

identified, and although existing alternative hypotheses do not always receive a fair hearing, the phylogenies are always explicitly defended.

This well-illustrated book is written in an accessible style. The inescapable abundance of taxonomic names and morphological terminology, and the high density of information that is offered in the form of consecutive lists of characters and their discussion, prevents the book from being an easy read. This is an admirable attempt to summarize and critically evaluate an impressive body of morphological and phylogenetic information, and rather than merely reporting expert opinions, Ax infuses his work with original phylogenetic reasoning, resulting in various novel phylogenetic hypotheses and taxon names. This makes his volume both a valuable source for zoology students, and a worthy contribution to a continually evolving and exciting field of zoological research.

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BIRDS OF NEPAL. *Princeton Field Guides.*

By Richard Grimmett, Carol Inskipp, and Tim Inskipp; illustrated by Clive Byers, Daniel Cole, John Cox, Gerald Driessens, Carl D'Silva, Martin Elliott, Kim Franklin, Alan Harris, Peter Hayman, Craig Robson, Jan Wilczur, and Tim Worfolk. Princeton (New Jersey): Princeton University Press. \$29.95 (paper). 288 p; ill.; indexes of English and scientific names. ISBN: 0-691-07048-2. 2000.

LONGEVITY RECORDS: LIFE SPANS OF MAMMALS, BIRDS, AMPHIBIANS, REPTILES, AND FISH. *Mono-graphs on Population Aging, Volume 8.*

By James R. Carey and Debra S. Judge. Odense (Denmark): Odense University Press. 200.00 kr. 241 p; ill.; indexes of scientific binomials and common names. ISBN: 87-7838-539-3. 2000.

BIRDER'S MEXICO. *The Louise Lindsey Merrick Natural Environment Series, Number 12.*

By Roland H. Wauer. College Station (Texas): Texas A&M University Press. \$18.95 (paper). xxvii + 304 p; ill.; index. ISBN: 0-89096-918-3. [Previously published as *Naturalist's Mexico*, 1992.] 1999.

Some birding guidebooks are meant to be taken along on trips and referred to for minute details: where to turn off the main road, where to stay the night, or even where to seek particular species. This book is different. I am not certain that I would take it along on a trip, as it is not intended to be *that* type of guidebook; rather, it is meant to be read before a trip, to get an idea of what awaits at a site.

Wauer brings to this volume a fascination for Mexico and its birds. This enthusiasm is present in every chapter, and makes the book, as I believe was intended, an effective advertisement for Mexican birding. Having visited almost all of the sites that Wauer mentions, his descriptions are accurate, and would indeed be useful to potential visitors. For each site, Wauer provides a nice mixture of anecdotes and bird finding advice, focusing on the species endemic to Mexico. My criticisms are few—the descriptions are a bit dated (with most of Wauer's visits occurring more than a decade ago) and his term "North American" for migrants from the U.S. and Canada is a bit irritating, given that Mexico is geographically part of North America. Regardless, this book will prove a worthy read for birders interested in visiting Mexico.

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COMPARATIVE HEARING: BIRDS AND REPTILES. *Springer Handbook of Auditory Research, Volume 13.*

Edited by Robert J. Dooling, Richard R. Fay, and Arthur N. Popper. New York: Springer. \$98.00. xiv + 380 p; ill.; index. ISBN: 0-387-94684-5. 2000.

Part of the allure in studying the sensory systems of nonhuman animals is the promise that general physiological and behavioral mechanisms, along with a more comprehensive understanding of structure-function relationships, will emerge from comparative analyses. Such analyses require extensive data sets, and must often await collection in proper review papers. In Volume 13 of this long running and popular series, the editors present reviews of the auditory literature framed by this comparative theme. Each of the six main chapters provides a well-written and reasonably thorough (although not exhaustive) review, covering various aspects of hearing in birds and reptiles. Moving in ordered fashion from peripheral transduction to central nervous system anatomy and physiology, and then to behavior, the volume is largely successful in maintaining its comparative perspective. This is particularly true for the separate chapters that cover the middle ear, hearing organ, and central anatomy in both birds and reptiles, where a number of general trends and conserved features become apparent. Such broad scope is less apparent in the final chapters that deal with sound localization and psychophysical behaviors, but this reflects more a paucity in data from reptiles rather than any fault of the authors. Even here, as in the chapter on hearing organs in lizards, the comparative approach is upheld within particular taxa.

As is true for most of the volumes in this series, each chapter can stand on its own as a useful and timely review for nonspecialists in other fields of

auditory research. The content is probably too specific to serve as a textbook for undergraduate coursework, but selected chapters will fit well into graduate level classes and seminars. The retail price is high, and may prove to be an impediment to broad use in any didactic capacity.

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ANTELOPES, DEER, AND RELATIVES: FOSSIL RECORD, BEHAVIORAL ECOLOGY, SYSTEMATICS, AND CONSERVATION.

Edited by Elisabeth S Vrba and George B Schaller. New Haven (Connecticut): Yale University Press. \$65.00. viii + 341 p + 8 pl; ill.; index. ISBN: 0-300-08142-1. [Sponsored by the Yale Institution for Biospheric Studies and the Wildlife Conservation Society, New York.] 2000.

The somewhat unwieldy title of this book barely manages to define its ambitious scope. This is a truly multidisciplinary work, with contributions from an array of distinguished biologists. It must rank as one of the best summaries of this interesting and important animal group.

Following the editors' introduction, 22 chapters are separated into three parts. In the first part, The Past, four papers tackle the conundrum that is the pattern of relationships among the major ruminant groups, but others address extinct giraffid diet and early mammal extinctions. Guthrie's paper on representation of ungulates in Paleolithic art was a revelation: it can tell us not only about coloration of Irish Elk, but also woolly rhinoceros group sizes and biogeographic gradients in bison horn size. Interpreting phylogenetic relationships is the dominant theme of Part II, The Present. Points of agreement and disagreement between genetic and behavioral-morphological approaches illustrate both the difficulty and recent progress in resolution of this challenging group. The origins of the saola and other newly discovered species (described by Groves and Schaller) only add to the puzzle. Other noteworthy articles describe patterns of niche partitioning, conspicuous coloration, and sexual dimorphism in extant species, although Jarman's explanation for female-hornedness has certainly been proposed previously. Applying scientific approaches to conservation is the focus of Part III, including topics such as the use of molecular genetics in biodiversity assessment of barking deer, conservation of genomic variation, comparative merits of North American and European wildlife management practices, and the sobering issue of prioritizing conservation efforts. Perhaps a notable omission was consideration of conservation breeding or reintroduction: the Arabian oryx is surely a classic success story.

Representing the proceedings of a 1997 interdis-

ciplinary workshop, this book is an object lesson in adopting multifaceted approaches in evolutionary biology and conservation, with just one exception: despite so much information regarding phylogenetic relationships, it is surprising and disappointing that none of the cross-species analyses (e.g., chapters by Jarman, Estes, and Sinclair) used modern comparative approaches controlling for shared evolutionary descent. Nonetheless, the book is an excellent and comprehensive review of the subject.

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ONTOGENY, FUNCTIONAL ECOLOGY, AND EVOLUTION OF BATS.

Edited by Rick A Adams and Scott C Pedersen. Cambridge and New York: Cambridge University Press. \$100.00. viii + 398 p; ill.; index. ISBN: 0-521-62632-3. 2000.

The editors of this book set as their goal to add to the increasing emphasis on integrative approaches to biology by presenting reviews incorporating ontogeny into studies of systematics, functional morphology, ecology, and evolution. They view ontogeny as a crucial link between the very different time scales represented by ecological and evolutionary processes. Although this goal is admirably achieved in some chapters, it is not in others, and only rarely are the three aspects mentioned in the title brought together.

Twelve chapters focus on the ontogeny of different structures of bats, starting with Simmon's clear synthesis of the current understanding of bat phylogeny. Bat heads receive considerable attention, with individual chapters on the ontogeny of the brain, skull, cochlea, dentition, and basicranium. As in all the chapters, these are primarily reviews of current knowledge and they are reasonably up to date; references include those from 1998. Some authors, such as Adams and Thibault discussing the hindlimb, present previously unpublished data, thereby increasing the usefulness of the book. In most chapters, intriguing questions for future research are highlighted, as in Reep and Bhatnagar's suggestion that investigating the ontogeny of the retina-to-brain connection might shed light on the debate over a mono or diphyletic origin of bats. A concluding chapter, pulling the various reviews together and looking at the big picture, would have been enlightening.

Although I was disappointed with the lack of integration of ontogeny, ecology, and evolution in many chapters (Adams's on wings being a notable exception), this can be attributed at least partly to a lack of data. There are over 900 species of bats, but ontogenetic data exist for only a handful, and a single species, the little brown bat (*Myotis lucifugus*),