rich field of lead exposure in human development, and vice versa; or the public health official who becomes familiar with the work on retention of lead fragments in hunted wildlife. Proof of this book's integrated approach to lead is the diversity of author affiliations: wildlife research centers, zoos, environmental agencies and non-profits, human medicine, and state conservation offices, to name a few.

The book is composed of 53 papers (25 peer-reviewed, 10 not peer-reviewed, and 18 extended abstracts) organized in four main sections: review of lead uptake and toxicosis in humans and wildlife; lead exposure in humans from spent ammunition; lead exposure, sources, and toxicosis in wildlife; and, remediation of lead exposure from spent ammunition. There are also nine expert commentaries transcribed from the meeting and an introduction and conference summary by the esteemed raptor biologist Ian Newton. Birds, especially raptors, are the predominant taxonomic group in the research. Not surprisingly, work on the California Condor (*Gymnogyps californianus*) is well represented. Other bird species addressed include Golden Eagles (*Aquila chrysaetos*) and fish eagles (*Haliaeetus* spp.), waterfowl, doves, and other terrestrial birds.

Geographically, most papers concern the United States, but there is good representation from Europe. In the one paper from South America, Saggese et al. review lead toxicosis in raptors from Argentina. In discussing sources of lead in the environment, they cite the recent and growing popularity of dove and pigeon hunting in central Argentina where, absent any limits on the number of birds killed, hunters regularly discharge over 1,000 cartridges per day, killing or injuring as many birds. The barbarism of these hunts is, therefore, compounded by the 1,600 metric tons of lead released into the local environment each year and the fact that crippled and dead birds are left for scavengers (including humans) to consume, lead shot and all.

There are only two minor flaws with the book. The first is the repetition of basic information in many of the papers. One would only notice this if the book was read cover-to-cover, a method for which the book was not designed. The second flaw concerns the 18 entries that are extended abstracts. Some of these are quite extensive with figures and tables, etc. while others aren't 'extended' at all. Either way, no one likes to cite abstracts and when I searched for full papers that these abstracts should have evolved into by now I wasn't able to find any.

In his closing comments for the meeting, Ian Newton noted the conference showed that lead from spent ammunition poses a bigger human health problem than previously recognized. Indeed, after reading this book, one cannot help but be alarmed at the widespread and insidious nature of lead ingestion by humans and wildlife. These proceedings are a call for action and, unlike many environmental problems that seem insurmountable; the removal of lead from outdoor sporting equipment is attainable.

The book is published by the non-profit organization The Peregrine Fund and the entire proceedings are available at http://www.peregrinefund.org/Lead_conference/. Other than a few color photos and figures online that are represented in grayscale in the print edition, there are no substantial differences between the book and the online version. The reader's personal preference is the best guide in deciding which version to acquire. Either way, acquire this book and spread the word! I strongly recommend this book to anyone who wants to be more knowledgeable about the threats to wildlife, humans, and the environment posed by the release of lead into our fields and wetlands.—JOHN CURNUTT, Regional Wildlife Ecologist, USDA, Forest Service, Eastern Region, 626 East Wisconsin Avenue, Milwaukee, WI 53203, USA; e-mail: jcurnutt@fs.fed.us

THE BIRDS OF THE REPUBLIC OF PANAMA. PART 5. GAZETTEER AND BIBLIOGRAPHY. By Deborah C. Siegel and Storrs L. Olson. Buteo Books, Shipman, Virginia, USA. 2008: 516 pages plus 1 inset map. ISBN: 978-0-931130-17-5. $45.00 (hardcover).—Even in these modern days of hand-held GPS receivers and Google Earth, the final volume of Alexander Wetmore's *magnum opus*: *The Birds of the Republic of Panama* is a welcome addition to the library of any serious student of neotropical birds who will want to make room for it along side the previous four volumes. It is outstanding in its primary role, as a 20th century ornithological gazetteer, but most modern readers will find it wanting a few 21st century trappings that were left out and we can hope will be included in some future format.

The authors, Deborah Siegel and Storrs Olson, have done meticulous work in providing geo-

graphic precision to ambiguous place names, which are the norm in much of Latin America. Those who have done field work in these parts are familiar with the simultaneous tendency for multiple local names for a single place, the application of a general name to a region too large to be considered a single biogeographic point, and the duplication of common names across distant districts and provinces. For example, this volume lists nine unique locations with the moniker ''San José'' which the authors dutifully sort out. Siegel and Olson have also been mindful of the tendency of place names to change, which is especially problematic for the areas surrounding the Panama Canal; in many cases, a Spanish-language place name replaced earlier English-language names used during the U.S. administration of the Canal Zone. I recently reviewed collecting localities for the *niglaris* subspecies of *Myrmeciza exsul* mentioned in *The Birds of Panama. Volume 3*. Not surprisingly I was able to find precise locations and geographical coordinates for all, but I should also note that I found the same information on Google; the value of this volume is in the annotations for each location. For example, many of the place name descriptions follow a hyperlink format, whereby other place names of interest relative to the location in question are referenced. It was in this way that I was able to make sense of the confusion surrounding Cerros Colorado, Santiago and Flores: an important endemic bird area in the Serranía de Tabascá in western Panama. It should also be noted the authors were careful with resolving the many unintentional variants of place names caused by collectors (including me) whose command of Spanish was less than perfect.

Equally valuable is the detailed annotated bibliography of Panamanian ornithology. The span of this bibliography is vast. Here, topics as diverse as systematics, paleozoography, and natural history comingle from both recent (up until ~ 2005) and historical sources. I am especially appreciative for the effort the authors undertook to include works not typically found in searchable data bases such as museum monographs and Latin American regional journals published in Spanish. This volume should foster the inclusion of these works into the cited literature of future studies. Particularly of interest is the inclusion of the reference for a multitude of named taxa (genus, species or subspecies) with a Panamanian type location; perhaps only the authors know how close to being an exhaustive list this may be.

Given this attention to detail, I wonder how much greater an impact this final volume – in what is largely a 20th century work – could have had if only more 21st century informatics were used. As an active collector of birds in Panama, one of my favorite features of the book is a map highlighting every collecting location (as well as the geographic gaps in our collective efforts). However, the map appears to be an afterthought, as it is a separate inset to the book. There is no way to go from a dot on the map to that place name in the text to learn more about who collected there and when. Similarly, there is no way to find all of the place names in any geographic region, such as the Pearl Islands or the Darién Province, despite how useful that would be. I imagine that many of my colleagues from the gene jockey cohort of ornithologists will appreciate the bibliography's detailed listing of 19th century taxonomic literature when it comes time to give proper names to resurrected lineages. However, without a searchable index for scientific names, I wonder if this resource will be used to its fullest capability. Providing a digital PDF of the text would allow for searching on strings such as province name or latitude and longitude ranges. Alternatively, perhaps the basics of the place names (and the point map) could be created as an internet-based resource; readers could be directed to the text for the details pertaining to specific locations. To be fair, other gazetteers of Latin American ornithology have these problems, but the fact that this volume was published in 2008 makes their omission more apparent.

It is worth noting the book begins with a short bibliography of Dr. Wetmore that includes his portrait and a detailed timeline of his field expeditions in Panama. This is fitting for the final volume of Wetmore's unparalleled work. Panama has had a much larger role in the development of neotropical ornithology than could be predicted by its geographic size. This is in no small part due to the generations of ornithologists that refer to well-thumbed pages of *The Birds of Panama* to learn detail after detail about the distribution and natural history of that country's birds. We are all indebted for his effort.—MATTHEW J. MILLER, Postdoctoral Fellow in Molecular Evolution, Smithsonian Tropical Research Institute, Apartado Postal 0843-03092 Panamá, República de Panamá; e-mail: millerma@si.edu