Professional Review and Commentary[a]

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[a] The 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).

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FORENSIC SCIENCE NEWS

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Designer Drugs Update — *Worldwide*

Designer drugs continue to pose serious health problems worldwide while manufacturers of the substances continue to produce products that find loopholes in controlled substances laws. Of all the countries to have been affected by the problems of designer drugs, New Zealand had perhaps the most unique response to them, and that was to legalize them. Last year, the government of New Zealand passed the Psychoactive Substances Bill, which effectively gave legitimacy to hundreds of drugs so long as the manufacturers could prove that they posed no harmful effects. Recently, however, in April 2014, in the first major alteration to that law, New Zealand effectively banned all synthetic substances, admitting that the infrastructure had not been in place to verify that the substances were, in fact, safe. This new legislation applies primarily to the 41 synthetic drugs that had been openly and legally sold within the country.

Another area relating to designer drugs that has seen dramatic change is the online marketplace for obtaining the drugs. The famed Silk Road website was closed down by the FBI last October, but many new sites have sprung up to take its place. Like Silk Road, many of these sites operate in the "dark web", using encrypted software in order to avoid detection. A new search engine called Grams has recently come into use with the sole function of identifying encrypted websites that sell illicit substances.

Marijuana Revolution — *United States*

Despite the fact that marijuana is still classified as a controlled substance by the US government, the plant is undergoing a renaissance in the way that it is analyzed, ingested, packaged, and marketed. High-tech commercial laboratories analyze hundreds of varieties of marijuana with HPLC instrumentation and publish their results on their public websites. Companies produce a dizzying variety of consumable products containing "medical marijuana", from cannabis-infused cakes to cannabis butter to cannabis soda pop ... even a Nutella spread mixed with medical marijuana. The product packages are professionally produced and would look right at home on the shelves of a neighborhood grocery store. Another change in the way that marijuana is being consumed is the development of the vaporizer pipe. These small, lithium-ion-powered pipes instantly heat plant product to the point of vaporization, so there is almost no smoke or odor associated with the process. And the pipes are beautifully made in bright, shiny colors to the point where they look like a futuristic flash drive. And many pipe owners proudly display them almost like a status symbol ... a long way from old-style bongs and hash pipes.

Changes in the Forensic Sciences in UK and US — *England and United States*

High-level efforts to provide guidance to forensic science organizations have recently been launched in the United Kingdom and the United States. In the UK, the 55-year-old Forensic Science Society was granted a Royal Charter in January and is now known as the Chartered Society of Forensic Sciences. When the British government eliminated the Forensic Science Service in 2010, it was a major blow to the unity and coherence of the country's forensic science organizations. One of the goals of the newly chartered society will be to attempt to restore some of the connectivity between the forensic labs across England and Wales.

In the United States, the National Commission on Forensic Science was created, also in January, as a response to the 2009 federal report Strengthening Forensic Science in the United States: A Path Forward. The commission is an effort between the US Department of Justice and the National Institute of Standards and Technology (NIST). One of the major early efforts of NIST has been to begin reorganizing the existing Scientific Working Groups of the various forensic disciplines into the newly formed Organization for Scientific Area Committees.

Criminal Justice and Forensic Science Reform Act — *United States*

Representing another effort to generate reform in the forensic sciences in the United States, a bipartisan bill was introduced in the US Senate in March 2014, by Senators Patrick Leahy and John Cornyn. Titled the Criminal Justice and Forensic Science Reform Act, it stipulates, among other items, that all forensic laboratories that receive federal funding must be accredited by approved organizations, that scientists receive certification in their respective disciplines, and that standards and best practices be determined for each forensic discipline. The bill urges that an Office of Forensic Science be established within the Department of Justice and that this new office would help to "establish research priorities" in order that grant money be used for research that would have the most impact within the forensic sciences. Senator Leahy introduced similar forensic science legislation in 2011.

Oscar Pistorius Murder Trial — *South Africa*

The trial of famed runner Oscar Pistorius, accused of intentionally shooting and killing his girlfriend, has all the dramatics and media excess of the O. J. Simpson murder trial, with which it is often compared. The trial made history from its inception for being the first criminal trial in South African history to be televised, albeit with restrictions (witnesses could choose not to be on camera while testifying, for example). Still, every detail of the trial has been communicated to the public as scores of people attending the trial send out hundreds of Twitter messages during the proceedings describing in graphic detail every moment of the trial. Tens of thousands of people follow their updates online. Recent events have Pistorius, who has repeatedly retched and suffered emotional breakdowns in court, having to respond to accusations that he received acting lessons prior to the start of the trial. It has been an interesting study in trial forensics as several of the forensic scientists have been taken to task for opining on subject matter that they ultimately admit is beyond their expertise and experience. Since there are no juries at criminal trials in South Africa, the case will be decided by the presiding judge.

COMMENTARY/UPDATE

— Strengthening Forensic Science Standards to Improve Confidence in Crime Lab Analyses —

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A small US federal agency, one that no scriptwriter has ever placed at the center of a Hollywood thriller, has taken a leading role in the real-life mission to strengthen forensic science. The agency — the National Institute of Standards and Technology (NIST) — is known internationally for accurate measurements, many of them being the best in the world.

What can an institute obsessed with the monotony of measurements and standards do for forensic science, a field intertwined with human drama and where questions about the rigor of scientific methods have sown doubts in recent years?

Forensic lab practitioners in the United States know that they already rely on NIST physical reference standards to validate the accuracy of their methods and instrument calibrations. Founded in 1901, NIST supports standards in diverse fields such as construction, information technology, manufacturing, energy production, healthcare, and transportation. NIST, part of the US Department of Commerce, has also played a role in forensic sciences for nearly 100 years.

In 2009, the US National Research Council issued Strengthening Forensic Science in the United States: A Path Forward (available online at *https://www.ncjrs.gov/app/publications/abstract.aspx?ID=250103*), a report that identified weaknesses in forensic sciences and presented recommendations to address them. Given NIST's long involvement in forensic science, it was natural to involve it in improving accuracy and confidence in the results of forensic analyses.

Since the beginning of this year, NIST Forensic Science Program staff members have poured long hours into plans for a new framework to incorporate the work of nearly two dozen heretofore independent forensic scientific working groups. These groups, made up of forensic experts from federal, state, local, and international agencies, have worked to advance forensic science and establish standards. NIST envisions establishing a new administrative framework to accomplish this work and vet new standards and guidelines.

The stage for this was set last year when 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 newly established National Commission on Forensic Science (*see http://www.nist.gov/forensics/forensic-science-commission-011014.cfm*). The commission will focus on 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. The commission held its first and second meetings Feb. 3–4 (**Figure 1**) and May 12–13, 2014, in Washington, DC. It will continue to meet quarterly.

As the commission was taking shape, NIST worked on plans for administering new "guidance groups" to develop and propose discipline-specific standards and guidelines. NIST's experience in developing measurement standards and its role in working with standards development organizations to support documentary standards have been extremely valuable in designing the plan.

The overall concept is that new standards and guidelines will be developed through the NIST-administered guidance groups, with approved standards being listed in a Registry of Standards. This coordinated effort will help to standardize national guidance for forensic science practitioners.

As it worked on plans for the guidance groups, it selected a name for a new administering body: the Organization for Scientific Area Committees (OSAC). OSAC will consist of a Forensic Science Standards Board, three resource committees, five scientific area committees,

Figure 1. The National Commission on Forensic Science held its first meeting Feb. 3-4 , 2014. During the meeting, Mark Stolorow, NIST Office of Special Programs (far right), presented NIST's plan for a new Organization of Scientific Area Committees that will coordinate development of standards and guidelines to improve quality and consistency of work in the forensic science community. Also pictured are (from left) John Butler and Nelson Santos, vice chairs of the commission; Brette Steele of the Department of Justice; and NIST Director Pat Gallagher, co-chair of the commission (Photo courtesy of US Department of Justice).

and 24 subcommittees (*see* organization chart (**Figure 2**) below or at *http://nist.gov/forensics/upload/orgchart3-18-14-new.pdf*). In this plan, "subcommittee" replaces the original placeholder name of "guidance group".

Early this year, NIST also launched an OSAC webpage to keep the forensic science community updated on the developing plans (*see www.nist.gov/forensics/osac.cfm*). On April 11, NIST opened the selection process for OSAC members. It is seeking people who work in forensic science laboratories, criminal justice agencies, and academic institutions. NIST also intends for OSAC to represent a balance of expertise in various forensic science disciplines.

NIST expects to complete appointments to the Forensic Science Standards Board and scientific area committees by the end of summer 2014. Subcommittee appointments and a meeting of all OSAC members will follow.

On February 18, 2014, at the American Academy of Forensic Sciences annual meeting in Seattle, the NIST Forensic Science Program held a live webcast panel presentation to explain its plans for OSAC. Those who are interested can watch a video of the 83-minute presentation online at *www.nist.gov/forensics/aafswebcast.cfm*.

NIST is encouraging people to sign up for news updates about OSAC and other forensic science activities at NIST by visiting *www.nist.gov/forensics*. Look for the box that says "Sign up to receive news about NIST Forensic Science," enter your email address, and click "submit". Also stay up to date by watching for developments on the NIST OSAC webpage, *www.nist.gov/forensics/osac.cfm*.

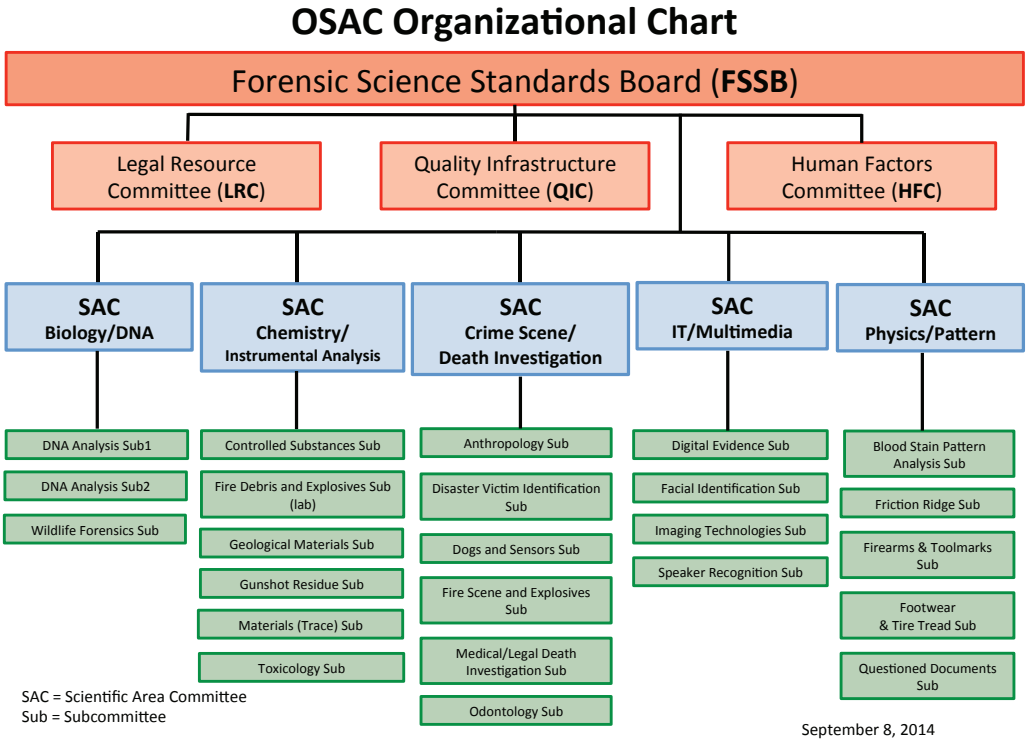

Figure 2. Organizational chart of the Organization for Scientific Area Committees (OSAC).

UPCOMING EVENTS

International Association for Identification — 99th International Education Conference
August 10–16, 2014; Minneapolis Convention Center
Minneapolis, MN, US

The International Conference on Forensic Inference and Statistics
August 19–22, 2014; Leiden University
Leiden, Netherlands

The International Forum for Drug and Alcohol Testing — Annual Conference
September 10–12, 2014; Titanic Belfast
Queens Island, Belfast, Northern Ireland

The 25th International Symposium on Human Identification
September 29–October 2, 2014; Arizona Biltmore
Phoenix, AZ, US

World Forensic Festival 2014 — hosting:
The 20th World Meeting of the International Association of Forensic Sciences;
The 6th Asian Forensic Sciences Network Annual Meeting & Symposium; and
The 5th Meeting of Asia Pacific Medico-Legal Association
October 12–18, 2014; Coex Convention & Exhibition Center
Seoul, Korea

Society of Forensic Toxicologists — Annual Meeting
October 19–24, 2014; Amway Grand Plaza Hotel/Devos Place Convention Center
Grand Rapids, MI, US

2014 International Conference on Forensic Nursing Science and Practice
October 22–25, 2014; Pointe Hilton Tapatio Cliffs
Phoenix, AZ, US

The International Association of Forensic Toxicologists — Annual Meeting
November 8–13, 2014; Pan Americano Hotel
Buenos Aires, Argentina

American Academy of Forensic Sciences — Annual Meeting
February 16–21, 2015; Hyatt Regency Orlando
Orlando, FL, US

American Association of Crime Laboratory Directors — Annual Symposium
April 26–30, 2015; Marriott Wardman Park
Washington, DC, US

International Association for Identification — 100th International Education Conference
August 2–8, 2015
Sacramento, CA, US

NEW FORENSIC SCIENCE BOOKS

Advances in Forensic Human Identification
X. Mallett, T. Blythe, R. Berry (Eds)
CRC Press: Boca Raton, FL, US; 2014

Death and Accident Investigation Protocols
M. H. Dudley
CRC Press: Boca Raton, FL, US; 2013

Forensic Anthropology, Current Methods and Practice
A. Christensen, N. Passalacqua, E. Bartelink
Academic Press/Elsevier: Waltham, MA, US; 2014

Forensic Approaches to Buried Remains
J. Hunter, B. Simpson, C. S. Colls
Wiley-Blackwell: Somerset, NJ, US; 2013

Forensic Ballistics in Court: Interpretation and Presentation of Firearms Evidence
B. J. Heard
Wiley-Blackwell: Somerset, NJ, US; 2013

Forensic DNA Applications: An Interdisciplinary Perspective
D. Primorac, M. Schanfield (Eds)
CRC Press: Boca Raton, FL, US; 2014

The Forensic Examination and Interpretation of Tool Marks
D. Baldwin, J. Birkett, O. Facey, G. Rabey
Wiley-Blackwell: Somerset, NJ, US; 2013

Forensic Science, An Introduction to Scientific and Investigative Techniques, 4th ed
S. James, J. Nordby, S. Bell (Eds)
CRC Press: Boca Raton, FL, US; 2014

Manual of Forensic Taphonomy
J. Pokines, S. A. Symes, C. Roper (Eds)
CRC Press: Boca Raton, FL, US; 2013

The Science of Forensic Entomology
D. B. Rivers, G. A. Dahlem
Wiley-Blackwell: Somerset, NJ, US; 2013

Wildlife DNA Analysis: Applications in Forensic Science
A. Linacre, S. Tobe
Wiley-Blackwell: Somerset, NJ, US; 2013

Case Studies in Drowning Forensics
K. Gannon, D. L. Gilbertson
CRC Press: Boca Raton, FL, US; 2014

DNA Analysis for Missing Person Identification in Mass Fatalities
A. Sozer
CRC Press, Boca Raton, FL, US; 2014

Forensic Analysis of Biological Evidence: A Laboratory Guide for Serological and DNA Typing
J. T. McClintock
CRC Press: Boca Raton, FL, US; 2014

BOOK REVIEW

Forensic DNA Analysis: Current Practices and Emerging Technologies
J. G. Shewale, R. H. Liu (Eds)
CRC Press: Boca Raton, FL, US; 2013

Reviewed by: *S. K. Sinha, InnoGenomics Technologies, New Orleans, LA, US*

The book "Forensic DNA Analysis, Current Practices and Emerging Technologies" edited by Dr. Jaiprakash Shewale and Dr. Ray Liu, is an up-to-date treatise on DNA analysis methods for criminal casework. It is a collection of articles by well-established forensic DNA researchers and practitioners. The book provides a reliable resource for forensic science educators, practitioners, and other criminal justice professionals.

The editors, Dr. Shewale and Dr. Liu, are experienced forensic scientists. Dr. Shewale was involved in field sample testing as well as development of new products for forensic DNA analysis. Dr. Liu has extensive teaching experience in the field of forensic science. The articles are contributed by subject matter experts in their respective fields. The topics covered in this book are very carefully chosen to provide, as the name suggests, current and future methods for each step in the forensic DNA analysis process. The articles provide a practical guide as well as the theoretical background to understand the chemical and biochemical aspects of evidence preservation, evaluation, and DNA analysis.

The book has five sections. Grouped within each section are the essential steps needed to perform forensic DNA testing. The first section details the first step of any crime lab process, namely the collection and storage of evidence samples. The articles within this section detail the best practices for maintaining the integrity and stability of different evidence samples.

The second section of the book deals with a quality assessment of evidence samples. Articles written by experts describe the issues and current advances in this field. Crime laboratories can benefit from the information provided, which can increase sample process efficiencies and improve decisions regarding DNA template concentrations as well as identifying the tissue source of a DNA sample. The articles in this section are reviews of the current status of research in tissue identification well as the qualitative and quantitative assessment of forensic DNA samples. These articles contain a wealth of information on these topics including exhaustive references.

The third section of this book contains five articles extensively covering the principles of STR analysis and associated methods. Current capillary electrophoretic analyses as well as details regarding new, next-generation sequence platforms are discussed in detail. Section III also includes a scholarly article on new autosomal STR loci as well as additional Y-STR markers, and provides a wealth of information to assist in understanding the biology and genetics of the STR markers used in forensic DNA testing.

Section IV contains articles on non-STR markers currently in use in forensic laboratories, as well as future markers that can provide additional genetic information. Markers such as mitochondrial (Mt) DNA, SNPs, and INDELs are also introduced and discussed in this section.

Section V provides an overview of issues related to forensic DNA analyst training. The articles in this section provide a set of guidelines for crime laboratories to assist in the design of an appropriate training program for their laboratory. It also provides information on available training centers for forensic DNA analyst training.

This book serves as an excellent resource for practicing forensic scientists as well as aspiring forensic DNA scientists who have a molecular biology background but need to understand specific issues regarding evidence handling, preservation, extraction, and analysis of DNA evidence samples for criminal casework. In summary, the articles contained in this book are practical and scholarly, cover all aspects of current forensic DNA testing, and include next-generation technologies, tests, and future applications.

Finally, this book is a valuable addition for practicing crime laboratories and a useful teaching tool for forensic biology courses.