Cattle Plague: A History

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BOOK REVIEWS . . .

Cattle Plague: A History. By C. A. Spinage. Published by Kluwer/Plenum Publishers, New York, USA. 2003. 770 Pages. ISBN 0-306-47789-0, US$249.50 (Hardback).

We forget quickly. In 1709, one of the most dreaded diseases of livestock reemerged in Europe. A similar or identical disease criss-crossed the continent on multiple occasions over the previous two millennia, often in the wake of wars, but the 1709 panzootic was particularly devastating. Over a period of 8 yr, rinderpest killed three million cattle, and by 1865 an estimated 28 million cattle had died in Germany alone. In all, some 200 million cattle are thought to have died of rinderpest in 18th century Europe. Effects of the disease were not restricted to the European continent. It had a major impact on native herbivores in eastern and southern Africa. Depending on the mortality figure one chooses to use, between 75 and 225 million deaths occurred in native species after its introduction in the 1880s. As recently as the 1980s and in spite of two decades of largely successful international vaccination efforts, rinderpest reemerged in the southern Sudan and produced what some consider the biggest disaster in domestic cattle in the 20th century. Two million cattle were affected in Nigeria alone, with 500,000 deaths. The impacts on wildlife species were substantial but less well documented.

The book under review, *Cattle Plague: A History*, by C. A. Spinage, is a reminder to the scientific community of the long, rich history of rinderpest and of humanity's effort to understand and control it. The reminder is timely, since the Food and Agriculture Organization's (FAO) rinderpest eradication program aims at global eradication by 2010. Rinderpest (German for cattle plague) was selected by the FAO because of its historical role as a cause of famine and because of its ranking with foot and mouth disease as the leading worldwide threat to agriculture. One anticipated benefit of eradication will be its elimination from wildlife species, since cattle are natural reservoirs of infection for over 40 wildlife species. Although strains vary in virulence and rinderpest does not always manifest as an acute diarrheal syndrome, mortality often exceeds 90%. I recently had the privilege of seeing cases of rinderpest in cattle. It is a grim, painful disease.

At 770 pages, *Cattle Plague* is a labor of love that must have been years in the making. There are 33 pages of citations, most in English but many in German, Italian, French, Dutch, and Afrikaans, citations taken from rare monographs, public records, and government reports dating to the early 1600s. Of particular interest to many readers are three chapters dealing with the impact of rinderpest on African wildlife species (chapters 28 and 29) and with its economic and social effects in Africa (chapter 27). The text covers in exhaustive fashion many aspects of rinderpest. This includes its role in the emergence of veterinary epidemiology as a discipline, its association with European witchcraft prosecutions, early theories about infectious disease, and impacts on wildlife in Europe, Asia, and Africa. The book is not light reading, and is more a treatise than a romp. But a Germanic approach is appropriate for a disease of this pedigree and importance. *Cattle Plague* is the definitive scholarly epitaph of a disease that is, one hopes, on its way out.

Rinderpest was associated with several scientific landmarks. It was one of the first diseases of animals to be effectively controlled by movement controls and quarantine (1712–1715), although lessons from the Papal States' campaign were lost for much of the 1700s and beyond. Rinderpest was associated with the original demonstration of maternal immunity (1711), the first use of a clinical thermometer to detect fever (1865), and the establishment of the Office International des Epizootics in the wake of the 1920 outbreak in Antwerp. Veterinary services in Britain, Germany, Russia, and several African colonies trace their origins to public and political concerns about the impact of rinderpest on national economies. One of the distinctive strengths of this book is the large amount of space given to accounts of the disease in Eastern Europe, Asia, and Africa. Many of the scientific advances came out of Japan and Africa.

There are ironies in rinderpest's success as a panzootic disease. Only one immunologic strain of rinderpest virus exists, and animals surviving infection are immune for life. The agent is fragile and rapidly inactivated in the environment. Its reliance on animal-to-animal transmission meant that, even before effective vaccines were developed, the disease could be successfully controlled by a combination of strict quarantine, movement controls, slaughter policies, and carcass burial. Various physicians had the insight that rinderpest was infectious, but that knowledge was lost in a haze of theories about the spontaneous origin of rinderpest in dirt,

specific countries, or breeds of cattle. While it makes distressing reading, particularly in terms of the knowledge that the Papal States and England successfully controlled a large rinderpest outbreak in the early 1700s, it is a reminder that scientific muddle often carried the day. As archaevirus of the genus *Morbillivirus,* rinderpest virus is the ancestor of agents responsible for measles, canine distemper, peste des petites ruminants, and phocine distemper. Past efforts to control rinderpest carry a message for us about related morbilliviruses, old and emerging, which typically cause acute, high-morbidity clinical syndromes. Given the right conditions—a naive, densely crowded population, ideally somewhat stressed, and a delayed response by regulatory agencies—the scene is set for an epizootic.

Confusion about effective control measures was due to the failure to distinguish rinderpest from other diseases, specifically anthrax. In spite of the striking ulcerative oral and enteric lesions of rinderpest, it is remarkable that confusion persisted for centuries. I was left scratching my head by early accounts that purported to be firsthand descriptions of postmortem lesions in affected cows. I had a clear mental image of gentlemen-physicians peering with mild disgust into opened carcasses over the shoulders of slaughter men, leaving quickly for the nearest coffee house to pen their conclusions. It was the antithesis of the demonstration by Vesalius that the interventricular pores described by Galen did not exist. For 1,200 yr, anatomists who deigned to look at the human heart at necropsy managed to see something that was not there. Attempts by governments to control rinderpest during the Middle Ages and beyond were similarly stymied by scientific confusion about how to separate rinderpest from anthrax, and what to do with the information.

This is an expensive book at $249.50. It is unlikely to fly to the shelves of wildlife biologists and veterinarians unless they relish medical history. It is an exhaustive, meticulous work of scholarship and an exemplar of what it takes to essay an account of an important disease in livestock and wildlife. My only criticism is petty. The illustrations are not half tones, resulting in some loss of detail, particularly if the text is used for teaching. Colleagues with courses in wildlife disease, virology, pathology, immunology, and medical history will benefit from institutional access to this book. Wildlife history buffs will buy and treasure copies of their own.

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Parasites and Diseases of Wild Birds in Florida. By Donald J. Forrester and Marilyn G. Spalding. Published by the University of Florida Press, Gainesville, Florida, USA. 2003. 1,024 Pages. ISBN 0-8130-2560-5. US$125.00 (Hardcover).

As noted in the author's preface, the purpose of this book is to provide a reference on the myriad parasites, diseases, and other factors that cause or may cause morbidity and mortality in wild birds in Florida. The emphasis of this book is on the distribution, prevalence, and significance of those factors. The book is not intended to fill the role of a diagnostic manual, although it may help augment other diagnostic manuals available. The audience intended for this book is broad, and it includes wildlife biologists, ornithologists, resource administrators, students, and veterinarians.

The book is organized into 26 chapters and has information on 311 of the 457 species of free-ranging birds in Florida or its offshore waters. The chapters are organized by host species or groups of related species, which makes the large book user-friendly. The information is a compilation of the published literature, "gray literature," and personal files, notes, and reports from individuals, agencies, and organizations. The book provides extensive coverage on cranes, wading birds, wild turkeys, northern bobwhite quail, mourning doves, and bald eagles and is a reflection of the general efforts to study these particular species. Each chapter presents an overview that discusses the survival status of the populations or group of birds on which the chapter focuses. The chapters cover 13 fundamental categories of morbidity and mortality in wild birds, followed by information on the significance of the diseases to the bird populations and any public health considerations. The final chapter provides, primarily in tabular form, a summary of the health problems that are significant or potentially significant for each species of bird covered in previous chapters. This chapter also lists those organisms that are potentially zoonotic.

For such a large undertaking, the authors have done a nice job in cataloging the disease agents of the birds of Florida. Much of the information is readily retrievable from the numerous tables and makes for quick reference. In most cases the photographs are helpful and convey useful information. Some, however, such as a syringe being loaded with mosquito extracts or a technician identifying and sorting anesthetized mosquitoes, are not needed and add nothing to the text. This book will be a nice

addition to the libraries of zoologists and biologists studying birds as well as wildlife disease specialists. And, since birds and disease agents do not recognize state lines, its usefulness will not be restricted to those individuals working in Florida.

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Helminths of Wildlife. Edited by N. Chowdrury and A. Alonso Aguirre. Published by Science Publishers, Inc., Enfield, New Hampshire 03748, USA. 2001. 534 Pages. ISBN 1-57808-0924. US$118.00.

Helminths of Wildlife, by N. Chowdrury and A. Alonso Aguirre, compiles practical information about helminth parasites of wild animals presented with a global perspective. The book was written by 24 authors of various affiliations throughout the world, and the text consists of three major sections: General Aspects; Wildlife Management and Conservation; and Wildlife Helminths Geographical Perspective.

The primary focus of the book is to address helminth fauna of wild animals throughout the world that are of economic importance or that represent a conservation priority. The text is over 500 pages in length and addresses helminthes of wildlife in areas outside of the Northern Hemisphere, where data on this subject is sparse but where biologic diversity is great. Following each chapter in section III, Wildlife Helminths Geographical Perspective, there is an extensive appendix listing mammalian hosts, distribution, location of parasite recovery in the host, and a brief description of pathologic signs associated with infection. Unfortunately, there are few photographs or figures of the parasites and/or diseases discussed, and those that are presented are black and white.

This book represents an important step in attempting to compile data on the occurrence, distribution, and significance of helminth parasites of wild animals outside of the Northern Hemisphere. The references and appendices compiled for mammalian hosts from the Nearctic, Neotropical, Palaearctic, Oriental, Ethiopian, and Australian regions alone constitute a major contribution to knowledge in this area and represent a welcome update for this information in a single location. *Helminths of Wildlife* provides a welcome global perspective to helminthology of wild animals and will serve as a useful counterpart to *Parasitic Diseases of Wild Mammals* (2nd edition, Samuel, W. M., M. J. Pybus, and A. A. Kocan [Editors], Iowa State University Press, 2001). This book should prove useful to wildlife veterinarians and parasitologists as well as wildlife managers who deal with the occurrence and effects of helminth parasites of wildlife throughout the world.

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Alaska Wildlife Serologic Survey 1975–2000. By R. L. Zarnke. Published by the Alaska Department of Fish and Game, Federal Aid in Wildlife Restoration, Research Final Report, Grants W-27-3 and W-27-4, Study 18.71, Juneau, Alaska. Free of charge (compact disk).

Serologic surveys have been frequently used to screen free-ranging wildlife populations for exposure to a wide range of infectious diseases. This technique has been very popular among field researchers, given the low cost and relative ease of detecting antibodies to multiple infectious agents in a single sample. Serodiagnosis can be a useful tool, though one must recognize the problems associated with application of tests and interpretation of results in species for which they have not been validated (Gardner et al., 1996). Despite the inherent limitations of this technique (see Tyler and Cullor, 1989), serologic surveys have played an important role in identifying the presence and relative prevalence of disease agents within wildlife populations. This information is often used to provide direction for detailed follow-up studies on the disease agent itself and its significance in the population. Dr. Randy Zarnke has been a leader in the use of serologic surveys to monitor the health of free-ranging wildlife populations in Alaska over the last 25 yr, and he has presented his results in numerous study reports and papers in peer-reviewed journals.

While conventional publications presenting a summary and interpretation of study results will meet most readers' needs, there are times when one wishes to have access to more specific information that can only be gleaned from the "raw" data. By using a compact disk (CD) format for this "publication," the author is able to present both a comprehensive report summarizing 25 yr of serologic surveys as well as detailed test results for those interested in reviewing and interpreting the data for them-

selves. While the CD presents limited new information, it is valuable in consolidating the considerable body of serologic work done in Alaska over the last quarter of a century. Its intended audience includes not only wildlife disease researchers, but also field biologists, wildlife managers, subsistence hunters and trappers, and the general public. As such, considerable effort has gone into packaging the material in a user-friendly format and in a language that the general public can understand.

Alaska Wildlife Serologic Survey 1975–2000 can be operated on any PC running Windows, and when opened, it offers a series of files with fairly self-explanatory names. All files are in Adobe PDF format, and a free copy of Adobe Reader 4.0 and instructions for installing the software are provided on the disks. The CD is divided into three main sections: a Summary Report, a series of 160 separate Serologic Survey Tables presenting test results by species and disease agent, and a series of files providing supporting information on caribou herd distributions, acronyms, and game management units. The Summary Report is well organized, well written, and succinct. The 34-page document summarizes and interprets the results for those host species and disease agents for which there is a significant amount of data. There are separate "chapters" for 11 common diseases, each with a clear and concise section on the disease agent, host range, transmission, effects, diagnosis, prevalence rates, and human health implications. The reports' appendices provide abstracts and citations for 14 previously published journal articles using parts of the larger data set presented here. The Serologic Survey Tables present detailed serologic test results for each possible host/disease agent combination, with prevalence data broken down by year and herd or game management unit. The tables are organized alphabetically based on common name of the host. The amount of data for each host/disease agent combination is quite variable, with a surprisingly large sample size for some species. The two supporting maps on caribou herd ranges and location of state game management units are well done and informative. Overall, the author is to be commended in presenting a "common" type of data and report in a very unique, interactive, and useful format.

Copies of the CD are available free of charge by contacting Laura McCarthy, Alaska Department of Fish and Game, 1300 College Road, Fairbanks, Alaska 99701, USA (email: laura_mccarthy@fishgame.state.ak.us).

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British Small Animal Veterinary Association Manual of Wildlife Casualties. Edited by Elizabeth Mullineaux, Dick Best, and John E. Cooper. Published by the British Small Animal Veterinary Association, Gloucester, UK. 2003. 250 Pages. ISBN 0-905-21463-3. US$124.99.

Although a fair amount is known about many species by wildlife veterinarians and rehabilitators, attempts to formalize and centralize the information for use in the wildlife rehabilitation field have been rare, but are recently increasing. The United Kingdom has been at the forefront of many of these attempts. As stated in the preface, this manual is intended to be a reference for veterinary surgeons in the UK, those unfamiliar with the treatment of wildlife, and those faced with cases presented by concerned members of the general public.

It is essential that anybody wishing to provide veterinary and rehabilitative care for wildlife be aware of the relevant laws. The manual does a comprehensive job of reviewing the laws pertinent to England and Wales, but it must be remembered that these laws are not generally applicable. According to this manual, The Royal College of Veterinary Surgeons suggests "that all veterinary surgeons provide emergency service for wildlife casualties and that such care enhances the public perception of the profession," and their legislation makes this recommendation legal in the UK. The same is emphatically not true in the United States; in fact, there are numerous excellent reasons why the medical care of wildlife should only be performed by professionals and facilities dedicated to the care of wild species.

In addition to being aware of the laws governing their activities, it is equally important that anyone wishing to provide veterinary and rehabilitative care for wildlife understand the philosophical and ethical underpinnings of the activity. Kirkwood does an excellent job of providing an overview (a comprehensive discussion

would encompass a complete text in and of itself) in Chapter 1 and initiates the discussion with a review of the three primary rationales for human intervention in wildlife illness and injuries, and these are worth reiterating: for species conservation; for control of wild reservoirs of diseases important to human and domestic animal health; and for welfare of the individual. This manual, and in fact much of wildlife rehabilitation in general, is concerned with the final justification. This has arisen over the last few decades as acceptance of animals' capacity for pain and suffering has become increasingly widespread and as a result of our recognition of the fact that approximately 75% of animals presented to wildlife rehabilitators have been negatively affected by human activities. However, indiscriminate intervention can have unpredictable and undesirable effects at both the individual and population levels, and it is important to assess every case on its own merits without being influenced by the emotions of the rescuer or other caregiver. Finally, it must be recognized that there are limited options for permanently disabled wild individuals, and euthanasia may be in the best interest of the animal.

The first five chapters of the book comprise an introduction to the field and cover the ethics and philosophy, as discussed above, basic principles of treating wildlife casualties, principles of clinical pathology and postmortem examinations, and the law affecting British wildlife casualties. The succeeding chapters are dedicated to providing more in-depth information on individual species or groups of related species. Chapters are included on hedgehogs; squirrels; other insectivores and rodents; bats; rabbits and hares; badgers; otters; other mustelids; wildcats; foxes; deer; marine mammals; seabirds—gulls, auks, gannets, and petrels; wading birds, including herons; waterfowl—swan, geese, ducks, grebes, and divers; crakes and rails—coot and moorhen; birds of prey; gamebirds; pigeons and doves; small birds; and reptiles and amphibians and fish. The manual concludes with three appendices, an avian formulary, useful addresses for those in the UK, and common and scientific names of species mentioned in the book as well as a glossary of terms. Contributors include many of the best-known and most experienced wildlife professionals in the UK.

The quality and quantity of information covered for each group of animals is quite varied. Most chapters contain good information at a level of detail that is appropriate for the percentage of rehabilitation cases seen from that group of animals. For instance, long-legged wading birds are sufficiently addressed in only a few pages, since they apparently represent less than 1% of all avian casualties in the UK (although they comprise a larger percentage of admissions in some parts of the USA). The chapters on hedgehogs, insectivores/rodents, and rabbits/hares are notably informative and complete.

There are a few peculiar groupings of animals into a single chapter when differences in natural history suggest extremely different methods of captive care. For example, although gulls are included in the same chapter as auks, gannets, and petrels, their only commonality is that they are primarily piscivorous. Similarly, grebes and divers (loons) should not be considered by the wildlife rehabilitator to be in the same treatment or husbandry category as swans, geese, and ducks, even though they are covered together in this manual.

I am grateful to the editors, contributors, and the British Small Animal Veterinary Association for producing a resource that supports the continued professional development of the field of wildlife rehabilitation. I think that with recognition of the limitations inherent in trying to cover such a broad topic in one reference, this manual can serve as a useful addition to the library of veterinarians and rehabilitators working with wildlife, particularly those practicing in the UK.

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