

**Introduction to Veterinary and Comparative Forensic Medicine.** By John E. Cooper and Margaret E. Cooper. Wiley-Blackwell Publishing, Ltd., Ames, Iowa. 2007. 432 pp. ISBN 978-1-4051-1101-0. US \$125.99 (hardback).

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*Review by Richard K. Stroud*

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In recent years, the term *forensic* has been popularized by television shows, such as CSI, and by cases followed in the media, such as the O. J. Simpson case and others. The dog-fighting conviction for animal cruelty against the football star, Michael Vick, has focused a great deal of attention on veterinary forensic medicine. Aside from this text, at least two additional texts and a flurry of popular books have been published relating to animal forensic cases within the past 2 yr.

So is animal or "comparative" forensics really new? Forensic investigational techniques have been applied to animal death investigations, particularly wildlife death, for many years. Dr. Ward Stone has been active in providing forensic evidence in wildlife cases for the New York Conservation Department for many years. The concept of a crime laboratory, dedicated to providing forensic evidence in wildlife criminal investigations was proposed in the 1980s and was built and staffed in 1989 in Ashland, Oregon. Additional capability for both wildlife and domestic animal forensic cases has been established in the United States, as well as in both developed and some undeveloped countries throughout the world, to facilitate the evaluation of evidence related to illegal activity involving animals, especially wildlife.

Much to their credit, the authors John and Margaret Cooper have been the first to bring together some of the basic scientific concepts related to forensic investigations involving animals in a timely and comprehensive book covering both domestic and wildlife species. Because my review is for the *Journal of Wildlife Diseases*, I will concentrate on the portions of the text that relate to wildlife, along with general information relative to the forensic process, with the goal of answering the following question: Is *Introduction to Veterinary and Comparative Forensic Medicine* valuable to the wildlife veterinarian or biologist who is active in the scientific study of wildlife mortality that might have forensic implications?

Wildlife management has always included wildlife law enforcement as a tool in the

conservation of all species of importance to people. In the past, game wardens have concentrated on species that were harvested in hunting and fishing activities. Today, the scope of wildlife law enforcement is much broader, involving endangered species, marine mammals, migratory birds, and even illegally traded insects, reptiles, amphibians, and fish. Just as in human criminal cases, the scientific evaluation of evidence is essential in wildlife law enforcement.

The authors state their main objective in writing this book has been to provide a ready guide to the principles of forensic medicine for veterinarians and others who are involved with animals. As a team, Dr. John Cooper, a veterinary pathologist, and his wife, Margaret Cooper, a solicitor or lawyer, have traveled throughout the world dealing with a broad range of animal species under various social and economic systems for many years. They are perhaps the most qualified individuals to write such a comprehensive text from an international perspective.

Chapter 1 lays the groundwork for the rest of the text, defining *forensic medicine* as the applied use of medical knowledge, especially pathology to the purpose of law. The wildlife veterinarian or wildlife biologist is an essential member of a team that investigates illegal activity that results in taking of protected animal species or resources essential to the survival of animal populations. He or she may be a team leader in assessing a cause of death in a given case, but that determination may be only a single aspect of a complex investigation by law enforcement personnel and other scientific disciplines investigating the illegal activity that affects wildlife.

Evidence gathered from the examination of a carcass of an illegally killed wildlife species must be properly collected, documented, preserved, maintained, and passed on to a scientist of another discipline (team member) to be forensically useful in the case. This process establishes interdisciplinary links that solve complex associations between the victim and perpetrator.

Contrary to some who would claim that veterinary forensics is new science, the principles and practices of veterinary necropsy, documentation, and evidence recovery are solidly based on long-standing, court-approved protocols used in human forensics. The authors clearly state in the introduction of Chapter 2 that the basic principles of forensic investigation, in relation to meticulous record-keeping, systematic examination and proper treatment of material (evidence) are the same,

regardless of whether the victim is human or not.

The concept of *comparative forensic medicine* is also introduced in Chapter 2. There are some distinct advantages in using this term, rather than *veterinary forensics*, because it gives much more latitude to include such subjects as zoonotic disease, liability for environmental degradation, and involvement in commercialized trade of wildlife parts by wildlife forensic veterinarians and allied biologists or zoologists. The term *veterinary forensics* is too confining for the wildlife disease specialist who may be more involved with environmental conservation, as a whole, in a particular forensic case.

As a final note concerning Chapter 2, the authors state, under their listing of requirements of a forensic veterinarian in the investigation of wildlife crime, that the powers of observation, curiosity, and unconventional lateral thinking are most salient. To succeed, one needs the eyes and other attributes of a countryman, a field worker and a nature detective. I believe this describes a Wildlife Disease Association (WDA) member and gives insight as to why we have joined WDA as a professional organization.

Chapter 3 gives insight into animal law, mostly from the European (especially the United Kingdom) and international perspective. The concept of law enforcement bolstered by forensic investigational techniques is essential in protecting wildlife that is covered under the Convention on the International Trade in Endangered Species (CITES) and other pertinent laws and regulations. Trade in zoological specimens is also mentioned where shipping (transport) regulations are violated. This is pertinent to wildlife forensic investigation, exotic disease control, and the introduction of harmful “native species into ecosystems. This theme is carried through into Chapter 4 on the health and welfare of wildlife in zoos and aquariums, rehabilitation centers, and other such situations in which a WDA member may be involved.

Chapter 5 provides the reader with an excellent overview of the role of forensic investigation in conservation and wildlife crime. The authors’ perspective is European or, perhaps, international and tends toward the veterinarian as the team leader. The problems associated with international wildlife law enforcement in which forensic investigation is essential are also presented, which should be of interest to all wildlife veterinarians associated with WDA. Unfortunately, little mention is made of wildlife enforcement in North America, which involves a rather

large law enforcement effort by professional state and federal wildlife conservation officers. In the United States and Canada, game wardens, wildlife conservation officers, state or federal special agents, or other such designated law officers are the primary investigators in most wildlife-related criminal investigations. They maintain both the legal authority, as well as the required training, for wildlife law enforcement to be the leaders and directors of any wildlife-related crime investigation. Wildlife Disease Association members who work with state and federal agencies in the United States and Canada are keenly aware of this important connection with agency conservation officers. This is especially true for crime scene investigations (CSIs), where evidence relates the victim (wildlife) to the perpetrator of the criminal activity, and preserves the link throughout the criminal prosecution. Almost all wildlife enforcement investigations are done by these officers who may use veterinarians and other specific forensic expertise to assist in prosecuting wildlife criminal activity, be it enforcement of local hunting regulations or pursuing international commercial trade in wildlife.

Chapter 5 lists many areas of forensic investigation of interest to the wildlife veterinarian or wildlife biologist. The authors mention the term *environmental forensics*, which includes investigations such as environmental risk assessment, environmental contamination events, oil spills, electrical power grid or wind farm raptor mortalities, etc. that may have significant effects on the ecology of the area or even on survival of the species. Wildlife health, at the individual or population level, may be the major effect of these events. The forensic assessment by a wildlife health specialist must be done in a court-acceptable manner to win either protection or compensation from the responsible party. As pointed out in the text (p. 103), this is a “truly interdisciplinary” activity and may be, in my opinion, one of the most important contributions in comparative forensic medicine that a WDA member can make.

The remainder of the text deals with methodology for forensic investigations. Chapter 6 mostly deals with record keeping and documentation of clinical observations. Unfortunately, this is related more to animal abuse cases than to wildlife cases. Of particular interest to WDA members is the discussion of cases involving improper shipment of wildlife.

Postmortem procedures for forensic wildlife cases are covered in Chapter 7, which is more pertinent to wildlife veterinarians. This mate-

rial is well covered and is certainly important for the wildlife investigator doing a postmortem for forensic purposes. However, two important aspects of the forensic necropsy are either not emphasized or not adequately covered. Photographic documentation throughout the necropsy process should be stressed in any forensic necropsy. A picture, properly formatted with identifying labels and scales is “worth a thousand words” to a jury. In Chapter 9, additional comments regarding photography are included but no practical how-to guidelines are included. A second important concept not discussed is the collection of duplicate samples, which may be requested by the defense for their own testing, because original samples may be altered significantly or even destroyed by the analytical process. This is particularly important in cases involving poisoning or environmental contaminants. The examination and descriptions of gunshot wounds in Chapter 7 is inadequate for a text on wildlife forensics, considering that gunshot is the cause of death in a large percentage of wildlife that are killed illegally. Wildlife veterinary pathologists involved in forensic work must have a good understanding of guns used in hunting and the consequences of various projectiles in carcasses (terminal wound ballistics). Examination and interpretation of gunshot wounds in a carcass may give valuable clues to the investigator concerning the type of weapon used and the events surrounding the animal’s death.

Important how-to information pertaining to evidence collection, documentation, and storage are covered in Chapters 9, 10, and 11. Although the information is general, the wildlife investigator can certainly apply it to any forensic wildlife case. The information relative to the chain of custody is especially well done. Perhaps one of the most valuable

chapters in the book is Chapter 12—Serving as an Expert and Appearing in Court. Few of us in the wildlife field went to school with the idea that we wanted to appear in a courtroom. In today’s contentious world, much of what we do for wildlife or fisheries may include some legal element, potentially requiring courtroom testimony. Chapter 12 takes some of the mystery out of the legal system and the process of being an expert witness. This material should, in my opinion, be a routine part of our professional training, whether we are trained as a veterinarians or as wildlife biologists.

In summary, I believe that the question posed—“Is *Introduction to Veterinary and Comparative Forensic Medicine* valuable to the wildlife veterinarian or biologist who is active in the scientific study of wildlife mortality that may have forensic implications?”—must be answered with a resounding yes. The text is well written and illustrated. Although it is not necessarily a how-to manual for forensic wildlife investigation in every instance or in every jurisdiction, it certainly provides the basic concepts necessary for the WDA member who may become involved in a legal case requiring forensic evaluation and expert witness testimony.

The only real disappointment, in my opinion, regarding this text is the inclusion of the political statement on p. 111 condemning the United States for not signing the Kyoto Agreement and certain other treaties. Such statements are inappropriate in a scientific text of this caliber.

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