

ORNITHOLOGICAL LITERATURE

AVIAN BIOLOGY, VOL. 4. By Donald S. Farner and James R. King (eds.). Academic Press, New York and London, 1974: xxii + 504 pp., many charts, graphs, drawings, and black and white photographs. \$37.00.—Chapter 1, by Terence Bennett, deals with the peripheral and autonomic nervous systems. There is a brief review of the 12 cranial nerves (n. terminalis is absent in birds) giving their nuclei in the brain and their disposition, and a brief discussion of spinal nerves. Somatic afferent innervation is discussed with particular attention to muscle spindles, tendon organs, sensory capsules, and cutaneous receptors. Visceral afferent innervation is considered in terms of respiratory, cardiovascular, and gastrointestinal systems. The somatic efferent, somatic afferent, and visceral afferent innervation are considered together under the heading "peripheral nervous system", although the p.n.s. was earlier defined from a purely structural standpoint as comprising essentially the cranial and spinal nerves. There is thus some confusion between a strictly structural division of the nervous system (central and peripheral sections) and a functional division (somatic afferent, somatic efferent, visceral afferent, and visceral efferent), but this is apparently followed for convenience in writing, as the largest part of the chapter is devoted to the visceral efferent (autonomic) system. This is perhaps one reason why Bennett follows Campbell's definition of the autonomic system as those efferent pathways with peripheral ganglionic synapses. Caution is advised against assuming simple correlations between types of transmitter substances and sympathetic or parasympathetic systems. The distinctions between these systems are not always clear in birds, and the terms are avoided in this chapter. The bulk of this section is devoted to detailed descriptions of the autonomic ganglia, followed by reviews of the innervation to the cardiovascular, respiratory, digestive, excretory, genital, endocrine, and integumentary systems, and the eye. Under each system the component organs are discussed individually.

This chapter is largely an extensive literature review, and points up many areas where precise information is lacking. It also shows that most information on the avian nervous system is still based on the domestic chicken. Bennett has written an exhaustive literature review, giving more than 30 pages of references, but only one illustration. A remarkable amount of information is summarized here, but there is little attempt at a general synthesis.

In Chapter 2 M. Menaker and A. Oksche discuss the avian pineal organ. Several distinct structural types are recognized in different birds, but most of the work has been limited to a few species. Detailed accounts are given of pineal cell types, nervous apparatus, secretory apparatus, and vasculature. With respect to function, much experimental evidence is reviewed and found to be contradictory. This is attributed to a lack of experimental controls resulting from a failure to appreciate the complexity of the problem. The pineal appears to be involved in integrating photoreception, circadian rhythmicity, and long-term control of the reproductive cycle. Much of the problem may arise from the fact that a good deal of the experimental work has been done on the chicken, in which artificial selection has modified or eliminated the normal environmental control of reproduction. An understanding of the general function of the avian pineal has not yet been achieved.

In Chapter 3 Walter J. Bock discusses the avian skeletomuscular system. The 2 systems are considered together because of their close functional relationship. In

A. J. Marshall's *Biology and Comparative Physiology of Birds*, to which *Avian Biology* is a successor, separate chapters were devoted to these systems; Bock feels that a similar review is undesirable now because little new material has appeared since that work was published. Instead he devotes this chapter to "an inquiry into the foundations, methodology, and goals of evolutionary morphology as exemplified by the avian skeletomuscular system." He points out that despite the great volume of literature on descriptive morphology, much is not applicable to current problems because of inadequate detail. He urges that current workers not merely describe structure for its own sake, but base all descriptive studies on specific questions in avian biology. Nomenclatural problems are discussed, and Bock refers to the hoped-for establishment of a standardized nomenclature of avian anatomy by the International Committee on Avian Anatomical Nomenclature.

The functional morphology of the skeletomuscular system is considered at great length. Bock feels that most work to this time is inadequate because of poor understanding of the complexities of the system, especially the muscles. The biomechanics of the skeleton are analyzed with examples from Bock's own work, particularly on the skull. The physiology of muscle is treated in detail, and the point is made that so many aspects of muscle function are not apparent from gross examination, that simple description and measurement (e.g. of muscle mass as a measure of strength) do not permit a valid examination of the functional capabilities of the system. Bock discusses the kind of approach necessary to give a meaningful functional analysis of the skeletomuscular system. This includes the use of the engineering technique of free-body diagrams and the analysis of torques as well as linear forces. This method of analyzing the function of the skeleton should be studied by all workers planning such investigations. The analysis of muscle function is a more difficult problem. So many factors of muscle activity can only be determined by physiological experiments that a useful analysis would appear possible only when using a few species that can be studied experimentally. For instance the student who wishes to analyze evolutionary adaptations in a large group of birds for which only preserved specimens are available will be unable to attack most of these problems. We may then ask whether it is better to do what is possible with the material available or to abandon such studies altogether. I would favor the former approach, but some readers may find Bock's arguments discouraging.

In the section on comparative morphology and systematics Bock defines homologous features as those that "can be traced back phylogenetically to the same feature... in the immediate common ancestor..." Although this definition includes no methods of accomplishing this tracing, the use of the phrase "can be traced back" is unfortunate. If taken literally it would make the concept of homology almost useless in practice, because there is no way to trace back features to a common ancestor with certainty; there are only various methods of inferring this relationship. In a formal theoretical definition it might be better to replace the phrase "can be traced back phylogenetically to..." with something like "have evolved from". This, however, might lead to circular reasoning in which homology and phylogeny are defined in terms of each other, a problem which Bock discusses and tries to avoid.

In Chapter 4 William A. Calder and James R. King review the thermal and caloric relations of birds. They discuss the physics of heat exchange and relate the theoretical model to the complex problems of a living bird in a variable environment. Much early physiological work was done with captive birds in controlled laboratory conditions, which are much simpler than the situation in nature. Nevertheless, the authors con-

clude that these studies form a reliable basis for analyzing the natural situation. The physiological responses to heat and cold are discussed at length, as is hypothermia. One important point that is brought out in this review is that birds are much more variable in their physiological responses to thermal stress than is generally appreciated, particularly in their ability to conserve energy by reducing metabolic activity under cold conditions.

Chapter 5, by M. Berger and J. S. Hart, deals with the physiology and energetics of flight. It opens with the old question of whether respiratory movements are coordinated with wing-beats. Recent work shows that they are coordinated in varying patterns, usually with several wing-beats to each respiratory movement. There are distinct patterns of coordination in different phases of flight, and in birds with different wing-loadings.

Respiratory rate increases during flight, but oxygen extraction decreases, showing that ventilation increases more rapidly than metabolic need requires. Fat is the main energy source in flight. Oxygen consumption is greatest during ascending flight, least during descent. Variations related to body size are discussed. A review of circulatory adaptations emphasizes heart rate and heart size relative to body weight in birds as compared to mammals. Other subjects considered include temperature regulation, water loss, and energy turnover during migration. The general approach is quantitative, and data from the literature are summarized in extensive tables.

The book ends with author, subject, and bird name indices. This volume, like others in the series, is marked by a high level of both scholarship and price.—ROBERT J. RAIKOW.

A FIELD GUIDE TO MEXICAN BIRDS. FIELD MARKS OF ALL SPECIES FOUND IN MEXICO, GUATEMALA, BELIZE (BRITISH HONDURAS), EL SALVADOR. By Roger Tory Peterson and Edward L. Chalif. Houghton Mifflin Co., Boston, 1973:xxii + 298 pp., 48 color plates, end-papers (maps). \$8.95.—Peterson's long-awaited field guide to Mexican birds now exists as worn field copies, and we may try to assess it (and its predecessors) as contributions to ornithology and field identification. The full title makes one wonder whether even R. T. Peterson could cover this large, complex region and maintain his usual standards. Alas, he did not.

What the Peterson-Chalif guide (hereafter P&C) gives us is an erratic text and good plates of adults of strictly Mexican birds, i.e. species not, or only locally found in the U.S., supplemented by U.S. species in some problem genera. In the 48 crowded plates the general standards are high, but we found minor inaccuracies in bill shapes, colors, and patterns too numerous to list here.

One trouble is that omission of most northern birds from the plates makes P&C, like its predecessors, only a partially illustrated guide. Anyone wishing plates of all Mexican species must carry at least one additional guide. Confusing young of such birds as the Hepatic Tanager and Brown-headed Cowbird are not included. Further, major variations in a number of species are also omitted; for example, no female quail is illustrated. Field guides, too, need their "taxonomic editor" if produced by those unfamiliar with an area and its birds. Most unfortunate is the absence from the list of those who aided P&C, of all of the few bird students ever resident in Mexico and most of the more active recent visitors.

The text is rather disappointing. The authors treat 1038 species in only 260 pages, as compared to 606 pages in the still pocket-sized "Birds of Mexico" by Blake (1953). Families appear in the familiar Wetmore-A.O.U. order, and each is introduced by a brief but helpful paragraph with range, general characteristics, habits, and food. The number of species is given for the world and for Mexico.

Species then follow in the general Hellmayr-Blake order, with *Attila* still in the Cotingidae, the Coerebidae maintained, etc. Curiously, the Bald Eagle appears between the kites and harriers, which are followed by *Accipiter*, with *Leucopternis* stuck in the middle. One wonders why P&C include such marginal species as *Puffinus nativitatis*, *Pterodroma phaeopygia*, Hawaiian Duck, and others, yet omit Thayer's Gull and Arctic Tern, which must surely occur regularly in Mexico.

Strictly Mexican species are treated in the usual Peterson style, under *Field marks*, *Similar species*, *Voice*, *Range* (general and in Mexico), and *Habitat*. Occasionally a *Note* section is added for some confusing aspect. A brief *Memo*, with one or 2 identifying clues, replaces *Field marks*, *Voice*, and usually *Habitat* for most species shared with the U.S. *Memo* descriptions are usually of breeding plumages (of northern subspecies) which may or may not be seen in the tropics. For example, the Western Bluebird is said to have a "Rusty patch on back (usually)", the Eastern Bluebird a "Blue back"; but one Mexican race of Western is blue-backed, while southern Easterns usually have some red on the back. The *Memos* are particularly inadequate for ducks (especially the mallard group), terns, and female blackbirds.

On the other hand, a few genera have been brought up to date, following the findings of studies on *Ortalis* (Vaurie), *Otus* (Marshall), *Myiarchus* (Lanyon), and *Hylochilus* (Crossin & Ely). Some accounts commendably present alternate viewpoints of differing authors, and not infrequently alternate common (English) names are given.

Names follow the Blake-Eisenmann choices in nearly all cases; thus the familiar Mearns, or Fool Quail now becomes "Montezuma (Harlequin) Quail". The Scarlet-headed Oriole (*Icterus pustulatus*) of the A.O.U. checklist appears in P&C as "Streak-backed Oriole, *Icterus sclateri*", with a "Note: Birds north of Isthmus of Tehuantepec are sometimes treated as a separate species, Flame-headed Oriole, *Icterus pustulatus*." Unless a birder pays unusual heed to scientific names, he will surely be fooled here. (Incidentally, the P&C combination is impossible; *pustulatus* has priority.) However, while many birds are no more "scarlet-headed" than "Purple Finches" are purple, these latter-day changes gloss over the fact that others are not streaked-backed (*I. p. graysoni*), some birds of the adjacent Mexican mainland, and *contra* P&C, females and young of the northern form (*I. p. microstictus*)! Use of changed names results in an occasional *lapsus* like "Bushy-crested Jay of Chiapas" (p. 167) sending even experts scurrying to the index.

On the other hand, P&C are to be commended for maintaining the common names Pygmy-Owl and Screech-Owl for the genera *Glaucidium* and *Otus* (except, curiously, *O. flammeolus*)—even though *Otus* does not "screech". Names are handles, useful as long as their application is widely known, and we need names for genera with closely similar species. The Latin names must now serve the purpose since each recent book (including the A.O.U. checklist and P&C) has its own set of English names! If this forces birders to pay a little attention to scientific names, so much the better!

Voice usually describes the primary song, and is successful on the whole, considering the difficulty of verbal description. It is omitted for most U.S. species,

except for some best told by voice (e.g. flycatchers). The person who provided the voice description is often identified. One might wish better coverage of the more usual call or location notes, but these are very hard to describe verbally. Occasionally some salient point is omitted, as for example the ear-splitting volume of the song of *Saltator atriceps*, or the strident quality of the Thick-billed Kingbird. On the whole, however, these are the best vocal descriptions of Mexican birds available.

Habitat is a real help. Altitudes are given sparingly, and not always accurately, particularly in the lower limits.

Ranges in Mexico are disappointing, particularly in view of the claim (p. ix) "we have researched every pertinent published source, including a large number of papers and notes in the ornithological journals, especially *The Auk*, *The Condor*, and *The Wilson Bulletin*. All important regional publications south to Panama were also consulted." In high hopes, therefore, we open the text, only to lay it down dismayed. Apparently the *only* foreign publication consulted was Alvarez del Toro's Chiapas list, and even this is not fully digested; the Varied Bunting is credited to "Pacific slope of Chiapas", whereas it actually inhabits only the arid interior, on the Caribbean slope; while the extremely localized *Tangara cabanisi* of the Sierra Madre (Pacific slope) warrants only "mts of Chiapas". Obviously, neither Mexican nor British journals nor the Zoological Record were consulted. Failure to cover foreign literature leads to complete omission of one species, *Sporophila (schistacea?)* Berlioz.

P&C's bibliography lists all bird-finding guides and U.S. field guides. Their distributions do not always agree with each other or with P&C's, which is not necessarily bad; we prefer *not* to find P&C repeating Alden's Sinaloa Green Jays or Davis's Chiapas nuthatches, and regret their inclusion of Alden's Nayarit Baltimore Orioles. Completely ignored are Wetmore, Peters, Hellmayr & Conover, and publications (other than Peterson's guide) from the much-better known U.S. border states. More technical works, even major U.S. journals, are poorly covered; and most museum publications are omitted.

Despite abundant inaccuracies in the text, the plates do make P&C indispensable. All other published illustrations are either outclassed or are in such specialized publications as to be hardly worth lugging along, since the birder is already loaded down with at least 2 books.

With the publication of this milestone, it is an opportune time to reassess the guide-type books available on Mexican and northern Central American birds. Chronologically, the others are: 1953, E. R. Blake, "Birds of Mexico" (Univ. Chicago Press); 1955, E. P. Edwards, "Finding Birds in Mexico" (E. P. Edwards, rev. 2nd. ed., 1968); 1966, F. B. Smithe, "The Birds of Tikal" (Natural History Press); 1968, P. Alden, "Finding the Birds in Western Mexico" (Univ. Arizona Press); 1970, H. C. Land, "Birds of Guatemala" (Livingston Publ. Co.); 1972, E. P. Edwards, "A Field Guide to the Birds of Mexico" (E. P. Edwards); and L. I. Davis, "A Field Guide to the Birds of Mexico and Central America (Univ. Texas Press). There is also the large format "Las Aves de Chiapas", by M. Alvarez del Toro, 1971 (publ. by the Chiapas State Government) with colored plates of many species of southern Mexico.

Of the general works, Davis's does not merit serious discussion; its only real merit, the plates, have now been largely supplanted by P&C. Alden provides locally useful maps and some superior plates, but deplorable inaccuracy in bird identifications.

Of the more useful books, Smithe's fine Tikal guide has now been supplanted, to a

great extent, by Land's major contribution, with its excellent introduction and coverage of all Guatemala—except for Smithe's better-than-average voice descriptions. Still, it remains useful in and near the Peten as would Alvarez's in Chiapas were it available. Edwards' "finding" guide, though out-dated due to rapid changes in habitats, is probably essential for a person first exploring Mexico. His field guide is an excellent supplement to P&C, providing descriptions and additional (often better) information on ranges, altitudes, habitat, and behavior.

And lastly, that most under-rated contribution "Birds of Mexico", (Blake 1953) has been invaluable to field ornithologists. The shortcomings of all recent books on Mexico show that it was over criticized by all of us at the time. Its information, though often imperfect, has stimulated or even permitted the flowering of Mexican Ornithology (as far as this has yet occurred). It is still a must for an ornithologist working in Mexico today. A special Quetzalcoatl Award for pioneer Middle American field guide writing to Bob Blake!—ROBERT W. DICKERMAN AND ALLAN R. PHILLIPS.

BIRD GUIDE OF THAILAND, 2nd (revised) edition. By Boonsong Lekagul and Edward W. Cronin, Jr. Kurusapa Ladprao Press, Bangkok, 1974: 325 pp., 112 color plates. No price given. Order from Association for the Conservation of Wildlife, 4, Old Custom House Lane, Bangrak, Bangkok, Thailand.—This field guide to the birds of Thailand is similar in size and format to the Peterson series. The color plates by the senior author are scattered throughout the book so that illustrations are usually on the page facing the description or an adjacent page. For each of nearly 850 species there is a brief description emphasizing field characters, and beside each description is a small outline map of Thailand showing the known distribution. The authors warn, however, that the distributions of birds in Thailand are very incompletely known, and that amateur ornithologists can make a valuable contribution by adding to this information. The book ends with a bibliography, glossary, list of subspecies, list of synonyms, indices to scientific, English, and Thai names, and a list of names changed since the first edition. It is well constructed and clearly printed, and would seem to be an indispensable aid to birding in Thailand.—R. J. RAIKOW.

BIRDS OF NEW JERSEY: THEIR HABITS AND HABITATS. By Charles Leck. Rutgers University Press, New Brunswick, N.J., 1975: 190pp. \$12.50.—This small book is intended to serve as a guide to birding areas in New Jersey. The title, which suggests a state bird book, is thus misleading. Two-thirds of the book is devoted to the description and location of various bird habitats, and the rest contains records of New Jersey birds, including an annotated checklist. There are a few black-and-white photographs of birds, which are superfluous because the book is meant to supplement field guides and not to replace them, and some more relevant photos of habitats as well as a few maps. The price is steep, but the book should prove useful to those unfamiliar with birding in New Jersey.—R. J. RAIKOW.

A CHECK-LIST OF OKLAHOMA BIRDS. By George M. Sutton. University of Oklahoma, Norman: 48 pp. \$1.00. Order from The Stovall Museum, Univ. Oklahoma, Norman 73609.—This is a supplement to the author's book "Oklahoma Birds" (1967) and incorporates changes in nomenclature made in the 32nd Supplement to the A.O.U. Checklist of North American Birds. Entries for 394 species include dates and counties of past observations. A handy companion to a field guide.—R.J.R.

BIRDS OF THE WORLD ON STAMPS. By Willard F. Stanley, Beverly S. Ridgely, and Gustavs E. Eglajs. Handbook No. 82, American Topical Association, Milwaukee, 1974: 102 pp., black-and-white photos. Paper cover. \$6.00.—Order from American Topical Association, 3308 North 50th St., Milwaukee, WI 53216.

LANDSCAPING FOR BIRDS. By Shirley A. Briggs (ed.). Audubon Naturalist Society of the Central Atlantic States, Inc., Washington D.C., 1973: 62 pp., many drawings. Paper cover. \$2.00.—Order from the publisher at 8940 Jones Mill Rd., Washington DC 20015.

THE BIRDS OF CALIFORNIA. By Arnold Small. Winchester Press, N.Y., 1974: xxiv + 310 pp., 378 black-and-white photographs. \$12.50.—This book includes the first complete annotated list of the birds of California since Grinnell and Miller's *The Distribution of the Birds of California* (Pacific Coast Avifauna No. 27, 1944), and if only for that reason should find a place in the library of anyone interested in the avifauna of the state. As the author indicates, however, "this book does not purport to revise or supplant that essential work, as its emphasis and thrust are different." Instead, it is designed to "serve as an introduction to the hobby and sport of bird study as well as provide a comprehensive overview of the spatial and temporal [and ecological] distribution of the birds of California." I suspect that it was also meant to showcase his excellent photographic efforts. Despite its shortcomings, the book achieves these goals.

The first section (15 p) is an unannotated "Checklist of the Birds of California." Chapter 1 (18 p), "California and Its Bird Life," is a broad survey of climate, bird distribution and the 11 land regions. Chapters 2-4 include, respectively, an excellent discussion of amateur bird study (11 p), an "Annotated List of the Birds of California" (106 p), and a detailed treatment of "California's Habitats for Birds" (164 p). The index, to bird names only, is quite complete.

The checklist, with checkboxes for tallying one's state list, contains the common and scientific names of the orders, families, and 518 species of birds recorded in California from 1900 to 1973. Rarities based on specimens or photographs are so indicated; reliable sight records are accepted. Subspecies are not treated except where former species have been lumped recently.

Having eagerly awaited the publication of this book, I must confess to more than a twinge of disappointment that the species accounts in the annotated list are so brief, averaging only about 5½ lines each. Only in the case of extreme rarities, for which all records are given, are the accounts complete. The author, however, had no intention of producing a monograph, so the prospective buyer should not expect one.

The warning that the annotated list "includes the *seasonal status* of most of the population of each species and takes no notice of extremes in date or range within California" (p 34) might well have been printed in bold-face type, for the unwary reader can be lulled into a false sense of security by the detailed factual treatment afforded some species and thus come to expect it for all. He should have been warned even more strongly not to attempt inferences from the absence of information. While not a fault in itself, the omission of data becomes tantamount to error when the presented information states or implies the contrary. Far too often, such is the case in this book.

Most species accounts are divided into seasonal status, habitat, and range in California. The habitat sections are generally complete, though they do not always stress preferred habitat. Examples of important omissions are the Pectoral Sandpiper's virtual restriction to fresh or slightly brackish waters and the Rufous-crowned Sparrow's preference for rocky areas. The Horned Grebe is not "confined exclusively to salt water."

Range in California, described on the basis of political divisions and major land forms, is necessarily brief, often being restricted to the phrase "length of state." Many of these summaries appear to be based on Grinnell and Miller (op. cit.). Notable omissions, where the opposite is stated or implied, include the following: the Manx Shearwater is far less common and regular in the northern half of the state; along the northern coast the Swainson's Hawk is very rare in migration and does not breed north of Monterey Co.; the Least Tern does not just "wander north to San Francisco Bay" but breeds there; the Spotted Owl occurs regularly in the mountains near Monterey, and its Muir Woods population is no more "isolated" than many others in the state.

The habitat and range sections are reasonably well done. The summaries of seasonal status, however, are another matter. Although the author has considered the proper 3 status categories—occurrence, abundance, and frequency—his terms are in some cases ill-conceived, poorly defined, and are not applied consistently.

For example, abundance terminology is confined to common, uncommon, and rare. The absence of additional categories has resulted in such anomalies as the very common Mallard and fairly common Red-breasted Merganser both being termed "common"; and perhaps has caused the reversal in terminology between the "rare" Rock Sandpiper and "uncommon" Solitary Sandpiper. "Abundant" is applied to the Sooty Shearwater and "very rare" to the Peregrine Falcon, but neither term is defined. Most importantly, *many* species accounts completely lack abundance terms! As a result, the birder cannot, for instance, determine his chances of picking a Royal Tern out of a flock of Elegants (or could it be vice versa?); the conservationist cannot learn that the once rare Snowy Egret has made a comeback and should now be considered fairly common; and the ornithologist can only guess at the current abundance of the rapidly-colonizing Cattle Egret.

Confined to such a limited format, the author probably should not have attempted to distinguish between "pure transients" (species that "migrate through the state" but "do not breed") and "complex transients" (species in which some individuals migrate through while others winter or breed). In any event, the attempt has failed, partly because the definition (p 35) of pure transient does not exclude wintering birds, but mostly because of incomplete application. The Spotted Sandpiper and Ruby-crowned Kinglet are used as examples of complex transients (p 19) but are not so termed in the annotated list. Additional species surely fall into this category (e.g. Sharp-shinned Hawk) but are not so listed; while other forms (e.g. Western Red-tailed Hawk) are so defined but not so designated. Use of the term "transient" for many of the vagrant eastern warblers is novel but not acceptable. A transient is a bird that migrates through an area between

its regular breeding grounds and regular wintering grounds and is at all times within its normal range. To defend a transient status for such vagrant warbler species as Blackburnian and Black-throated Blue, and especially the southeastern-ranging Prairie and Hooded, would be difficult indeed.

"Perennial visitor," said to be restricted to "sea birds" but applied to the Willet, should have been used, if at all, for a number of other birds (e.g. Common Loon and Black-bellied Plover), but perhaps not for the Wandering Tattler, one of the rarest summer visitors.

Although the writing style is direct and readable, it frequently suffers from a weakness in organization that results in disconcerting and space-consuming repetition. One example must suffice. The statement on p 300 that "Western Gulls of the 'Yellow-legged' race from the Gulf of California regularly visit the Salton Sea in small numbers after their breeding season in Mexico is completed by August" is repeated almost verbatim on p 301.

Typographical errors are scarce except in scientific names; a cursory inspection revealed discrepancies involving 20 species. For 9 species the errors are repeated or compounded in the checklist, annotated list, and index (*Miniotitla*, *Mniotitla*, and *Minotitla* for the Black-and-white Warbler) and thus would not seem to be merely typographical in origin. The entire species account for the Cassin's Sparrow has been repeated under Field Sparrow. The only record of the latter is of a single bird that remained on Southeast Farallon Island from 17 June to 9 July 1969. Contradictions are more common—too much so for such a scholarly work. The Laysan Albatross, for example, is said to be most numerous off the California coast during "summer and fall" (p 144) and (correctly) "October through March" (p 38). The Cattle Egret is said (p 297) to have first nested in California in 1971; the species account gives the proper year, 1970.

The 341 closeup photographs of birds illustrate 304 species and all 65 California families. In such a profusely illustrated book I was amazed to find only one caption error—the Red-breasted Merganser (p 55) is not a female. Many of the 37 habitat photographs were so carefully executed that I had to look carefully to be sure they were not of museum dioramas! Although many of the bird photographs are quite small, the bird images are large enough that size detracts only in relation to "what might have been." The appreciable amount of blank space adjacent to the photos is attractive and adds a certain degree of sumptuousness, but I wonder if a tighter design might have produced financial savings that could have been used for higher quality reproduction. Despite these drawbacks, the photographs are pleasurable to view and are especially so because most were taken away from nests; Mr. Small must be an accomplished stalker.

The discussion of avian habitats (Chapter 4), by virtue of its completeness, is the most useful, interesting, and novel section of the book. Each of the 25 or so bird habitats is clearly described in relation to the dominant vegetation, physiography, geographic limits, climate, avian components, and effects of man. The mention of many specific birding localities makes this section a general but helpful bird-finding guide.

Because many species have been added to the state list since 1944, this book becomes the most complete and convenient source of information on rarities. The accounts of the commoner species are too brief and inaccurate for the ornithologist or ardent birder but will be of interest to others. Beginning birders or those unfamiliar with the state will find the discussions of birding and habitats very enlightening. But those who hoped for a thorough and up-to-date monograph of bird distribution in California will have to wait.—LAURENCE C. BINFORD.

THE OWLS OF NORTH AMERICA. Paintings and drawings by Karl E. Karalus, text by Allan W. Eckert. Doubleday, Garden City, N.Y., 1973: 9 × 12½ in. (boxed), xxii + 279 pp., 59 col. pls., 54 drawings, 59 range maps. \$50.00.—Many behaviorally and/or morphologically distinct groups of birds have been immortalized by pen and brush. Although North American owls fit both categories, this is the first work addressed solely to them in which “all the species and subspecies . . . (are) . . . illustrated in color and fully described.” With the authors’ objectives thus stated, I will attempt to evaluate whether this work justifies their claim.

The overall design of this book is excellent. It is printed on high quality paper, color plates are vivid, binding and cover are sturdy, and the book has an attractive slipcase. The text is divided into 5 sections: introduction, natural history descriptions, comparison tables, glossary, and bibliography. The color plates are conveniently grouped in 4’s; each cluster usually separated by 15 pages of text. Most of the drawings are located adjacent to that portion of the text to which they relate.

The introduction explains the format used in species descriptions and the type of material handled under the various headings. Although short, the introduction is an admirable Methods section and will greatly aid those readers unfamiliar with such matters as wing length, molt, sexual dimorphism, and topography.

The main body of the text includes descriptions of each owl species and subspecies found north of Mexico. The section dealing with each species begins with the bird’s classification according to the A.O.U. sequence of order, family, subfamily (where relevant), genus, specific, and subspecific names. The natural history description for each species is based on the best known subspecies. All other subspecific descriptions present material “only insofar as they differ from the representative subspecies.” Each description is divided into sections giving scientific name and original description; other names; and distinguishing physical, ecological, and behavioral features; young and family life characteristics; distribution in North America; migration; and economic influence. Following the main text 15 comparison tables summarize the species size relative to all other species. The glossary defines some 150 terms, many of them related to owl topography. The text ends with a bibliography of about 280 titles, followed by an index.

The paintings by Mr. Karalus are impressive. Not only are they beautiful, but it is obvious Mr. Karalus has spent considerable time observing his subjects. Plates VI and VII show *Strix occidentalis* in a crouched position, which is characteristic of some owls, but not often noted by owl-watchers. Most owls tend to look cuddly, whereas a real-life *Glaucidium gnoma* appears sinister; Plates XLV and XLVI capture this inherent ferocity. Although most of the paintings accurately depict subspecific variation, this is sometimes difficult to perceive due to the variation in scale and body position illustrated in the plates. Two somewhat common artistic errors (or liberties) are present in a few plates. Beak size and the amount visible appears excessive. Also the artist has incorporated components from both dorsal and lateral aspects into paintings with a predominantly lateral orientation (*Surnia ulula*, Plate XLI). Such a position seems improbable, even for a neck-swivelling owl. The *Otus trichopsis* figured in Plates XXXIII and XXXIV appear ill; I have yet to see an *O. trichopsis* painting that is an accurate representation of this bird. The white of the feathers in my copy seems dull or tainted. This, I hope, is a publishing error and not a fault of the original plates. On the whole, this is the finest collection of North American owl paintings to be found in any one work.

The text is pretentious, imprecise, inaccurate, and unscientific. I will labor at some length to illustrate my point, because, due to the (apparent) scientific organization and comprehensive nature of this book, someone may mistake it as an authoritative treatise.

A list of some indicative errors follows. The American Ornithologists' Union is referred to as the "American Ornithological Union." "Owls have two fovea for simultaneous focus at objects near and far"; owls possess only one fovea and are unique in that it is temporally located, also fovea is not plural. There is a "comblike organ in the back of the eye which acutely sharpens perception"; there is presently no factual basis to support such a conclusion with regard to the pecten. In topography sketch #3 of the introduction one finds "cere (nostrils)"; the cere is the fleshy unfeathered skin at the base of the upper mandible. In the topography sketch #2 of the Introduction one also finds "culmen (upper mandible)"; the culmen is the mid-dorsal ridge of the upper mandible. Throughout the text specific names (e.g., *alba*, *asio*, *cunicularia*) are referred to as "species" names; proper taxonomy stipulates the species name is a binomial consisting of both genus and specific names. In the drawing of an *Otus asio* skeleton (p. 101) the labeling of the radius and ulna is reversed. The wings of *Speotyto cunicularia* "are long and narrow and certainly reminiscent of the wings of a sparrow hawk"; this most certainly is not a common attitude of *S. cunicularia* wings. As a final example, the glossary defines a species as "a group of subspecies (or a distinct single race) with like characteristics among one another, but dissimilar in certain characteristics to others of the same Genus"; need any comment be made!?

The failure of the authors to comprehend the biological meaning of species and subspecies has resulted in an inaccurate text which will greatly confuse the literature. This is well illustrated with regard to *O. trichopsis*. The text delineates 2 subspecies of *O. trichopsis*, "*O. t. trichopsis*" and "*O. t. asperus*." The *trichopsis* race is said to reside most commonly at an altitude of 5500-6500 feet, whereas "*asperus*" resides only within a few hundred feet of the 7000 foot zone. "*Asperus*" can be distinguished from *trichopsis* by its "darker gray" color and bolder "streaking of both back and breast." The distribution of both races illustrated and discussed on p 154-155 indicates they are almost totally sympatric.

J. T. Marshall, Jr. in his analysis of North and Middle American Screech Owls (Western Found. Vert. Zool. Monogr. No. 1, 1967) makes no mention of altitudinal segregation between the *trichopsis* and *asperus* races. He concludes that *trichopsis* is darker ("blackish") with broad, coarse crossbars and *trichopsis* and *asperus* are totally allopatric. The A.O.U. checklist (1957) recognizes only *O. t. trichopsis*. Thus there are a number of incongruities among this book, the A.O.U., and J. T. Marshall, Jr. The authors have misspelled *asperus* ("asperus"), reversed the distinguishing characters of darkness of color and width of feather bars and listed 2 allopatric races as sympatric, but altitudinally segregated. It is difficult to comprehend how things got so turned around when the authors were only reviewing existing data. The entire text is written with this belief that subspecies are discrete morphological units which can and do exist in sympatry.

In a more general vein, the text ignores much information readily available in the literature. Possibly the weakest section deals with *Micrathene whitneyi*. Under "young and family" Eckert professes "disappointingly little is known about the nest life of this dainty little owl." Of "courtship and mating" he concludes the data "are still largely wanting." The writer has neglected Ligon's comprehensive monograph "The Biology of the Elf Owl, *Micrathene whitneyi*" (Univ. Mich. Zool. Misc. Publ. 136, 1968). Many statements on "Ears and Hearing" are supported only by the author's observations on ear asymmetry and by *field experiments* such as breaking twigs and squealing. This methodology leads to conclusions such as hearing "is . . . more useful than vision" (*G. gnoma*),

"hearing is the primary means of prey location" (*O. trichopsis*), and "the auditory sense is acute . . . a great deal of prey is located through the rustling of grass" (*S. cunicularia*). Although most owls do have excellent sound perception, there is little justification for such pronouncements. The important work of Payne (Living Bird 1:151-159, 1962) concerning owl hearing is not cited. In the section on *S. cunicularia*, Eckert asserts that "there are numerous strong superstitions and many more erroneous beliefs in regard to the Burrowing Owl." Most of his discussion does nothing to refute the superstitions or correct the errors; rather it propagates many. The range maps of subspecies do not include the total species' range (unless representing a monotypic species). These maps would have been more informative if all the subspecific distributions of each species had been incorporated into a full page composite or, at least, if each subspecies distribution had been delineated within the species' range. As is, it is difficult to appreciate the geographic relationships among subspecies. It is also disappointing to note that the text rarely mentions any of the strigiform physiological data published within the past decade.

A major failing is the lack of in-text citations except for one footnote crediting someone else's work and one in-text reference to A. C. Bent. The authors' justification for this omission is to "keep the text itself reasonably free of material which is chiefly extraneous or incidental." In a comprehensive work such as this where most of the information has not been gathered first-hand by the author, citations are important and mandatory. Without them, the text has little credence. The lack of citations also reduces the usefulness of the bibliography.

The bibliography is a sorrowful mess! A foreword presents the disturbing news that "often certain books, papers, theses . . . provided only a single minor datum which was incorporated into this volume; to list these . . . would be virtually pointless." The bibliographic style is not a standard form i.e., "Baldwin, S. P. VARIATIONS IN BIRD WEIGHTS (with S. Charles Kendeigh), *The Auk*, Vol. 55, 1938, pp. 416-17." Under the K's one will find the same publication listed, but now Baldwin's name is in parentheses. At least 36 such cases of cross-referencing occur. Yet, in at least 8 other works of multiple authorship, one author has not been cross-referenced. A rather amusing set of errors is that J. David Ligon (approx. age 34) is credited with a 1926 publication by J. Stokley Ligon yet he (J.D.L.) is not cited for his own work on *M. whitneyi*. A more useful arrangement of the bibliography would have been to list each owl species and then cite contributing publications. There are other errors in this bibliography.

I could continue with comments about the lack of listing catalog numbers and museum locations for the owl specimens measured; that much information contained in some of the works cited in the bibliography is not incorporated into the text; that I suspect the bibliography was compiled by a company specializing in such matters. In short, many other ills could have been singled out for attention, but I hope my opinion is clear—regardless of price, this book *isn't* worth it. The paintings are superb and Karl E. Karalus does establish himself as an excellent wildlife artist; but the text by Allan W. Eckert is a poor imitation of A. C. Bent's "Life Histories of North American Birds of Prey, Part 2." If procured, this book can add only to one's coffee table.—DENNIS J. MARTIN.

THE BOOK OF OWLS. By Lewis Wayne Walker. Alfred A. Knopf, Inc., New York, 1974: xiii + 255 pp., 96 black-and-white photos, one figure. \$12.50.—Lewis Wayne Walker was a naturalist, ornithologist, conservationist (long before it was fashionable),

and inveterate owl watcher. His death in 1971 was untimely not only because the scientific and lay communities lost an excellent talent, but because his legacy to owl investigators, this book, apparently was not yet complete. The book consists of 14 chapters, each of the first 13 discussing one owl species. These chapters begin with a general natural history discussion, including anecdotes of Walker's experiences with the species, and end with brief accounts of the species' measurements, vocalizations, nesting and feeding habits, and activity pattern. The last chapter is a "potpourri of facts" which does much to dispel many misconceptions surrounding owls. Throughout the text Walker emphasizes benefits accruing to mankind from owls' dietary preference for rodents. His presentation supports the belief that rarely are species which man considers aesthetically or economically valuable eaten by owls. Although there is no bibliography many comprehensive works concerning owls are mentioned in the text.

I feel that if Walker had survived until the completion of this book it would have been, as the jacket proclaims, "an authoritative guide to all major species of North American Owls." As it is this work totally neglects the Barred, Whiskered, and Ferruginous owls. A discussion of the Barred Owl was excluded because of its close relationship to the Spotted Owl, which is discussed. Although these species are closely related, their natural histories are sufficiently distinct to warrant separate discussions.

Some confusion arises from the omission of scientific names from the text. The "Screech Owls" chapter appears to consider only *Otus asio*, but one lonely paragraph on *O. flammeolus* is injected near the end. The chapter "Horned Owls" causes pause to contemplate whether one is speaking of horned (eared) owls in general or, as is the case, the Great Horned Owl specifically. These minor problems are more of style than content. What is disturbing is that much of the text either has not been written by Walker (i.e., Pygmy, Spotted, and Great Gray owls) or nearly all the substantive material was gleaned from the works of others (i.e., Snowy and Hawk owls).

The book's photographic content and the vividness of its reproductions are unmatched. Although all the photographs are black-and-white, they do adequate justice to their subjects, which are usually seen at night as black and white figures anyway. Of particular interest for their content are the photos of the protective posture of the Screech Owl (p 24) and the female and young Burrowing Owls in their burrow (p 121 & 123). The beauty of the photos of the juvenile Barn Owl (p 8) and the Spotted Owl (p 128) are indicative of Walker's artistic excellence with a camera. Some apparent off-set toning problems occurred during the printing of my copy, resulting in black smudges on many text pages. Fortunately this problem did not affect the half-tones.

The strength of this book lies not only in its information content, but in the naturalist-man, Lewis Wayne Walker, and the mystique of the owls he loved. For those who wish to understand why birds so fascinate man, need to re-ignite their investigative fires, or simply want to learn more about owls, this book is a fine investment.—DENNIS J. MARTIN.

WHERE TO FIND BIRDS IN WESTERN PENNSYLVANIA. By David B. Freeland (ed.). Audubon Society of Western Pennsylvania, Pittsburgh, 1975: 61 pp., 25 maps. Paper cover. \$2.75. Order from Paul M. Wick, 24 Woodland Rd., Sewickley, PA 15143.—This useful guide contains detailed maps and instructions for finding birds in 23 areas of Western Pennsylvania. Each area is described by an experienced observer from the Audubon Society of Western Pennsylvania.—R.J.R.

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