how profiling can be used primarily as an investigative tool.

The last chapter discusses the future of forensic science. The author does a good job of establishing how difficult it is to predict where forensic science is headed, but references to the NAS report provide an overview indicating the types of changes that are necessary. The book concludes with an appendix including trigonometric tables used in bloodstain pattern analysis and an extensive glossary.

Forensic Science: An Introduction to Scientific and Investigative Techniques is a valuable textbook for instructors teaching an introductory forensic science course at the undergraduate level. The condensed nature of this fourth edition succinctly focuses on primary forensic disciplines at a level that can easily be understood. By providing basic information as well as lists of additional resources, this book could be the foundation for students beginning their forensic science education.

APPENDIX
THE NATIONAL COMMISSION ON FORENSIC SCIENCE and
ORGANIZATION FOR SCIENTIFIC AREA COMMITTEES

In 2009, the U.S. National Research Council issued a report entitled, *Strengthening Forensic Science in the United States: A Path Forward* (see <https://www.ncjrs.gov/app/publications/abstract.aspx?ID=250103>), to identify weaknesses in forensic sciences and present recommendations to address them. In 2013, The US National Institute of Standards and Technology (NIST) and the US Department of Justice (DOJ) signed a memorandum of understanding (see <http://www.nist.gov/oles/doj-nist-forensic-science021513.cfm>) for a new initiative to strengthen the practice of forensic science.

DOJ's role is to oversee the National Commission on Forensic Science (see <http://www.nist.gov/forensics/forensic-science-commission-011014.cfm>). "Members of the commission will work to improve the practice of forensic science by developing guidance concerning the intersections between forensic science and the criminal justice system. The commission also will work to develop policy recommendations for the US Attorney General,

including uniform codes for professional responsibility and requirements for formal training and certification."

NIST's role is to administer new "guidance groups" to develop and propose discipline-specific standards and guidelines. As it worked on plans for the guidance groups, NIST selected a name for a new administering body: the Organization for Scientific Area Committees (OSAC). OSAC is consisted of a Forensic Science Standards Board (**Figure I**), three resource committees, five scientific area committees, and 24 subcommittees [see <http://nist.gov/forensics/osac/upload/OSAC-Block-Org-Chart-3-17-2015-2.pdf>]. In this plan, "subcommittee" replaces the original placeholder name of "guidance group".

Members of the National Commission on Forensic Science (**Table I**; p. 148), Forensic Science Standards Board and its three resource committees (**Table II**; p. 149–150), and five Scientific Area Committees and their subcommittees (**Tables III-1 to III-5**; p. 151–163) are compiled in this Appendix for ready reference.

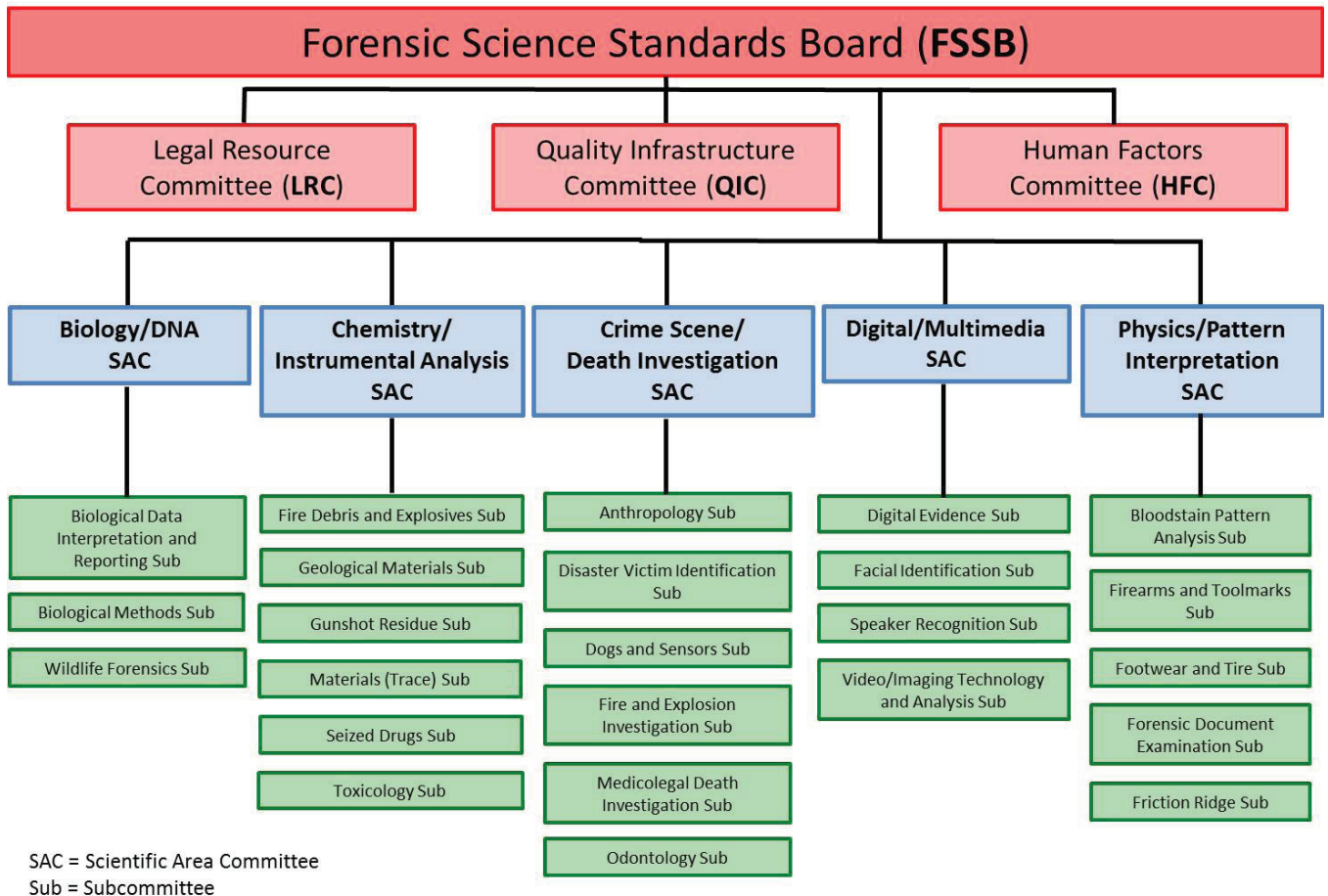


Figure I. Organization of Scientific Area Committees and Subcommittees [March 17, 2015 version].

Table I. Commissioners of the National Commission on Forensic Science

Name	Affiliation; title
<i>Co-Chairs</i>	
Sally Q. Yares	US Department of Justice; Deputy Attorney General
Willie E. May, Ph.D.	US National Institute of Standard and Technology; Director
<i>Vice-Chairs</i>	
Nelson Santos	US Drug Enforcement Administration; Deputy Assistant Administrator for the Office of Forensic Sciences
John M. Butler, Ph.D.	US National Institute of Standard and Technology; Fellow
<i>Commission Staff</i>	
Andrew J. Bruck	US Department of Justice; Counsel to the Deputy Attorney General
Robin Jones	US National Commission on Forensic Science; Program manager
Jonathan McGrath, Ph.D.	US National Institute of Justice; Senior policy analyst
Danielle M. Weiss	Booz Allen Hamilton (Seattle, WA); Lead associate
<i>Commission Members</i>	
Suzanne Bell, Ph.D.	West Virginia University; Associate professor
Frederick Bieber, Ph.D.	Harvard Medical School; Medical geneticist
Cecelia Crouse, Ph.D.	Palm Beach County (FL) Sheriff's Office Crime Laboratory; Director
M. Bonner Denton, Ph.D.	University of Arizona; Professor
Vincent Di Maio, M.D.	Consultant in forensic pathology
Jules Epstein	Widener University; Associate professor
Stephen Fienberg, Ph.D.	Carnegie Mellon University; Maurice Falk University Professor
John Fudenberg	Clark County (NV) Office of the Coroner/Medical Examiner; Assistant coroner
S. James Gates, Jr., Ph.D.	University of Maryland; University System Regents Professor & John S. Toll Professor
Dean Gialamas	Los Angeles County (CA) Sheriff's Department, Scientific Services Bureau; Crime laboratory director
Paul Giannelli	Case Western Reserve University; Distinguished University Professor and Albert J. Weatherhead III & Richard W. Weatherhead Professor
Hon. Barbara Hervey	Texas Court of Criminal Appeals; Judge
Susan Howley	National Center for Victims of Crime; Public policy director
Ted Hunt	Jackson County (MO) Prosecuting Attorney's Office; Chief trial attorney
Linda Jackson	Virginia Department of Forensic Science; Director
Pamela King	Minnesota State Public Defender Office; Assistant state public defender
Marc LeBeau, Ph.D.	US Federal Bureau of Investigation; Senior forensic scientist
Hon. Bridget Mary McCormack	Michigan Supreme Court; Justice
Peter Neufeld	Benjamin Cardozo School of Law; Co-director of innocence project
Phil Pulaski	New York City Police Department; Chief of detectives
Matthew Redle	Sheridan County (WY); Prosecuting attorney
Michael "Jeff" Salyards, Ph.D.	US Department of the Army's Defense Forensic Science Center; Executive director
<i>Ex-Officio Members</i>	
Hon. Jed Rakoff	Southern District of New York; Senior US district judge
David Honey, Ph.D.	US Office of the Director of National Intelligence; Assistant deputy director
Marilyn Huestis, Ph.D.	US National Institute on Drug Abuse, Chemistry & Drug Metabolism Section; Chief
Gerald LaPorte	US National Institute of Justice, Office of Investigative & Forensic Sciences; Acting director
Patricia Manzolillo	US Postal Inspection Service, Forensic Laboratory Services; Laboratory director
Frances Schrotter	American National Standards Institute; Senior vice president & chief operations officer
Kathryn Turman	US Federal Bureau of Investigation Office of Victim Assistance; Assistant director
Mark Weiss, Ph.D.	US National Science Foundation, Behavior & Cognitive Sciences; Division director

Table II. The Forensic Science Standards Board and its resource committees

Name	Affiliation; title
Forensic Science Standards Board	
<i>Professional Association Representatives</i>	
Jeremy Triplett	<i>Chair, Forensic Science Standards Board</i> American Society of Crime Laboratory Directors; Advocacy committee chair Kentucky State Police Forensic Laboratory; Supervisor
Mark Keisler	<i>Vice -Chair, Forensic Science Standards Board</i> Association of Firearm & Tool Mark Examiners; Past president & member-at-large Indiana State Police Laboratory; Forensic Firearms Identification Unit supervisor
Laurel Farrell	<i>Executive Secretary, Forensic Science Standards Board</i> Society of Forensic Toxicologists; Director & past president American Society of Crime Laboratory Directors; Laboratory Accreditation Program Manager — Calibration
Andrew Baker, M.D.	National Association of Medical Examiners; Standards committee chair Hennepin County (MN) Medical Examiner
Steven Johnson	International Association for Identification; First vice president Ideal Innovations Inc.; Certified latent print examiner/facial examiner
Barry Logan, Ph.D.	American Academy of Forensic Sciences; Past president NMS Labs; Vice president (Forensic Sci. Initiatives) & chief (Forensic Toxicology)
<i>Research Representatives</i>	
Anil Jain, Ph.D.	Michigan State University; Distinguished professor
Karen Kafadar, Ph.D.	University of Virginia, Department of Statistics; Professor & chair
Sarah Kerrigan, Ph.D.	Sam Houston State University, Forensic Science Department; Chair
Douglas Ubelaker, Ph.D.	Smithsonian Institution, National Museum of Natural History; Curator
<i>Scientific Area Committee Chairs</i>	
George Herrin Jr., Ph.D.	<i>Chair, Biology/DNA Scientific Area Committee</i> Georgia Bureau of Investigation; Division of Forensic Science deputy director
Scott Oulton	<i>Chair, Chemistry/Instrumental Analysis Scientific Area Committee</i> Drug Enforcement Administration; Associate deputy assistant administrator
Gregory Davis, M.D.	<i>Chair, Crime Scene/Death Investigation Scientific Area Committee</i> University of Alabama at Birmingham; Professor, division director, & chief coroner/ medical examiner
Richard V. Bruegge, Ph.D.	<i>Chair, Digital/Multimedia Scientific Area Committee</i> US Federal Bureau of Investigation; Senior photographic technologist
Austin Hicklin	<i>Chair, Physics/Pattern Interpretation Scientific Area Committee</i> Noblis (Falls Church, VA); Biometrics and forensic science fellow
<i>NIST Ex Officio Member</i>	
Mark Stolorow	US National Institute of Standards and Technology Office of Special Programs; Organization of Scientific Area Committee Affairs director
Legal Resource Committee	
Christopher J. Plourd	<i>Chair, Legal Resource Committee</i> State of California; Superior court judge
Jennifer Friedman	Los Angeles County; Deputy public defender
Christine Funk	Washington (DC) Department of Forensic Sciences (local government); General counsel
Lynn Robitaille Garcia	Texas Forensic Science Commission (state government); General counsel
Ted R. Hunt	Jackson County (MO) Prosecutor's Office; Chief trial attorney & DNA cold case project director
David H. Kaye	Pennsylvania State University, Forensic Science Program; Professor & graduate faculty
David A. Moran	University of Michigan Law School; Professor of law
Henry R. Reeve	Denver District Attorney's Office
Ronald S. Reinstein	Arizona Supreme Court; Judge & judicial consultant
Barry Scheck	Cardozo School of Law, Yeshiva University; Professor Innocence Project, Co-Director; NY Commission on Forensic Science, Commissioner; Neufeld, Scheck, & Brustin, LLC

Table II. (Continued)

Name	Affiliation; title
<i>Quality Infrastructure Committee</i>	
Karen Reczek	<i>Chair, Quality Infrastructure Committee</i> US NIST Standards Coordination Office; Senior standards information specialist
Karin Athanas	American Association for Laboratory Accreditation; Program manager
Sally S. Aiken	Spokane County (WA); Medical examiner
Barbara E. Andree	US Bureau of Alcohol, Tobacco, Firearms and Explosives; Forensic chemist
Jason Bond	Indiana State Police Laboratory Division; Quality assurance coordinator
Pamela L. Bordner	American Society of Crime Laboratory Directors/Laboratory Accreditation Board; Sr. accreditation program manager
Kris Cano	Scottsdale (AZ) Police Department Crime Laboratory; Forensic laboratory manager
Deborah Friedman	Broward (FL) Sheriff's Office Crime Laboratory; Criminalist III
Matthew Gamette	Idaho State Police Forensic Services; Laboratory improvement and quality manager
Keith Greenaway	ANSI-ASQ National Accreditation Board; Vice president
Arlene Hall	Illinois State Police, Division of Forensic Services; Commander
Bruce Houlihan	Orange County Crime Laboratory/Orange County Sheriff-Coroner; Director
Alice R. Isenberg, Ph.D.	US Federal Bureau of Investigation Laboratory; Section chief
Timothy Kupferschmid	New York City Office of Chief Medical Examiner; Laboratory director
Frances E. Schrotter	American National Standards Institute; Sr. vice president & chief operation officer
<i>Human Factors Committee</i>	
William C. Thompson, Ph.D.	<i>Chair, Human Factors Committee</i> University of California, Irvine; Professor
Deborah A. Boehm-Davis, Ph.D.	George Mason University, College of Humanities and Social Sciences; Dean
Cleotilde Gonzalez, Ph.D.	Carnegie Mellon University; Associate research professor
Christian A. Meissner, Ph.D.	Iowa State University; Professor
Erin Morris, Ph.D.	Los Angeles County (CA) Public Defender; Behavioral sciences research analyst
Sunita Sah, Ph.D.	Georgetown University McDonough School of Business; Assistant professor
Scott Shappell, Ph.D.	Emory-Riddle Aeronautical University, Human Factors and Systems Department; Chair
Dan Simon	University of Southern California, Gould School of Law, & Department of Psychology; Professor
Brian C. Stanton	US National Institute of Standards and Technology ; Cognitive scientist

Table III-1. Biology/DNA Scientific Area Committee and its subcommittees

Name	Affiliation
Biology/DNA Scientific Area Committee	
George Herrin, Jr., Ph.D.	<i>Chair, Biology/DNA Scientific Area Committee</i>
Robyn Ragsdale, Ph.D.	Georgia Bureau of Investigation, Division of Forensic Sciences
Kimberly Murga	<i>Chair, Biological Data Interpretation & Reporting Subcommittee</i>
M. Katherine Moore	Florida Department of Law Enforcement
John Butler, Ph.D.	<i>Chair, Biological Methods Subcommittee</i>
Thomas Callaghan, Ph.D.	Las Vegas Metropolitan Police Department
Robin Cotton, Ph.D.	<i>Chair, Wildlife Subcommittee</i>
Phillip Danielson, Ph.D.	US National Oceanic and Atmospheric Administration, National Marine
Angelo Della Manna	Fisheries Service
Deedra Hawk	US National Institute of Standards and Technology
Bruce Weir, Ph.D.	US Federal Bureau of Investigation
	Boston University
	University of Denver
	Alabama Department of Forensic Sciences
	Wyoming Game and Fish Department Wildlife Forensic and Fish Health
	Laboratory
	University of Washington
<i>Biological Data Interpretation and Reporting Subcommittee</i>	
Robyn Ragsdale, Ph.D.	<i>Chair, Biological Data Interpretation and Reporting Subcommittee</i>
Todd Bille	Florida Department of Law Enforcement
Lisa Marie Brewer	US Bureau of Alcohol, Tobacco, Firearms and Explosives Laboratory
Michael Coble, Ph.D.	Glendale (CA) Police Department
Kathleen Corrado, Ph.D.	US National Institute of Standards and Technology
Julie French	Onondaga County (NY) Center for Forensic Sciences
Bill Gartside	GE Healthcare (Lansing, MI)
Catherine Grgicak, Ph.D.	San Bernardino (CA) County Sheriff's Department
Rebekah Kay	Boston University School of Medicine
Susannah Kehl	Utah Bureau of Forensic Services
Timothy McMahon, Ph.D.	US Federal Bureau of Investigation
Shawn Montpetit	US Armed Forces DNA Identification Laboratory
Jeff Nye	San Diego (CA) Police Department Crime Laboratory
Mechthild Prinz, Ph.D.	Michigan Department of State Police
Margaret Schwartz, Ph.D.	John Jay College of Criminal Justice, City University of New York
Carl Sobieralski	Vermont Forensic Laboratory
Joel Sutton	Indiana State Police Laboratory
Christian Westring, Ph.D.	US Department of Defense, Defense Forensic Science Center
Charlotte Word, Ph.D.	NMS Labs (Willow Grove, PA)
Sandy Zabell, Ph.D.	Private Consultant (Gaithersburg, MD)
	Northwestern University
<i>Biological Methods Subcommittee</i>	
Kimberly Murga	<i>Chair, Biological Methods Subcommittee</i>
Jason Befus	Las Vegas Metropolitan Police Department
Eric Buel, Ph.D.	Maryland State Police Forensic Sciences Division
Debra Glidewell	Vermont Department of Public Safety (retired)
Susan Greenspoon, Ph.D.	US Department of Defense, Defense Forensic Science Center
Amy Jeanguenat	Virginia Department of Forensic Science
Kristine Kadesh, Ph.D.	Bode Technology (Lorton, VA)
Eugene Lien	Jefferson County (CO) Regional Crime Laboratory
Kathleen Mayntz-Press	New York City Office of the Chief Medical Examiner
Bruce McCord, Ph.D.	Arizona Department of Public Safety Crime Laboratory
	Florida International University

Table III-1. (Continued)

Name	Affiliation
<i>Biological Methods Subcommittee (Continued)</i>	
Stacy McDonald, Ph.D.	Dallas County (TX) Southwestern Institute of Forensic Sciences
Amy McGuckian	Palm Beach County (FL) Sheriff's Office
Robert Sean Oliver	US Armed Forces DNA Identification Laboratory
Daniele Podini, Ph.D.	George Washington University
Margaret Sanger, Ph.D.	Kentucky State Police Forensic Laboratory
Taylor Scott III, Ph.D.	Illinois State Police
Peter Vallone, Ph.D.	US National Institute of Standards and Technology
Steven Weitz	US Bureau of Alcohol, Tobacco, Firearms and Explosives
Elisa Wurmbach, Ph.D.	New York City Office of the Chief Medical Examiner
Caroline Zervos	US Federal Bureau of Investigation
<i>Wildlife Subcommittee</i>	
M. Katherine Moore	<i>Chair, Wildlife Subcommittee</i>
Barry Baker	US National Oceanic and Atmospheric Administration, National Marine Fisheries Service
Tasha Bauman	US Fish and Wildlife Service, National Fish and Wildlife Forensics Laboratory
Mary Burnham-Curtis, Ph.D.	Wyoming Game and Fish Wildlife Forensic and Fish Health Laboratory
Jason Byrd, Ph.D.	US Fish and Wildlife Service, Office of Law Enforcement
Kimberly Frazier	University of Florida
Jenny Giles, Ph.D.	Wyoming Game and Fish Department
Lee-Ann Collins Hayek, Ph.D.	US National Oceanic and Atmospheric Administration, National Marine Fisheries Service
David Foran, Ph.D.	Forensic Unit
Steven Hoofer, Ph.D.	University of California, Davis, Veterinary Genetics Laboratory Forensic Unit
Christina Lindquist	Smithsonian Institution
Benjamin Paul (Trey) Knott III	Michigan State University
R. Christopher O'Brien, Ph.D.	Sedgwick County (KS) Regional Forensic Science Center
Pepper Trail, Ph.D.	University of California, Davis, Veterinary Genetics Laboratory Forensic Unit
	US National Oceanic and Atmospheric Administration, Northwest Fisheries Science Center
	University of New Haven
	US Fish and Wildlife Service, National Fish and Wildlife Forensics Laboratory

Table III-2. Chemistry/Instrumental Analysis Scientific Area Committee and its subcommittees

Name	Affiliation
Chemistry/Instrumental Analysis Scientific Area Committee	
Scott Oulton	<i>Chair, Chemistry/Instrumental Analysis Scientific Area Committee</i> US Drug Enforcement Administration
Vincent Desiderio	<i>Chair, Fire Debris and Explosives Subcommittee</i> US Postal Inspection Service
William Schneck	<i>Chair, Geological Materials Subcommittee</i> Washington State Patrol Crime Lab
Michael Martinez	<i>Chair, Gunshot Residue Subcommittee</i> Bexar County (TX) Criminal Investigation Laboratory
Susan Gross	<i>Chair, Materials (Trace) Subcommittee</i> Minnesota Bureau of Criminal Apprehension
Sandra Rodriguez-Cruz, Ph.D.	<i>Chair, Seized Drugs Subcommittee</i> US Drug Enforcement Administration
Marc LeBeau, Ph.D.	<i>Chair, Toxicology Subcommittee</i> US Federal Bureau of Investigation
Jose Almirall, Ph.D.	Florida International University
Christopher Bommarito	Forensic Science Consultants Inc. (Williamston, MI)
Carl Chasteen	State of Florida, Division of State Fire Marshall
William Guthrie	US National Institute of Standards and Technology
Stephen Morgan, Ph.D.	University of South Carolina
Jeri Roper-Miller, Ph.D.	RTI International (Research Triangle Park, NC)
Eric Steel	US National Institute of Standards and Technology
Chris Taylor	US Army Criminal Investigation Laboratory, Defense Forensic Science Center
<i>Fire Debris and Explosives Subcommittee</i>	
Vincent Desiderio	<i>Chair, Fire Debris and Explosives Subcommittee</i> US Postal Inspection Service
Philip Antoci	New York City Police Department
Andrew Armstrong, Ph.D.	Armstrong Forensic Laboratory (Arlington, TX)
Marcela Brown	US National Institute of Standards and Technology
Brenda Christy	Virginia Department of Forensic Science
Inge Corbin	US Army Criminal Investigation Command
Michelle Evans	US Bureau of Alcohol, Tobacco, Firearms and Explosives
Adam Hall, Ph.D.	Northeastern University
Susan Seebode Hetzel	SEA Ltd. (Lawrenceville, GA)
Dennis Hilliard	Rhode Island State Crime Laboratory
Judith Hoffman	Montana State Crime Laboratory
Katherine Hutches, Ph.D.	US Bureau of Alcohol, Tobacco, Firearms and Explosives
Douglas Klapeck	US Bureau of Alcohol, Tobacco, Firearms and Explosives
Wayne Moorehead	Pennsylvania State University
Robert Mothershead II	US Federal Bureau of Investigation
Reta Newman	Pinellas County (FL) Crime Laboratory
Jimmie Carol Oxley, Ph.D.	University of Rhode Island
William Randle	Missouri State Highway Patrol
Michael Sigman, Ph.D.	University of Central Florida
Lisa Windsor	Tucson Police Department Crime Laboratory
<i>Geological Materials Subcommittee</i>	
William Schneck	<i>Chair, Geological Materials Subcommittee</i> Washington State Patrol Crime Laboratory
Andrew Bowen	US Postal Inspection Service
Maureen Bottrell	US Federal Bureau of Investigation Laboratory
Brad Lee, Ph.D.	University of Kentucky
Jack Hietpas, Ph.D.	US Federal Bureau of Investigation

Table III-2. (Continued)

Name	Affiliation
<i>Geological Materials Subcommittee (Continued)</i>	
Kim Mooney, Ph.D. Samual 'Skip' J. Palenik Marianne Stam David Szymanski, Ph.D. Martin Wells, Ph.D. Cynthia Zeissler	US Army Criminal Investigation Laboratory Microtrace, LLC (Elgin, IL) California Department of Justice Bentley University Cornell University US National Institute of Standards and Technology
<i>Gunshot Residue Subcommittee</i>	
Michael Martinez Suzanne Bell, Ph.D. Robert Berk Carol Crowe Douglas DeGaetano John Drugan Dave Edwards David Freehling James Garcia Debra Kowal Wayne Niemeyer Frank Platek Koren Powers Nicholas Ritchie, Ph.D. Jason Schroeder Rodney Simmons Michael Trimpe Emily Weber Thomas White J. Matney Wyatt	<i>Chair, Gunshot Residue Subcommittee</i> Bexar County (TX) Criminal Investigation Laboratory West Virginia University Illinois State Police Colorado Bureau of Investigation Commonwealth of Virginia Department of Forensic Science Massachusetts State Police Forensic Group Jeol USA Inc. (Peabody, MA) North Carolina State Crime Laboratory US Department of Defense, Defense Forensic Science Center, Forensic Exploitation Directorate Los Angeles County (CA) Department of Coroner McCrone Associates, Inc. (Westmont, IL) US Food and Drug Administration Forensic Chemistry Center West Virginia State Police Forensic Laboratory US National Institute of Standards and Technology Harris County (TX) Institute of Forensic Sciences Wyoming State Crime Laboratory Hamilton County (OH) Coroner's Laboratory Hamilton County (OH) Coroner's Office Texas Department of Public Safety Crime Laboratory Services US Army Criminal Investigation Laboratory
<i>Material (Trace) Subcommittee</i>	
Susan Gross Leanora (Brun-Conti) Bender Alicia Carriquiry, Ph.D. Dave Green Tammy Jergovich Sandra Koch Cheryl Lozen Amy Michaud Andria Hobbs Mehlretter Christopher Palenik, Ph.D. Sandy Parent Edward Pollock Jennifer Remy Stephen Shaw Chantelle Taylor Tatiana Trejos, Ph.D. Jennifer Verkouteren Jodi Blakely Webb Robyn Weimer Diana Wright, Ph.D.	<i>Chair, Materials (Trace) Subcommittee</i> Minnesota Bureau of Criminal Apprehension US Bureau of Alcohol, Tobacco, Firearms and Explosives Iowa State University Lake County (OH) Crime Laboratory Georgia Bureau of Investigation Pennsylvania State University Michigan State Police US Bureau of Alcohol, Tobacco, Firearms and Explosives US Federal Bureau of Investigation Laboratory Microtrace, LLC (Elgin, IL) Texas Department of Public Safety Crime Laboratory Sacramento County (CA) District Attorney's Office Laboratory North Carolina State Crime Laboratory US Federal Bureau of Investigation Laboratory Arkansas State Crime Laboratory Florida International University US National Institute of Standards and Technology US Federal Bureau of Investigation Laboratory Virginia Department of Forensic Science US Federal Bureau of Investigation Laboratory

Table III-2. (Continued)

Name	Affiliation
<i>Seized Drugs Subcommittee</i>	
Sandra Rodriguez-Cruz, Ph.D.	<i>Chair, Seized Drugs Subcommittee</i>
Georgiy Bobashev, Ph.D.	US Drug Enforcement Administration
Jason Bory	RTI International (Research Triangle Park, NC)
Thomas Brettell, Ph.D.	US Customs and Border Protection, Laboratories and Scientific Services Directorate
Claire Dragovich	Cedar Crest College
Garth Glassburg	DuPage County (IL) Forensic Science Center
Thomas Gluodenis, Jr., Ph.D.	Northeastern Illinois Regional Crime Laboratory
David Gouldthorpe	Agilent Technologies (Wilmington, DE)
Glen Jackson, Ph.D.	Las Vegas (NV) Metropolitan Police Department Forensic Laboratory
David Koppenhaver	West Virginia University
Elzbeta “Ella” Kubicz, Ph.D.	Virginia Department of Forensic Science
Benny Lum	Wyoming State Crime Laboratory
Christian Matchett	Broward County (FL) Sheriff’s Office Crime Laboratory
Gina Nano	US Department of Defense, Defense Forensic Science Center
Richard Paulas	University of Massachusetts Medical School, Drugs of Abuse Laboratory
Eric Person, Ph.D.	Illinois State Police, Division of Forensic Services
Tiffany Ribadeneyra	California State University, Fresno
Sandra Sachs, Ph.D.	Nassau County (NY) Office of the Medical Examiner
Agnes Winokur	Oakland (CA) Police Department Criminalistics Laboratory
Travis Worst, Ph.D.	US Drug Enforcement Administration
Ohio Bureau of Criminal Investigation	
<i>Toxicology Subcommittee</i>	
Marc LeBeau, Ph.D.	<i>Chair, Toxicology Subcommittee</i>
Dan Anderson	US Federal Bureau of Investigation
Connie Margaret Borrer, Ph.D.	Los Angeles Department of Coroner
Sabra Botch-Jones	Arizona State University
Nichole Bynum	fTox Consulting, LLC (Wobum, MA)
Fiona Couper, Ph.D.	RTI International (Research Triangle Park, NC)
Kenneth Emil Ferslew, Ph.D.	Washington State Patrol
Marilyn Huestis, Ph.D.	East Tennessee State University
Robert Johnson, Ph.D.	US National Institute on Drug Abuse
Matthew Juhascik, Ph.D.	Tarrant County (TX) Medical Examiner’s Office
Philip Kemp, Ph.D.	Montgomery County (OH) Coroner’s Office
Melissa Kennedy	US Federal Aviation Administration
Jennifer Limoges	Virginia Department of Forensic Science
Robert Middleberg, Ph.D.	New York State Police
Madeline Montgomery	NMS Labs (Willow Grove, PA)
Christine Moore, Ph.D.	US Federal Bureau of Investigation Laboratory
Suman Rana, Ph.D.	Immunoanalysis Corporation (Pomona, CA)
Robert Sears	Redwood Toxicology Laboratory (Santa Rosa, CA)
Ruth Ellen Winecker, Ph.D.	South Carolina Law Enforcement Division
Dustin Tate Yeatman	North Carolina Office of the Chief Medical Examiner
Palm Beach County (FL) Sheriff’s Office Crime Laboratory	

Table III-3. Crime Scene/Death Investigation Scientific Area Committee and its subcommittees

Name	Affiliation
Crime Scene/Death Investigation Scientific Area Committee	
Gregory George Davis, M.D., SAC	<i>Chair, Crime Scene/Death Investigation Scientific Area Committee</i> University of Alabama at Birmingham
Thomas Holland, Ph.D.	<i>Chair, Anthropology Subcommittee</i> US Department of Defense Joint POW/MIA Accounting Command, Central Identification Laboratory
Jason Wiersema, Ph.D.	<i>Chair, Disaster Victim Identification Subcommittee</i> Harris County (TX) Institute of Forensic Sciences
Kenneth Furton, Ph.D.	<i>Chair, Dogs and Sensors Subcommittee</i> Florida International University
Craig Beyler, Ph.D.	<i>Chair, Fire and Explosion Investigation Subcommittee</i> Hughes Associates Fire Science and Engineering (Baltimore, MD)
John Fudenberg	<i>Chair, Medicolegal Death Investigation Subcommittee</i> Clark County (NV) Office of the Coroner Medical Examiner
Robert Barsley, D.D.S.	<i>Chair, Odontology Subcommittee</i> Louisiana State University, Health Sciences Center School of Dentistry
John Allen	US Bureau of Alcohol, Tobacco, Firearms and Explosives
Kenneth Aschheim, D.D.S.	New York City Office of Chief Medical Examiner
Jeremy Chappell	Kansas City (MO) Police Department
George Cronin, Ph.D.	Pennsylvania State Police and University of Pennsylvania
Timothy Davidson	Cowlitz County (WA) Coroner's Office
J. Scott Denton, M.D.	Independent Forensic Pathologist for Illinois Coroners and Consultant (Bloomington, IL)
Peter Massey, Ph.D.	University of New Haven
Marilyn Miller, Ed.D.	Virginia Commonwealth University, Richmond
Marcella Sorg, Ph.D.	University of Maine
Shawn Wilson	Hennepin County (MN) Medical Examiner
Anthropology Subcommittee	
Thomas Holland, Ph.D., DOD	<i>Chair, Anthropology Subcommittee</i> Joint POW/MIA Accounting Command, Central Identification Laboratory
Eric Bartelink, Ph.D.	California State University at Chico
William Belcher, Ph.D.	US Department of Defense Joint POW/MIA Accounting Command
Hugh Berryman, Ph.D.	Middle Tennessee State University
Angi Christensen, Ph.D.	US Federal Bureau of Investigation
Gretchen Dabbs, Ph.D.	Southern Illinois University
Todd Fenton, Ph.D.	Michigan State University
Diane France, Ph.D.	Human Identification Laboratory of Colorado
Kristen Hartnett, Ph.D.	New York City Office of Chief Medical Examiner
Joseph Hefner, Ph.D.	Michigan State University
Jennifer Love, Ph.D.	Washington (DC) Office of Chief Medical Examiner
Owen Middleton, M.D.	Hennepin County (MN) Medical Examiner's Office
Stephen Ousley, Ph.D.	Mercyhurst University
Nicholas Passalacqua, Ph.D.	US Department of Defense Joint POW/MIA Accounting Command
Vincent Sava	US Department of Defense Joint POW/MIA Accounting Command
Douglas Scott, Ph.D.	Consultant (Grand Junction, CO)
Richard Thomas, Ph.D.	US Federal Bureau of Investigation
Michael Warren, Ph.D.	University of Florida, C. A. Pound Human Identification Laboratory
Disaster Victim Identification Subcommittee	
Jason Wiersema, Ph.D.	<i>Chair, Disaster Victim Identification Subcommittee</i> Harris County (TX) Institute of Forensic Sciences
Donald Bloom	US National Disaster Medical System
Elissia Conlon	New York City Office of the Chief Medical Examiner
Joyce deJong, D.O.	Western Michigan University School of Medicine

Table III-3. (Continued)

Name	Affiliation
<i>Disaster Victim Identification Subcommittee (Continued)</i>	
Dennis Dirkmaat, Ph.D.	Mercyhurst University, Anthropology Department
Benjamin Figura, Ph.D.	New York City Office of the Chief Medical Examiner
Elias Kontanis, Ph.D.	US National Transportation Safety Board
Raymond Miller, D.D.S.	State University of New York, Buffalo
Dan Morgan	Cuyahoga County (OH) Medical Examiner
Thomas Parsons, Ph.D.	International Commission on Missing Persons (Sarajevo, Bosnia & Herzegovina)
Aaron Uhle	US Federal Bureau of Investigation
Suzanne Utley-Bobak, M.D.	District 12 Medical Examiners Office, FL
Mark Wadhams	US Armed Forces DNA Identification Laboratory Registry of Pathology
Allan Warnick, D.D.S.	Wayne County (OH) Medical Examiner
Victor Weedn, M.D.	George Washington University
Allison Woody	Harris County (TX) Institute of Forensic Sciences
Timothy Zolandz	US Federal Bureau of Investigation
<i>Dogs and Sensors Subcommittee</i>	
Kenneth Furton, Ph.D.	<i>Chair, Dogs and Sensors Subcommittee</i>
	Florida International University
Terry Anderson	City of Pasadena (TX) Police Department (retired)
Deborah Burnett	Fayette County (TN) Sheriff's Department
Frederick Helfers III,	Police Detective for City of Everett (WA) (retired)
David Kontny	US Department of Homeland Security
William MacCrehan, Ph.D.	US National Institute of Standards and Technology
Herbert Nakamura	Hawaii K-9 Concepts (Waimanalo, HI)
Billy Ray Neely, Jr.	US Bureau of Alcohol, Tobacco, Firearms and Explosives
Cynthia Otto, Ph.D.	University of Pennsylvania
John Pearce	AMK9 Academy (Anniston, AL)
Donald Roberts	US Department of Homeland Security
Sara Suzanne Perry	Sumner County (TN) Emergency Management Agency
Craig Schultz	US Federal Bureau of Investigation
Susan Stejskal, Ph.D.	St. Joseph County (MI) Sheriff's Department
Rex Stockham	US Federal Bureau of Investigation
Terry Uetrecht	Union Pacific Railroad police officer (retired)
	Secretary of the National Narcotic Detector Dog Association
Paul Waggoner, Ph.D.	Auburn University
Barbara Weakley-Jones, M.D.	Jefferson County (TX) Coroner
<i>Fire and Explosion Investigation Subcommittee</i>	
Craig Beyler, Ph.D.,	<i>Chair, Fire and Explosion Investigation Subcommittee</i>
	Hughes Associates Fire Science and Engineering (Baltimore, MD)
Steven Carman	Carman and Associates Fire Investigation, Inc. (Grass Valley, CA)
Philip Crombie, Jr.	Travelers Insurance (St. Paul, MN)
John Golder,	US Bureau of Alcohol, Tobacco, Firearms and Explosives
Mark Goodson	Goodson Engineering (Denton, TX)
Gregory Gorbett, Ph.D.	Eastern Kentucky University
Eve Hinman, Ph.D.	Hinman Consulting Engineers (San Francisco, CA)
Mark Johnson, Ph.D.	University of Central Florida
John Lentini	Scientific Fire Analysis, LLC (Islamorada, FL)
David McCollam	US Federal Bureau of Investigation
Elayne Pope, Ph.D.	Office of the Chief Medical Examiner, Tidewater District, Virginia Department of Health
Melvin Robin	US Bureau of Alcohol, Tobacco, Firearms and Explosives
Matthew Varisco	US Bureau of Alcohol, Tobacco, Firearms and Explosives
Charles "Randy" Watson	SEA Ltd. (Lawrenceville, GA)
Chad Wissinger	Ohio Division of State Fire Marshal Forensic Laboratory

Table III-3. (Continued)

Name	Affiliation
<i>Medicolegal Death Investigation Subcommittee</i>	
John Fudenberg	<i>Chair, Medicolegal Death Investigation Subcommittee</i>
David Carter, Ph.D.	Clark County (NV) Office of the Coroner Medical Examiner
Steve Cina, M.D.	Chaminade University of Honolulu
Laura Crandall	Cook County (IL) Medical Examiner's Office
David Fowler, M.D.	New York University Langone Medical Center
James Gill, M.D.	Maryland Office of the Chief Medical Examiner
Tom Hensley	Office of the Chief Medical Examiner (CT)
Marie Herrman, M.D.	Jackson County (MO) Medical Examiner's Office
Julie Howe	County of Volusia (FL)
Kelly Keyes	Franklin, Jefferson, and St. Charles Counties (MO) Medical Examiner Offices
Matthew Lunn	Orange County (CA) Sheriff's Coroner Office
Lauri McGivern	Arapahoe (CO) County Coroner's Office
Marcus Nashelsky, M.D.	Vermont Office of the Chief Medical Examiner
Kurt Nolte, M.D.	University of Iowa Carver College of Medicine Department of Pathology
Bill Oliver, M.D.	Office of the Medical Investigator, University of New Mexico School of Medicine
Keith Pinckard, M.D./Ph.D.	Brody School of Medicine at East Carolina University
Lindsey Thomas, M.D.	New Mexico Office of the Medical Investigator
Margaret Warner, Ph.D.	Hennepin County (MN)
Gary Watts	US Centers for Disease Control and Prevention, National Center for Health Statistics
	Richland County (SC)
<i>Odontology Subcommittee</i>	
Robert Barsley, DDS	<i>Chair, Odontology Subcommittee</i>
Mary Bush, D.D.S.	Louisiana State University, Health Sciences Center School of Dentistry
Mary Cimrmancic, D.D.S.	State University of New York at Buffalo School of Dental Medicine
Lawrence Dobrin, D.D.S.	Marquette University
Carla Evans, D.D.S./Ph.D./D.M.Sc.	New York City Office of the Chief Medical Examiner
Adam Freeman, D.D.S.	University of Illinois at Chicago
James Lewis, D.M.D.	Self Employed (Westport, CT)
Peter Loomis, D.D.S.	Self Employed (Madison, IL)
James McGivney, D.M.D.	New Mexico Office of the Medical Examiner
Roger Metcalf, D.D.S.	Self Employed (Webster Groves, MO)
Haskell Pitluck	Tarrant County (TX) Medical Examiner's District
David Senn, D.D.S.	Circuit court judge, retired (Crystal Lake, IL)
Calvin Shirona, D.M.D.	University of Texas Health Science Center at San Antonio
Sharon Stanford	Bexar County (TX) Medical Examiner's Office
Brad Wing	US Department of Defense Joint POW/MIA Accounting Command
Franklin Wright, D.M.D.	American Dental Association (Chicago, IL)
	US National Institute of Standards and Technology
	Self Employed (Cincinnati, OH)

Table III-4. Digital/Multimedia Scientific Area Committee and its subcommittees

Name	Affiliation
Digital/Multimedia Scientific Area Committee	
Richard Vorder Bruegge, Ph.D.	<i>Chair, Digital/Multimedia Scientific Area Committee</i> US Federal Bureau of Investigation
James Darnell	<i>Chair, Digital Evidence Subcommittee</i> US Secret Service
Lora Sims	<i>Chair, Facial Identification Subcommittee</i> Ideal Innovations Inc. (Arlington, VA)
Hiroataka Nakasone, Ph.D.	<i>Chair, Speaker Recognition Subcommittee</i> US Federal Bureau of Investigation
Carl Kriigel	<i>Chair, Video/Imaging Technology and Analysis Subcommittee</i> US Army Criminal Investigation Laboratory, Defense Forensic Science Center
Joseph Campbell, Ph.D.	Massachusetts Institute of Technology, Lincoln Laboratory
Eoghan Casey, Ph.D.	The MITRE Corporation (Bedford, MA & McLean, VA)
John Garofolo	US National Institute of Standards and Technology
Samuel Liles, Ph.D.	Purdue University
Abhyuday Mandal, Ph.D.	University of Georgia
Lam Nguyen	US Drug Enforcement Administration
Paul Penders	Connecticut Department of Emergency Services and Public Protection
Michael Piper	Target Corporation (Minneapolis, MN)
Mark Pollitt, Ph.D.	Digital Evidence Professional Services, Inc. (Ellicott City, MD)
Reva Schwartz	US Secret Service
<i>Digital Evidence Subcommittee</i>	
James Darnell	<i>Chair, Digital Evidence Subcommittee</i> US Secret Service
Samuel Brothers	US Customs and Border Protection
Joshua Bruntly	Marshall University
Ovie Carroll	US Department of Justice
Joseph Cassilly	State's Attorney for Harford County (MD)
William Eber	Defense Cyber Crime Center, Air Force Office of Special Investigations
Sabrina Feve	US Attorney's Office, Southern District of California, Department of Justice
Daren Ford	Weld County (CO) Sheriff's Office
David Hallimore	Houston Forensic Science Center, Inc. (Houston, TX)
James Holland	Wal-Mart Stores, Inc. (Centerton, AR)
Mary Horvath	US Federal Bureau of Investigation
James Lyle, Ph.D.	US National Institute of Standards and Technology
Andrew Neal	TransPerfect Legal Solutions (Dallas/Fort Worth, TX)
Mark Phillips	Johnson County (KS) Sheriff's Office Criminalistics Laboratory
Ryan Pittman	NASA Office of Inspector General Computer Crimes Division
Paul Reedy	District of Columbia Department of Forensic Sciences
Marcus Rogers, Ph.D.	Purdue University
Jeffrey Taylor	Arkansas State Crime Laboratory
Steve Watson	Intel Corporation (Beaverton, OR)
<i>Facial Identification Subcommittee</i>	
Lora Sims	<i>Chair, Facial Identification Subcommittee</i> Ideal Innovations Inc. (Arlington, VA)
Water E. Bruehs	US Federal Bureau of Investigation
Mark Dolfi	Los Angeles County (CA) Sheriff's Department
Heather Dyson	Ideal Innovations, Inc. (Arlington, VA)
Patrick J. Flynn, Ph.D.	University of Notre Dame
Trudy Lou Ford	US Federal Bureau of Investigation
Neal Gieselman	Aware, Inc. (Bedford, CT)
Matthew Graves	US Army Criminal Investigation Laboratory

Table III-4. (Continued)

Name	Affiliation
<i>Facial Identification Subcommittee (Continued)</i>	
Scott McCallum	US Federal Government
Trish Murphy	US Department of Defense
P. Jonathon Phillips, Ph.D.	US National Institute of Standards and Technology
Cary Rodrigues	US National Counterterrorism Center
Kirt Simmons, D.D.S./Ph.D.	Arkansas Children's Hospital
Britt Toalson	Seattle (WA) Police Department
Antonio Trindade	US Customs and Border Protection, US Border Patrol
Jane Wankmiller	Michigan State Police
Steven Wilkins	Pierce County (WA) Sheriff's Department
<i>Speaker Recognition Subcommittee</i>	
Hirotaka Nakasone, Ph.D.	<i>Chair, Speaker Recognition Subcommittee</i> US Federal Bureau of Investigation
Walter Andrews, Ph.D.	Raytheon BBN Technologies (Cambridge, MA)
Christopher Cieri, Ph.D.	Linguistic Data Consortium, The University of Pennsylvania
Kevin Farrell, Ph.D.	Nuance Inc. (Burlington, MA)
David Farris	US Federal Government
Steven Gibbs	US Federal Government
Dorothy Glancy	Santa Clara University
John Godfrey, Ph.D.	Johns Hopkins University
John Hansen, Ph.D.	University of Texas at Dallas
Peter Higgins	Higgins Associates (Malibu, CA)
Aaron Lawson, Ph.D.	SRI International (Research Triangle Park, NC)
Mitchell McLaren, Ph.D.	SRI International (Research Triangle Park, NC)
David Marks	US Department of Energy, Sandia National Laboratory
Ken Marr	US Federal Bureau of Investigation
Alvin Martin, Ph.D.	US National Institute of Standards and Technology
Oscar Morales	US Federal Government
Doug Reynolds, Ph.D.	Massachusetts Institute of Technology, Lincoln Laboratory
Raymond Slyh, Ph.D.	US Air Force Research Laboratory
Pedro Torres-Carrasquillo, Ph.D.	Massachusetts Institute of Technology, Lincoln Laboratory
James Wayman, Ph.D.	San Jose State University
<i>Video/Imaging Technology and Analysis Subcommittee</i>	
Carl Kriigel	<i>Chair, Video/Imaging Technology and Analysis Subcommittee</i> US Army Criminal Investigation Laboratory, Defense Forensic Science Center
David Allen, Ph.D.	US National Institute of Technology
Ed Baker	Video Consultant NW, LLC (Milton, WA)
Melody Buba	US Federal Bureau of Investigation
Julie Carnes	Target Corporation (Minneapolis, MN)
Wendy Dinova-Wimmer	2Visualize Inc. (Gaithersburg, MD)
Kenneth James Hoerricks	Los Angeles (CA) Police Department
Christopher Iber	US Federal Bureau of Investigation
Douglas Lacey	BEK TEK, LLC (Stafford, VA)
Christina Malone	US Army Criminal Investigation Laboratory, Defense Forensic Science Center
Kimberly Meline	US Federal Bureau of Investigation
David Papargiris	Evidox Corporation (Boston, MA)
David Pauly	Methodist University, Fayetteville (NC)
Robert Sanders	Wisconsin State Crime Laboratory
Dorothy Stout	Resolution Video (Palmyra, VA)
Alice Thomas	US Secret Service
Craig Thrane	CT Image Analysis (Minneapolis, MN)
William Trenkle, Ph.D.	US Department of Health and Human Services
David Witzke	Foray Technology (San Diego, CA)
Robert Young	City of Mesa (AZ) Police Department

Table III-5. Physics/Pattern Scientific Area Committee and its subcommittees

Name	Affiliation
Physics/Pattern Interpretation Scientific Area Committee	
R. Austin Hicklin	<i>Chair, Physics/Pattern Interpretation Scientific Area Committee</i> Noblis (Falls Church, VA)
Toby L. Wolson	<i>Chair, Bloodstain Pattern Analysis Subcommittee</i> Miami-Dade (FL) Police Department Forensic Services Bureau
Andy Smith	<i>Chair, Firearms and Toolmarks Subcommittee</i> San Francisco Police Department Crime Lab
G. Matt Johnson	<i>Chair, Footwear and Tire Subcommittee</i> Orange County Sheriff's Department Crime Laboratory
Rigo Vargas	<i>Chair, Forensic Document Examination Subcommittee</i> Mississippi State Crime Laboratory
Melissa Gische	<i>Chair, Friction Ridge Subcommittee</i> US Federal Bureau of Investigation
David Baldwin, Ph.D.	US Department of Energy Ames Laboratory
JoAnn Buscaglia, Ph.D.	US Federal Bureau of Investigation Laboratory
Thomas Busey, Ph.D.	Indiana University, Bloomington
Paul Kish	Paul Erwin Kish Forensic Consultant & Associates, Corning, NY
Linton A. Mohammed, Ph.D.	Forensic Science Consultants, Inc.
Nicholas D. K. Petraco, Ph.D.	City University of New York, John Jay College
Hal Stern, Ph.D.	University of California, Irvine
David A. Stoney, Ph.D.	Stoney Forensic, Inc. (Chantilly, VA)
John R. Vanderkolk	Indiana State Police Laboratory
<i>Bloodstain Pattern Subcommittee</i>	
Toby L. Wolson	<i>Chair, Bloodstain Pattern Analysis Subcommittee</i> Miami-Dade (FL) Police Department Forensic Services Bureau
Almon Brown	South Carolina Law Enforcement Division
Kim Clements	Washington (DC) Consolidated Forensic Laboratory
Peter De Forest	John Jay College of Criminal Justice at City University of New York (retired)
Tom Griffin	Bevel, Gardner, and Associates (Edmond, OK)
Jeff Gurvis	National Forensic Support Laboratory (private sector) (Chicago, IL)
Leah Innocci	Wyoming State Police Crime Laboratory
Holly Latham	Kansas Bureau of Investigation
Jeremiah Morris	Johnson County (KS) Sheriff's Office Criminalistics Laboratory
Kenneth Martin	Consultant, Martin Forensics; Bevel, Gardner and Associates (Mattapoisett, MA)
James Pex	International Forensic Experts, LLC (North Bend, OR)
Elizabeth Richards, Ph.D.	US Air Force Office of Special Investigations
Ralph Ristenbatt III	Pennsylvania State University
Jason Simser, Ph.D.	Minnesota Bureau of Criminal Apprehension Forensic Science Laboratory
LeeAnn Singley	Grayson Singley Associates, LLC (Bethlehem, PA)
Gabriele Suboch, Ph.D.	Northcentral University (online degree programs)
Elizabeth Toomer	US Naval Criminal Investigation Service
Peter Valentin	University of New Haven
Haonan Wang, Ph.D.	Colorado State University
Kevin Winer	Kansas City (MO) Police Crime Laboratory
<i>Firearms and Toolmarks Subcommittee</i>	
Andy Smith	<i>Chair, Firearms and Toolmarks Subcommittee</i> San Francisco Police Department Crime Laboratory
Denis Burke	New York City Police Department
Eric Collins	Contra Costa County (CA) Office of the Sheriff, Forensic Services Division
Laura Fleming	Dallas County (TX) Southwestern Institute of Forensic Sciences
Wendy Gibson	Virginia Department of Forensic Science
Brandon Giroux	Giroux Forensics Inc. (Northville, MI)

Table III-5. (Continued)

Name	Affiliation
<i>Firearms and Toolmarks Subcommittee (Continued)</i>	
Michael Haag	Albuquerque (NM) Police Department Crime Laboratory
James Hamby, Ph.D.	International Forensic Science Laboratory and Training Centre (Indianapolis, IN)
Gabriel Hernandez	Miami-Dade County (FL) Police Department
Ryan Lilien, M.D./Ph.D.	Cadre Research Labs (Chicago, IL)
Christopher Monturo	Miami Valley (OH) Regional Crime Laboratory
Max Morris, Ph.D.	Iowa State University
Douglas Murphy	US Federal Bureau of Investigation
Michael Neel	US Bureau of Alcohol, Tobacco, Firearms and Explosives
James Steven Scott	Tennessee Bureau of Investigation Crime Laboratory
Erich Smith	US Federal Bureau of Investigation
Theodore Vorburger, Ph.D.	US National Institute of Standards and Technology
Todd Weller	Oakland (CA) Police Department
David Wright	Johnson County (KS) Sheriff's Office Criminalistics Laboratory
Xiaoyu Alan Zheng	US National Institute of Standards and Technology
<i>Footwear and Tire Subcommittee</i>	
G. Matt Johnson	<i>Chair, Footwear and Tire Subcommittee</i> Orange County Sheriff's Department Crime Laboratory
Sarah E. Bohne	Colorado Bureau of Investigation
Aurora Dumitra	New York City Police Department Police Laboratory
Eric Gilkerson	US Federal Bureau of Investigation
Michael Gorn	Sarasota County (FL) Sheriff's Office
Stephen Greene	US Customs and Border Protection
Christopher Hamburg	Oregon State Police
Amanda Hanshaw Lane	Virginia Department of Forensic Service
Gerhard Dean Hauptmann	Baltimore County (MD) Police Department Forensic Services Section
Dwane Hilderbrand	Forensic ITC Services (Scottsdale, AZ)
Cindy Homer	Maine State Police Crime Laboratory
Alan Kainuma	Honolulu (HI) Police Department
David Kanaris	Alaska Scientific Crime Detection Laboratory
Jan LeMay	Northern Colorado Regional Forensic Laboratory
Brian McVicker	US Federal Bureau of Investigation
Rodney Schenck	US Department of Defense, Defense Forensic Science Center
Jacqueline Speir, Ph.D.	West Virginia University
Christine Snyder, Ph.D.	Seminole County (FL) Sheriff's Office
James Streeter	North East Forensics, LLC (Groton, CT)
Melissa Valadez	Texas Department of Public Safety Crime Laboratory
<i>Forensic Document Examination Subcommittee</i>	
Rigo Vargas	<i>Chair, Forensic Document Examination Subcommittee</i> Mississippi State Crime Laboratory
Brett Bishop	Washington State Patrol
Ted Burkes	US Federal Bureau of Investigation
Mark Goff	Michigan Department of State Police
Derek Hammond	US Army Criminal Investigation Laboratory
Lisa Hanson	Minnesota Bureau of Criminal Apprehension Forensic Science Laboratory
Mark Lancaster, Ph.D.	Northern Kentucky University
Gary Licht	Iowa Division of Criminal Investigation Criminalistics Laboratory
Hector Maldonado	US Federal Bureau of Investigation
Carl McClary	US Bureau of Alcohol, Tobacco, Firearms and Explosives
Mara Merlino, Ph.D.	Kentucky State University
Karen Nobles	Self Employed (Pensacola, FL)
John Paul Osborn	Osborn and Son (Middlesex, NJ)

Table III-5. (Continued)

Name	Affiliation
<i>Forensic Document Examination Subcommittee (Continued)</i>	
David Lee Parrett	Forensic Document Examination Services, LLC (Oklahoma City, OK)
Thomas Riley	Riley Welch and LaPorte Associates Forensic Laboratories (Frankenmuth, MI)
Christopher Saunders, Ph.D.	South Dakota State University
Joseph Stephens	US Secret Service
Peter Tytell	Forensic Research, LLC (New York, NY)
Kesha White	Florida Department of Law Enforcement
Elaine Wooton	US Immigration and Customs Enforcement, Homeland Security Investigations Forensic Laboratory
<i>Friction Ridge Subcommittee</i>	
Melissa Gische	<i>Chair, Friction Ridge Subcommittee</i> US Federal Bureau of Investigation
Rachelle Babler	San Diego (CA) Police Department
John Black	Black and White Forensics, LLC (Olanta, SC)
Kerrie Cathcart	Target Forensic Services Laboratory (Minneapolis, MN & Las Vegas, NV)
Heidi Eldridge	Las Vegas Metropolitan Police Department
Michael French	MorphoTrak, LLC (Seattle, WA)
Edward German	US Federal Government
Hariharan Iyer, Ph.D.	US National Institute of Standards and Technology
Louis Kriel	Georgia Bureau of Investigation
Mark Mills	Onondaga County (NY) Center for Forensic Sciences
Eric Ray	Arizona Department of Public Safety
Alison Rees	US Bureau of Alcohol, Tobacco, Firearms and Explosives
Andrew Reitnauer	Nassau County (NY) Office of the Chief Medical Examiner, Latent Print Section
Maria Antonia Roberts	US Federal Bureau of Investigation
Matthew Schwarz	Schwarz Forensic Enterprises, Inc. (Ankeny, IA)
Carl Speckels	City of Phoenix (AZ) Crime Laboratory
Henry Swofford	US Department of Defense, Defense Forensic Science Center
Elham Tabassi	US National Institute of Standards and Technology
Maria Weir	Los Angeles County (CA) Sheriff's Department
Lisa Zinn	Orange County (CA) Sheriff's Crime Laboratory

