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.

Avian biology, vol. VIII.—Donald S. Farner, James R. King, and Kenneth C. Parkes (Eds.). 1985. New York, Academic Press. xxiii + 256 pp. ISBN 0-12-249408-3 (v. 8). $49.50.—This volume is the slimmest in the "Avian Biology" series. It also differs from previous ones in containing only two chapters, one by James Wittenberger and George Hunt entitled "The adaptive significance of coloniality in birds," and a much longer one by Storrs Olson, "The fossil record of birds." The volume is well made, with quality paper and bindings, but typesetting errors are more numerous than one might expect in a book costing 20¢ per page.

The Wittenberger and Hunt chapter provides an extensive review of the literature on the evolution of avian coloniality and attempts to discern adaptiveness through cost-benefit analyses. I say "attempts" not to disparage the authors' efforts, but because the inadequacies of the available data doom them to inconclusive results. Inconclusive as it is, the exercise is still valuable for it provides a more coherent theoretical perspective on coloniality, and should stimulate more sophisticated approaches to the subject.

Wittenberger and Hunt consider net costs and benefits of four types: energetic, predation-related, mate-access, and competitive effects (interference). They stress that the adaptive value of coloniality is likely a result of the combined effects of these variables. They evaluate the variables mainly by reviewing the literature for evidence supporting or contradicting the importance of each variable and, in most cases, find the data inadequate to support strong conclusions.

In the course of their analyses they examine several models of the adaptive significance of coloniality, most notably Horn's geometric model based on random distribution of food, Ward and Zahavi's information center model, and a model that the authors derive from Lack's comments on effective strategies for concealment at different population densities. They find scant support in the data for any of these models. Wittenberger and Hunt list and evaluate the assumptions of each model (generally more explicitly than the original authors), a commendably rigorous procedure. Oddly, in a few instances they seem to have confused model assumptions with model predictions. This confusion is perhaps most evident in their evaluation of the information center hypothesis, where they list six "assumptions": (1) food is patchy and ephemeral, (2) successful foragers are distinguishable, (3) successful foragers are constrained to return frequently to the colony or roost, (4) successful foragers tend to return to the same feeding locations, (5) unsuccessful foragers tend to follow successful ones, and (6) by following successful birds, others can increase their success. The first four of these clearly are model assumptions, and must be evaluated to determine whether the model can be applied to a particular case. The last two seem instead to be model predictions, and their evaluation tests the model logic rather than its applicability.

Overall, I felt the authors' arguments could have been sharpened by a more extended consideration of the alternatives to coloniality, the possible pathways to coloniality, and the behavioral attributes of colonial birds. Ancestor species with type A territories might evolve colonial habits under very different selective regimes than might ancestors with dispersed, nonterritorial social systems. Certainly in some birds the behavioral adaptations that facilitate colonial nesting are so pervasive that dispersed breeding is prevented. In these birds the current costs and benefits of coloniality are not necessarily representative of the selective regime in which it evolved. Arguments such as this evoking "the ghost of selection past" are seldom satisfying (and often are untestable), but they deserve consideration when choosing species or studies appropriate for evaluating hypotheses of adaptation.

These criticisms probably convey a more negative impression than I intend. The points I criticize are rather minor, and the theoretical development and literature review will be valuable. Indeed, this chapter may be most useful for its demonstration of the inadequacy of the available data; the discerning student should be able to find ideas for dozens of thesis projects among these pages.

The "fossil record" chapter relates, in Olson's words, "what I believe paleornithology currently tells us about the first appearance and evolution of the major taxa of birds." As such, it combines an extensive review of the avian paleontological literature (Quaternary excepted) since the publication of Brodkorb's Catalog of Fossil Birds (in parts, 1963–1978), with the author's critical commentary on avian systematics and on other workers' treatment of avian fossils. Olson begins with a brief introduction

describing the chapter, legitimately taking his colleagues to task for naming taxa based on undiagnostic fragments of bone, outlining his "working arrangement" of avian higher taxa, and describing the system of stratigraphic nomenclature he used. Subchapter II is devoted to *Archaeopteryx*, III–VI to other Mesozoic birds, VII to paleognathous birds, VIII to what he calls "basal" land birds, IX to "higher" land birds, and X to water birds.

The *Archaeopteryx* subchapter is brief, citing rather than discussing the numerous recent reanalyses of *Archaeopteryx* in studies of avian origins and of the evolution of bird flight. Olson lists several morphological features that support the view that *Archaeopteryx* was volant, and also contributes the insight that the universal arrangement of feathers into tracts supports aerodynamic rather than thermoregulatory hypotheses of feather evolution.

Subchapters IV and V deal with Hesperornithiformes and Ichthyornithiformes, respectively. The hesperornithiform subchapter depends largely on the studies of L. D. Martin and various coworkers. Olson, however, rejects Martin's placement of the group in the subclass Neornithes, instead retaining it in its own subclass (and incorrectly accuses Martin of relegating these birds to an infraorder!).

Subchapter VII, on paleognathous birds, contains some of the most important insights in the chapter. Olson reviews the evidence that the three defining characters of the modern paleognaths (paleognathous palate, grooved rhamphotheca, and open ilioischiatic fenestra) are derivable by neoteny, describes some histological investigations on the rhamphotheca, and concludes that all could have so arisen. He lists 5 hypotheses of origin for these birds, reworded here for brevity: (1) they are a strictly monophyletic group, and the three defining characters are derived synapomorphies; (2) they arose once, by neoteny, from a neognathous volant ancestor; (3) they are descendants of an early group of paleognathous volant birds, separate from all neognathous birds; (4) some of the living paleognathous birds evolved as in (3), and others are descended through neoteny from neognathous birds; and (5) all arose through neoteny from neognathous birds, perhaps each group separately. I consider these hypotheses superior to simple hypotheses of phylogenetic pattern because they should elicit more specific tests. For example, to distinguish between hypotheses 2 and 5, one might search for evidence of separate neotenic pathways to flightlessness (i.e. inconsistencies in the degree of paedomorphosis of different body parts). Olson seems to lean toward the fourth alternative, with the Casuariiformes most likely derived from ancestral paleognathous volant birds, and Ostriches, Kiwis, and Moas most likely neotenic derivatives of neognathous birds. Indeed, he makes a case (in subchapter IX) for the derivation of Ostriches from gruiform ancestors through the extinct families Geranoididae, Eogruidae, and Ergilornithidae. Olson bases this argument in large part on the reduction and loss of the trochlea for toe II, and on the shortening of the pedal phalanges. This hypothesis of Ostrich relationships did not generate much enthusiasm when first proposed, and I suspect most avian systematists will remain dubious in the absence of pelvic, palatal, and mandibular material from the Eogruidae and Ergilornithidae.

In the remaining subchapters (VIII–IX) Olson develops his "working arrangement" of the higher taxa of neognathous birds. He begins by assuming (apparently from the morphology of *Archaeopteryx*) that the neognathous birds evolved from terrestrial or arboreal ancestors. These ancestors underwent a late Tertiary radiation, producing a "basal" land-bird assemblage. In this radiation two lineages evolved that subsequently underwent major radiations, one to produce the "higher" land birds and the other to produce water birds. Because this arrangement is tentative, a detailed critique is unwarranted. I will, however, make a few comments. The earliest known fossils of apparently neognathous birds are of aquatic types, while the earliest fossils relatable to the "basal" land-bird assemblage date from the early Eocene, and most groups do not appear until the late Eocene or later. In contrast, several families of Olson's "higher" land birds date from the early Eocene, and owls, at least, are known from the Paleocene. The water birds date from even earlier periods, apparently with two or more families in the latest Cretaceous, and with a variety of Paleocene representatives. The apparent youth, then, of the "basal" land birds seems to suggest that they could be derived from the early water-bird stock, rather than vice versa. I also question the nomenclatural practice of assigning the earliest members of the water-bird assemblage to the order Charadriiformes. Do these birds really share unique derived character states with the modern members of the Charadriiformes? Do the modern charadriiform families really begin diverging from each other in the Mesozoic?

Overall, Olson's "working arrangement" of avian taxa has much to recommend it, for it provides a reasonable, testable model of avian evolution. Even if it is wrong in many details (as I suspect), it should encourage the development of other schemes relating the orders of birds, an undertaking largely ignored in this century.

As mentioned earlier, much of the chapter is devoted to Olson's commentary on the systematic work of his peers and predecessors. Clearly, a great many avian fossils have been misassigned, described on inadequate evidence, inadequately or imprecisely described, or poorly prepared, and Olson does a service by drawing attention to these lapses. I consider it unfortunate, however, that Olson chose to do so in a

highly personal and occasionally offensive manner. This approach does nothing to advance our understanding of avian fossils, and in instances where Olson's corrections are in error, may even interfere.

This chapter is required reading for all students of higher avian systematics, and I recommend it to nonavian vertebrate paleontologists as well.—WAYNE HOFFMAN.

The beginnings of birds.—M. K. Hecht, J. H. Ostrom, G. Viohl, and P. Wellnhofer (Eds.). 1985. Eichstätt, Friends of the Jura Museums. 382 pp. ISBN 3-9801178-0-4. DM 93.—It is difficult to find an ornithologist who is not interested in some aspect of *Archaeopteryx*. Not only does it indulge fantasies on dinosaurs and their kin, but the fossils represent some of the most elemental and significant problems that surround the origin of birds. This symposium, held in Eichstätt in 1984, included investigators who have been associated with or written on issues involving the evolution of birds. They produced the 38 articles in these proceedings. The conferees' interests were extremely broad even though the only hard evidence is 5 fossils. Whether all 5 even belong to the same species is contended.

This volume has more arguments per page than any I have read in a long while. It is amazing, given the limited amount of data, how many hypotheses and interpretations have been generated. This reflects the richness of the material, the significance of the issues, and the skills of the authors. The convenors of this meeting were wise in their choice of participants. They selected a group of authors unafraid to take divergent positions, to argue for radical or revisionist viewpoints, and yet, apparently, to listen to one another.

The major issues debated were the identity of *Archaeopteryx*, its relevance to the origin of birds, and its significance to the evolution of flight. This means, of course, that issues such as the identity of possible sister groups and the question of monophyly emerged. Because most authors had written previously on these issues, there is some repetition among the articles published here and those from earlier publications. This is sometimes cumbersome, but necessary for clarity. Anatomical features and intellectual positions both are subject to analysis in excruciating detail. There are papers on the geology and paleoecology of the Solnhofen formation that set the ecological background for the events that accommodated the life of the beast. There are restatements of a variety of orthodoxy positions and new discussions of the problems regarding what the structure of the manus, digits, pubis, and skull tell us of these events.

The various possible sister groups of *Archaeopteryx* are discussed at length. These include the proposed relationships to a variety of reptilian taxa and to other birds. The debate over an arborial or cursorial origin is unsettled. New material on alternative origins and on the Jurassic Coelurosaurs is valuable. Several lines of analysis now indicate that most "avian" characteristics were present in nonavian coelurosaurian dinosaurs. The most obvious exception is feathers, which still remain the cornerstone of the definition of the Class. Functional analyses at all stages provide productive insights into the proposed processes in the evolution of morphological features.

In addition to the various interpretations of the fossil data, which is all structural, a new dimension is included. There are exciting and important models for the preconditions of powered flight, reconstructions of the physiology and behavior of proposed ancestors, and new evidence on the structure and function of the wing and flight feathers. New analyses of the probable mode of flight in pro-avis are documented by further aerodynamic studies on contemporary wings, mechanical features, and design constraints, all set in an ecological framework. This discussion presents a clearer statement of the issues that surrounded a very complex set of changes, the forces that may have driven them, and the constraints imposed on them.

The volume closes with a series of short papers on the people and institutions associated with some of the specimens. Finally, there is a discussion of the recent flap over the accusation of fraud in which the feather impressions were added to two of the major specimens. It illustrates the continued interest the public takes in these fossils and therefore their meaning for ornithology.

Two papers that bear on these issues have appeared since this volume. One is an extensive review by Jan Dyck (1985, Zool. Scripta 14: 137–154) of the literature on the evolution of feathers. He assumes that feathers arose from reptilian scales and that pennaceous feathers preceded downy feathers. He considers the design of the early feathers important in the water repellancy of the plumage. Despite the richness of the literature in this area, the ontogenetic mechanisms involved and the molecular changes in structure are still not understood (Brush, Avian Biol. 9 in press).

The second paper is on the scapulocoracoid of flightless birds (Feduccia 1986, Ibis 128: 128–132). Alan Feduccia, whose contribution to the symposium addressed the aerodynamic functions of feathers, takes a different tack here. He considers the nature of the scapulocoracoid in the ratites as a primitive character, associated with other primitive traits and flightlessness. Flightlessness in carinate birds is accompanied by a neotenic production of a similar morphology. This feature is then related to that of biped theropod dinosaurs with the speculation that the two are related.

The location of the table of contents at the back of the book is inconvenient. My copy came with a short errata list, and other typographical errors were scattered throughout the text. Given the diverse languages of the authors and editors, these are minor relative to the excitement with which the ideas are communicated. The mechanical production is adequate, and the quality of the prints of the fossil material is outstanding. The line drawings and diagrams are placed appropriately and are well executed. The high density of ideas and excitement in this volume make it a bargain.

The book was fun to read. People obviously enjoyed thinking about *Archaeopteryx* and, even more, speculating about it. Everyone should find something of interest. All the questions are not answered, nor are all the answers correct. There have been some very strange ideas associated with these fossils, only some of which are discussed here. But the discussions are fruitful, the arguments often persuasive, and an air of delight permeates the text. If you enjoy controversy, get this book. The illustrations are a challenge in themselves. Fossils never reveal enough, but what an unexcelled opportunity to study the evidence for yourself.—A.H.B.

[Demography of birds.]—V. A. Paevskii. 1985. Trudy Zoologicheskogo Instituta No. 125. Leningrad, Nauka. 285 pp., 50 text figures, 40 tables. 2 rubles 70 kopecks.—The author lists three goals of this monograph: to review the basic methodology and theoretical foundations of demographic analysis, to summarize the results of specific studies done at the Biological Station of the Institute of Zoology, and to summarize what is known about the demography of the world avifauna. Paevskii has the best success with the last topic. About half of the book is devoted to reviewing the world literature, and the space is well spent. The casual reader may be somewhat daunted by the numerous, lengthy tables and the exhaustive amount of synthesis, but this detail is one of the main strengths of this treatment.

The sections on theory and methodology are aimed directly at the practical user and do not offer new insights. Ricklefs (1983, Current Ornithol. 1: 1–32) is a better choice for exploring the limits of demographic theory. The remainder of the monograph examines the results of a number of long-term studies directed by Paevskii, and could constitute a separate treatment in itself. The studies reported here on *Fringilla coelebs* and *Erithacus rubecula* were relatively short as Soviet ornithology goes (8–10 yr), but they examine in depth the life histories and weekly changes in the population structure of these resident passerines. The population study of *Accipiter nisus*, in contrast, began in 1947, and allowed a longitudinal analysis not possible in shorter studies. In particular, Paevskii was able to demonstrate the indirect effect of agricultural DDT, through its prey, on the population structure of this raptor. Although the statistical treatment is elementary and much of the discussion relies on visual inspection of graphs and tables, he is fairly successful in this approach.

This monograph provides an invaluable introduction to Soviet life-history research (around 350 references) and does an admirable job on the rest of the world literature (about 500 references). The breadth of information contained in the tables alone constitutes a significant contribution to avian demography, and may prove to be a valuable resource to future workers in this field.—DOUGLAS SIEGEL-CAUSEY.

[Birds of sparsely settled towns.]—S. M. Tsybulin. 1985. Novosibirsk, USSR, Nauka. 168 pp., 20 figures. 1 ruble 70 kopecks.—This monograph represents 9 years of research during 1963–1981 on the dynamics of the avian community near Akademgorod in west-central Siberia. Tsybulin selected 6 habitats in and near Akademgorod for study: urban (city parks and green belts), orchards and tree plantations, the rough fringes of natural forests, aspen-birch groves, birch-pine groves, and a natural forest site far from town. In each area, seasonal changes in species diversity and composition were observed as distinct pulses, caused primarily by movements of migrating species, and by some species switching habitats during the year. *Pyrrhula pyrrhula* and *Carduelis flammea* moved in early spring from the outlying forest areas into the urban parks to breed; *Dendrocopus major* shifted from the competitive winter "refuges" in town to breed in the birch-pine forests; *Sylvia curruca*, after the breeding season, moved from the birch-pine forests to the aspen-birch groves in late summer before migrating. Tsybulin concludes that seasonal effects seem more important in determining the community structure than factors related to habitat differences. The maximal change in species assemblages in the same habitat was between winter and summer seasons; the minimal change observed was between the late fall and early spring periods. These differences were partially attributable to one obvious cause, the migration of transient and breeding birds.

These results are not particularly surprising, and are perhaps familiar to any ornithologist who has followed the progress of a boreal bird community through annual cycles. The distinctive features of this study are its breadth of detail and direction of analysis. Roughly half of the monograph is devoted to tabular and expository presentation of data, and summary descriptions; the other half contains species accounts. The wealth of detail and perceptive observations represents a mine of information possibly unequaled by similar studies anywhere. But it is a lode only partially explored: the analyses stop far

short of what could be done, and are generally bereft of supporting detail. For example, Table 2 gives the relation of feeding-site preference (i.e. ground, canopy, etc.) to season and habitat type, but none of the species are identified. The results are summarized in one short paragraph and represent only casual inspection. Tables 4 and 5 relate the biogeographic affinities of the avifauna (by diversity and abundance) in each study habitat by two-month blocks from winter to fall. None of the species are identified here, but, with considerable effort, they can be derived by careful inspection of Tables 6–10. The biogeographic affinities are buried in the species accounts, but often are not given. The analysis used here apparently involves discrete time-series and principal components, but there are no examples, no details, no data, nothing.

Most of these missing data and supporting information could be reconstructed from the species accounts and other publications, but it would be a daunting task. Instead of demonstrating laxity or ineptitude, these omissions, serious to our eyes, are more likely a reflection of the utilitarian constraints often placed on Soviet natural history studies. For whatever reasons, it seems clear that here the conclusions are more important than the biology or technique, and that their relevance to Rural Planning is the reason for publication. This study represents state-of-the-art ecological analysis in Soviet ornithology, and, as such, deserves a closer look than might otherwise be deserved. Barring the lapses mentioned above, Tsybulin's study is one of the most detailed examinations of the dynamics of an avian community through an entire season, and represents a major contribution to avian ecology.—DOUGLAS SIEGEL-CAUSEY.

The western bird watcher: an introduction to birding in the American West.—Kevin J. Zimmer. 1985. Englewood Cliffs, New Jersey, Prentice-Hall. ix + 278 pp., 42 black-and-white photographs, 26 line drawings. ISBN 0-13-950817-1, $10.95 (paper); ISBN 0-13-950825-2, $19.95 (cloth).—Written as an introduction to finding and identifying birds in the contiguous United States west of the Mississippi, this book has much to offer. Beginning and intermediate birders should find the chapters on techniques of finding birds, identifying birds, and keeping field notes useful. The chapters on special birding environments of the West and finding the western specialty birds will be most valuable to visitors, but the intermediate to expert birder or field ornithologist will want this book for its 106 pages of advanced identification information on 41 problem groups. Many of these field problems are of interest throughout North America.

Zimmer begins with "Birding the West," good descriptions of the highlights of western birding, enhanced by attractive line drawings by Mimi Hoppe Wolf. Three of the most thrilling forms of western birding are not extolled: pelagic birding, wildlife refuges with their astounding concentrations of waterfowl and many raptors, and vagrant hunting. Techniques for pelagic birding and for vagrant finding at desert oases are presented elsewhere, but nowhere does Zimmer try to capture their exhilaration. Coastal and island vagrants are overlooked entirely.

"Techniques of birdfinding" ranges from habitat recognition to calling birds in and birding ethics. Only five sentences are allocated to the influences of tide on shorebird activities, and they convey little or no understanding of this crucial topic! Zimmer recommends shorebirding at low tide because food is exposed and birds are feeding. In many of the best locations you would need an astronomical telescope to watch shorebirds at low tide! Here, and perhaps in most places, foraging is most concentrated and easily watched during upper-mid ebb (especially) and upper-mid flood phases, but even this varies among sites less than 1 km apart. Indeed, shorebirds often can be found most reliably at high-tide roosts. On page 44 Zimmer makes a good point about individual vagrants returning for several years, but all five non-shorebird examples are cited erroneously. The list of rare-bird alerts is outdated. Five are listed for California, but there are already nine. San Bernardino (714-793-5599) and Sacramento (916-481-0118) were well established when this book was written, and the Monterey number had been changed to 408-449-6100. Morro Coast (805-528-7182) and San Joaquin Valley (209-571-0246) started just after the book's publication. Similarly, Shearwater Journeys is now at 408-688-1990.

The 56-page overview of the distribution and finding of over 230 western specialty species is good but necessarily brief for each species, so detailed directions often must be sought in local guides.

A sound philosophical framework is presented in "Techniques of identifying birds," and most of the examples are well chosen. There is some overgeneralizing. For example, all 3 phalaropes commonly molt to adult basic plumage during migration, not only Wilson's. The nonbreeding plumages of phalaropes are somewhat confused, resulting in errors. The heading is "basic-plumaged phalarope [sic]," but juvenile plumages are generally lumped with the basic and the distinctions lost. Moreover, the photos compare different plumages for the 3 different species when they should have compared juveniles to juveniles, basics to basics, or, best, all six plumages together.

"Difficult identifications: beyond the field guides" succeeds rather well at synthesizing much of the current knowledge concerning most of the tougher species of western birds by bringing together advanced material scattered in the literature or not

widely known. This section is useful and accurate; I noted only 22 deficiencies.

The identification notes are supported by 7 drawings by Dale A. Zimmerman and Mimi Hoppe Wolf and 42 black-and-white photographs. The drawings are good except for Fig. 5.24, medium-sized terns, which is poorly composed for comparisons, fails to show the differences in proportions even to the extent they show in the field, and portrays the rump of Forster's Tern as white instead of gray. Many of the photos effectively compare study skins. These and the field photos serve the text well, but a few are overly cropped and some of the museum skins could have had more suitable lighting and backgrounds (e.g. white geese). The gull specimens in Fig. 5.20 were poorly selected for comparability, and they don't show well against the background. In Fig. 5.38, the Eastern Bluebird specimen gives a totally erroneous and exaggerated impression of its bill and wing lengths because its head is turned downward (compare Fig. 5.37) and its wing tips are hidden among the rectrices.

The bibliography cites no regional checklists other than those contained in bird-finding guides. The strangest omission is Zimmer's own book on bird finding in North Dakota.

Generally, this book is well produced. It would have benefited from tighter editing for grammar. Throughout the book one is caught by misuse or inconsistent use of singulars and plurals. "Semi-annual" is used repeatedly to mean every couple of years. "Pterodrama" [sic] somehow became a section heading instead of a genus name in context. The most serious editorial lapse was the transposition of Figs. 5.46, 5.47, and 5.48, but the most amusing was the revelation that the Great Gray Owl "is more common in forests of northern Canada and Arkansas" (rather than Alaska).

Beyond its value to the beginner or the visitor to the West, this book is a useful supplement to your field guides. If you ever go into the field, buy this book. Libraries should also obtain it. Its presence next to the field guides will help dispel the notion that the latter are the final word in identification, something we will never produce.—STEPHEN F. BAILEY.

Habitat selection in birds.—Martin L. Cody (Ed.). 1985. New York, Academic Press, Inc. xvi + 558 pp., 1 black-and-white plate, 83 text figures. ISBN 0-12-178080-5. $69.50.—As a consequence of their mobility birds have enormous potential for habitat selection, and as a consequence of their high visibility perhaps no other group has received so much attention in this regard. This volume is an attempt to synthesize a modern statement on how a variety of ornithologists view this broad topic. Presumably, the ultimate goals of this work are to indicate the current status of research on habitat selection in birds and to provide signposts to the most rewarding avenues of future investigation.

The 17 chapters by 22 contributing investigators are arranged into three main parts (excluding the traditional introductory chapter): 4 chapters on habitat selection by particular taxa, 5 chapters on habitat selection in particular habitat types, and 8 chapters that deal with a potpourri of subjects (e.g. behavior, physiology) in relation to habitat selection. Many of the chapters, even those with an apparently general topic, tend to be somewhat idiosyncratic. Thus, although the particular research interests of each author are usually well represented, the overall breadth of the book is reduced. Nonetheless, most areas of recent interest and future direction are represented. Individually, many of the chapters are good; collectively, there are gaps in the overview. The greatest shortcoming of the collection is a lack of synthesis. Perhaps it is too much to expect an integration of such a diverse subject area, but one always has hopes.

Cody's introduction begins with a good summary of why avian ecologists have been so interested in habitat selection, although he overemphasizes niche segregation and habitat partitioning to the detriment of other ecological concepts. This emphasis carries over into an interpretation of some new data collected in Mexico and a somewhat selective literature survey. Although much of Cody's discussion here is plainly labeled as speculative, I did not feel my appetite was sufficiently whetted for subsequent chapters.

Almost two-thirds of the chapters contain data, at least some portion of which is hitherto unpublished. These tend to be the most interesting chapters. Indeed, most sections that simply present a basic review of existing information without further analysis or interpretation (e.g. on marsh-nesting birds and meliphagids) are least thought provoking and probably will be of interest only to those who are concerned with those specific areas. Walsberg's chapter on physiological considerations and Winkler and Leisler's on morphology contain no new insights, but they stand out from the others by their emphasis on considerations of *micro-* rather than *macro-*habitat selection, a feature that tends to be overlooked in many of the other contributions.

Morse's chapter on paruline warblers is not speculative, but contains a good summary of the voluminous literature on this group. He believes avian ecologists have gotten about as far as they can with correlational data and that the time for experiments relative to habitat selection is long overdue. Although this admonition is echoed in many of the subsequent chapters, few of those chapters actually contain the results of such experiments. Klopfer and Ganzhorn suggest that in the area where experiments have been made most often, behavioral or ethological aspects of habitat selection, most have

been too simple-minded to reveal accurately the processes underlying the ontogenetic development of habitat preference and its expression.

Two of the better chapters are found in the taxonomic section. Alatalo and his colleagues clearly demonstrate the advantages of a relatively long-term (5 yr) study of a population of marked individuals with known morphologies and reproductive histories. This chapter includes a lucid summary of their results that other chapters lack. Although limited in scope to three species of *Buteo* cohabiting in western North America, Janes does a good job of integrating the roles of bird morphology, foraging behavior, and prey distribution in determining habitat selection. He includes a simple model of habitat preference that directly relates foraging behavior to habitat structure.

Cody's contribution to the taxonomic section consists of virtually all his early sylviine warbler work in northern Europe (previously published) combined with newer data from elsewhere in Europe and Africa. His conclusion parallels his previous one, that interspecific interaction is the principal feature underlying habitat selection. Unfortunately, his focus on this process leads him to claim rather extravagantly to have detected evolution of narrower habitat preferences due to interaction between two species of *Sylvia* based on censuses of a single plot separated by eight years. This assertion requires a more serious evaluation of alternative hypotheses than it receives here.

Cody's contribution to the habitat section (open-country, mainly grassland habitat types) represents a somewhat different view than the interspecific interaction approach applied to the sylviines. He attributes most of the patterns observed in open-country birds to resource tracking in a fluctuating environment. In sharp contrast, Wiens (birds in shrubsteppe habitat types) discusses alternative views to the notion that observed patterns of habitat selection either represent local optima or are strongly influenced by resource-related competitive interactions. He focuses particularly on the subject of scale effects, presenting a series of analyses that examine habitat associations that range from a continental level down to foraging patterns of individual birds. His conceptual model of the influence of various factors on the expression of realized habitat selection (one of the few models presented in the book) is primarily an organizational tool and provides little in the way of testable predictions or hypotheses.

The remaining two chapters in the habitats section deal with forest birds in the hardwoods of northeastern North America (Sherry and Holmes) and the tropical forests of Amazonia (Terborgh). Sherry and Holmes have written a very good chapter that, like those of Wiens and Morse, stresses the importance of scale of analysis. Sherry and Holmes's perception of patterns of species dispersion, and the inferences they derive from those patterns, changed with sampling areas that ranged in size from 1 to 16 ha. Terborgh, on the other hand, seems less interested in habitat selection *per se* than in the question of why there is higher bird diversity in a tropical forest than in a temperate forest of similar structure. A definitive answer does not emerge. He does, however, give a compelling (if somewhat condescending) view of the rigors and difficulties of sampling birds and habitats in the tropics.

Herrera has contributed an excellent chapter on frugivores. Here, habitat selection is obviously related to the temporo-spatial distribution of fruits, with substantial significance attributed to the distribution of fruit sizes in determining the composition of local bird assemblages. His data suggest that frugivores, in their role as fruit dispersers, modify their own habitat and lead to its "improvement" (i.e. increased abundance of preferred plant species). The positive feedback between plants with bird-dispersed fruits and seed-dispersing birds raises an intriguing question: Are these birds found where they are because the habitat attributes match their preferences, or does the habitat match their preferences because the birds, at least in part, have modified the habitat to promote those attributes? Hutto also emphasizes the role of food resources (and habitat scale) in determining patterns of habitat occupancy, but the pattern developed for migratory parulines in the nonbreeding season is not nearly so neat as that for frugivores. Although his repeated statements that birds seem to forage where the food is may seem trivial, they are nonetheless true. The accurate assessment of the distribution of populations with respect to food abundance clearly deserves more direct attention than many of us have given it in the past.

In a comparison of habitat selection in island vs. mainland birds, Blondel relies almost solely on competition theory and its corollaries to interpret the patterns detected in the Mediterranean. Although he mentions alternative processes, they never seem to be considered fully. This chapter is useful, however, for his discussion of the limitations of present methods of island biogeographical analysis, and his speculation on speciation patterns in *Sylvia*.

Rosenzweig provides the sole theoretical chapter of the book. He baldly states that habitat selection theory is really just a branch of optimal foraging theory. This ignores the consideration of variation in scale emphasized in earlier chapters. He assumes that a bird selects a habitat to maximize its fitness (which is reasonable), and that fitness is maximized by maximizing foraging efficiency (a more debatable conjecture). The models he develops will be difficult to follow for those not familiar with his previous papers. They do, however, make fairly precise predictions for which Rosenzweig and others provide tests. I wish

that a second theoretical chapter had been included, one that emphasized a different viewpoint or considered habitat selection at a different scale.

This book develops several salient features of the field. First, the ecology of habitat selection is still very much the ecology of communities; 15 of 18 chapters deal explicitly with relationships between two or more species and how those relationships determine patterns of habitat occupancy. Despite the controversies that have raged among community ecologists during the last decade, interspecific resource competition still provides a convenient interpretation for many of the patterns reported, albeit with considerably less uncritical acceptance than in the past. Second, the nature and abundance of resources to which birds respond when refining their habitat affinities requires vastly better documentation if we are to make much further progress. What few theories of habitat selection we have are couched in terms of animals in relation to their resources, and before we can successfully evaluate current theories or propose new ones we must have more reliable information on resources. Indeed, the most important variables to measure are no longer certain; although 13 chapters discuss habitat use with respect to vegetation structure, 8 are explicitly concerned with the distribution and abundance of food or prey.

Third, and this partially represents a personal bias, is the increasing importance of spatial scale in our consideration of habitat use. Several contributors note that observed patterns of habitat occupancy are sensitive to the spatial scale on which they are viewed and thus that the processes involved in producing these patterns are likely to be scale dependent as well. Consideration of the scale at which different analyses have been conducted may help to reconcile conflicting views on what processes are truly important in structuring bird communities. A fourth point, and one made early on, is that most authors agree that we have gone about as far as we can with current methodologies, mostly employing correlational techniques and the so-called "natural experiment." Manipulative studies are strongly stressed (almost always "in the future"), but the results of disappointingly few are reported.

Finally, few really good theoretical models of habitat selection are available to avian ecologists. Wiens and Burger provide some descriptive models, but no quantitative predictions. Janes provides a predictive model, but one of relatively narrow scope (soaring predators). The potential shortcomings of Rosenzweig's approach have already been mentioned; it is not at all apparent that it will provide a good description of the population consequences of individual behavior. Currently, the only alternative is the Fretwell-Lucas Ideal Free (or Despotic) Distribution, which is now nearing the end of its second decade of use (and abuse). Unfortunately, the Fretwell-Lucas model errs in the opposite direction, describing population trends but leaving individual behavior as a "black box."

Cody has assembled and edited an important volume. The book is well produced and relatively free of typos. References are current, with many citations through 1985 or "in press." Many of the data are unpublished, and one wonders how much would have survived a rigorous peer review for a major journal. Unfortunately, at $70 the price is appalling, and therefore I think purchase of this volume will be limited to institutional libraries and professionals already deeply involved in the field. Its cost would make it difficult to justify its use in a graduate-level seminar, although this would certainly seem to be an appropriate audience. Because of the idiosyncratic nature of most chapters and the lack of overall integration, I suspect many people will simply photocopy pertinent sections.—JOHN T. ROTENBERRY.

Bird conservation, 2.—Stanley A. Temple (Ed.). 1985. Annual publication of the International Council for Bird Preservation, United States Section. Madison, Wisconsin, University of Wisconsin Press. 181 pp. ISBN 0-299-10220-3 (cloth), 0-299-10224-6 (paper). $17.50 (cloth), $12.95 (paper).—This is the second volume in the ICBP series "designed to provide a yearly overview of current research and key ecological topics in the field of bird conservation." In addition to short notes on conservation activities and an annotated bibliography of conservation-related literature, each volume has a major theme. Volume 1 focused on birds of prey; here the conservation problems of island birds occurring in the United States (Hawaii) or its possessions are examined.

The volume begins with "Why endemic island birds are so vulnerable to extinction." Temple (pp. 3–6) points out that 93% of the avian extinctions during the period 1600–1980 were of island endemics, while 54% of presently endangered species occur on islands. The suggested reasons for this vulnerability include the small, closed populations present on islands and some of the unusual traits (tameness, lack of resistance to disease) of these populations.

Two chapters deal with the birds of Hawaii, an avifauna that has been reduced by at least 33% since 1600 and contains 62% endangered species today. In "Historical and current factors affecting Hawaiian native birds," C. J. Ralph and C. van Riper III (pp. 7–42) describe the islands as they must have been before settlement, then enumerate the modifications of the last 1,500 years. Two waves of devastation have occurred, one caused by Polynesians around 500 A.D. and another by "modern" Europeans starting in the late 1700's. Intensive agriculture by the Polynesians greatly modified the vegetation of these islands, especially in the lowlands, while their hunting activi-

ties quickly led to the extinction of the many flightless forms. European settlement greatly modified upland areas, and added a variety of introduced competitors, predators, and diseases. The chapter ends with a more detailed look at the relative effects of each of these factors on Hawaiian birds.

This general overview is followed by "Distribution and abundance of Hawaiian native birds: a status report" by J. M. Scott and C. B. Kepler (pp. 43–70). Most of this chapter is composed of species accounts that detail the status of Hawaii's remaining endemic avifauna. A final section reviews the state of bird conservation programs for these species.

"Endangered birds in Micronesia: their history, status, and future prospects" are examined by J. Engbring and H. D. Pratt (pp. 71–105). This vast area is included because many of these tiny islands are American possessions. Although few species live on most islands, many endemic forms exist and are vulnerable to human or other disturbance. Recent work has greatly increased our knowledge of many of these avifaunas and generally has reduced the list of threatened or endangered species. The ongoing devastation of the avifauna on Guam is an exception to this pattern. In the last decade, most of the land birds on Guam have been reduced in range and population to less than 15% of that known previously. Extinctions seem imminent, but the causes for this disaster are still not certain.

"Bird conservation in the United States Caribbean" by J. W. Wiley (pp. 107–159) focuses on Puerto Rico. Despite massive vegetation changes, only about 2% of Puerto Rico's birds are known to have gone extinct in the last century, although as much as 22% of the native avifauna may be threatened or endangered. Wiley examines the general situation on this island, with emphasis on the most threatened species. The extensive effort put forth for some of these species is discussed, with comments on both successes and failures. Conservation problems on the Virgin Islands and other Caribbean possessions also are noted.

Only two notes totaling 4 pages comprise the "Bird conservation news and updates" section, both updates of articles in the previous volume. One reports recent success in the Peregrine Falcon restoration program, while the other details recent set-backs with the California Condor program. This is followed by 14 pages of annotated citations of papers published during 1983 and dealing with bird conservation.

The strength of this volume lies in the compilation of so much current information on the status of island birds. While the writing sometimes is focused at an audience below that of the professional (and the first chapter is so superficial as to be nearly meaningless), the literature citations with each chapter often provide access to more detailed information. Overall, this discussion of man's effects on insular forms is meaningful to amateur and professional alike, both for the detail it provides and the general patterns that appear.

The value of this series in providing the promised "concise reports on recent bird conservation activities" must be questioned. Four pages on raptors must not incorporate all the interesting avian conservation events of 1984.

It seems to me that the people in charge of these volumes must make two major decisions about the future of the series. First, they must decide the extent to which it will consist of symposium-like reviews of special conservation topics (such as raptors or island birds) vs. filling the role of a conservation newsletter. Presently, the series succeeds only at the first option. They also must choose between a professional or general audience and focus the format accordingly. While I found the information in this volume valuable, most of the writing was at a very general level. On the other hand, the lack of figures, pictures, or any other supporting material would, I feel, make this pretty dry reading for all but the most avid general reader. While it should be in all libraries, personal decisions about purchasing this series might revolve around the reader's interest in the topic presented in each volume, at least in its present form.—JOHN FAABORG.

Flyways: pioneering waterfowl management in North America.—A. S. Hawkins, R. C. Hanson, H. K. Nelson, and H. M. Reeves (Eds.). 1984. Washington, D.C., U.S. Department of the Interior, Fish and Wildlife Service. xix + 517 pp., numerous black-and-white photographs and illustrations. (Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.) Cloth, $17.00.—According to the editors, the purpose of this book is "to tell the many stories that, put together, tell the overall story of the evolution of what fairly may be regarded as the world's most remarkable wildlife management program." They obtained the personal histories and recollections of 50 pioneer waterfowl workers in North America, either as summaries of their writings or as essays written by still-living members of this fraternity, and developed a narrative of waterfowl management's early days, approximately the 1930's to 1960's. Twenty-nine of the authors and three of the editors are retired from their professions; two authors died before the book was printed. Thus, this is not only a first-hand account, but a "last chance" effort to save some of the history of waterfowl management in the Americas.

The book is a collection of memorabilia. Conscious effort was made to preserve not only the facts, but also the times and personal views of the early workers. The text has not been edited to reflect the anonymous style common to scientific journals. Whether

it was the hair-raising first use of aircraft for surveys, wilderness strandings, combating the elements during too-short seasons, or the dilemma of too few people for too large a job, the immense dedication of these early workers comes through. By the authors' accounts, the times were such that opportunities seemed unlimited, anything was possible, and every day was a new adventure in a cause to which all were dedicated. Nostalgia is evident in these tellings.

The text covers the origins of the waterfowl crisis (Ch. 1), the way things were before duck numbers were reduced (Ch. 2), the pioneers of waterfowl conservation in North America (Chs. 3–5), early waterfowl surveys (Ch. 6), various "tools of the trade" (Ch. 7), national and international agreements (Ch. 8), the development of the flyway concept (Ch. 9), case histories of important habitat types (Ch. 10), and the status of some persistent problems (Ch. 11). Accompanying the text is a superb collection of photographs from the early decades of the century, several maps, and reproductions of original waterfowl art by 23 artists, including 10 duck stamps and numerous pen-and-ink and scratchboard sketches.

Major themes are apparent throughout the 11 chapters. Until the advent of the airplane in migratory bird work, waterfowl study floundered for lack of mobility and the means to assess the vast North American waterfowl habitat. The spirit of cooperation among scientists, managers, administrators, politicians, and the public, who all grasped the necessity to do "something" positive following the devastating droughts of the 1930's, is emphasized. Plaudits are given to the aura of international cooperation whereby a truly inter- and intracontinental resource was addressed for the benefit of all. The spirit of "can do" is apparent in all of the chapters. Dedicated persons spent their professional lives under often arduous circumstances far from home, and wrestled with the same difficulties for decades, but expressed no regrets and would do it all again. They truly and appropriately feel pride in the accomplishments of the era.

I read this book in two ways: first by skipping around to read those chapters of most personal interest, and then later page by page. The former course is to be recommended. Many of the authors were contemporaries, so some material is duplicated between chapters, making a straight-through reading somewhat tedious. Conversely, each essay is a complete vignette that can be read alone or with adjacent presentations. One must remember that this is a "selected" portrait of the events after the early 1930's. It is not a scientific account, nor even a strictly chronological rendition of facts. Not all of the persons one might expect to find prominently mentioned are necessarily either authors or subjects of discussion. Several distractions become quite aggravating upon close and sequential reading, namely an incredible 44 typographical errors (I undoubtedly missed some in my review) and at least 16 instances where text was missing, misplaced, or duplicated. Common and scientific names are standardized (only two variances from current usage were noted), however, and only one of the hundreds of figures had a misplaced caption. All but three of the photographs, most several decades old, were of good quality and clearly illustrated the adjacent text.

Overall, this book is impressive because of its historical scope. Rather than a compendium of facts, it is a record of viewpoints and feelings, and of how the dedication of a few established a foundation for those who followed. The authors and editors are to be commended for their perseverance in this 5-year undertaking and for their foresight in saving this portion of our heritage. It is recommended for perusal by the current generation of waterfowl workers who, in their own way, are yet "pioneers."—RONALD E. KIRBY.

OTHER ITEMS OF INTEREST

Voices of the Peruvian rainforest.—Theodore A. Parker, III. 1985. Ithaca, New York, Library of Natural Sounds, Cornell Laboratory of Ornithology. 1 cassette. No price given.—This cassette contains uniformly excellent recordings of 27 species of Amazonian birds (with another 12 species audible in the background). A number of other characteristic sounds of the Peruvian "rainforest," including two monkeys, the giant otter, the black caiman, and a frog chorus, are heard. The recordings are arranged in the order in which one might hear them during the day. The tape begins with vocalizations of the early dawn (including the remarkable call of the Great Potoo, *Nyctibius grandis*), proceeds with the varied songs of the morning chorus and midday doldrums, and ends with several nocturnal vocalizations. Parker clearly selected many vocalizations on the basis of their intrinsic interest. While I was listening to the tape in my office, a crowd gathered and responded appreciatively to the recordings of the howler monkey, Musician Wren (*Cyphorhinus arada*), Pale-winged Trumpeter (*Psophia leucoptera*), Red-throated Caracara (*Daptrius americanus*), Hoazin (*Opisthocomus hoazin*), Horned Screamer (*Anhima cornuta*), giant otter, and Common Potoo (*Nyctibius griseus*; recorded by the late Paul Schwartz). The tape also includes a few less spectacular, but equally characteristic, songs of antbirds, tapaculas, parrots, and nunbirds. Especially notable are long recordings of two accomplished mimics, the Yellow-rumped Cacique (*Cacicus cela*), which imitates harsh sounds like that of the giant otter, and Lawrence's Thrush (*Turdus lawrencii*), which does nearly perfect imitations of many forest birds. I also enjoyed hearing the fine recording of the Rufous-fronted Antthrush (*Formicarius rufifrons*), which Parker taped

the morning he "rediscovered" the species, previously known only from two specimens.

Most recordings were made in three sites in Amazonian Peru: one in northeastern Peru on the Rio Napo and two in southeastern Peru in the Manu National Park and the Tambopata Reserve. Parker used a Nagra tape recorder and a Sennheiser microphone, arguably the best equipment available. There is remarkably little background noise on most recordings, and little obvious sound distortion. Usually there are 5–10 vocalizations per species. The pauses between calls are often rather long, but are typical of delivery under natural conditions.

The result of this careful recording and engineering is an extremely enjoyable cassette that should whet the appetite of those who have not visited Amazonian Peru, and provide pleasant memories for those who have. I am looking forward to the day when the Library of Natural Sounds releases a recording of the other 1,500 or so species Parker has recorded in Peru.—SCOTT K. ROBINSON.

The travelling naturalists.—Clare Lloyd. 1985. Seattle, University of Washington Press. 156 pp., 21 color plates, 52 black-and-white illustrations, maps. ISBN 0-295-96304-2. Cloth, $19.95.—This book describes eight interesting and adventuresome "heros": six born in England and two in Ireland, seven men and one woman (Mary Kingsley). Clare Lloyd, who studied zoology at University College, London, and at Oxford University, provides well-written, diverting biographies, using well-chosen quotations, of each world traveller.

Some people more important to the history of science have been omitted. Almost totally neglected are the stories of the surgeon-naturalists who accompanied almost every European and American exploring expedition. In writing of the Franklin expeditions, I found it unusual that she chose Leopold McClintock, who admittedly took the first Ivory Gull eggs back to Europe, rather than John Richardson. The other six subjects are Charles Waterton, Henry Walter Bates, John Hanning Speke, Howard Saunders, Henry Seebohm, and William Spottswood Green.

Lloyd has not delved into history as thoroughly as one might expect, leading to blatant errors. William Swainson is described as an American ornithologist. Franklin did not go west of the MacKenzie on his first expedition. The Great Fish River is the Back, not the Black River, and Melville Sound is not Melville Bay. John Rae did not himself find the remains of 30 men from Crozier's party. McClintock did in 1850 find traces of Franklin's first wintering.

The maps, though specially prepared for the book, fail to show many localities mentioned in the text. I found six typographical errors and two errors in the bibliography.

This selective, semipopular account will be of interest, but only the account of Henry Seebohm will be of value to ornithologists.—C. STUART HOUSTON.

Common birds of Egypt.—B. Bruun. 1985. Armenian University in Cairo Press. (Available through Columbia University Press, New York.) 38 pp. ISBN 977-424-0626. Paper, $12.95.—Contains 14 plates (by S. Baha el Din) of 122 common species. Information in English and Arabic on status and selected field characteristics. The illustrations are small and fuzzy.—A.H.B.

Songs of eastern birds.—Donald J. Borror. New York, Dover Publications. 50-min cassette. ISBN 0-486-99912-2. $7.95. **Songs of western birds.**—Donald J. Borror. New York, Dover Publications. 50-min cassette. ISBN 0-486-99913-0. $7.95. **Common bird songs.**—Donald J. Borror. New York, Dover Publications. 50-min cassette. ISBN 0-486-99913-0. $7.95.—These are a reissue in cassette form of a record set originally released in 1967–1970. The clarity and quality of the recordings are excellent. Each cassette is accompanied by a booklet that includes a small black-and-white sketch of the bird, and a short word description and sound spectrogram of the song. The eastern tape is arranged by song complexity and the western tape by geographic locality. The selection of species and song tapes reflects careful choices by Borror.—A.H.B.

Species-checklist of the birds of New Guinea.—Bruce M. Beehler and Brian W. Finch. 1985. Moonee Ponds, Victoria, Royal Australasian Ornithologists Union. (Available from RAOU, 21 Gladstone Street, Moonee Ponds, Victoria 3039, Australia.) iii + 127 pp. ISBN 0-9599823-2-9. Australian $12.—The 708 species of New Guinea birds (59 more than on Mayr's [1941, "Birds of the South Pacific"] list) are treated. The list omits distributional data, which will appear in Beehler et al.'s "Birds of New Guinea" (1986, Princeton, New Jersey, Princeton Univ. Press), and consideration of subspecies. Species are arranged according to an updated phylogenetic sequence, and Peters' check-list sequence is used for passerine families. Every binominal has the original citation.

The book is printed clearly, with space for annotation. A nomenclatural index is slightly longer than the actual species list. This facilitates cross referencing. The material is technically accurate and contains only minor typographical errors. English names are given for all species, selection of which was probably the most difficult task involved. The book is valuable for ornithologists interested in New Guinea birds and Australasian biogeography.—A.H.B.

Indiana birds and their haunts.—Charles E. Keller, Shirley A. Keller, and Timothy C. Keller. 1986. Bloomington, Indiana University Press. xi + 206 pp., 14 maps. ISBN 0-253-20382-1, paper, $10.95; cloth, $22.50.—This is an updated guide to finding birds in Indiana. A checklist presented in accordance with the 1983 A.O.U. check-list is featured. The first edition was reviewed in 1981 (Auk 98: 438). In addition to detailed directions to birding locations, information on local accommodations is included.—A.H.B.

Loon magic.—Tom Klein. 1985. Ashland, Wisconsin, Paper Birch Press, Inc. xiii + 130 pp., photographs. ISBN 0-9613961-0-5. $39.95.—I am always leery about books that are presented as "not an ornithological textbook" and are about birds, or are "meant to be read, not studied." The first denigrates the book and implies that ornithologists are not interested, are an intolerant lot, or are to be excluded from simple enjoyments. The latter is an unimaginable attitude for any author. Klein has written a semipopular book on loons. He claims it is a book for "loon people."

Except for a few flowery passages, the book has something to say. No excuses are necessary for the content or presentation, nor is there any reason to be condescending toward the reader—ornithologist or not.

The text by Klein is reasonably astute. It is filled with interesting trivia and some wonderful comments. The latter includes an introduction to the feet of the Common Loon (*Gavia immer*), which are "enormous and seriously under-studied"! The book is a general natural history that emphasizes the Common Loon and includes appropriate comparative material on three other species of *Gavia*.

The text is superficial in spots, but broad in its coverage. There is a stimulating admixture of fact and folklore. There are numerous anecdotes, some unusual hypotheses, and gentlemanly citations of earlier writers that provide a curious kind of historical perspective. There are some problems with accuracy and others with interpretations of questionable information. The book includes an excellent discussion of breeding status coupled with discussions of environmental change. The environment is addressed again in the final section, which documents the influence, mostly negative, of humans on loons. The recent winter die-off in Florida, which appears to be related to mercury, is mentioned.

The chapters are divided into three major groups: "Looking for loons," "Loons through the seasons," and "Looking ahead." The text is interspersed with numerous photographs that range from poor to spectacular. A final section, "Sources," includes a selected bibliography, loon organizations, and an unusual index. Interpretations of behavior are cautious, and Klein avoids the pitfall of anthropomorphism. The frequent counterexamples to common aphorisms are welcome and add to the presentation. Klein is scrupulous in his presentation of alternative explanations and indicates often where inadequate information exists. The result is a lively narrative, colorful, even saccharine in places, and yet one that satisfies the reader's curiosity. There are a few too many puns and unsuccessful attempts at humor. Nevertheless, there is some good reading here.—A.H.B.