REVIEWS

EDITED BY M. ROSS LEIN

The following reviews express the opinions of the individual reviewers regarding the strengths, weaknesses, and value of the books they review. As such, they are subjective evaluations and do not necessarily reflect the opinions of the editors or any official policy of the A.O.U.—Eds.

Animal Societies: Theories and Facts.—Yosiaki Itô, Jerram L. Brown, and Jiro Kikkawa (Eds.). 1987. Tokyo, Japan, Japan Scientific Societies Press. xvi + 291 pp., ISBN 4-7622-0514-1. No price given. Order from Business Center for Academic Societies Japan, Koshin Building, 6-16-3 Hongo, Bunkyo-ku, Tokyo 113, Japan.—This volume, based on a symposium held in Kyoto, Japan, in July 1986, offers an overview of current Japanese research in behavioral ecology. Interspersed among 13 chapters by Japanese scientists are seven chapters by a distinguished selection of scientists from the rest of the world. Only five chapters concern birds specifically. Most of the other topics should be of fundamental interest to students of avian behavioral ecology, if only because they treat general subjects (such as foraging, mating systems, dominance, and cooperation) from the slightly unfamiliar perspective of entomology, ichthyology, mammalogy, or pure theory.

For ornithologists, however, few of the chapters are provocative in the anticipated manner. Some of the chapters are relentlessly descriptive, such as Kawamichi et al.'s chapter on social organization in solitary mammals, Itô's observations on polistine wasps around the world, and Yamamoto's sketch of paternal care in two captive pairs of raccoon dog. Others concern issues, such as the evolution of termite soldier castes (Aoki) and sex change in anemonefish (Ochi & Yanagisawa), that lack common analogues in birds.

Other chapters contain lucid recapitulations of ideas, observations, or experiments which the authors have treated more fully elsewhere. This category includes Brown's chapter on the role of kin selection in the evolution of avian helping behavior, Taborsky's on cooperation in fish, and Krebs' on the interplay of modeling and laboratory experiments.

Several chapters clearly fulfill the hope that casting aside taxonomic provincialism will facilitate fresh insight. West-Eberhard's chapter on flexible strategies, while initially focused on how incipient sociality might originate without genetic change from preexisting behavior of solitary wasps expressed in a new ecological context, suggests how quickly and easily avian helping behavior might originate and why widespread helping does not require the spread of "helping" genes. The explanation implies that, while kin selection may be crucial in maintaining helping behavior, it might easily be irrelevant to its origin. Sakagami and Maeta, studying carpenter bees, describe laboratory and field experiments that support West-Eberhard, at least in the Hymenoptera.

Hamilton's chapter on the constraints placed on social evolution by pathogens and the possibility of "cheating" in cooperative relationships represents the sort of inspired speculation which I, for one, would like to see published by more of our most creative scientific thinkers. In relatively few pages of stunning scope, he synthesizes his thoughts on cooperation, kin recognition, the evolutionary importance of disease, sex, intelligence, cultural evolution, and the human future.

The twin platitudes of reviewers of symposium volumes with many second-language contributors are that the contributions are scientifically and lexically uneven. Unfortunately, these platitudes are true with a vengeance for this volume. A few of the weaker contributions read like glorified abstracts, or concatenated abstracts from several papers. Even in some of the most descriptive papers, statistical analysis is all but eschewed. There are also obviously a number of cogent reviews. For example, Fujioka's chapter on brood reduction in cattle egrets, while not offering new interpretations, summarizes the important implications of brood reduction succinctly.

A stronger editorial hand would have been useful. Nearly all chapters include summaries, but beyond that stylistic consistency is minimal. The English runs the gamut from elegant to marginally comprehensible. In a trend we also see in the U.S., acronyms are overused and often obstruct communication. Another item I found particularly annoying was the editorial decision to use a reference format which, like *Science* or *Nature* but without the excuse of necessary brevity, lacks the title of cited works.

In sum, if the book's chief goal was to introduce the range of behavioral research presently occurring in Japan, it was very successful. Unfortunately, some of the most exciting work (like Aoki's studies on sterile soldier castes in aphids) may not be of immediate interest to ornithologists. To the extent that the book laudably seeks to unify fundamental behavioral issues across taxa, it is less successful. Ornithologists who have been reading the recent literature will find fresh ideas in relatively few chapters, although those

chapters are provocative. Clearly any complete college or university library will wish to possess this book.—STEVEN N. AUSTAD.

Breeding Birds of Ontario: Nidiology and Distribution. Vol. 2, Passerines.—George K. Peck and Ross D. James. 1987. Toronto, Ontario Royal Museum. xi + 387 pp., 206 figures (142 maps), 36 unnumbered drawings. ISBN 0-88854-328-X. Can. $36.00.—Recently a number of major books dealing specifically with or including Ontario birds have been published: see Godfrey's "The birds of Canada," rev. ed. (1986, Ottawa, Natl. Mus. Nat. Sci.), Speirs' "Birds of Ontario," vols. 1 and 2 (1985, Toronto, Nat. Heritage), and Cadman et al.'s "Atlas of the Breeding Birds of Ontario" (1987, Ontario, Univ. Waterloo Press). One wonders about potential overlap. However, ornithologists interested in field biology and nidiology will find this book an invaluable compilation and summary of a huge data base of breeding records for Ontario passerines that is not available elsewhere.

This book is the second in a two-volume series (the first volume on nonpasserines was published in 1983). It is based on the Ontario Nest Records Scheme (ONRS) and includes all records up to 1984, and some selected records from 1985 and 1986. Data from 65,091 nest record cards for 144 species are efficiently summarized (in total the two volumes include data from more than 325,000 nests on 84,848 nest record cards). Additional information on Ontario birds from various sources was also considered for completeness. Both authors have more than 20 years experience working on breeding birds of Ontario and have detailed knowledge of the ONRS.

The format for the major part of the book is highly structured with one map and approximately a page of text for each of the 140 confirmed breeding species. There follows a short section on 4 unconfirmed breeding species. The text is interspersed with 36 drawings of birds by the second author, many of which are exceptionally good. The first Appendix provides a detailed set of additions and corrections to Vol. 1, noting all major changes from 1980 to 1986. A second Appendix provides a combined list and chart of egg-laying dates for all Ontario breeding birds including range and peak period. Following the list of plant names, Literature Cited, Selected Bibliography, and Index, there is an extensive selection of 96 photos of habitats, nests, and breeding species.

The text for each species is divided into two sections. The greatest strength of the book is the enormous amount of information effectively summarized in the Nidiology section, which has four components. The component on Records is made up of three paragraphs. The first describes typical breeding habitat, refers often to the photographs, and enumerates occurrences in different habitat types. In the second paragraph, the authors identify and separate specific common nest-site characteristics, again including frequencies (e.g. "open areas for foraging near the nest were a prerequisite . . . and other manmade structures on which 96% of all nests were located" [Eastern Phoebe, pp. 22–23]). The specific details of nest locations are summarized, including details of tree species and size, descriptions of various tree nest sites (such as horizontal branch or fork), information on associations with other bird species, and a summary of nest heights. A third paragraph describes typical nests and interesting variations. Construction characteristics, materials and detailed measurements are summarized including size ranges.

The last three components of the Nidiology section summarize all ONRS data on Eggs (clutch size and cowbird parasitism), Incubation Period, and Egg Dates.

The second major section, Breeding Distribution, is the weaker of the two, and suffers in comparison with the vast amount of data summarized in the Nidiology section. For each species there is a general overview of the assumed breeding range in the province. This gives a good balance to the maps which show only confirmed records based on the nest records. To some extent, as the authors admit in the first volume, the maps reflect the distribution of active field workers as well as birds.

The selection of photographs provide valuable information, particularly on breeding habitats. The species accounts refer specifically to some, but unfortunately not all. There is some chance that they will be overlooked because of their position. Readers would be well advised to work through them carefully.

The book is well laid out, clearly printed, and seems well bound. The 7" × 10" format makes it slightly large for the field where I suspect many copies will receive their greatest use. The book has been carefully edited and I did not notice any substantial errors. Some essential introductory material on the Ontario Nest Record Scheme, methodology, and the forest and physiography of Ontario appear only in Volume 1. They should have been repeated in this volume as well, but that is a minor criticism. Although based solely on Ontario information, the detailed summaries will be of interest to all ornithologists who have an interest in nidiology.—DANIEL A. WELSH.

Newfoundland Birds: Exploitation, Study, Conservation.—William A. Montevecchi and Leslie M. Tuck. 1987. Publ. Nuttall Ornithol. Club, No. 21. x + 273 pp., frontispiece, 23 tables, 40 text figures, 4 appendices.—This book is a review of the interactions of humans and birds in Newfoundland from prehistoric times to the present. It is divided into 11 chap-

ters, four appendices, and an extensive list of references. In the first chapter, the authors give a brief survey of Newfoundland ornithology, justifiably emphasizing seabirds and the changes that have occurred in the colonies because of human influence, and provide a cursory overview of the book's contents. The second chapter, a geographic and physical description of the island, is well illustrated and very useful because it covers succinctly but adequately the physical characteristics of the island.

The next chapter has well-documented information about the "utilization of birds by prehistoric inhabitants" based on the results of archaeological investigations. This section will be particularly useful to those interested in past avian distribution. The chapter on "early written accounts" summarizes the scanty ornithological information found in the writings of the early travelers and explorers such as John Cabot, de Cortereal, Jacques Cartier, Humphrey Gilbert, Nicholas Denys, and George Cartwright. It is interesting and well-researched, although additional information would have been welcome.

In Chapter 5, the authors summarize Joseph Banks' work in Newfoundland and Labrador, and introduce too briefly the work of his predecessors. The 34 species recorded by Banks in Newfoundland are reviewed with appropriate and accurate comments, and the Newfoundland observations are presented in a table along with those he made in Labrador.

Chapters 6 and 7 are devoted to ornithological work in Newfoundland during the 19th century. The information provided is very thorough, and useful comments accompany the summary of the work of each naturalist. Tables listing the species reported and giving the names used at the time of publication are provided where appropriate. In this manner the works of L. A. Anspach, R. H. Bonnycastle, J. B. Jukes, J. J. Audubon, H. Reeks, and J. C. Cahoon, along with others whose contributions are less significant or in obscure publications, are briefly analyzed and given recognition, sometimes for the first time. The information given in these publications about the species that now have a different status (such as the Great Auk, Labrador Duck, and Eskimo Curlew) is particularly interesting.

In the following chapter, the authors review the ornithological work of the 20th century with an emphasis on "The Birds of Newfoundland" by H. S. Peters and T. D. Burleigh (1951) and the life-long work of one of the authors, the late L. M. Tuck. The latter section of this chapter is a modest summary of the role and influence of Les Tuck as an outstanding contributor to the knowledge of Newfoundland birds.

Seabirds are treated in Chapter 9, the most extensive of the book. The authors chose to treat the most important islands, groups of islands, or nesting sites individually and comment on the known breeding species, particularly on the changes in the status of colonial species. Population changes are well-documented and give a new insight into the understanding of species that have expanded or colonized the island or new colonies, especially during this century. A similar treatment is provided for the land birds in the next chapter and indicates changes in the composition and status of the present bird fauna of the island. The concluding chapter discusses numerous aspects of bird conservation in Newfoundland as well as the traditional uses of birds in relation to present conservation practices. The section on alcid hunting will be particularly informative to those interested in seabirds. The appendices contain a list of 332 species recorded in Newfoundland, including "breeding residents" (could it be otherwise for a resident species?) and a fascinating list of local vernacular names. The latter seems to be complete for English (Newfoundland) names, but not for the French names used in the few French-speaking settlements of the island.

This book is well-written, well-organized, and carefully edited except for the misspelling of a few names of persons and places. It would be a very useful addition to the library of anyone interested in historical ornithology, economic aspects of birds, seabirds, insular biology, and conservation. Montevecchi deserves congratulations for having competently brought to fruition the sustained initial research effort and massive data compilation by L. M. Tuck. Without the dedication of both authors this work would undoubtedly never have been completed. I strongly recommend it to ornithologists, naturalists, and general biologists as well as wildlife managers and conservationists.—HENRI OUELLET.

Bruno Liljefors: The Peerless Eye.—Martha Hill. 1987. Garden City, New York, Doubleday & Co., 174 pp., 175 illustrations (112 color and 63 black and white with 24 photographs of people and places). ISBN 0-385-24361-8. Cloth. $60.00.—Most serious ornithologists over 30 probably know that bird illustration, occasionally raised to art, is inextricably entangled in the history of ornithology. There is thus a cultural component in this field uncommon among sciences. Also, the last 25 years have seen an extraordinary explosion of enthusiasm for birds, natural history, and related pictures on the part of a general public whose eagerness to buy is often matched by its lack of artistic sophistication.

Important to a fuller understanding of these matters by all concerned is the work of the Swedish artist Bruno Liljefors (1860–1939) who, though relatively little known in America, is one of the few painters of wildlife significantly recognized by the larger world of art. In his time, with Anders Zorn and Carl Larsson, he was one of Sweden's three best known painters. This book culminates a project begun by Martha Hill in September 1978 with an article in *Audubon*, of which she is now picture editor. With it she gives possibly

the best—and certainly the most elegant—view of Liljefors' life and work available in English.

In an introductory section of 48 well-illustrated pages (nicely printed in sepia), Hill succeeds in bringing Liljefors and his surroundings to life. A rich selection of his pictures from the Swedish galleries and homes where most of them still reside follows. That Liljefors was the greatest painter of birds seen to date, as is often claimed, could possibly be argued by proponents of such diverse artists as Audubon or Fuertes. That he was the greatest *painter* who has dealt habitually with birds, the pictures in this book leave no reasonable doubt. The pictures (nearly all oil paintings, many of which are large) are well-reproduced on good, heavy stock with indication of dates and sizes.

With extreme effort, I limit myself to the few points beyond, some of which I have stressed before (see *Living Bird* 18:27).

Liljefors' intent was to record experience, not what is there but what can be perceived and recalled. Here we see the results of his tireless efforts to identify the relatively few critical things seen in nature at the expense of the infinity of meaningless detail routinely suppressed or overlooked by the human mind.

His success is striking, both in action pictures such as the Goshawk exploding a blackgame lek (p. 69), the Capercaillie attacked by a pine marten (p. 78), and the Golden Eagle and hare (p. 110), and in quieter ones too, with a sometimes overpowering sense of ambience, as in the woodcock and fox in dawn moist meadow (p. 73) and the exquisite contrast of sensed cold and promised warmth in the eagle owl picture on p. 129.

Beyond commonplace realism, Liljefors discovered the sometimes brutal effects of various intensities and wave-lengths of light on the human retina, and shows this dramatically with the dawn scene with eiders (p. 108–109) and a gull at its nest (p. 168).

As for ornithology per se, Liljefors clearly knew the creatures of his world, with a sure grasp of the essences that detail merely cloaks and should not encumber unnecessarily.

Critics and philosophers, as Hill shows at some length, were as busy and sometimes banal in Liljefors' time as in any other. To our great good fortune this strong-minded individualist was little moved by shallow judgments revolving about "Darwinian" fang and claw twaddle, Nietzschean Superman fantasy, and the like. He painted as he wished to with no goals more sinister or abstruse than recording natural beauty as he saw it.

I have no criticisms of real consequence. The few typos (e.g. "Beginings" in large type on p. 4) and *lapsi* are the kind inevitably discovered by authors upon opening the first mint copy. Peregrine is misspelled twice on p. 144. The date (1919) on the eider painting on p. 164 is printed as 1930. The gulls on p. 121 look like Lesser Black-backed Gulls rather than Herring Gulls as labelled. A very complicated quotation on p. 62 seems to be unclosed but no one else may ever be picky enough to find it. While a wider horizontal format would have prevented fewer pictures from crossing the gutter it would doubtless have increased the very reasonable price and it would be churlish to complain.

This excellent and attractive volume is recommended to serious students of art involving birds (and other wildlife), the research libraries that serve them, and to all who appreciate fine painting of animals and wild landscape.—ROBERT M. MENGEL.

Community Ecology: Pattern and Process.—Jiro Kikkawa and Derek J. Anderson (Eds.). 1986. Palo Alto, California, Blackwell Scientific Publications, Inc. xi + 432 pp., 63 text figures. ISBN 0-86793-272-4, paper, $28.00; 0-86793-264-3, cloth, $50.00.—This book aims to provide "a fresh and critical look at major patterns and processes that must underlie all community organization." To this end the editors assembled 15 chapters from 18 contributors on topics that range from the trophic relationships of decomposers to resource exploitation patterns of human populations in tropical rainforests. Perhaps only half the chapters succeed in achieving this ambitious goal, but this volume fills an empty niche in the highly competitive milieu of recent community ecology anthologies. Although only two chapters provide extensive, explicit discussion of birds, much of the material is relevant from a purely ecological perspective.

The volume opens with the obligatory introductory chapter by the editors, which is mainly a brief historical survey of community ecology. Unfortunately, the survey is too brief and does little either to whet the interest of the reader or provide a framework for the chapters which follow. Indeed, the authors themselves question the coherence of their account, and one suspects that their efforts might have been better directed.

The second section consists of three chapters under the misleading heading of "Limits of Communities" that ostensibly examine the methodological framework of community ecology. Goodall describes the "biotope" of a species, and the definitions seem useful in focusing attention on important environmental components relative to different attributes of a species. Kikkawa discusses the concepts of complexity, diversity, and stability of communities, with emphasis on attempts to operationalize their measurement in natural systems. This subject, however, contains more than can be squeezed into 20 pages and, as with the Introduction, the treatment is too brief. Nonetheless, its caveats on the numerical description and comparison of complex communities are worth consideration by anyone contemplating a multivariate analysis. The

chapter by Greig-Smith on chaos/order in community organization is confusing and, to my mind, contributes little to the volume.

Three chapters on patterns of resource utilization are grouped together, and two of them will be of particular interest to ornithologists. Terborgh and Robinson discuss the definition, description, and utility of ecological guilds, emphasizing intercommunity comparisons of guild structure in birds. They assess patterns of convergence in tropical avifaunas from different continents (largely reiterating the work of J. Karr and others), but the centerpiece of their effort is a comparison of the structure of guilds in dissimilar habitats (tropical vs. temperate forests). They provide some interesting (but untested) methods for operationalizing concepts such as guild "niche dimension" and species packing. Although they justifiably caution against taking their numbers too seriously, I think their approach merits serious consideration. Schoener provides an extensive review of resource partitioning, much of which is relevant to avian ecology. Although the summary calls for a multivariate explanatory approach to patterns of resource use, the bulk of the chapter is developed around a unitary explanation, interspecific competition. This reflects the historical development of the theory of resource partitioning, and Schoener provides an excellent, concise description of that theory. The third chapter in this section is a descriptive account of trophic relationships of decomposers by Kurihara and Kikkawa. While making use of guild concepts, it is more ecosystem-oriented than standard community ecology.

Five chapters grouped under the heading "Ecological Processes" form the core of this volume; all are reviews, and all are interesting. Lawton and MacGarvin examine the organization of herbivore communities by comparing and contrasting extremes—insects and mammals. This approach provides few concrete generalizations about herbivores; instead, as with most analyses of intriguing data sets, it raises questions more interesting than those it answers. Holmes and Price provide a lucid framework for examining parasite-host communities, complete with a table of concepts, assumptions, and predictions. The hierarchical approach to communities so necessary for studying parasites may be usefully generalized to free-living animals as well. A chapter by Kitching on predator-prey interactions is short on theory but contains a number of well-presented, thought-provoking examples. In particular, Kitching emphasizes effects that cascade through a system rather than simply one-predator/one-prey population interactions.

The two chapters most critical of existing work fall into this section. After providing a too-brief discussion of the development of plant community succession theory, Anderson finds fault in the lack of coherence of that theory. Although he does not offer a model to replace the existing paradigms, he outlines the requirements of such a model. His criticisms are valid and his outline is thought-provoking, but his review of contemporary theory is incomplete which weakens the integration. (He omits, for example, D. Tilman's mechanistic model of plant succession.) Underwood provides the harshest assessment yet of the quality of field experiments ostensibly designed to evaluate interspecific competition. Within sometimes lurid prose lies a detailed critique of flaws in most of the field experiments cited in previous reviews provided by J. Connell and T. Schoener. He shows no mercy, concluding that a bad experiment is worse than no experiment at all. His remarks are well worth reading by anyone contemplating manipulations in the field. Not only will the design be improved and the results less equivocal, the risk of showing up as a bad example in future reviews is reduced.

The volume concludes with a section on evolutionary processes with chapters by Freeland on parasite-host communities, Bradshaw and Mortimer on more broadly defined communities, and Dwyer on the variety of human resource-acquisition strategies in tropical rainforests. Dwyer's chapter seems out of place in this section (particularly in contrast to the other two chapters), yet it is quite interesting in its approach to human ecology. The framework of "subsistence modes" Dwyer develops to categorize rainforest peoples should find wide and useful application to other groups of organisms as well. The other two chapters are primarily reviews of the array of evolutionary processes thought to be important in producing the variety of patterns observed in natural communities. These authors, particularly Bradshaw and Mortimer, clearly view communities as unremittingly interactive assemblages.

The review chapters are almost all of high quality, and this volume would therefore be an excellent basis for a semester-long graduate level seminar in community ecology. Although one can argue about specific interpretations or omissions in virtually every chapter (such argument being the essence of today's community ecology it seems), the papers in this anthology are far less contentious than those in D. Strong et al. (1984, Ecological Communities: Conceptual Issues and the Evidence, Princeton University Press). Further, whereas many lack the spark found in many of the papers in the recent volume edited by T. Case and J. Diamond (1986, Community Ecology, Harper and Row), the review format is sufficiently different from the more specific and idiosyncratic nature of chapters in the latter that the text fills a substantially different niche. Indeed, its greatest similarity is to the now somewhat dated "Theoretical Ecology," edited by R. May (1976, 1981, Sinauer Associates), to which it compares favorably.

This is a book worth having for those interested in broad areas of community ecology. It is well-produced and contains few typographical errors. The more than 1,400 references are mostly current through 1985 and provide a good entry into the literature. Al-

though some topics are underrepresented (e.g. scale-dependency and landscape perspectives), most of the ground is covered in a topical manner.—JOHN T. ROTENBERRY.

Bird Communities at Sea off California: 1975 to 1983.—Kenneth T. Briggs, W. Breck Tyler, David B. Lewis, and David R. Carlson. 1987. Cooper Ornithol. Soc., Stud. Avian Biol. No. 11. iv + 74 pp., 29 text figures. ISBN 0-935868-36-4. $7.00.—The California Current is one of the most productive eastern boundary current systems in the world and is associated with extensive coastal upwelling. It extends from southern British Columbia to Baja California but is centered off the California coast. While seabird communities of upwelling systems have been described elsewhere (e.g. Benguela and Senegal systems), the California system has received less attention. Seabird communities have been described in the Bering Sea, Gulf of Alaska, and northern British Columbia (Bering and Alaska current systems) and in southern British Columbia, Washington, and Oregon (northern California Current). The detailed documentation of the California seabird community presented in this study extends our knowledge of seabird use of the California Current System, clarifies earlier accounts of seabird occurrence in the state, and now all but completes the goal of initial quantitative description of seabird communities along much of the eastern margin of the North Pacific. This is a grand achievement for west-coast seabird biologists. It was a difficult and costly task fueled by plans for offshore oil development.

It is gratifying that this study is one of the most extensive of its kind to date. The goals were "to describe quantitatively the occurrence of seabirds in waters off California and relate patterns of abundance, seasonality, and community diversity to physical and biological characteristics of the ocean habitat." The study was undertaken in two separate parts. Southern California was examined from April 1975 to March 1978 using ship and aerial surveys (covering over 70,000 linear km). Central and northern California were examined from February 1980 to January 1983 using monthly aerial surveys (covering about 83,000 and 45,000 linear km in central and northern portions, respectively). About 3.5 million birds were logged. Such extensive and standardized coverage of a fairly large piece of ocean (over 10° latitude, up to 200 km offshore) is undoubtedly a first, and permitted one of the best documentations possible.

This work is organized into a review of the oceanography of the California Current System off California; the status, numbers, and habitat affinities of seabirds, organized in species accounts; and the analyses of diversity (using the Shannon Index), species associations and scales of aggregation (using Cole's Coefficient of Association and Ord's Index of Patchiness), and habitat use (using depth, distance from shore, and surface temperature in principal components analysis).

Of 103 species recorded in California, 74 were observed. Sixty-two species reached estimated population sizes over 20,000 birds. About 30 species were numerous. The *breeding residents* included Leach's Storm-Petrel, Brandt's and Pelagic cormorants, Brown Pelican, Western Gull, Pigeon Guillemot, Common Murre, and Cassin's Auklet; *winter residents* included Western and Clark's grebes, Northern Fulmar, Surf and White-winged scoters, and Rhinoceros Auklets; *summer visitors* included Sooty, Pinked-footed, and Buller's shearwaters, Black-footed Albatross, Black Storm-Petrel, and Heermann's Gull; and *spring and fall migrants* included Pacific Loon, Red and Red-necked phalaropes, Pomarine Jaeger, and Arctic and Common terns. Four species or species groups reached estimated population sizes over one million birds: Sooty Shearwater, phalaropes, Common Murre, and Cassin's Auklet. The maximum estimated population size (at one point in time) of four to six million birds occurred in late fall/early winter and had a biomass of about 4.8 million kg. In contrast, only about 700,000 seabirds of 23 species breed in the state, of which 90% is made up of Common Murres, Cassin's Auklets, Brandt's Cormorant, and Western Gulls.

The seabird community of central and northern California was similar to Oregon and Washington in the northern California Current, dominated by Common Murres, Cassin's Auklets, and Sooty Shearwaters. But in southern California, where the California Current is farther from shore, gulls, storm-petrels, pelicans, cormorants, and terns predominated. This boundary is also evident in breeding species where Black Storm-Petrels, Brown Pelicans, and Xantus Murrelets only breed southwards while Fork-tailed Storm-Petrels, Common Murres, Marbled Murrelets, and Tufted Puffins only breed northwards. Seabird densities, biomass, and diversity rivaled that of other highly productive eastern boundary current systems. In central and northern California, *upwelling fronts* (at the shelf break with high temperature gradients) segregated different elements of the seabird community into the offshore California Current (warmer, fresher, clearer, thermally stratified waters) where gulls, terns, and storm-petrels aggregated over larger distances; the nearshore coastal upwelling zone (colder, saltier, nutrient-rich, mixed waters) where Pacific Loons, Western and Clark's grebes, Surf and White-winged scoters, Brown Pelicans, and cormorants aggregated; and the upwelling frontal zone between where Common Murres, Cassin's Auklets, and phalaropes aggregated over smaller distances.

Some will agonize over the fact that the actual prey of this seabird community was not discussed anywhere in this tome. This is a major drawback that

weakens all aspects of the study but is partly forgivable relative to the effort spent on surveys and their analyses. Another flaw was the inadequate coverage of coastal waters within a few kilometers of shore and in major estuaries (e.g. San Francisco Bay) where certain species only occur. This zone requires further work. It also would have been useful to examine the persistence of specific aggregations of seabirds over time. The pooling of data over large areas to detect regional trends and a monthly data collection schedule precluded examination of use of specific areas on different time scales, especially near breeding colonies and where either recurrent oceanographic processes or prey behavior occur at the same locality. The temporal and spatial predictability of prey patches will have a profound influence on further evaluation of many aspects of seabird community structure. While these flaws exist, further analyses of certain abundant species (especially Sooty Shearwaters, phalaropes, Common Murres, Cassin's Auklets, and Brown Pelicans) are pursued elsewhere in much more detail by these authors and are cited to round out gaps in the discussion.

Further attention could have been paid to the apparently stable "nonequilibrium" state of the California Current System and its seabird community. Certain upwelling systems (e.g. Peru) are characterized as having a simple structure. They are relatively stable on the short term, but have long-term instabilities (i.e. "El Niño" events). It is evident from the regional graph presented in the California species accounts that almost all species occur in a regular fashion with only minor annual variations (except for the latter half of 1982). It is unfortunate that this study did not continue beyond January 1983 so the full effects of the intense 1982–1983 "El Niño" event could be evaluated. Effects may have been of short duration because most species breed elsewhere, outside the main influence of "El Niño." Reproductive failures and changes in population size which have led to long-lasting effects on some breeding species occurred on the Farallon Islands. The diversity and apparent resilience (or robustness) of this community may be augmented further by great heterogeneity of the environment (upwelling occurs to some extent throughout the year) and by a more complex food web than in the Peru Current. The fact that maximum biomass occurs outside the main upwelling and breeding seasons when prey are thought to be most abundant is perplexing. This is, however, related partly to historical declines in breeding species and certain prey species (e.g. sardines).

In all, this landmark work is a must for all libraries and researchers' bookshelves.—HARRY R. CARTER.

Seabirds: Feeding Ecology and Role in Marine Ecosystems.—J. P. Croxall (Ed.). 1987. Cambridge, Cambridge University Press. vii + 408 pp. ISBN 0-521-30178-5. $59.50.—Research on foraging ecology of seabirds has entered an exciting new phase. In addition to traditional dietary studies, there is increased emphasis on at-sea investigations, integrated with data on oceanography, productivity, and pelagic food webs. The aim of this book was to review the current state of this research. The core 14 chapters, by 22 authors, fall loosely into three categories: general processes involving seabirds; diets and feeding behavior of the major orders and families; and food and energetics of seabird communities from eight geographic regions. Each chapter has its own style and reference list, and there are few attempts to cross reference. Spelling and the common names of birds are not standardized (British in some chapters, American in others). This may confuse the unwary.

Chapter two, which follows Croxall's brief introduction, is most thought-provoking. Hunt and Schneider review scale-dependent physical and biological processes that affect seabird abundance and distribution. They draw on the terminology and concepts derived from studies of zooplankton by Steele and others to outline the ambits (spheres of action in time and space) of seabirds and to show that seabirds respond to physical events at five time-space scales. These range from associations with water masses on a global scale, through associations with large upwelling systems, concentrations at fronts, eddies and ice-edges, down to fine-scaled feeding aggregations at surface cells a few meters across. With the increased popularity of shipboard surveys, this chapter serves as a timely reminder that the interactions and patterns perceived may vary according to the scale at which the sampling and analyses are done. Unexplained variance at one scale may be part of a pattern when viewed from a larger perspective.

Pennycuick adopts an interesting approach to the explanation of seabird flight. He derives a simple mathematical model of flight parameters for a "standard seabird," then shows, with allometric adjustments, that this fits all procellariiforms except diving petrels (Pelecanoididae). The flight patterns and wing dimensions of most other seabirds can be explained as four major modifications of the standard model. Few anatomical specializations or types of flight have evolved among seabirds, despite their varied feeding methods.

Kooyman and Davis give a rather sketchy review of dive capacities, hydrodynamics, underwater metabolism, and hunting economics. Most diving is maintained by aerobic metabolism. This maximizes the total time underwater during a foraging bout, but limits the duration and depth of each dive and hence strongly influences foraging behavior. Regrettably, virtually no reference is made to studies of diving physiology in waterfowl. There is still much to learn about the interrelationships of avian diving physiology and underwater foraging ecology.

Furness provides a comprehensive review of the occurrence and economics of kleptoparasitism among seabirds. Seagoing pirates, including specialists like jaegers, tend to have very low success rates and, with few exceptions, have a negligible impact on their hosts. Furness speculates that food shortages, due to low abundance or poor accessibility of prey, led to kleptoparasitic skills in seabirds.

The reviews of the food and feeding ecology of penguins (Croxall and Lishman), procellariiforms (Prince and Morgan), pelecaniforms (Schreiber and Clapp) and Pacific alcids (Vermeer, Sealy, and Sanger) provide much of the information in the book, and will be invaluable to researchers and others seeking comparative material. The penguin and procellariiform chapters are particularly pleasing. They provide generous, up-to-date summaries of major prey types and feeding methods, with some analyses of foraging ranges and interspecific differences. The pelecaniform and alcid chapters are less quantitative, but give plenty of references and discuss some interesting aspects of foraging ecology, such as the effects of coloration and nesting requirements.

Six chapters deal with seabird communities in selected geographical regions. Energy models form the analytical framework in five of these chapters, but the initial assumptions, data gathering, and modeling techniques differ so that comparisons of the results require caution. Sanger reviews the trophic niches of birds in the Gulf of Alaska, and discusses resource partitioning. He speculates that low-order carnivores may respond more quickly to blooms of productivity, and be less susceptible to the effects of commercial fishing. Schneider, Hunt, and Powers compare the effects of physical hydrography and related biological events on seabirds in two boreal shelf regions. Energy fluxes to seabirds in Bristol Bay (Bering Sea) and Georges Bank (NW Atlantic) are similar, but differ from other regions with differing physical oceanic features. Briggs and Chu update earlier models of energy flux to seabirds off California, and show the effects of surface hydrography on seabird foraging.

The only tropical region reviewed is Hawaii (Harrison and Seki), where the mobility of seabirds makes them effective predators of the sparse and patchy prey. They may take up to 42% of the annual production of small epipelagic fish and squid. Historical records of guano harvests provide useful estimates of past seabird populations. Duffy and Siegfried use such data, with some lengthy extrapolations, to estimate that breeding seabirds take less than 5% of the populations of the principal schooling fish of the Humboldt and Benguela upwellings. They find no evidence that birds regulate the recruitment of Peruvian anchovettas. Croxall and Prince review an impressive array of data on the diets and at-sea behavior of the huge populations of birds breeding at South Georgia. Although seabirds are major predators of krill, they do not appear to regulate krill populations, and the authors feel that it is premature to use breeding success of seabirds or seals to monitor krill stocks.

Croxall's concluding chapter contains more summary than synthesis, but he discusses interactions between seabirds and commercial fisheries, an underlying theme of many chapters. Seabirds have undoubtedly been affected by overfishing in several parts of the world, but the nature of the competition is not simple and the factors that influence birds and fishermen are not identical. Schneider et al. suggest that both seabirds and large fisheries (e.g. factory ships) require a densely aggregated resource. Negative interactions between these consumers may occur well before any major reduction in the overall stock, if large schools are depleted or broken up. Duffy and Siegfried, on the other hand, point out that many seabird populations have remained relatively stable despite drastic changes in their prey populations brought on by climatic changes and overfishing. Seabirds take substantial amounts of food from localized marine ecosystems (estimates range from 5–42% of available production). Seabird impact on these ecosystems, and the selective forces operating on foraging behavior, cannot be assessed clearly until more is known about the size, dynamics, and movements of seabird prey populations.

I was disappointed to see some contributors discuss resource partitioning as though trophic competition among seabird species was a well-established fact rather than a controversial hypothesis. Differences in diets or foraging methods do not necessarily demonstrate divergent selection due to competition, especially among seabirds where density-dependent food shortages are difficult to prove.

This is an excellent book. Seabird biologists should already have a well-thumbed copy on their desks. Many other ornithologists will find useful data, references, and ideas. Perhaps the people who most need to read this book are fisheries' biologists and oceanographers, who might realize that seabirds can provide a wonderful view into the black box of complex interactions beneath the waves.—ALAN E. BURGER.

OTHER ITEMS OF INTEREST

Voices of the Wrens: Family Troglodytidae.—J. W. Hardy and B. B. Coffey Jr. 1988. ARA Records, P.O. Box 12347, Gainesville, Florida 32604-0347. Pamphlet and 77-minute cassette. $10.50.—Hardy and Coffey present vocalizations of 71 of the 74 wren "species" that they recognize. This tape is therefore a considerably expanded version of Hardy's 1977 tape that included sounds of only 43 species. Median length of selections is about 55 seconds, with only 11 selections less than 30 seconds in duration. The authors could not resist saving the most impressive selection for the grand finale, a 3¾ minute, virtuoso performance by the Musician Wren (*Cyphorhinus arada*).

This collection of recordings, like Hardy's other similar endeavors, has something for everyone: beautiful sounds from an "ultimate *songbird* family," insights on the taxonomy of the group based on vocal behavior, a style of humor and commentary that makes the reader feel as if the entire production were done just for him/her, and a wealth of suggestions for future research on vocal behavior and taxonomy.

Many of the selections are superb, but others are less than good. For example, distortion (selection 50), reverberation (70), and background sounds [goats and their bells (2), a cough (40), other birds] are considerable at times. Furthermore, I have never met a cassette recording that has done justice to the song of the Winter Wren (*Troglodytes troglodytes*). Many of the tropical wren species are so poorly known that it is impossible to know how typical the available sound selections are. For one temperate-zone species that I know well, however, I was disappointed. The 14-second selection for the Marsh Wren (*Cistothorus palustris*) consists of "plastic song" (not fully developed, mature song) from an early season migrant in Florida.

My overall reaction is to disregard these relatively minor shortcomings in production. The "music" is at times mind-boggling. The Chestnut-bellied Wren (*Cyphorhinus thoracicus*), for example, seems to be a human-generated sequence of songs in slightly different keys and would delight and astound any human musician. The taxonomic suggestions are intriguing. This persistence and herculean effort to assemble recordings of all (but three) known wren "species" is a service to the entire ornithological community.—DONALD E. KROODSMA.

Threatened Animals and Plants in Finland.—P. Rassi and R. Väisänen (Eds.). 1987. Ministry of the Environment, Helsinki, 82 pp. ISBN 951-46-7961-X. Available from Government Printing Center, P.O. Box 516, SF 00101 Helsinki, Finland. No price given.—In 1983 the Finnish government created a committee of five experts to report on the threatened species of the country. The report, in three thick, richly illustrated volumes, was published in Finnish (1986). The English version is a slim "Red Data Book" but includes all the essentials that outsiders, conservationists as well as scientists, need to know about the status of threatened wildlife species in Finland. About 400 plants, the same number of invertebrates, and 69 vertebrates are treated. In the last group, 38 are bird species. The book gives a short history of conservation legislation regarding species and nature areas. It presents, in detail, the concept of a threatened species as understood in Finland. The bulk of the English book comprises species descriptions. The organisms are classed, in declining order: disappeared, endangered, vulnerable, in need of monitoring. Monitoring may be needed for declining status, rarity, or incomplete knowledge. Criteria for assessment to any category include state of knowledge, taxonomic status (many subspecies have been termed endangered although the species is not endangered, e.g. *Calidris alpina schinzii*), history of occurrence in Finland, distribution and abundance, population dynamics over the past few decades, biology of a species, specific or generalized habitat requirements, and finally, conservation measures presently in effect.

The threatened species are listed with their habitat requirements in Finland. Reasons are given for the threat to each species. Species are also tabulated by habitat and by the factors that threaten their existence.

The second half of the book summarizes the threatened vertebrate and invertebrate animals, vascular plants, bryophytes and algae, and fungi including lichens. Among the threatened species of birds are loons, diving ducks of the coniferous forest belt, all four eagle and five falcon species of the country, a few coastal water birds and shorebirds, and some southern elements of the Finnish forest and woodland avifauna. All told, exemplarily executed conservation measures in a country renowned for its nature-loving and scientifically advanced population.—M. D. F. UDVARDY AND M. E. UDVARDY.

The Birds of Ghana.—L. G. Grimes. 1987. British Ornithologists' Union Check-list No. 9. 276 pp., 11 tables, 12 text figures, 16 black and white photos. ISBN 0-907446-08-6. Paper. No price given.—Another in the British Ornithologists' Union's ambitious series of check-lists, this one is packed with existing information on Ghana's birds by an ornithologist who spent 15 years there. The near-crisis situation pertaining to West Africa's disappearing forests makes this an especially important contribution, with baseline data. The author hopes it will act as a "launch pad" for others in Ghana, but one wonders if it contains all we will ever know for some species.

Ghana is large (242,000 km^2) and important in the history of West African ornithology, as the frequently visited, former "Gold Coast." The status and what (often little) is known of the breeding of some 72 Ghanian species is documented in a good format. The history of ornithology in the country is well-covered. There are excellent maps, 16 photos of habitats, and 11 tables that treat vegetation, climate, bird habitats, breeding data, seasonality, migration, and a comparison with Nigeria's avifauna. The species accounts cover 150 pages and are followed by a summary list coded for status in 21 pages. Appendices deal with banding (ringing) data and returns, an "eco-taxonomic" list of migrants, an important but incomplete list

of the locations of specimens from Ghana, weights, a list of taxa described from Ghana, and a gazetteer.

Over 325 references are cited and listed. There is an index of English group names and of generic names. I found no errors in my perusal, and the volume is well-produced. The systematics (except for higher categories) and English names are based upon earlier (pre-1970) classification and names, and not the more recent ones (e.g. Snow 1978, An atlas of speciation in African non-passerine birds, London). Nonetheless, this publication is most useful as an up-to-date account of the status and distribution of the birds in a major West African country.—L. L. SHORT.

Ptitsy Moskvy i Podmoskovya. [Birds of Moscow and Vicinity.]—V. D. Ilyichev, V. T. Butyev, and V. M. Konstantinov. 1987. Moscow, Nauka. 272 pp., 150 text figures. 60 k.—Moscow is the point of entry into the Soviet Union for most tourists, but until recently there has not been a book devoted to the capital avifauna. Various field guides for the birds of the USSR encompass regions so vast and a fauna so large that detail and specificity are lost. Over 200 species have been recorded from the Moscow region, and 120 are spring and summer residents. For each of the latter, the authors have provided quite detailed summaries of breeding biology, phenology, measurements, natural history, and ecological notes. Its utility as a field guide is enhanced by line drawings for each species, but diminished by the curious lack of a species index. As one who finds identifying small birds in trees a chore, I would have welcomed better help than these sparse figures.

This is a book of urban birds. Moscow and its suburbs are one of the largest metropolitan regions in northern Europe, with estimates of its size ranging from 9 to 15 million inhabitants, an exact census depending upon which cities are included. The capital region covers about 12,000 km^2, but the area of Moscow itself is less than 10% of this. Contained within the city limits are over 300 parks that total about 17 km^2. These parks provide most of the habitat for the 20 or so species of breeding birds. The authors summarize the effects of urbanization on this regional avifauna by their own detailed studies begun in the early 1970s by Y. A. Isakov, and by comparison with earlier work done at the beginning of the Soviet period.

Since the Revolution, the central metropolitan area has grown at least fivefold in population but suitable habitat has decreased about 30% through construction. The increased population density of humans has pushed most species into the rural fringes where appropriate habitat still exists. Thus, the diversity of breeding birds decreases from about 120 species in undisturbed rural reserves, to 54 in the suburban parks, to about 18 in the central city. This change is dynamic and can be assessed through long-term study. The authors were able to track the fate of each species as Moscow and Russia grew and industrialized. By the late 1970s, a stable urban avifauna had developed, and patterns analogous to that seen in transition habitats were evident.

Urbanization is considered only as a phenomenon, and judgments about its desirability, inevitability, or prevention are lacking. In addition to this summary analysis, the authors included chapters on the practical advantages of urban bird life, on how to attract and control birds, and on the pleasures of watching birds. At the very least, this is a valuable regional resource to the breeding birds of the Moscow region.—DOUGLAS SIEGEL-CAUSEY.

Birds of Prey: A Kinship.—H. von Michaëlis. 1987. Republic of South Africa, Knysna, The S.A. Natural History Publication C. C. No price given.—In 1952, the appearance of "Birds of the Gauntlet" by H. von Michaëlis brought to the world's attention a bird-life illustrator of rare talent. The formal plates were enhanced by numerous fine sketches of hawks and eagles in flight. Now, 35 years later, von Michaëlis was persuaded to come out of retirement to write the text for this volume, which features ten oil paintings of species of South African raptors done on commission in the late 1950s. Splendidly reproduced in a limited edition, the volume also includes many sepia sketches and drawings of raptors and waterfowl.

Trained in East Prussia and for six years a sculptor in Rome, von Michaëlis has spent most of his life in South Africa as artist, falconer and glider pilot, always surrounded by a variety of captive and tame wildlife. It was a surprise to learn that at one time he made regular trips to the United States to paint horses and cowboys. Two of his efforts are said to grace President Reagan's ranch house in California.

As to the text, he gives us choppy short essays about raptors with much superfluous philosophizing and some lurid fiction. Caution is required. For example, we are told that Peregrine Falcons arrive exhausted on the barrier islands along the coast of the eastern United States after a flight from northern Europe across the Atlantic. This is nonsense. Skip the text, which is inferior to that of the author's earlier book, but enjoy the illustrations.—D. AMADON.

The Editorial Office continually receives material for review. A portion of this material is inappropriate for detailed comment for a variety of reasons. However, because it may be of general biological, but not specific ornithological, interest or potentially of only limited readership, it is not reviewed. As a service to our readers, occasionally these items will be listed briefly.—A.H.B.

Having Everything Right.—K. R. Strafford. 1987. New York, Penguin Books. 190 pp. ISBN 0-14-010254-X. $6.95.

Ring of Bright Water.—G. Maxwell. 1987 (reprint of 1960 volume). New York, Penguin Books. 212 pp. ISBN 0-14-003923-6. $6.95.

The Evolution of Vertebrate Design.—L. Radinsky. 1987. Univ. Chicago Press. 188 pp. ISBN 0-226-702367. $12.95 (Paper).

Companion to a *Sand Country Almanac.*—J. B. Callicott, Ed. 1987. Madison, Univ. Wisconsin Press. 308 pp. ISBN 0-229-11230-L. $22.50.

The Bird Feeder Book.—D. J. L. Stokes. 1987. Boston, Massachusetts, Little, Brown & Co. 90 pp. ISBN 0-316-81733-3. $8.95.

Proceedings of the Fifth Nordic Ornithological Congress, 1985.—M. O. G. Eriksson, Ed. 1987. Acta Regiae Soc. Sci. et. Litt Gothoburgensis. Zoological 14. 228 pp. Kr 150.

Mammalian Dispersal Patterns.—B. D. Chepko-Sade and Z. T. Haplin, Eds. 1987. Chicago, Illinois, Univ. Chicago Press. 342 pp. ISBN 0-226-10268-8. $19.95.

A Field Guide to the Birds of Australia.—G. Pizzey. 1987. Collins, Sidney (paperback of 1980 issue; available through Princeton Univ. Press, Princeton, New Jersey). ISBN 0-00-217282-8. $19.95.

Treasury of North American Birdlore.—P. S. Eriksson and A. Pistorius, Eds. 1987. Middlebury, Vermont 05753, Paul S. Eriksson Publ. ISBN 0-8397-8372-8. $24.95.

Neogene Avian Localities of North America.—J. Becker. 1987. Washington, D.C., Smithsonian Institution Press, 955 L'Enfant Plaza. ISBN 0-87474-225-OP.

Aldo Leopold: His Life and Work.—C. Meine. 1988. Madison, Univ. Wisconsin Press. 638 pp. ISBN 0-299-11490-2. $29.50.

Early American Waterfowling: 1700's-1930.—Stephen Miller. 1986. Piscataway, New Jersey, Winchestor Press. 279 pp. ISBN 0-8329-0438-4. $27.95.

The Book of Naturalists: An Anthology of the Best Natural History.—W. Beebe. 1988. Princeton, New Jersey, Princeton Univ. Press (reprint of 1944 volume). 499 pp. ISBN 0-691-024081. $12.50.

Der Zaunkönig.—M. Dallman. 1987. A. Zimmer Verlag, Wittenberg Lutherstadt, GDR, DM 10.00. ISBN 3-7403-001715.

Der Steinrötel.—E. Schmidt and T. Farkas. 1988. A. Zimmer Verlag, Wittenberg Lutherstadt, GDR, DM 10.80. ISBN 3-7403-0044-2.

Die Ohrenlerche.—R. Pätzold, 1987. A. Zimmer Verlag, Wittenberg Lutherstadt, GDR, DM 16.00. ISBN 3-7403-0051-5.

Temperature Biology of Animals.—A. R. Cossins and K. Bowler. 1987. London, Chapman and Hall. ix + 339 pp. No price given. ISBN 0-412-15900-7.

Conversion Factors: SI Units and Many Others.—C. J. Pennycuick. 1988. Chicago, Univ. Chicago Press. 47 pp. ISBN 0226-65507-5. $5.95.

Swallows.—P. Tate. 1988. North Pomfret, Vermont, H. F. & G. Witherby, Ltd., distributed by David & Charles, Inc. (reprint of 1981 edition). 96 pp. ISBN 0-85493-140-6. $13.95.

Ecological Relationships of Plants and Animals.—H. F. Howe and L. C. Westley. 1988. New York, Oxford Univ. Press. 273 pp. ISBN 0-19-504431-2. $29.95.

Presenting Science to the Public.—B. Gastel. 1983. Philadelphia, Pennsylvania, ISI Press. 146 pp. ISBN 0-89495-029-0. Paper. $11.95.

Collins Guide to the Birds of Britain and Europe.—H. Heinzel, R. Fitter, and J. Parslow. 1988 (reprint of 1972 volume). Distributed by Penguin Press, New York. 320 pp. Maps. ISBN 0-8289-0665-3. Paper $15.95.

Rare Mammals of the World.—J. A. Burton and B. Pearson. 1987. New York, Stephen Greene Press (Publisher); distributed by Penguin Press, New York. 240 pp. ISBN 0-8289-0658-0. $25.00.

Collins Field Guide to the Birds of South-east Asia.—B. King, M. Woodcock, and E. C. Dickinson. 1988 (reprint of 1975 volume). New York, Stephen Greene Press; distributed by Penguin Press, 480 pp. ISBN 0-8289-0650-5. Paper $19.95.

Collins Field Guide to the Birds of West Africa.—W. Serle, G. J. Morel, and W. Hartwig. 1988 (reprint of 1977 edition). New York, Stephen Greene Press; distributed by Penguin Press. 351 pp. ISBN 0-8289-0660-2. $21.95.

Sexual Selection and Animal Genitalia.—W. G. Eberhard. 1988 (reprint of 1985 edition). Cambridge, Massachusetts, Harvard Univ. Press. 244 pp. ISBN 0-674-80284-5. Paper $14.95.

Hierarchy, Perspectives for Ecological Complexity.—T. F. H. Allen and T. B. Starr. 1988. Chicago, Univ. Chicago Press. 310 pp. ISBN 0-226-01432-0. Paper $12.95.

The New Environmental Age.—M. Nicholson. 1987. New York, Cambridge Univ. Press. xiv + 232 pp. ISBN 0-521-33522-1. No price given.

New Directions in Physiological Ecology.—M. E. Feder, A. F. Bennett, W. W. Burggren, and R. B. Huey. 1987. New York, Cambridge Univ. Press. x + 364 pp. ISBN 0-521-34938-9. No price given.

Where to Find Birds in Australia.—J. Bransbury. 1987. Century Hutchinson, 16-22 Church Street, Hawthorn, Victoria 3122, Australia. xvi + 539 pp. ISBN 0-091-68941-4. $35.00.

The Ancestral Kestrel: Proceedings of a Symposium on Kestrel Species. 1983.—D. M. Bird and R. Bowman. 1987. Raptor Research Foundation and MacDonald Raptor Research Center, McGill Univ. vii + 178 pp. ISBN 0-935868-34-8. Paper. No price given.

Der Baumfalke.—D. Fiuczynski. 1987. Die Neve Brchm-Bücherei. A. Ziensen Verlag. Wittenberg. 208 pp. ISBN 3-7403-0012-4. DM 22.00.

DATE OF ISSUE (Vol. 106, No. 1): 25 January 1989