# Professional Review and Commentary<sup>a</sup>

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<sup>a</sup> 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, please contact John Collins at the RTI International Center for Forensic Sciences at +1 919 597 5157 or <a href="mailto:icenter">icenter</a> icenter for Forensic Sciences at +1 919 597 5157 or <a href="mailto:icenter">icenter</a> icenter for Forensic Sciences at +1 919 597 5157 or <a href="mailto:icenter">icenter</a> icenter for Forensic Sciences at +1 919 597 5157 or <a href="mailto:icenter">icenter</a> icenter for Forensic Sciences at +1 919 597 5157 or <a href="mailto:icenter">icenter</a> icenter for Forensic Sciences at +1 919 597 5157 or <a href="mailto:icenter">icenter</a> icenter for Forensic Sciences at +1 919 597 5157 or <a href="mailto:icenter">icenter</a> icenter for Forensic Sciences at +1 919 597 5157 or <a href="mailto:icenter">icenter</a> icenter for Forensic Sciences at +1 919 597 5157 or <a href="mailto:icenter">icenter</a> icenter for Forensic Sciences at +1 919 597 5157 or <a href="mailto:icenter">icenter</a> icenter for Forensic Sciences at +1 919 597 5157 or <a href="mailto:icenter">icenter</a> icenter for Forensic Sciences at +1 919 597 5157 or <a href="mailto:icenter">icenter</a> icenter for Forensic Sciences at +1 919 597 5157 or <a href="mailto:icenter">icenter</a> icenter for Forensic Sciences at +1 919 597 5157 or <a href="mailto:icenter">icenter</a> icenter for Forensic Sciences at +1 919 597 5157 or <a href="mailto:icenter">icenter</a> icenter for Forensic Sciences at +1 919 597 5157 or <a href="mailto:icenter">icenter</a> icenter for Forensic Sciences at +1 919 597 5157 or <a href="mailto:icenter">icenter</a> icenter for Forensic Sciences at +1 919 5197 5197 or <a href="mailto:icenter">icenter</a> icenter forensic Sciences at +1 919 5197 or <a href="mailto:icenter">icenter</a> icenter for Forensic Sciences at +1 919 5197 or <a href="mailto:icenter">icenter</a> icenter forensic Sciences at +1 919 51



#### FORENSIC SCIENCE NEWS

## US Supreme Court Approves Arrestee DNA — United States

In a 5-4 decision, the U.S. Supreme Court ruled that the swabbing of an arrestee's cheek for purposes of DNA collection do not constitute an unreasonable search and seizure. The case under consideration was that of Alonzo King, who was arrested for terrorizing a crowd of people with a firearm in 2009. King was arrested and submitted to a DNA swab. The major opinion noted that the critical issue at hand was the concept of "reasonableness." George Washington University Law School Professor Orin Kerr told National Public Radio that "the court is talking about serious offenses ... but they don't say what counts as a serious offense ... so we just don't know how for this opinion would apply." In recent years, the Court has tackled major cases involving the balance between expanding technology and privacy. Some experts argue that the Court will eventually consider the collection of DNA from any arrestee, regardless of the seriousness of the crime.

# **Digital Forensics to Become More Difficult** — *United*

The quickly expanding use of "smart" mobile devices creates the necessity for better encryption. This will present challenges to forensic experts seeking to access the personal data or communications of individuals involved with criminal activity. Complicating matters further, it appears that the constitutionality of mobile device evidence is being taken more seriously than it was for personal computers. Courts are erring on the side of caution due to the elevated expectation of privacy associated with mobile devices. Although evidence from mobile devices will remain critical, its technical and constitutional accessibility will become increasingly complex.

# Forensic Experts Cast Doubt on Mummified Head — France

What collectors believe is the mummified head of King Henry IV may not be, according to DNA tests reported in the European Journal of Human Genetics. The findings refute 2010 facial reconstruction work performed on the head while in the possession of private collectors. King Henry IV ruled France from 1589 to 1610. According to legend, the king's body was exhumed from its tomb during the French Revolution in 1793 and beheaded. The recent DNA tests were led by Jean-Jacques Cassiman at the University of Leuven in Belgium, who determined that DNA collected from the head did not match DNA samples known to have come from the House of Bourbon, which was part of King Henry IV's lineage. According to

Cassiman, there was not enough DNA available for testing to completely exclude the mysterious head as being that of King Henry IV.

## Fate of Jailed Environmentalists Delayed — Russia

Russian authorities arrested 30 crew members of the Greenpeace vessel Arctic Sunrise in September 2013 while the ship sailed near the Gazprom oil rig in the Pechora Sea. Although the crew members were originally charged with piracy, Russian investigators and forensic experts later claimed that illicit drugs were found aboard the ship. Greenpeace representatives and other critics are accusing the Russian government of intimidation for the purpose of protecting its oil industry. A drug-sniffer dog reportedly searched the ship in Norway prior to its departure toward Russian waters, leaving critics to believe that the only drugs found must have been for personal medical use. Efforts to persuade Russian President Vladmir Putin to intervene in the case were hampered when Putin did not attend the East Asia summit in Brunei.

# **Experts Called in Murder of Olympian's Girlfriend** — South Africa

The defense team of Oscar Pistorius, the South African double-amputee Olympian charged with killing his 29-year-old girlfriend in early 2013, hired a team of forensic experts to examine and review crime scene evidence in the case. Among the most critical pieces of evidence was a door through which fatal bullets fired from the murder weapon passed during the shooting. At issue is whether or not the height and angles of trajectory could have been produced by Pistorius, who claims he was not wearing his prosthetic limbs and was shooting in self defense. Prosecutors, on the other hand, argue that Pistorius was, in fact, wearing his limbs and was the killer who intentionally shot the fatal bullets through the door. The identities of the forensic experts hired by Pistorious's team have not been released. The Associated Press confirmed, however, that they visited the crime scene on multiple occasions, and that the door is critical evidence.

### **Disgraced Chemist Pleads Guilty** — *United States*

On November 23, 2013, the Associated Press reported that Annie Dookhan, the former drug chemist accused of falsifying laboratory results in potentially thousands of criminal cases, pleaded guilty to charges of "obstruction of justice, perjury, and tampering with evidence." The plea agreement came about a month after Suffolk County Superior Court Judge Carol S. Ball ruled that Dookhan's prison sentence would be limited to 3 to 5 years if Dookhan agreed to plead guilty to some 27 criminal charges. According to Judge Ball, who was quoted by the Boston Globe on October 24, 2013, "the consequences of her

behavior, which she ought to have foreseen, have been nothing short of catastrophic: Innocent persons were incarcerated, guilty persons have been released to further endanger the public, millions and millions of public dollars are being expended to deal with the chaos Ms. Dookhan created, and the integrity of the criminal justice system has been shaken to the core."

Dookhan is a former drug chemist at the Jamaica Plain Public Health Laboratory, which was not accredited. Among the charges to which she pled guilty was falsely claiming that she held a master's degree in chemistry. By the time she entered her plea, it was estimated that the Commonwealth of Massachusetts had spent approximately \$8.5 million in response to the crisis, with another \$8.6 million authorized for the current fiscal year, according to the Associated Press. "The legislature has authorized as much as \$30 million to cover costs incurred by the court system, prosecutors, public defenders and other state agencies," said Alex Zaroulis, spokeswoman for the state Office of Administration and Finance.

#### **COMMENTARY**

— The Internationalization of Forensic Science —

J. M. Collins RTI International Center for Forensic Sciences Research Triangle Park, North Carolina United States of America

Forensic scientists in the United States have been consumed by controversy, legislative initiatives, and the prospect of new governmental oversight schemes. The phenomenon seemed to emerge in the 1990s following the advent of DNA profiling and accusations that forensic science malpractice was a leading cause of erroneous convictions. Clearly, there is an attempt in the States to rein in forensic science and subject it to more strict forms of governance.

Interestingly, the international stage is being illuminated by an entirely different set of priorities. Around the world, there is a growing realization that forensic science is a critical tool for responding to natural and civil disasters. Since the dawn of the 21st century, the human condition has been shaken by historic events that resulted in massive loss of life.

In 2004, for example, one of the largest earthquakes ever recorded struck the Indian Ocean. Multiple tsunamis were triggered, killing more than 230,000 people from Indonesia to Somalia. The 9.2-magnitude earthquake produced waves over 100 feet tall. The forensic response was overwhelming.

In the wake of such catastrophe, it becomes an immediate priority of governments and citizens to identify the dead and, if possible, return the remains to grieving family members. But for many nations, access to the necessary DNA testing and other forensic technologies is limited; and to a large extent, this access becomes dependent on the degree of international interest, a measure that some argue is unfair and potentially discriminatory.

This problem, however, is not limited to natural disasters. It also applies to mass political violence, which can be even more challenging in instances where governments have waged war against their own people.

Such violence presents two enormous challenges in executing a global forensic response. First, rogue governments have no interest in identifying their dead, preferring to simply erase their memories from existence. Second, political violence will tend to require a broader forensic response than simply DNA or postmortem examinations. In these instances, not only is the identification of the dead a priority, so too is proving the commission of war crimes or other international atrocities.

The September issue of the journal *Science* contained a timely article titled DNA Identification After Conflict or Disaster. In the article, Alex John London, a medical ethicist at Carnegie Mellon University, explains that:

In the context of poverty and deprivation, forensic identification might appear to be a luxury. But access to scientific identification of the missing and the dead after mass casualty events can be a starting point for healing, reconstruction, and the ability to access financial resources or to regain or maintain social status.

Unfortunately, the extent and quality of the international forensic response is based more on the availability of financial resources and the degree of international public interest than on official protocol or policies. For this reason, London argues that:

... formalized international structures are needed to promote more equitable access to scientific identification techniques, ensure their fair and efficient use, and provide uniform protections to participants after largescale conflict and disaster.

Such international structures have precedent. The International Atomic Energy Agency, for example, dispatches inspectors to nuclear facilities. In light of the massive loss of life experienced in just the first two decades of the 21st century, envisioning such a coordinated international forensic response is not without merit.

Thinking about forensic science as an international response seems to give it more perceptual heft — and justifiably so. But it also challenges the idea that forensic science can be entirely regulated by any one country or

jurisdiction. Practitioners in the United States, for example, continually benefit from knowledge gained overseas, which will produce subsequent advancements that can be applied in criminal casework. Similarly, international practitioners learned great lessons from the forensic response executed after the terrorist attacks of September 11, 2001.

As legislative and regulatory initiatives gain traction in the United States, it would be a monumental failure to ignore future international influences that will certainly shape the future of forensic science. It would also stand as an affront to science itself, which depends entirely on scientific, peer-based governance. If the right balance is not struck, it will weaken the credibility and progress of forensic science across the board.

#### References

http://kcur.org/post/dna-science-helpful-too-pricey-many-countries

http://www.sciencemag.org/content/341/6151/1178.full

#### **UPDATE**

— The International Forensic Strategic Alliance —

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I was recently asked what activities are going on internationally with the International Forensic Strategic Alliance (IFSA) and what challenges are facing our forensic network partners.

IFSA is a partnership among regional forensic networks representing forensic science laboratory managers around the world. There are currently six forensic networks that have membership in IFSA:

- The American Society of Crime Laboratory Directors (ASCLD);
- The European Network of Forensic Science Institutes (ENFSI);
- The Senior Managers of Australian and New Zealand Forensic Laboratories (SMANZFL);
- The Academia Iberoamericana de Criminalistica y Estudios Forenses (AICEF);
- The Asian Forensic Sciences Network (AFSN); and
- The Southern Africa Regional Forensic Science Network (SARFS).

All of these networks have similar roles, functions, and objectives; they recognize the value gained through long-term collaboration and cooperation on strategic issues related to the management of forensic science laboratories.

IFSA recently met at the 17th International Forensic Science Managers Symposium in Lyon, France, where my colleagues and I discussed IFSA's role globally and the challenges we all face in forensic science. From our conversations it is evident that forensics laboratories around the globe share similar challenges. Topping the list is our universal lack of funding, which drastically affects our ability to conduct research and development, to provide appropriate continuing education to our staff, and to keep up with the supply and demand of services requested by our customers (the criminal justice community).

The collaboration and the sharing of resources and knowledge between and within networks is paramount to overcome fiscal constraints faced by laboratories. IFSA, representing networks around the globe, can help leverage this collaboration. Our combined networks form a strong alliance representing 82 countries and more than 550 forensic institutions worldwide.

IFSA's first priority is to identify, collect, and share information on service models. All networks can benefit from sharing the knowledge of enhancements to laboratory and/or system service models which introduce efficiencies into the forensic science process. This is particularly important in an environment of reducing budgets. Field triaging and ITC systems that provide transparent management and operational intelligence have been determined to increase the efficiency of forensic services.

As part of its mission to collaborate by sharing information and knowledge, IFSA's second priority is the development of minimum requirements documents to assist emerging forensic laboratories in developing countries. IFSA has developed the minimum requirements documents as a first step toward building a quality forensic laboratory. The central focus of the documents will be quality management, supported by chapters on competencies, equipment and consumables, procedures, protocols and validation, and forensic processes from collection through reporting.

Forensic laboratories should build on this foundation and strive to increase the quality of services. Next-level requirements are available from discipline-specific guidance groups such as SWGDRUGs and SWGDAM. Ultimately all laboratories should strive to achieve ISO accreditation.

IFSA's emphasis on R&D and emerging technologies is intended to distribute information to all networks about technological innovations and research, including the foundational reliability of current methods. This information sharing will assist laboratories in making major decisions such as the adoption of new methods of analyses, need for validations, and purchase of cuttingedge equipment. The development of new products and

processes aims at meeting the increasing expectation of the capabilities of forensic laboratories as well as reinforcing confidence in their work product.

Collectively, our laboratories in the U.S. can learn from our international partners, collaborate and share results of research and development, and leverage our collective knowledge. IFSA will continue to facilitate collaboration and the sharing of knowledge throughout the world to better the field of forensic science.

#### RESEARCH

— The Forensic Laboratory Report Project —

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## The Project

In 2009, the National Research Council of the National Academies released a report entitled: *Strengthening Forensic Science in the United States: A Path Forward.* This report was issued after more than two years of study, following testimony by a committee commissioned by the National Academy of Sciences (NAS) to study the major issues confronting forensic science in the 21st century. The Committee issued 13 recommendations for the improvement of forensic sciences services going forward. The second recommendation reads as follows:

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

This recommendation was motivated in large part by testimony received by the Committee from solicited witnesses who testified that many reports that are issued by public forensic science laboratories in criminal cases were little more than a certificate of analysis, which contained just demographic information about the submitting agency and the accused, a short description of the evidence, and the final conclusion of the analysis. These reports did not contain any descriptions of materials, methods of analysis, detailed procedures, results and data of the tests run, reasoning that led to the final conclusion, or description of limitations and possible sources of error. It was also

found that the length, depth, and breadth of laboratory reports often depended on the type of evidence that was analyzed (e.g., drugs, DNA, fingerprints, etc.).

As a result of the NAS Report, it was decided that an assessment should be carried out that would determine what types of laboratory reports are actually being issued by forensic science laboratories today in the US. The membership of the American Society of Crime Laboratory Directors (ASCLD), whose membership spans the great majority of public forensic science laboratories in the U.S., was solicited for examples of laboratory reports in certain areas. In 2010, a letter was constructed that requested redacted laboratory reports. All information concerning the identity of the suspect, the submitting agency, and the laboratory was to be stripped out or obliterated. The only demographic information requested concerned the type of jurisdiction covered by the laboratory (federal, state, regional, local). The letter requested laboratory reports for the following types of evidence:

- Controlled substances:
- Trace or chemical evidence;
  - Hairs or fibers;
  - Fire residues; and
  - Glass or soil or paint.
- · Latent prints;
- Firearms/tool marks;
- Handwriting or other questioned documents case;
- Blood alcohol; and
- DNA.

A total of 421 laboratory reports or templates were received from 38 laboratories. The number of reports from a given laboratory ranged from one to 25. The mean was approximately eight. Data analysis was done in two ways:

- Each report was treated as an independent submission without regard to which laboratory submitted it or how many other reports were received from that laboratory.
- The reports were grouped by laboratory to see if there were effects on the data from having some laboratories submit unusually large numbers of reports. This turned out to not affect the results materially, and the results of the project were reported out using #1 independent submissions. The laboratory reports were subjected to content analysis that categorized them into various types of information. The categories were as follows:
  - Demographics;
  - Request for examination;
  - Inventory of Executive;
  - Methods/materials;
  - Procedures Specific, detailed, step-by-step procedures for the analysis of each piece of evidence;
  - Results;
  - · Discussion;
  - Limitations/sources of error; and
  - Data.

#### Conclusions

During meetings of the NAS Forensic Science Committee in 2006–08, the Committee heard testimony that many forensic science laboratory reports are lacking in many respects, especially the presence of data generated during the testing of the evidence, detailed procedures of the analysis, discussion concerning how the results of each test contributed to the conclusions reached. Some witnesses described some laboratory reports as being little more than "certificates of analysis", rather than scientific reports.

Analysis of the more than 400 laboratory reports in this study confirmed the aforementioned testimony to a large extent. It is noted that the degree to which reports conformed to this abbreviated model varied with the type of evidence. The effect was most pronounced with illicit drug and toxicology cases. The most "scientific" of the reports were those dealing with DNA analysis. Fingerprint reports as well as firearm/tool mark reports tended to be less rigorous than those for DNA but were more scientific than drug reports. The rest were somewhere in between.

The few reports received from federal laboratories tended to be more complete than those from state and local jurisdictions. There was little difference in rigor among state, regional, and local jurisdictions.

## **Request for Assistance**

We are now in the process of expanding the study internationally. The author is seeking redacted laboratory reports from laboratories all over the world.

If you are in a position to contribute, please contact Dr. Jay Siegel at siegel.jay@gmail.com.

#### **UPCOMING EVENTS**

## American Academy of Forensic Sciences — Annual Meeting

February 17–22, 2014; Washington State Convention Center Seattle, WA, US

## American Society of Crime Laboratory Directors — **Annual Symposium**

May 3–8, 2014; Doubletree Resort Paradise Valley Scottsdale, Arizona, US

#### Association of Firearm & Toolmark Examiners — Conference

May 11–16, 2014; The Westin Seattle Seattle, WA, US

### International Association for Identification — 99th **International Education Conference**

August 10–16, 2014; Minneapolis Convention Center Minneapolis, MN, US

## Society of Forensic Toxicologists — Annual Meeting

October 19–24, 2014; Amway Grand Plaza Hotel/Devos Place Convention Center Grand Rapids, MI, US

#### International Association of Law and Forensic Science - Annual Conference

April 1–3, 2014 Dubai, United Arab Emirates

# Second European Conference on Child Abuse and

May 21–23, 2014; De Meervaart Amsterdam, The Netherlands

#### NEW FORENSIC SCIENCE BOOKS

## Digital Forensics Processing and Procedures

D. Watson, A. Jones

Syngress: Waltham, MA, US; 2013

### Expert Bytes: Computer Expertise in Forensic Documents - Players, Needs, and Pitfalls

V. Atanasiu

CRC Press: Boca Raton, FL, US; 2013

### Forensic DNAAnalysis: Current Practices and Emerging **Technologies**

J. G. Shewale, R. H. Liu (Eds) CRC Press: Boca Raton, FL, US; 2013

## Forensic Victimology: Examining Violent Crime Victims in Investigative and Legal Contexts

B. E. Turvey

Academic Press: Waltham, MA, US; 2nd ed; 2013

# Handbook of Forensic Sociology and Psychology

S. J. Morewitz, M. L. Goldstein (Eds) Springer: New York, NY, US; 2013

#### Introduction to Forensic Psychology

S. L. Shipley, B. A. Arrigo

Academic Press: Waltham, MA, US; 3rd ed; 2012

#### Legal and Forensic Medicine

R. G. Beran (Ed)

Springer-Verlag: Berlin, Germany; 2013

## Manual of Forensic Taphonomy

J. Pokines, S. A. Symes (Eds)

CRC Press: Boca Raton, FL, US; 2013

# Novel Psychoactive Substances: Classification, Pharmacology and Toxicology

P. I. Dargan, D. M. Wood (Eds)

Academic Press: Waltham, MA, US; 2013

## Police Interview and Interrogation Techniques

M. R. Napier

CRC Press: Boca Raton, FL, US; 2013

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#### **BOOK REVIEWS**<sup>a</sup>

## **Underwater Forensic Investigation**

R. F. Becker

CRC Press: Boca Raton, FL, US; 2013

Reviewed by: B. Kroupa, RTI International, Research

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Ron Becker is an accomplished criminal investigator turned personal injury attorney and judge. He took a fascination for the history of marine archaeology and underwater search and recovery and coupled it with his passion for forensic science and criminal law procedure in the pursuit of educating others in underwater forensic investigations. He is the author of the second edition of *Underwater Forensic Investigation*, published in 2013 by CRC Press. The text, which is 351 pages divided into 15 chapters, is a comprehensive view of this emerging area of criminal investigations. Once delivered by search-and-rescue divers thought to possess no special skill sets and on loan from fire departments, these units were tasked with nothing more than what amounted to basic "salvage operations" to recover submerged evidence.

Professor Becker is the creator of Texas State University's Underwater Institute, a training facility for public safety divers in underwater investigations with a reliance on forensic protocol. He currently serves as the program director for Chaminade University's Criminology and Criminal Justice Programs. He has worked as an educator, underwater recovery consultant, and author of five criminal investigative texts. His life's work clearly seems to influence the delivery of his material, which is formatted like a lesson plan complete with new words and concepts, learning outcomes, review questions, and reference materials to add to the student experience.

A modern forensic science theme is revealed in the preface that any approach to the study of this evolving specialized forensic service begins with "an appreciation for the full spectrum of activities" that comprise a criminal investigation. Starting from the initial dry-land crime scene processing, to the underwater crime scene, and on to the courtroom, the author emphasizes the importance of each step of an underwater investigation. When embraced as an integral part of the investigation, the full evidentiary potential of an underwater forensic investigation can be realized. The introduction debunks 10 common myths that lay the foundation for the usefulness and value that a competent underwater forensic dive team can offer, a "criminal justice family" regardless of the size and caseload of a jurisdiction.

Each chapter reinforces the theme as he adds layers of forensic and legal knowledge for those new to the concept of processing an underwater crime scene. The role and responsibilities of an underwater forensic investigator as they relate to incident command, the law of search and seizure and an enlightening chapter on defense lawyers, prosecutors, and investigators are some of the chapters Professor Becker includes. These subjects provide a broader context for the reader as to why this service, if offered, should be properly staffed, resourced, and maintained.

While he includes rudimentary explanations of scuba diving concepts, generally accepted theories, safety, and specialized equipment that are easy to follow, the body of his work is dedicated to technical competencies expected of the underwater forensic investigator. Chapters on the recovery and proper documentation of forensic evidence most commonly encountered such as firearms, aircraft, and vessels are detailed and include thorough explanations of laboratory testing that could be requested to support investigative leads.

If you are an aspiring underwater forensic investigator, this book will encourage you to expand your knowledge of dry-land forensic crime scene processing and modern forensic techniques. For the police and crime lab administrator who may have a more historical view of this subject matter, the book effectively creates awareness and understanding of the benefits to ensuring any team operating in your service area does so with an eye on scientific rigor and commitment to building technical skill. The author is able to provide in this quick read evidence that the operational aspects of underwater forensic investigations are clearly making strides in evolving from simple salvage missions to recovery and reconstruction operations.

Copies of this book are not available in paperback editions; however, hardcover copies retail for approximately US\$85 and the Kindle version can be downloaded from Amazon for approximately US\$89 for use by Kindle Fire tablets, Android tablets, iPads, PCs, and Macs.

# Wildlife Forensic Investigation: Principles and Practice J. E. Cooper, M. E. Cooper

CDC D

CRC Press: Boca Raton, FL, US; 2013

Reviewed by: D. L. Merritt, RTI International, Research Triangle Park, NC, US

John and Margaret Cooper each have an extensive career devoted to research, education, and the conservation of wildlife. John is a veterinary pathologist specializing in tropical diseases and comparative medicine in wildlife and exotic species. Margaret is a lawyer who studies animal and conservation law. Recognizing the importance

<sup>&</sup>lt;sup>a</sup> To recommend a book for review, please e-mail John Collins at RTI International at jcollins@rti.org.

of investigative capabilities that include a variety of backgrounds and a solid understanding of forensics, specifically about free and captive wildlife, the Coopers accepted the challenge that led to this May 2013 publication, *Wildlife Forensic Investigation: Principles and Practice*.

Published by CRC Press, this ambitious textbook is 770 pages divided into 16 chapters, 11 appendices, an extensive "References and Further Reading" section, and a comprehensive index. A total of 26 contributors, including those from the US Fish and Wildlife Service (Ashland, OR) and the National Wildlife Crime Unit in Scotland, add to the diversity of expert knowledge presented in chapters such as "The Wildlife Crime Scene: An Introduction for First Responders" and "Forensic Entomology."

The authors first endeavor to define "wildlife" and "wildlife crime" and, in doing so, they describe the myriad habitats and situations in which wildlife, both free and captive, can be found. This naturally segues into an explanation of what "wildlife forensics" is: why it is important; how it can be used; and what a proper investigation should entail. Chapter 13, "Special Considerations and Scenarios," as well as many of the appendices, may be especially helpful to the novice investigator by offering sample forms, equipment lists, and detailed case studies.

According to the Coopers, they wanted to create a text that was both wide-ranging and detailed in the investigative methods of wildlife crime. Wildlife Forensic Investigation is tailored for "those involved in legal proceedings and other action concerning wildlife," not necessarily toward those more experienced with forensic applications, though there are some technical sections, such as Chapter 11: "Genetic Methodologies in Wildlife Crime Investigations."

Wildlife Forensic Investigation: Principles and Practice is a comprehensive text that emphasizes the importance of this emerging discipline within forensic science. The Coopers expound on the many situations involving interactions of free and captive wildlife and humans. Ancillary forensic professionals, such as those in the judicial system or those in the practice of veterinary medicine, will get the most benefit from the information described here. The authors also include an impressive list of organizations and sources of information.

Hardcover copies of this book retail between US\$90 and US\$130. The Kindle version can be downloaded from *Amazon.com* for approximately US\$84. There is also the option of renting the text in the electronic VitalBook<sup>TM</sup> format from VitalSource (through *CRCPress.com*).